Abstract Book of The 5th WFNS Spine Committee Biennial Conference in conjunction with
The 22nd Annual Scientific Meeting of Indonesian Neurosurgical Society (INS),
The 12th Asian Epilepsy Surgery Congress (AESC) and
The 2nd International Fujita Bantane Interim Meeting of Neurosurgery

“Meeting the Challenges, Facing the Future”
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Dear Friends,

It is our great pleasure to invite you to The 5th WFNS Spine Committee Biennial Conference of WFNS which will be held at Bali, Indonesia between October 25th - 27th, 2018.

WFNS scientific committees try to contribute to the education and progress of sub disciplines of neurosurgery. Spine surgery is getting a high interest and Spine Committee Symposia every two years are the largest activity of the committee. I am happy to invite you to Bali, Indonesia to endorse activities in this part of the world. This meeting will be in conjunction with the Annual Meeting of Indonesian Neurological Society, Asian Epilepsy Surgery Congress. On October 25, a one-day cadaver dissection course will be held in Surabaya.

The meeting aims to reach a large number of audience, thus contribute to the spine education in this area more effectively. There will be “intense”, and full of excellent lectures from prominent experts, results of implementation of new procedures, case discussions, debate sessions, video demonstrations, and workshops from industry.

The location of our congress is Bali island, one of the most beautiful and exotic place of the world. We really hope that it will endow us with many precious and long-lasting memories to cherish.

We look forward to seeing you in Bali in October 2018.

Co-chairman of the WFNS Spine Committee.

Mehmet Zileli  Michael G.Fehlings  Daniel J.Hoh
Dear colleagues and friends,

It is truly an honor for us to inform you that The 5th WFNS Spine Committee Biennial Conference will be held from October 25th to 27th, 2018 at Bali Nusa Dua Convention Center (BNICC), Nusa Dua, Bali, with the theme “Meeting Challenges, Facing the Future”. The conference will start with one full day cadaveric Spine workshop that covers various Spine Surgery procedures on October 25th 2018, held in Airlangga University, Surabaya and Spinal Pain and Brain Epiduroscopy Workshop, will be held on October 25th, 2018, at Department of Anatomy, Fac. of Medicine, Udayana University, Bali Indonesia.

The above conference will be held in conjunction with The 22nd Annual Scientific Meeting of Indonesian Neurosurgical Society (INS), The 12th Asian Epilepsy Surgery Congress (AESC) and The 5th WFNS Spine Committee Biennial Conference.

Throughout the conference days we will also held the medical exhibition that will show case the latest medical technology in neurosurgery.

Please kindly be inform that aside from Spine and Epilepsy we will also covers various topic in Neurosurgery. We will be very happy to accept your abstract(s), to be presented in oral presentation on October 25th 2018 at BNICC. Please submit your abstract(s) through the website www.wfns-ins-aesc.org or email to wfnsins@pharma-pro.com.

Winners of the Free Paper Competition will be announced during Closing Ceremony on October 27th 2018.

Bali, a truly unique, magnificent and one of the most beautiful place on earth is awaits you. With the easy access of free Visa on Arrival (VoA) for 169 countries and international airport (DPS) please also bring your family to enjoy Bali. Make sure you have blocked your agenda for this important meeting and check the congress website www.wfns-ins-aesc.org for further details, registration and accommodation booking.

Thank you for your kind attention and looking forward to meeting you soon in Bali...

Sri Maliawan          Abdul Hafid Bajamal
Chairman of Organizing Committee       President of Indonesian Neurosurgical Society (INS)

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Dear Colleagues and friends,

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 12th Asian Epilepsy Surgery Congress (AESC), taking place at the legendary Paradise Island of Bali, Indonesia, from the 26th to 27th of October 2018.

This annual meeting will be held in conjunction with several other scientific events especially the 22nd Annual Scientific Meeting of Indonesian Neurosurgical Society (INS), and the 5th WFNS spine Committee Biennial Conference.

The Asian Epilepsy Surgery Congress was initially established as a friendship meeting among neurosurgeons interested in epilepsy surgery in several Asian countries, but it has grown rapidly over the past few years with participants from around the globe. It is a quite unique scientific society offering a forum for both sharing the results of, and to further engender the best scientific advances related to the surgical treatment of Epilepsy.

We chose the Bali Nusa Dua Convention Center as the best spot in the Paradise Island of Bali, offering the participant to enjoy both the beautiful landscape of Bali’s nature and the legendary Balinese tradition.

We hope this Congress will meet your highest expectations in enhancing your knowledge, and at the same time offering a perfect opportunity to enjoy new and wonderful experiences in one of the world’s best resort of Bali.

Zainal Muttaqin
President of 12th Asian Epilepsy Surgery Congress
SCIENTIFIC SCHEDULE OF
WFNS SPINE COMMITTEE - INS - FUJITA BANTANE
## Day 1, Thursday, 25th October 2018

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<td>06.30</td>
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| 08.00 – 09.00 | Plenary Lecture 1  
Moderator: Scott C. Robertson (USA) & Abdul Hafid Bajamal (Indonesia)  
Room: NDH 3 |
| 08.00 – 08.15 | Spine Tuberculosis  
Djoko Riadi (Indonesia) |
| 08.15 – 08.30 | Percutaneous Endoscopic Spinal Surgery; Possibility and Limitation  
Yukoh Ohara (Japan) |
| 08.30 – 08.45 | Foreman Magnum Decompression for Type Arnold Chiari Malformation  
Sri Maliawan (Indonesia) |
| 08.45 – 09.00 | Laminoplasty Techniques for Cervical Myelopathy and Radiculopathy  
Junichi Mizuno (Japan) |
| 09.00 – 10.00 | Opening Ceremony                                                         |
| 09.00 – 09.10 | Patient Safety and Ethic  
Suteja – President of Indonesian Medicine Society branch Bali (Indonesia) |
| 10.00 – 10.30 | Opening Exhibition & Coffee Break – Exhibition Area                    |
| 10.30 – 11.30 | Plenary Lecture 2  
Moderator: Junichi Mizuno (Japan) & Sri Maliawan (Indonesia)  
Room: NDH 3 |
| 10.30 – 10.45 | Problems of Surgery in Geriatric Spine  
Mehmet Zileli (Turkey) |
| 10.45 – 11.00 | Spine Anatomy Differences At A Global Level; Do Our Patients have the same Spines, Spine Disease and Can We Generalize Spine Treatment  
Wilco C. Peul (Netherlands) |
| 11.00 – 11.15 | Anterior and Posterior Approach to Subaxial Cervical Spine  
Maurizio Fornari (Italy) |
### ABSTRACT

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<td>Posterior Decompression and Fusion for Spondylotic Myelopathy</td>
<td>Oscar L. Alves (Portugal)</td>
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### SS 1 – SPINE 1: CERVICAL DEGENERATIVE

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<td>Ibet Marie Y. Sih (Philippines)</td>
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<td>Long-Term Follow-up of Cervical Disc Herniation</td>
<td>George J. Dohrman (USA)</td>
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<td>Nobuyuki Shimokawa (Japan)</td>
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<td>Tethered Cord Injury: True or Flase</td>
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<td>ELAN4, A New Pioneer of Comfortable and Reliable in Neuro and Spine Surgery</td>
<td>Michael Mauch (Germany)</td>
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<td>New Management and Strategy of Cerebral Aneurysm by Feature in Japan</td>
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<td>Deepak Bhangale</td>
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<td>Manage Lumber Discogenic Pain by Disc FX</td>
<td>Alfred Sutrisno Sim</td>
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<td>Patology and Pathophysiology of Lumber Herniated Nucleus Pulposus on Minimally Invasive Surgery Approach</td>
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<td>Yoshihiro Kitahama (Japan)</td>
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<td>Sujoy K. Sanyal (India)</td>
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<td>Salman Y. Sharif (Pakistan)</td>
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<td>Fusao Ikawa (Japan)</td>
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<td>Save Radical Resection for High Grade Glioma, Where are We Now?</td>
<td>Irwan Barlian Immadoel Haq (Indonesia)</td>
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<td>Oscar L. Alves (Portugal)</td>
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<td>M. Balamurugan (India)</td>
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<td>16.20 – 16.30</td>
<td>Osteoplastic Procedures for Front temporal Craniotomy                                   Yasuhiro Sanada (Japan)</td>
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<td>Serum Levels of TNF-A, II-10 and TNF-A/II-10 Ratio on Traumatic Brain Injury in Wistar Rats Andi Asadul Islam (Indonesia)</td>
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<td>Primary Neurosurgical Life Support (PNLS): Effective Simulation Training for Neurosurgical Management Hisato Ikeda (Japan)</td>
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<td>Early Decompressive or Late Decompressive Craniotomy for Intracranial Bleeding with Severe GCS (A Proposed for Hospital with NeurotraumaSurgery Facility) Tedy Apriawan (Indonesia)</td>
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<td>TBA                                                                                      Hiroshi Okudera (Japan)</td>
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<td>Prognostic Value of Convergent Type of Haemorrhage Visualized by Susceptibility Weighted Image in Diffuse Brain Injury Kazuo Okuchi (Japan)</td>
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<td>17.20 – 17.30</td>
<td>Management of Neurosurgery Cases in Lombok Island Earthquake 2018                         Rohadi (Indonesia)</td>
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<td><strong>SS 10 –BRAIN 4: TECHNIQUE</strong> Moderator: Kazumi Ohmori (Japan) &amp; Arie Ibrahim (Indonesia) Room: NDH 2</td>
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<tr>
<td>16.20 – 16.30</td>
<td>Modern Surgical Management of Patients with Symptomatic Low Grade Gioma in Eloquent Areas Christiano B. Lumenta (Germany)</td>
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<td>16.30 – 16.40</td>
<td>Pitfall Anterior Transpetrosal (Kawase Approach) for Combine Midle and Posterior Fossa Lession Agung Budi Setiono (Indonesia)</td>
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<td>16.40 – 16.50</td>
<td>Strategy of Minimal Invasive Surgery in Spontaneous ICH                                   Arie Ibrahim (Indonesia)</td>
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<tr>
<td>16.50 – 17.00</td>
<td>A Technical Method of Extrudal Anterior Clinoidectomy. <del>Microanatomy and Actual Operative Procedures</del> Kazumi Ohmori (Japan)</td>
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<td>17.10 – 17.20</td>
<td>Micro vascular Decompression with Key Hole Craniotomy                                     Yasuhiro Sanada (Japan)</td>
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<td>19.00 – 22.00</td>
<td>Cultural Dinner Jepun Garden Bali Nusa Dua Convention Center (BNDCC)</td>
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<td><strong>Day 3, Saturday, 27th October 2018</strong></td>
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<td>06.30</td>
<td>Re-registration</td>
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<tr>
<td>08.00 – 09.00</td>
<td>Plenary Lecture 3 Moderator: Wilco C. Peul (Netherland) &amp; Eko Agus Subagio (Indonesia) Room: NDH 3</td>
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<td>08.00 – 08.15</td>
<td>Spinal Cord Tumor PS. Ramani (India)</td>
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<td>08.15 – 08.30</td>
<td>Learning Curve MIS Surgery                                                               Salman Y. Sharif (Pakistan)</td>
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<td>08.30 – 08.45</td>
<td>Development of Modern Experimental Spinal Cord Injury and the Importance of Biomechanics George J. Dohrman (USA)</td>
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<tr>
<td>08.45 – 09.00</td>
<td>Image-Guide Neurospine Surgery: Challenges and Solutions                                 Yoshihiro Takami (Japan)</td>
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<tr>
<td>09.00 – 10.00</td>
<td>Plenary Lecture 4 Moderator: Maurizio Fornari (Italy) &amp; Djoko Riadi (Indonesia) Room: NDH 3</td>
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<tr>
<td>09.00 – 09.15</td>
<td>Adjacent Cortico Cancellous Bone Grafts in Anterior Cervical Fusion Newer Concept         Jutty Parthiban (India)</td>
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<td>09.15 – 09.30</td>
<td>Anterior C1 C2 Fixation for Mobile AAD or Fracture Odontoid                               Sushil Patkar (India)</td>
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<td>09.30 – 09.45</td>
<td>Achieving a Better Mechanical Stability in Osteoporotic Spine</td>
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<td>Se-Hoon Kim (Republic of Korea)</td>
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<td>09.45 – 10.00</td>
<td>Minimally Invasive Management of Metastatic Spine Tumors</td>
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<td>Scott C. Robertson (USA)</td>
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<td>10.00 – 10.30</td>
<td>Coffee Break – Exhibition Area</td>
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<td>10.30 – 11.40</td>
<td>SS 11 – SPINE 6: TECHNIQUE</td>
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<td>Moderator: Sujoy K. Sanyal (India) &amp; Alfred Sutrisno Sim (Indonesia)</td>
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<td>10.30 – 10.40</td>
<td>Role of Spinal Navigation (O-arm) in Lumbar Fusion Procedures</td>
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<td>Kresimir Rotim (Croatia)</td>
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<td>10.40 – 10.50</td>
<td>Surgical Strategy for Spinal Infection and Osteoporosis, How I do It?</td>
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<td>Muhammad Faris (Croatia)</td>
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<td>10.50 – 11.00</td>
<td>MIS spinal fixation using O-arm</td>
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<td>Nobuyuki Shimokawa (Japan)</td>
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<td>11.00 – 11.10</td>
<td>Surgical Management for Thoracic Spinal Tuberculosis</td>
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<td>M. Sabri Ibrahim (Indonesia)</td>
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<td>11.10 – 11.20</td>
<td>Minimally Invasive Surgery of Spine Tumors</td>
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<td>Ibet Marie Y. Sih (Philippines)</td>
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<td>11.20 – 11.30</td>
<td>Transarticular Facet Screw Fixation of the Subaxial Cervical Spine: Advantages and Limitations</td>
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<td>Natarajan Muthukumar (India)</td>
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<td>11.30 – 11.40</td>
<td>Microscopic Decompression &amp; Instrumentation Technique in Spine Surgery</td>
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<td>Seong Soon (Republic of Korea)</td>
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<td>11.40 – 11.50</td>
<td>SS 12 – MISCELLANEOUS</td>
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<td>Moderator: Alberto Feletti (Italy) &amp; Endro Basuki (Indonesia)</td>
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<td>11.50 – 12.00</td>
<td>Patient Safety &amp; Ethics</td>
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<td>Endro Basuki (Indonesia)</td>
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<td>12.00 – 12.10</td>
<td>Lesson Learned from Indonesian Stock Exchange Spine Casualties: a Neurosurgeons Perspective</td>
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<td>Made Agus Mahendra Ingga (Indonesia)</td>
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<td>12.10 – 12.20</td>
<td>Primary Central Nervous System Lymphoma (PCNLS): 7 Years’ Experience in Single Institution</td>
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<td>Joni Wahyuhadi (Indonesia)</td>
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<td>12.20 – 12.30</td>
<td>Beyond the Pillars of Hercules: the Navigation of the Cerebral Aqueduct and the Fourth</td>
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<td>Ventricule to Manage Intraventricular Blood Clots and Arachnoid Cysts</td>
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<td>Alberto Feletti (Italy)</td>
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<td>11.10 – 11.20</td>
<td>Multisegmental Diffuse Intradural Extramedullary Spinal Tumor</td>
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<td>Tommy A. Nazwar (Indonesia)</td>
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<td>11.20 – 11.30</td>
<td>Mixed Pain Concept in Chronic Low Back Pain</td>
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<td>I Putu Eka Widyaadharma (Indonesia)</td>
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<td>11.30 – 11.40</td>
<td>Epidural Analgesia for Post Spine Surgery Pain Management</td>
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<td>Tjokorda Agung Senapathi (Indonesia)</td>
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<td>SS 13 – SPINE 7: TECHNIQUE</td>
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<td>Moderator: Keisuke Takai (Japan) &amp; Mohamad Saekhu (Indonesia)</td>
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<td>10.30 – 10.40</td>
<td>Low Back Pain and Sciatica, Surgical versus Nonsurgical Treatment!</td>
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<td>Wilco C. Peul (Netherlands)</td>
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<td>10.40 – 10.50</td>
<td>Microsurgical Treatment of Spinal Arteriovenous Fistulas and Malformation</td>
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<td>Keisuke Takai (Japan)</td>
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<td>10.50 – 11.00</td>
<td>Metastatic Spinal Cord Compression Tumor in Cipto Mangunkusumo General Hospital</td>
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<td>Mohamad Saekhu (Indonesia)</td>
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<td>11.00 – 11.10</td>
<td>100 Case Microdisectomy What I Learn?</td>
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<td>Subrady Leo (Indonesia)</td>
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<td>11.10 – 11.20</td>
<td>Anterior Cervical Approach</td>
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<td>Ridha Dharmajaya (Indonesia)</td>
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<td>11.20 – 11.30</td>
<td>Algorithm of Post Operative Spine Infection</td>
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<td>Erliano Sufarnap (Indonesia)</td>
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<td>11.30 – 11.40</td>
<td>Usefulness of Percutaneous Endoscopic Lumbar Discectomy</td>
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<td>Hiroto Kageyama (Japan)</td>
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<td>11.40 – 12.50</td>
<td>SS 14 – SPINE 8: TECHNIQUE</td>
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<td>Moderator: Kresimir Rotim (Croatia) &amp; Wawan Mulyawan (Indonesia)</td>
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<td>11.40 – 11.50</td>
<td>Intrudural Extraedullar Tumors- How I do It?</td>
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<td>Kresimir Rotim (Croatia)</td>
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<td>11.50 – 12.00</td>
<td>Intradiscal Decompression for Contained Lumbar Disc Herniation</td>
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<td>Wawan Mulyawan (Indonesia)</td>
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<td>12.00 – 12.10</td>
<td>Multiple Inherited Schwannomas, Meningiomas and Ependymomas: A Rare Case of</td>
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<td>Neurofibromatosis Type 2 Tumors</td>
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<td>Ahmad Faried (Indonesia)</td>
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<td>12.10 – 12.20</td>
<td>Evaluation and Emergency Treatment of the Newborn with Spina Bifida</td>
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<td>Dewa Putu Wisnu Wardhana (Indonesia)</td>
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| 12.20 – 12.30 | Cervical Spine Tumor Surgery  
Rully Hanafi Dahlan (Indonesia) |                                  |
| 12.30 – 12.40 | Surgical Treatment for Osteoporotic Vertebral Fracture in Geriatric Patients  
Takaoki Kimura (Japan) |                                  |
| 12.40 – 12.50 | Craniovertebral Fixation - a New Technique of Occipital Cervical Fixation  
Sushil Patkar (India) |                                  |
| 11.40 – 11.50 | SS 15 – FUNCTIONAL  
Moderator: Weiguo Zhao (China) & Agus Turchan (Indonesia)  
Room: NDH 1 |                                  |
| 11.40 – 12.00 | How to make MVD Safe & Efficacious - Personal Experience Gained Through 5120 Cases  
Weiguo Zhao (China) |                                  |
| 11.50 – 12.00 | Maximizing Decrease in Drug Dosage and Increase in ON time following Bilateral STN DBS Using Constant Current for Advanced Parkinsons Disease  
Sujoy K. Sanyal (India) |                                  |
| 12.00 – 12.10 | Radiofrequency Ablation for Chronic Knee Pain, Single Institute Experiences  
Agus Turchan (Indonesia) |                                  |
| 12.10 – 12.20 | Do's and Don'ts in Micro Vascular Decompression Surgery  
Akhmad Imron (Indonesia) |                                  |
| 12.20 – 12.30 | Stereotactic Surgery in Parkinson, Tremor and Dystonia  
Achmad Fahmi Ba'abud (Indonesia) |                                  |
| 12.30 – 12.40 | Secondary Trigeminal Neuralgia: Clinical Feature & Surgical Result  
Weiguo Zhao (China) |                                  |
| 12.40 – 12.50 | Starting Comprehensive Epilepsy in Surabaya Challenge, Opportunity and Strategy  
Heri Subianto (Indonesia) |                                  |
| 11.40 – 11.50 | SS 16 – BRAIN 5: VASCULAR 2  
Moderator : Shinichi Yoshimura (Japan) & Harsan (Indonesia)  
Room: NDH 2 |                                  |
| 11.40 – 12.00 | Minimally Invasive Strategies for Cerebral Aneurysm Surgery  
Yoko Kato (Japan) |                                  |
| 11.50 – 12.00 | Frontline of Endovascular Therapy for Cerebral Aneurysm  
Shinichi Yoshimura (Japan) |                                  |
| 12.00 – 12.10 | Strategy for Coiling of Wide-Necked Aneurysms and Fusiform Aneurysms  
Harsan (Indonesia) |                                  |
| 12.10 – 12.20 | Surgery for Cerebral AVM  
Yoko Kato (Japan) |                                  |
| 12.20 – 12.30 | Save Acute Stroke Patient by Endovascular Therapy  
Shinichi Yoshimura (Japan) |                                  |
| 12.30 – 12.40 | Acute Ischemic Stroke Management in Cipto Mangunkusumo National General Hospital  
Affan Priyambodo Permana (Indonesia) |                                  |
| 12.40 – 12.50 | Management of CCF In Fac. of Medicine Padjajaran Univeristy / Hasan Sadikin General Hospital  
Achmad Adam (Indonesia) |                                  |
| 12.00 – 12.10 | Strategy for Coiling of Wide-Necked Aneurysms and Fusiform Aneurysms  
Harsan (Indonesia) |                                  |
| 12.10 – 12.20 | Surgery for Cerebral AVM  
Yoko Kato (Japan) |                                  |
| 12.20 – 12.30 | Save Acute Stroke Patient by Endovascular Therapy  
Shinichi Yoshimura (Japan) |                                  |
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Affan Priyambodo Permana (Indonesia) |                                  |
| 12.40 – 12.50 | Management of CCF In Fac. of Medicine Padjajaran Univeristy / Hasan Sadikin General Hospital  
Achmad Adam (Indonesia) |                                  |
| 12.50 – 13.30 | Lunch Break – Exhibition Area  
WFNS Spine Meeting Uluwatu 3 |                                  |
Moderator: Kazutaka Uchida (Japan) & Nur Setiawan Suroto (Indonesia)  
Room: NDH 3 |                                  |
| 13.40 – 14.00 | Result of Early High Flow bypass & Trapping for Ruptured Blood Blister Like ICA Aneurysms  
Hiroki Kurita (Japan) |                                  |
| 13.50 – 14.00 | Table-Side Evaluation of C-Arm CT Perfusion Images Before and Just After Mechanical Thrombectomy Treatment for Acute Ischemic Stroke Patients  
Hiroshi Itokawa (Japan) |                                  |
| 14.00 – 14.10 | Dual Strategy Approach for Minimally Invasive Aneurysm Surgery  
Asra Al Fauzi (Indonesia) |                                  |
| 14.10 – 14.20 | Lessons Learnt from 200 AVM Surgery: Better Plans and Result  
Hiroki Kurita (Japan) |                                  |
| 14.20 – 14.30 | How to Manage Intracerebral Hematoma: Concept and Novel Method  
Motohiro Morioka (Japan) |                                  |
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<td>Discussion</td>
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<td>13.30 – 14.40</td>
<td>SS 18 – SPINE 9: MINIMAL INVASIVE</td>
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<td>Moderator: Sahat Edison Sitorus (Indonesia) &amp; Fadhil (Indonesia) Room: NDH 1</td>
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<td>SS 19 – SPINE 10: MINIMAL INVASIVE</td>
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<td>Moderator: Oscar L. Alves (Portugal) &amp; I Putu Eka Widyadharma (Indonesia) Room: NDH 2</td>
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<td>13.40 – 14.50</td>
<td>SS 20 – PEDIATRIC</td>
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<td>Moderator: Azmi Alias (Malaysia) &amp; Samsul Ashari (Indonesia) Room: NDH 3</td>
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<td>Discussion</td>
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<td>14.40 – 15.50</td>
<td>SS 21 – BRAIN &amp; PERIPHERAL NERVES: TRAUMA</td>
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<td>Moderator: Rahmat Andi Hartanto (Indonesia) &amp; Maximilian Christian Oley (Indonesia) Room: NDH 1</td>
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<td>14.40 – 14.50</td>
<td>Severe Extracranial Injuries Effect on Outcomes of Traumatic Brain Injuries</td>
<td>Kazuo Okuchi (Japan)</td>
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<td>14.40 – 14.50</td>
<td>The Hypothermia Therapy in Severe Traumatic Brain Injury: Impartial Perspective</td>
<td>Eko Prasetyo (Indonesia)</td>
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<td>14.50 – 15.00</td>
<td>The Role of Axonal Supercharging in Chronic Peripheral Nerve Injury</td>
<td>Ferry Senjaya (Indonesia)</td>
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<td>15.00 – 15.10</td>
<td>Management of Brachial Plexus Injury</td>
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<td>15.10 – 15.20</td>
<td>The Influence of Decompressive Craniectomy with Mesh on Periural Tissue of Wistar Mice with Traumatic Brain Injury</td>
<td>I Wayan Niruya (Indonesia)</td>
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<td>15.30 – 15.40</td>
<td>Penetrating Brain Injury Due to Gunshot Wounds by Low-Velocity Bullets as Air Rifle (Air Guns): A 7 Years Experience of the Neurosurgery Service Mahyudani (Indonesia)</td>
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<td>14.40 – 15.50</td>
<td>SS 22 – BRAIN: TECHNIQUE Moderator: Doddy Priambada (Indonesia) &amp; Bilzardy Ferry Zulkifli (Indonesia) Room: NDH 2</td>
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<td>14.40 – 14.50</td>
<td>Endoscopy for Sella Region Lesson Roland Sidabutar (Indonesia)</td>
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<td>Tansnasal Endoscopic Surgery for Pituitary Adenoma Tomoko Iida (Japan)</td>
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<td>15.00 – 15.10</td>
<td>Preoperative Embolization as a Brain Tumor’s Resection Strategy in a Young Woman with No Neurological Deficits: a Case Report Bilzardy Ferry Zulkifli (Indonesia)</td>
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<td>Awake Craniotomy Selvy Oswari (Indonesia)</td>
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<td>TBA Suzy Indarti (Indonesia)</td>
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<td>15.40 – 15.50</td>
<td>Microvascular Decompression Surgery “How to Do It Safely and Successfully”? Nadjiullah Budi Setiawan (Indonesia)</td>
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<td>15.50 – 16.50</td>
<td>Special Lecture Moderator: Sri Maliawan (Indonesia) &amp; Eko Agus Subagio (Indonesia) Room: NDH 3</td>
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<td>15.50 – 16.10</td>
<td>Craniocervical Junction Instability: When to Add Occiput to Fusion? Mehmet Zileli (Turkey)</td>
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<td>16.10 – 16.30</td>
<td>Role of Epilepsy Surgery in developing Basic Research in Neuroscience Gary Y. Mathern (USA)</td>
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<td>16.30 – 16.50</td>
<td>TBA Abdul Hafid Bajamal (Indonesia)</td>
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<td>16.50 – 17.00</td>
<td>Closing Ceremony Room: NDH 3</td>
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<td>17.50 – 19.00</td>
<td>Business Meeting of INS Room: NDH 3</td>
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Percutaneous endoscopic spine surgery is one of the most minimally invasive ones at present time. This system was used for surgery of lumbar disc herniation originally. But indications were spread since the electric drill can be used. Now we can operate the case with bony stenosis by using this system only. Following the trend of minimum invasive surgery, endoscopic surgery is widely accepted and it is not a special procedure anymore. Percutaneous endoscopic lumbar discectomy has many advantages when it is applied to lumbar disc surgery and cervical radiculopathy. So that, this procedure should be one of the standard choice for the treatment. On the other hand, however, open surgery is accepted as a safe and promising procedure. Even though PED has advantages, it should also provide the same safety level.
ABSTRACT

PLENARY LECTURE 1
FOREMAN MAGNUM DECOMPRESSION FOR TYPE I ARNOLD CHIARI MALFORMATION

Sri Maliawan, Wisnu Wardana, Wayan Niryana, Tjokorda Gde Bagus Mahadewa
Dept. of Neurosurgery, Faculty of Medicine, Sanglah General Hospital, Udayana University Denpasar Bali Indonesia.

Foramen magnum decompression in 18 patients with syringomyelia associated with type I Chiari malformations, 17 adults (age range 30-45 years old) and 1 pediatric (12 years). Bony of foramen magnum including C1 were decompress combined with the removal of dura mater and preserving arachnoids, and Dural graf were performed in 17 adult patients, and one pediatric patient just removal of the outer layer of dura mater. Postoperative follow-up after 1-8 years neurological symptoms and signs improved in 15 of 17 patients and were unchanged in two patients. Post-operative magnetic resonance imaging after surgery show a decrease in the size of the Syrinx or a disappearance of the Syrinx. One of pediatric patient neurological symptoms was improved. Foramen magnum decompression, by this technic reveal all patients neurologically improve none of the patient shows deterioration. All procedure preserving arachnoid layer and for pediatric almost just bony decompression.

Key words: Foramen magnum decompression, Chiari type one, syringomyelia, preserving arachnoid

PLENARY LECTURE 1
LAMINOPLASTY TECHNIQUES FOR CERVICAL MYELOPATHY AND RADICULOPATHY

Junichi Mizuno, M.D., Ph.D.
Director, Center for Minimally Invasive Spinal Surgery, Kawasaki, Kanagawa, JAPAN

Laminectomy for cervical spine is a very classic technique for most of the spine diseases. This technique has a long-standing history, and still stays as the main procedure. However, laminectomy is known to have serious complications such as delayed kyphosis with progressive neurological deterioration, postoperative hematoma or prolonged neck pain due to muscle atrophy. To avoid these complications, laminoplasty for the cervical lesions has been introduced in Japan in 1980s. This technique is getting popularity as a surgical procedure for multi-level cervical spondylosis and ossification of the posterior longitudinal ligament (OPLL), so-called a Japanese disease. There are 2 important points in cervical operation, which are decompression of the neural tissues and correction of the cervical alignment. Laminoplasty can achieve excellent decompression as good as laminectomy with relatively good maintenance of alignment. Since many patients are over 70s in their age, excessive correction of the alignment with many implants may bring harmful result. Another important issue is motion preservation of the neck. Long fusion in the cervical regions loses cervical motion resulting in neck pain. To maintain motion, we have created a brand new titanium spacer called “Laminoplasty Basket” for cervical laminoplasty. This new spacer is now on the market since 2013, and can be used for both open-door laminoplasty and double-door laminoplasty. In this presentation, we will demonstrate the usefulness of cervical laminoplasty techniques with this spacer.
After having more aged populations, the number of spine surgery in geriatric patients is increasing. The three main problems in geriatric spine surgery are: (1) Poor bone quality (osteoporosis), (2) Continuing degeneration and more deformity, and (3) More comorbidities. Surgery on elderly patients need special attention to these items. Weaker bone due to osteoporosis needs more fusion, less mobility preservation, needs additional support or bone augmentations. More deformity in aged patients need longer and balanced fixations. More comorbidities in aged patients may result with more systemic complications and outcomes are less satisfactory.

This talk will discuss the problems of aging spine and try to give more precise criteria for patient selection.
Introduction: the most common diseases that affect the cervical spine are cervical spondylotic myelopathy, trauma and tumors (excluding intradural lesions). The treatment can be summarized in anterior, posterior or combined approach. In most of the cases anterior or posterior approach have a clear indication. In some cases the choice of the best surgical option can become challenging. When combined anterior/posterior approach becomes mandatory still the timing of the two different procedures can remain disputable.

Material and methods: a series of patients operated on at our Institution during the last 7 years by anterior, posterior or combined approach is summarized. The importance of real-time navigation is emphasized. The clinical and radiological features, the choice of the timing and the different spinal devices adopted for tailoring the proper surgical treatment are described in detail. The possible complications and long-term results are presented. Timing of the surgical approaches is discussed in order to better clarify indications to combined anterior/posterior cervical approach.

Discussion: aim of the surgical treatment is decompression of the nervous structures, restoring the stability and the proper balance of the cervical spine. Mostly in traumatic and neoplastic diseases restoring the anterior and posterior columns is mandatory. The introduction of spinal navigation system is now a real aid especially during revision surgery of complex cases reducing the surgical time and the rate of complications.

Conclusions: decision making in cervical spinal surgery can imply combined approaches which should be based on the accurate study of the neurological state, the radiological imaging and of the most prominent biomechanical features of each case. In spite of any proper planning the risk of some failed surgery still remains considerable.
LUNCH SYMPOSIUM
ROBOTIC VISUALIZATION SYSTEM

Alexander Partsch (Germany)

LUNCH SYMPOSIUM
INTRODUCTION OF IORT (INTRABEAM) FOR NEUROSURGERY

Joshua Cheng S.K

Abstract:
Introduction of Intraoperative Radiotherapy
The application
Our products and use
Current use and research
Summary
ABSTRACT

IBET MARIE Y. SIH, M.D., F.A.F.N., F.P.C.S.

Department of Neurosurgery, Institute for the Neurosciences, St. Luke's Medical Center, Metro Manila, Philippines

The pathophysiology of cervical spondylosis ranges from disc degeneration to central and foraminal canal stenosis resulting to glacial instability, radiculopathy and myelopathy. Although management is varied, from medical management to surgical decompression, there remains to be a dilemma in the choice of management option. If surgery is chosen, again, the decision to address the problem via anterior approach or posterior approach may not be an easy task, even in the routine cervical spondylosis and spinal stenosis case.

The advantages and disadvantages of each treatment option are discussed, as evidenced from literature, and reinforced by personal series of patients.

Anterior surgery may cause temporary anterior throat discomfort while posterior surgery may cause muscle spasm and pain. But with the proper choice of surgical approach, results are good and improvement are similar.

Keywords: Surgical treatment of cervical spondylosis, surgical treatment of cervical spinal stenosis

SS 1 - SPINE 1: CERVICAL DEGENERATIVE
UPDATES IN TREATMENT OF CERVICAL SPONDYLOSIS AND SPINAL STENOSIS

Se-Hoon Kim, MD, PhD

Department of Neurosurgery, Ansan Hospital, Korea University College of Medicine, Seoul, Korea

Introduction:
Cervical laminoplasty has been widely accepted as one of the major treatments for cervical myelopathy and various modifications and supplementary procedures have been devised to achieve proper decompression and stability of the cervical spine. Ultrasonic devices first appeared in 1952 and were quickly adapted, and their use was expanded. The author present the retrospectively analyzed results of a modified unilateral open-door laminoplasty using ultrasonic osteotome and hydroxyapatite (HA) spacers.

Material and Methods:
From June 2008 to Aug 2016, among patients diagnosed with cervical spondylotic myelopathy and OPLL, the patients who received laminoplasty were reviewed. Clinical outcome was assessed using Frankel grade and Japanese Orthopaedic Association (JOA) score. The radiologic parameters were obtained from plain films, 3-dimensional computed tomography and magnetic resonance images.

Results:
A total of 125 cervical laminae were operated in 38 patients (male: female=29:9). 11 patients received 4-level laminoplasty and 27 patients received 3-level laminoplasty. Mean operation time was 226 minutes. Postoperatively, the mean Frankel grade and JOA score were significantly improved from 3.97 to 4.55 and from 12.76 to 14.63, respectively (P < 0.001). Radiologically, cervical curvature was worsened from 19.1° to 15.6° (p=0.025). The percentage of range of motion preservation was 73.3%. The axial dimension of the operated spinal canal was increased from 1.75 to 2.70 cm² (p<0.001).

Conclusions:
In our study, unilateral open-door laminoplasty using HA spacers and miniplates appears to be a safe, rapid and easy procedure to obtain an immediate and rigid stabilization of the posterior elements of the cervical spine. This modified laminoplasty method showed effective expansion of the spinal canal and favorable clinical outcomes.

Key Words: Cervical Vertebrae, Laminoplasty, Spinal Cord Compression, ossification of posterior longitudinal ligament, Ultrasonic Osteotome, Hydroxyapatites
SS 1 - SPINE 1: CERVICAL DEGENERATIVE
COMPLICATIONS OF ANTERIOR CERVICAL DISCECTOMY AND FUSION

Scott C. Robertson, MD, FACS, FAANS

Summary: Anterior cervical discectomy and fusions (ACDFs) are the most common surgery performed on the cervical spine. The number of cases being performed has tripled over the last two decades. Although ACDFs are typically safe and effective surgeries they carry an inherent complication rate which cannot be underestimated. Newer interbody devices and plating systems are being used. Surgeons performing these operations need to beware of the potential complications, inform their patients of the potential complications and be able to manage complications as they develop. In this chapter I will review recent large case reports as well as my own single surgeon experience of 2489 patients from 1998 – 2017 on ACDF complications. The overall complication rate in our series was 7.2% (n=180). Dysphagia, graft/hardware complications and hematomas were the most common complications seen in our experience. The goal of this chapter is to understand the rate and impact of perioperative complications in ACDFs and develop a strategy to avoid them when possible and manage them when they do occur.

SS 1 - SPINE 1: CERVICAL DEGENERATIVE
LONG-TERM FOLLOW-UP OF OPERATIONS FOR CERVICAL DISC HERNIATION

George J. Dohrmann, M.D., Ph.D. and Joseph C. Hsieh, M.D.
Neurosurgery University of Chicago

For many decades surgeons have been operating on symptomatic herniated cervical discs. However, the series of patients followed long-term were relatively small. Variations in technique, approach, and follow-up tended to bias what were mainly personal or institutional series. No truly large series with long-term follow-up has been analyzed. This study will do that.

A series of 6,000 patients was assembled. These patients had herniated cervical discs with associated radiculopathy. They were operated on anteriorly or posteriorly and followed for a minimum of 2 years. The outcome was relative to whether the patient graded their status as “good/excellent.” Specifically, they were divided into two groups: those operated anteriorly and those operated upon posteriorly. Of the 6,000 patients analyzed, 2,888 were operated on anteriorly (discectomy with/without fusion) and 3,112 were operated on posteriorly (laminoforaminotomy or “key-hole” facetomy). On initial follow-up the patients did well; however, a difference was noticed long-term. Patients operated anteriorly had a mean follow-up of 5.9 years (The results with or without fusion were the same). Posterior operations were done on just over half of the patients and the mean follow-up was 8.5 years.

Conclusion

The difference in long-term results between the two groups was significant (p<0.05). The possible reason for the difference between the two groups will be discussed.
SS 1 - SPINE 1: CERVICAL DEGENERATIVE
SURGICAL TREATMENT OF CERVICAL OPLL

Nobuyuki Shimokawa
Spine Center, Tsukazaki Hospital, Himeji, Japan

Cervical OPLL is more often in East Asia including our Japan. Mild symptomatic patients can be treated non-surgically and recommended to be followed closely. However, patients with progressive myelopathy or bowel and bladder symptoms are best indication for surgery. OPLL can be surgically treated via an anterior (direct decompression) or posterior (indirect decompression procedure such as laminoplasty) approach, or anterior-posterior combined approach. The optimal selection of approach has been discussed in terms of the classification of the type of OPLL (segmental type, continuous type, mixed type), the extended level of OPLL, cervical spine sagittal alignment including K-line. Anterior approach produced superior outcomes when OPLL occupies >50% to 60% of the canal due to its direct decompressive effect, despite of its increased technical difficulty and higher complication (CSF leakage, dysphagia, implant failure and so on) rates. Posterior approach is technically easier and allows decompression of the entire range of cervical spine. However patients may suffer from late neurologic deterioration because of more developed OPLL (static factor) or beaked OPLL with dynamic factor. In this paper, we would like to present the various recent strategies of surgical treatment for cervical OPLL.

SS 1 - SPINE 1: CERVICAL DEGENERATIVE
CERVICAL SPINAL CORD INJURY

Agus Yunianto (Indonesia)
The Presidential Gatot Soebroto Central Army Hospital Jakarta

Cervical Spinal Cord Injury is more frequent in young man than in elderly. In Indonesia usually cause by trauma / traffic accident, but in elderly can cause with out severe trauma because of the prevalency of ossification posterior longitudinal ligamentum (OPLL). OPLL can cause stenosis of the spinal canal slowly and during the spinal cord adapted with the stenosis, so no sign or symptom and the patient doesn’t complain about it. If the minor trauma was attack can make injury to the spinal cord, hematoma or infarc and the sign or symptom become occurred.

The prognosis of the recovery depend of the trauma, age of the patient and the rapid of the treatment in spine centre.

Key words: spinal cord injury, ossification posterior longitudinal ligamentum.
Tethered Cord Syndrome (TCS) is a poorly understood and poorly known problem. Professor Shokei Yamada stated that 75% of “failed back surgery” he came across in his practice in USA was due to TCS (Reference 1). When TCS is associated with a normal position of the conus medullaris (occult filum terminale syndrome), the diagnosis can be difficult and somewhat controversial.

The symptoms may consist of low back pain which sometimes may involve thoracic or even neck pain. The pain in contrast to sciatic pain may radiate to the groins. Typical aggravating factors which stretch the filum include crossing the legs as in a Buddha pose, bending forward, lying supine during sleep (which decreases the lumbar lordosis). Carrying an object of about 10kg or more may also aggravate the pain. There may be unexplained paraesthesia or numbness.

There may be urinary symptoms or erectile dysfunction. Occasionally control of bowel may be affected. One must enquire about the presence of nocturia and frequency of micturition during daytime.

The classical sign on examination with TCS is weakness of toes extensors as stated by Yamada. During my examination of my patients, I found that hip flexors weakness is another cardinal sign of TCS. Its presence in the absence of other factors strongly suggests TCS. Reflexes in the legs if hyperactive or asymmetric is another possible suggestion of TCS.

The first investigation of back or legs symptoms involve MRI of the spine. If there is no pathology to explain the patient’s symptoms or signs, before concluding psychosomatic reasons, one should consider TCS. Sometimes MRI may show a thickened filum terminale as a white dot in T1 axial cut. I find there is an association of the presence of the white dot with TCS. Fine cut CT scan of the lumbo-sacral spine may reveal the presence of spina bifida. Sometimes this may be just a small discontinuity of the lamina and may take an experienced radiologist to spot this. There seems to be an association between the size of the defect and the presence of symptoms.

The third useful test is urodynamic study to assess the integrity of the sensory and motor nerves supply to the bladder. The diagnosis of TCS cannot be made based on any single test but is based on the clinical pictures, presence of spina bifida and sometimes the presence of neurogenic bladder.

The treatment of mild or moderated TCS is conservative with avoidance of aggravating factors. Often such patients may not progress. But for severe case, division of the filum terminale offers good relief. Sometimes TCS coexists with other pathology such as spondylolisthesis and treatment of the 2 pathologies can be carried out at the same time.

In my experience of about 100 such case the chance of good relief of the symptoms is about 90%. There were 2 cases of complication of CSF leakage needing re-opening of the wound and dural repair.

Reference 1: S Yamada: Tethered Cord Syndrome in Children and Adults. AANS Thieme 2nd edition 2010
SS 2 - SPONSOR SESSION
ELAN4, A NEW PIONEER OF COMFORTABLE AND RELIABLE IN NEURO AND SPINE SURGERY
Michael Mauch (Germany)

SS 3 - SPINE 2: DEFORMITY
LATERAL APPROACH FOR STABILIZATION AND CORRECTION OF LUMBAR DEFORMITY
Junichi Mizuno (Japan)
SS 3 - SPINE 2: DEFORMITY
CORRECTION AND FIXATION SURGERY FOR ADULT SPINE DEFORMITY WITH OSTEOPOROSIS

Yasuhiro Nakajima

Osteoporosis is a major social problem in Japan, which is becoming a super aging society. Adult spinal deformity causes various symptoms such as neurological deficits, pain, gastroesophageal reflux disease, etc., which impair QOL of the patients. Osteoporosis is one of major etiologies for elderly spinal deformity. At the same time, osteoporosis often causes serious problems in surgical treatment for elderly spinal deformity including instrumentation failure, proximal and distal junctional kyphosis, etc. In this presentation, we would like to show our surgical strategies and osteoporosis treatments for prevention of instrument failure.

SS 3 - SPINE 2: DEFORMITY
SURGERY FOR ADULT DEGENERATIVE SCOLIOSIS

Onur Yaman

The main purpose of surgery in adult degenerative scoliosis (ADS) is to resolve the symptoms that occur due to compression. Instrumentation and fusion are needed for patients who undergo decompression surgery, especially those with instability. Before planning the surgery of the patient, anterio-posterior and lateral radiographs of scoliosis in standing position should be evaluated thoroughly.

SRS-Schwab Classification clearly indicates the sagittal alignment that needs to be achieved after surgery. To determine the PI of the patient before surgery indicates the lumbar lordosis that s/he will need after surgery. Lumbar lordosis needed to be achieved after surgery must be +/- 10 degrees greater than pelvic incidence. SRS-Schwab Classification does not provide information to surgeons about which curvatures should be included in the fusion or what the fusion levels should be. For this purpose, Berjano and Lamartina published an article about the determination of fusion levels. In the classification they proposed, they divided patients into two main groups as those with balance and those with imbalance. Patients in Types I, II, III have balance whereas patients in Type IV have imbalance. (Table 1)

For the non-apical group in Type I, the authors recommends decompression and fusion of only that segment. In case of Type II adjacent to the apex, only the decompression and fusion of the apical segment is recommended. In Type III, the entire coronal curvature should be included in the fusion. They recommend that the necessary fusion levels should be determined in order to correct the sagittal balance in Type Iva and both sagittal and coronal balance in Type IVb.

Table 1. ADS classification according to Berjano-Lamartina

<table>
<thead>
<tr>
<th>BALANCED</th>
<th>IMBALANCED</th>
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<tbody>
<tr>
<td>Type I</td>
<td>Non-apical</td>
</tr>
<tr>
<td>Type II</td>
<td>Adjacent to apex</td>
</tr>
<tr>
<td>Type III</td>
<td>Large, adjacent to apex</td>
</tr>
<tr>
<td>Type IVa</td>
<td>Sagittal imbalance</td>
</tr>
<tr>
<td>Type IVb</td>
<td>Sagittal and coronal imbalance</td>
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Spinal deformity occurs when there is abnormal curvature in the spine. Curvature can occur due to congenital or non-traumatic problems, in the form of scoliosis (side to side) or kyphosis (front to back), or a combination of kyphoscoliosis (side to side-front to back). It can also be due to trauma in the form of spondylolisthesis, dislocation, angulation or rotational injury. It may also be due to degenerative factors or autoimmune problems, such as degenerative scoliosis or bamboo spine or ankylosing spondylitis.

Principle of Operation Spinal deformity aims to improve and control spinal curvature, and improve spinal balance. There are three types of spinal deformity surgery: posterior fusion instrumentation to correct curvature by combining the spine from posterior; Fusion of anterior instrumentation to correct curvature spine by combining vertebrae from the front; complex deformity correction where parts of vertebrae may carved, this is called spinal osteotomy which aims to achieve a better spinal balance. Deformity surgery is used for therapeutic purpose that aims to correct, control and achieve spinal balance by fusing your spine.
SS 3 - SPINE 2: DEFORMITY
SPINAL OSTEOTOMIES FOR SPINAL DEFORMITIES

Onur Yaman

Keeping the head over the pelvis is the economical way to use less energy. The line drawn from C7 at the sagittal view has to pass near the superior posterior upper part of S1. For an ideal sagittal balance according to SRS-Schwab Classification for adult degenerative scoliosis (ADS) pelvic tilt (PT) has to be less than 20 degrees. For a spinopelvic harmony the difference between pelvic insidans (PI) and lumbar lordosis (LL) has to be less than 10 degrees. Pelvic parameters of ADS surgery is summarized at table 1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ideal Value</th>
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<tr>
<td>SVA</td>
<td>&lt; 4 cm</td>
</tr>
<tr>
<td>PT</td>
<td>&lt; 20°</td>
</tr>
<tr>
<td>PI-LL</td>
<td>&lt; 10°</td>
</tr>
</tbody>
</table>

Table 1. Ideal spinopelvic parameters

Osteotomy Indications
- Global or local imbalance
- Coronal imbalance
- Scheuermann's Kyphosis, ankylosing spondylitis, proximal junctional kyphosis
- Complex kyphoscoliosis

Osteotomy Classification
Schwab et al described a new classification system for osteotomies. Partial removal of the facet joint is type 1. Total removal of the facet joint is type 2. (Ponte and SPO) In type 3 pedicule is removed. Corner osteotomy described by Bejano and Lamartina is type 4. VCR osteotomy type is type 5 and more than one vertebrae resection osteotomy type is 6. (Table 2)

<table>
<thead>
<tr>
<th>Type</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Partial facet resection</td>
</tr>
<tr>
<td>Type II</td>
<td>Total facet resection</td>
</tr>
<tr>
<td>Type III</td>
<td>Pedicle subtraction osteotomy</td>
</tr>
<tr>
<td>Type IV</td>
<td>Removal of pedicle with the disc</td>
</tr>
<tr>
<td>Type V</td>
<td>Vertebral column resection</td>
</tr>
<tr>
<td>Type VI</td>
<td>More than one vertebrae resection</td>
</tr>
</tbody>
</table>

Table 2. Schwab's Osteotomy Classification

SS 4 - BRAIN 1: VASCULAR 1
UNDERSTANDING BRAIN AVMS EMBOLIZATION

Wismaji Sadewo MD PhD.
Dept. of Neurosurgery Faculty of Medicine, University of Indonesia, RSCM Hospital

Vascular malformations involving the brain are divided into subgroups, including arteriovenous malformations (AVM), developmental venous anomalies (DVA), cavernous malformations and capillary telangiectasias. These lesions are further categorized into those that demonstrate shunting from arterial to venous systems (i.e. the AVM), and those that do not have shunting (DVA, cavernous malformation, and capillary telangiectasia). (2)

Arteriovenous malformations are high flow shunts between the arterial and venous systems without an intervening capillary bed. These lesions are subdivided into the classic arteriovenous malformation and the arteriovenous fistulas. The classic AVM (also known as pial AVM) results from an abnormal connection between the arteries that normally supply the brain parenchyma and the veins that would normally drain this region. Arteriovenous fistulas are distinguished from AVMs by the presence of a direct, high flow fistula between artery and vein. There is no intervening nidus. These include the dural arteriovenous fistula (dAVF), the cavernous carotid fistula (CCF) and the vein of Galen malformation (VOG). AVMS can be treated with surgery, endovascular embolization, radiosurgery, or a combination of these methods. (1,3)

Understanding the associated imaging findings and potential complications of these lesions assists in determining the appropriate treatment options.

References
ABSTRACT

BOOK

ABSTRACT

BOOK

SS 4 - BRAIN 1: VASCULAR 1

TRANSPETROSAL APPROACH FOR GIANT ANEURYSMS IN POSTERIOR FOSSA – MICROANATOMY AND ACTUAL OPERATIVE PROCEDURES

Kazumi Ohmori

For most neurosurgeons, aneurysms of the posterior fossa lesion are the most challenging ones carrying the highest level of risk in surgery. In large or giant cases, especially, not only is the complexity of the anatomy an issue, but narrow and deep operative field causes the operation to be difficult and increases the risks.

There are various approaches reported in many types of literature for posterior fossa lesion aneurysms, such as subtemporal, suboccipital, transpetrosal, combined transpetrosal approach, and so on. However, even if combined transpetrosal approach, we cannot tell the operative space is wide enough in such a severe case.

If the patient has severe dysfunction or on severe condition, a translabyrinth or transcochlear approach may be done in addition to combined transpetrosal approach. Furthermore, we can expand the operative view by total petrosectomy, using the extended skull base approach techniques.

We show some photos of microanatomy of transpetrosal approach stepwisely by using cadaver heads, and actual operative videos of some cases in posterior fossa operated via transpetrosal approach.

The goal of this study is to be a clue for operations in posterior fossa giant aneurysms.

Motohiro Morioka MD, PhD
Professor and Chairman, Department of Neurosurgery, Kurume University, School of Medicine

The unusual IC aneurysms including the large and giant aneurysm or anterior wall aneurysms is relatively rare. However treatments of these aneurysms are challenging and daunting to most neurosurgeons, thus the therapeutic strategy must be planned carefully. In this presentation, I reviewed our experiences of supraclinoid large/giant aneurysms and summarized surgical technics, and introduce some hybrid surgery.

For the supraclinoid IC-large/giant aneurysm, clipping surgery using multiple fenestrated clips is the best treatment, if possible. To accomplish this clipping technique, following procedures are necessary; 1) Evaluation of cerebral blood flow of ipsilateral IC by angiography, balloon test occlusion (BTO) and so on. 2) Safety bypass (STA-MCA bypass), if necessary, 3) Exposure and transient occlusion of neck IC, 4) Suction decompression from IC, 5) multiple clipping by fenestrated clips.

Although the detailed procedures from 1) to 4) were described well in some texts and papers, some pitfalls in multiple fenestrated clipping technique are not so well-written. Especially, we must notice the IC stenosis and leakage in this clipping technique, furthermore understanding of the relationship between the neck and branching site of anterior choroidal artery is important. I would like to show some tips and pitfalls of these surgical procedures.
SS 4 - BRAIN 1: VASCULAR 1
NEW MANAGEMENT AND STRATEGY OF CEREBRAL ANEURYSM BY FEATURE IN JAPAN

Fusao Ikawa (Japan)
Department of neurosurgery, Shimane Prefectural Central Hospital
Department of neurosurgery, Graduate School of Biomedical and Health Sciences, Hiroshima University

Introduction:
Japanese people have a 2.8-times increased risk of rupture in western. So, in this paper, we discuss about the relationship between the number of ruptured and unruptured cerebral aneurysm (RCA and UCA) in Japan.

Subjects and Methods:
We investigated 5344 cases of subarachnoid hemorrhage (SAH) in Japanese stroke data bank (JSDB) from 2000 to 2014 and 475,397 cases of aneurysm survey in Japan neurosurgical society (JNSS) from 2001 to 2015. The outcomes of modified Rankin scale (mRS) at discharge were compared between the surgical clipping (SC) and endovascular coiling (EC) groups. Furthermore, annual population and number of death due to SAH were evaluated by records from the Ministry of Health, Labour, and Welfare (MHLW) in Japan. Also, the change of prevalence of hypertension and habitual smoking was evaluated.

Results:
The highest incidence in size of RCA was 56% under 6mm size group in JSDB. The estimated incidence of SAH according to the data of JNSS, MHLW was 23.8 per 100,000, highest in 2003, and decreasing gradually to 21.3 in 2012 in spite of the peak population in 2008. The number of treatment of UCA was increasing rapidly recently, however, the estimated treatment rate of total UCA was only 0.2 to 0.5 %. The prevalence of hypertension and habitual smoking have declined significantly from 2003 through 2012 (Cochran-Armitage test, p<0.001). No significant differences in mRS at discharge were found between SC and EC in the JSDB.

Conclusions:
We must focus not only the high rupture risk of large sized UCA but also small UCA. We cannot reduce the incidence of SAH only by increasing treatment number of UCA. The real reason of rupture in small UCA should be searched more in the future. Selection of the optimal treatment method should be based on the characteristics of both patient and aneurysm.

NEW MANAGEMENT AND STRATEGY OF CEREBRAL ANEURYSM BY FEATURE IN JAPAN

SS 4 - BRAIN 1: VASCULAR 1
SURGICAL CLIPPING VERSUS ENDOVASCULAR COILING IN CEREBRAL ANEURYSM

Setyo Widi Nugroho
Department of Neurosurgery Faculty of Medicine University Indonesia

Abstract:
Cerebral aneurysm subarachnoid hemorrhage (aSAH) is a catastrophic medical emergency requiring immediate intervention. The treatment of choice for both ruptured and unruptured aneurysm are surgical clipping and endovascular coiling.

Both modalities have advantages and disadvantages and both are used according to the the type of aneurysm. Endovascular coiling has increasingly become an alternative procedure for in both ruptured and unruptured aneurysms in last decades.

The advantage of surgical clipping is long term durability but it has disadvantage that it requires open surgery which is accompanied with more morbidity especially in elderly patients. The advantages of endovascular coiling are less invasive, easy access to vertebrobasilar system and multiple aneurysms in distant areas but long-term follow-up performed by intracranial subarachnoid aneurysm trial (ISAT) indicated that coiling had higher risk of rebleeding than clipping, it also has limitation in removing subarachnoid and intracerebral hemorrhage.

Some study showed different everage cost between surgical clipping and endovascular coiling for cerebral. There are no study comparing both procedure in Indonesia.

Key word: cerebral aneurysm – surgical clipping – endovascular coiling
SS 4 - BRAIN 1: VASCULAR 1
FLOW DIVERSION STENT FOR LARGE AND GIANT INTERNAL CAROTID ARTERY ANEURYSM: INITIAL EXPERIENCE

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Introduction
Treatment of large and giant aneurysm has traditionally been associated with a higher morbidity and mortality than smaller lesions. Endovascular technique with flow diversion stent provide parent vessel reconstruction to treat large and giant intracranial aneurysm. We report our initial experience using flow diversion stent with Pipeline Embolization Device (PED) in three patients.

Report
Headache was a common symptom followed by ophtalmoplegia in all patients. Four patients with internal carotid artery aneurisms were successfully treated with flow diversion stent using Pipeline Embolization Device (PED). No patients suffered from intra or post procedural complications

Conclusion
The use of flow diversion stent is effective and safe therapy for the treatment of large, giant, and wide necked aneurysm. Now, it represents a paradigm shift for the management of this kind of intracranial aneurysm in our institution.

SS 4 – SPINE 3: MINIMAL INVASIVE
MANAGEMENT OF POOR GRADE ANEURYSMAL SAH

Ittichai Sakarunchai

Poor-grade subarachnoid hemorrhage (SAH) (WFNS grades 4–5) is accounted for approximately 20-40% of all SAH patients. The hemorrhage triggers a cascade of complex events, can result in early brain injury, delayed cerebral ischemia, and systemic complications. The patients always present with high mortality and disability rate 70% and present with favorable outcome only 10%. Due to there be no randomizing controls trial study, hence, it is often treated with variable concepts especially conservatively and the timing of surgery is still controversial due to unfavorable outcome. Delayed treatment can leads the patient to be improved about 10% or worsen the grading at that time. The advantages of delayed surgery include the less brain swelling and less cerebrovascular instability during the surgery whereas the aneurysm may rupture again if surgery is delayed, thus increasing mortality. However, the early and aggressive treatment of this patient population has decreased overall mortality from more than 50 % to 30%. These management strategies include transfer to a high-volume cerebrovascular center, neurological and systemic support in the intensive care unit, early aneurysm repair, use of multimodal neuromonitoring, control of intracranial pressure, prevention and treatment of medical complications, and aggressive treatment of delayed cerebral ischemia.

Surgical clipping and endovascular coiling are considered two main aneurysm repair for this situation after the hemodynamic condition is stable.

Regarding to no consensus of treatment guideline, about timing of treatment, patients with poor-grade has benefit from early management is still unclear. Whereas rescues therapy with definite treatment either surgery or endovascular treatment will improve with the better outcome. We should not withdrawing treatment in all poor-grade patients. For the young neurosurgeons or the beginner who will take care this kind of patient, we have to use the other factors such as age, underlying disease, hemodynamic during admission (fever, heart rate, leukocytosis, systolic and diastolic blood pressure), fisher grading on CT scan, and WFNS grading to select the patient who can get the benefit for treatment. We found that the older age, fever, coexisting condition with pulmonary edema, leukocytosis, high grade of Fisher and WFNS will be the strong predictors for poor outcome. If the patient present with many factors, withdrawal treatment should be concerned because there is very poor of treatment.

So, the several parameters seem to reliably predict the outcome and may contribute to more effective planning of therapeutic management in patients with poor-grade SAH.
SS 5 - SPINE 3: MINIMAL INVASIVE
MICROSCOPIC LUMBAL DECOMPRESSION

Abdul Hafid Bajamal (Indonesia)

SS 5 - SPINE 3: MINIMAL INVASIVE
MINIMAL INVASIVE TLIF: CLINICO-RADIOLOGICAL ASSESSMENT SAFETY AND RELIABILITY

Deepak Bhangale (India)
SS 5 - SPINE 3: MINIMAL INVASIVE
DISC FX TECHNIQUE FOR SACROILIAC JOINT SYNDROME

Disc FX Technique For Sacroiliac Joint Syndrome

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Abstract

Background:
Dysfunction in the sacroiliac joint, also called the SI joint, can sometimes cause lower back and/or leg pain. Leg pain from sacroiliac joint dysfunction can be particularly difficult to differentiate from radiating leg pain caused by a lumbar disc herniation (sciatica) or Pyriformis syndrome as they can feel quite similar.

Sacroiliac joint pain ranges from mild to severe depending on the extent and cause of injury. Acute SI joint pain occurs suddenly and usually heals within several days to weeks. Chronic SI joint pain persists for more than three months, it may be felt all the time or worsen with certain activities.

The sacroiliac (SI) joints are formed by the connection of the sacrum and the right and left iliac bones.

There are many disorders that affect the joints of the body that can also cause inflammation in the SI joints. These include: gout, rheumatoid arthritis, psoriatic arthritis, reactive arthritis, and ankylosing spondylitis. Rarely, bacterial infection can involve the sacroiliac joints. It can lead to stiffness and severe pain in the SI joints, due to inflammation in the sacroiliac joints (sacroilitis).

Methode:
Disc-FX® is used for safely, rapidly and effectively performing micro invasive discectomy procedures for contained lumbar spine herniation. Less invasive compared to traditional discectomy procedures, Minimum annulotomy reduces risk of herniation, Multi-functional therapeutic options; debulking, ablation and modulation, Manual excision of herniated nucleus through 3.0mm portal.

Results:
Benefits of Disc FX Procedure: Minimal Access Procedure, Out-Patient Procedure, Minor Skin Incision, Rapid Procedure, Multiple Treatment Options, Local Anesthetic, Target Access to Damaged (Diseased) Area, Treat Multiple Disc Levels, Early Anticipated Return to Normal Activities

Conclusion:
Disc FX procedure is very effective for release pain at SI Joint syndrome Patients.

Key Words:
SI Joint syndrome, Lumbar Disc Herniation, Pyriformis Syndrome, Disc FX Methode

SS 5 - SPINE 3: MINIMAL INVASIVE
PATOLOGY AND PATHOPHYSIOLOGY OF LUMBAR HERNIATED NUCLEUS PULPOSUS ON MINIMALLY INVASIVE SURGERY APPROACH

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Lately, minimally invasive surgery for spinal disorders has become a trend. This kind of procedure can directly provide benefits, such as minimal tissue damage, shorter hospital stay, shorter duration of operation, and lesser fear for operation by the patient due to some techniques that just uses local anesthetic. However, a lot of this procedure were performed with inappropriate pathophysiological consideration.

The writer wants to give pathological and pathophysiological background on lumbar herniated nucleus pulposus related to the selection of minimally invasive surgery, especially stitchless percutaneous endoscopic lumbar discectomy. Appropriate medical considerations and selection of appropriate surgical approaches will maximize the advancement of surgery focused on patient safety.

Keywords: Minimally Invasive Surgery for Lumbar Spine – Stitchless Percutaneus Endoscopy Lumbar Discectomy – Pathology and Pathophysiology of Lumbar Herniated Nucleus Pulposus – Patient Safety
SS 5 - SPINE 3: MINIMAL INVASIVE

CURRENT STATUS, CHALLENGES AND FUTURE OF THE PERCUTANEOUS ENDOSCOPIC SPINE SURGERY

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Introduction:
Fifteen years have passed since percutaneous endoscopic spine surgery (PESS) was introduced in Japan. However, the indication for PESS is currently limited to patients with lumbar disc herniation in almost all surgeons, and only a limited number of surgeons are performing the procedure for patients with other diseases such as lumbar canal stenosis and cervical disc herniation. The annual number of spinal surgery performed in Japan in 2010 was 130,000. Among them, the annual number of endoscopic surgery was 10,000 (8%) and that of PESS was only 3,000 (2%).

Objectives:
The objectives of this study were to investigate why the indication for PESS has not expanded and why were limited surgeons adopted the PESS system, and to clarify the needs of spine surgeons, thereby exploring future directions of medical photonics.

Subjects and methods:
1. Learning curves were compared between the conventional method and PESS based on operative time.
2. Surgical outcomes were compared between the conventional method and PESS based on postoperative pain, length of hospital stay, complications, and recurrence rate.

Results:
1. The learning curve, based on operative time, for the conventional method reached an early plateau, while that for PESS did not reach a plateau even after 200 cases.
2. The postoperative wound pain was significantly decreased in PESS than in the conventional method. No significant differences were observed in the length of hospital stay, complication rate, or recurrence rate. One patient had contralateral lower transient motor paralysis, which was presumably attributable to PESS.

Discussion:
The following three topics were discussed. 1) Why PESS has an extremely slow learning curve. 2) Why Japanese surgeons are reluctant to use PESS system despite the patients’ positive expectations. 3) What conditions are needed to gain acceptance for the use of spinal endoscopy system among Japanese spine surgeons.

Conclusions:
PESS is a minimally invasive and safe procedure that meets the needs of patients; however, its use has not spread and its indication has not expanded because the instrument does not meet the needs of Japanese spine surgeons. Development of the instruments fitting the needs of surgeons through medical engineering collaboration is necessary for the future of PESS.
Objective:
Outlook towards Spinal Intramedullary Tumors has changed considerably with the advent of microsurgical techniques and intraoperative neuro monitoring. Gross total removal is not only technically feasible but also compatible with good neurological recovery.

Methods:
I have personally operated on over 184 intramedullary tumors from 1988-2007 and another 66 in the last 8 years. Of 184 followed up cases 40 were benign and 144 (79%) were either low or high grade Gliomas majority of whom were Astrocytomas and Ependymomas. Two thirds of adult patients were 15-45 years age and only 13 were children.

Preoperative MRI may be deceptive in identifying the histology and resectability of the tumor. We were be able to resect totally 52 / 70 Astrocytomas and 55 / 69 Ependymomas irrespective of the location. Thus, 107/144 (76 %) tumors were totally excised. Conventionally, Laminectomy was performed in the earlier years but for the past 10 years we have endeavored to do laminotomy in the last 100 cases. The replacement of laminae offers reconstitution of the architecture of the spine, protects the cord from peridural fibrosis, gives muscles their natural attachment and prevents deformity.

Performing midline myelotomy in a distended cord by underlying tumor is a great challenge even to an experienced neurosurgeon, and is the most important first step of intramedullary surgery. Radiotherapy is only administered to high grade Gliomas.

Results:
Total resection was achieved in 52/70 (75%) astrocytomas and 55/69 (80%) ependymomas. Complications included transient worsening 25/144 (18%), permanent neurodeficit 5/144 (3%).

Conclusions: Surgery of intramedullary tumors is challenging but good microsurgical technique gives promising results.

Keywords: Intramedullary tumors, Laminoplasty, Myelotomy
Objective:
Spinal intramedullary tumors are rare and considered to have a poor prognosis, unless they are radically removed. Technical progress has dramatically modified the strategy in management and outcome of patients with intramedullary tumor, allowing aggressive surgical approaches. According to our experiences in the treatment of patients with cervical intramedullary tumors (CIT) the effectivity of radical surgery will be reported.

Material and Methods:
The analysis revealed 37 patients with CIT who were evaluated with respect to diagnosis procedures, surgical technique, intraoperative neurophysiologic monitoring (IOM) as well as postoperative outcome. The average age is 38 years with experienced symptoms for a mean of 24 months preceding initial diagnosis. MRI were the most important radiological procedures, showed the exact location of the tumors within the spinal cord. After laminectomy or laminotomy, with preservation of the intervertebral joints, CO2 or Nd-YAG laser was used for myelotomy and tumor dissection as well as removal. IOM with SEP and MEP was performed in all procedures.

Results:
The histological findings were mostly astrocytoma (n=18) or ependymoma (n=10). A total removal of the lesion was achieved in 29 patients and subtotal removal in 8 patients. At the time of discharge 76% of the patients improved or were unchanged. Surgical results estimated 6 months after surgery showed an improvement or stable condition in 89% of the patients.

Conclusion: IOM, modern neurosurgical technique as well as experienced surgeons are important for the outcome. The other factor influencing the outcome is the preoperative level of neurological deficits.
SS 6 - SPINE 4: TUMOR
FLIP OSTEOPLASTIC LAMINOTOMY FLAP FOR EXCISION OF LONG SEGMENT SPINAL TUMOURS IN CHILDREN

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Introduction
Long segment laminectomy for excision of spinal tumors in children is known to be associated with significant rate of spinal deformity and instability.

We propose our surgical technique of using a flip osteoplastic laminotomy flap to provide adequate access and achieved complete excision of long segment spinal tumors in children while preserving posterior element of the spine.

Methods
Patient is positioned prone on bolster. Intraoperative image intensifier is used to localize the upper and lower level of spinal tumors. Posterior midline incision is made preserving the posterior interspinous and supraspinous ligaments, exposing both sides of lamina.

High-speed drills is used to make a small opening on superior border of the highest lamina and inferior border of the lowest lamina under microscopic visualization, ensuring intact dura. Laminotomy is performed on both sides using a low profile high-speed drills system, incorporating the ligamentum flavum. The interspinous ligament on cephalic end is cut with scissor and osteoplastic flap with intact interspinous ligament at the caudal end is raised, flip caudally and hold in position with towel clip.

Following removal of spinal tumors, the osteoplastic laminotomy flap is fixed back to its corresponding lamina and spinous process at the cephalic end with absorbable suture. Blunt tip needle was used to facilitate and guide the insertion of sutures through the respective lamina.

Results
All patients had complete or near complete removal of spinal tumor with good postoperative recovery. There were no complications related to this approach.

Conclusion
Flip osteoplastic laminotomy flap provide optimum access to long segment spinal tumors in children emphasizing on preservation of normal architecture of posterior elements in pediatric spine.

SS 6 - SPINE 4: TUMOR
SURGERY OF INTRAMEDULLARY TUMORS

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Surgery still offer a cure to majority of intramedullary tumors. The challenge of the surgery is taking out the tumor while preserving the function. Very often the patient has a huge tumor with very minimal symptoms such as mild numbness. The slow growth of the tumor nature provide enough time for the cord fibers to adapt accordingly. Usually the motor function is preserved and most of the pathologies are benign. For this reasons the majority of cases have good long-term tumor control. The functional outcome is depending on the preoperative functional state, especially for motor function. The patient should be educated prior to surgery, especially to anticipate the post-surgical rehabilitation period. The surgical technique should preserve the motor function, but the fine movement and sensory function usually get worst for several months after surgery and slowly recover within 6 months. We share our experience of 51 surgical cases with intramedullary tumor (18F;33M), the pathologies distributions are 23 ependymomas, 9 astrocytomas (1/8 anaplastic astrocytoma), 7 cavernomas, 10 hemangioblastomas, 1 glioblastoma multiforme, 1 tuberculoma. The location distribution, 30 at cervical cord, 14 thoracal, 4 thoracolumbal, 3 MO-upper cervical. The surgical outcome, all cases experience sensory changes, and recover within 6 months. Almost all cases experience some degree of spasticity and fine movement difficulty and they are improving over 6 months. Motor strength is usually preserved. One case of GBM, improve gradually for the first two months then followed by the disease course regardless the treatment. The tuberculoma case required one year to recover her neurological function with adequate treatment.

Key words. Intramedullary tumor. Surgery. Outcome.
Surgery for spinal intramedullary tumors remains one of the major challenges for neurosurgeons, due to their relative infrequency, unknown natural history, and surgical difficulty. Better balance between tumor control and functional preservation is the principal objective of surgery. We are sure that safe and precise resection of spinal intramedullary tumors, particularly encapsulated benign tumors, can result in acceptable or satisfactory postoperative outcomes. The diagnostic imaging may be the first step for successful surgery, although it does not always suggest the specific pathological nature of the spinal tumors or complex vascular anatomy. The surgical strategy including surgical positioning, intraoperative neurophysiological monitoring, selection of access myelotomy and vascular image guidance of fluorescent technology is the second step. The surgical technique to avoid any surgery-related complications is the third step. The careful assessment after tumor resection is the final step to accomplish the surgical mission. Surgeons should pursue the predominance or validity of surgical treatment, but should learn humility in their own technique and experience. Quality of life should inarguably be given top priority in the surgical management of spinal intramedullary tumors.
SS 7 – BRAIN 2: TUMOR
SURGICAL URGENCY GROUPING OF PITUITARY TUMOR PATIENTS

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Background: A priority scale has been proposed to distinguish patients with pituitary tumors who require urgent surgical intervention from those who are candidates for elective treatment. This classification system was established by a group of experts in endocrinology and neurosurgery who reviewed retrospectively pituitary tumor cases at the Brigham and Women’s Hospital (BWH), Boston, Massachusetts, USA. A risk stratification schema was developed to streamline patient care pathways.

Objective: To assess pituitary tumor patients treated at Dr. Cipto Mangunkusumo General Hospital using the classification system developed at Brigham and Women’s Hospital.

Method: We examined pituitary tumor cases treated at our hospital from 2015 to 2017 by identifying the groups of treatment timelines according to the classification system.

Result: There were 4 groups of surgical candidates according to the BWH classification system (group A: urgent—immediate; group B: prompt—initiate treatment within 1 to 2 weeks; group C: soon—initiate treatment within 3 months; group D: elective—as soon as indicated). Among 105 patients treated for pituitary tumors at our hospital, each was assigned to 1 of the 4 predetermined subgroups: group A, 14.28%; group B, 35.23%; group C, 29.52%; group D, 20.95%.

Conclusion: The classification system can be used as a platform for further studies to streamline care for high-risk pituitary tumor patients.

Keywords: pituitary tumor, risk stratification, surgical urgency

SS 7 – BRAIN 2: TUMOR
STRATEGY MANAGEMENT OF MALIGNANT ANTERIOR SKULL BASE TUMORS: PERSONAL EXPERIENCE

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Abstract

Background: Tumors involving the anterior skull base and paranasal sinuses are really challenging to treat because they are relatively rare, wide variety of pathology and variability in the extent of local structures. Total resection would be not possible; therefore the recurrent rate is very high. In many cases multidiscipline works are needed to treat these tumors

Methods: Anterior skull base tumors that were operated on between 2002 and early 2018 were retrospectively reviewed from author personal data.

Results: There were 11 cases with different pathologies; adenoid cystic carcinoma 5 cases, angiofibroma 2 cases, poorly differentiated carcinoma 1 case, malignant round cell tumors 2 cases, squamous cell carcinoma 1 case. Most of these tumors were removed through subfrontal or subcranial approaches and in some cases need ENT and ophthalmic surgeons involvement. All tumors, except 2 cases of adenoid cystic carcinoma were grossly total removed. All tumors showed recurrence in the follow up period, even in the total removal cases (adenoid cystic carcinoma).

Conclusion: Malignant anterior skull base tumors are challenging for skull base surgeons. Since they involve complicated structures, radical resection is not possible. In early stage, adenoid cystic carcinomas seem to be well defined therefore it can be totally removed, however since the perineural infiltrative nature of these tumors, their recurrent rate is very high.
ABSTRACT

SS 7 – BRAIN 2: TUMOR

TREATMENT STRATEGY FOR ELDERLY MENINGIOMA

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Introduction:
By OECD health data, Japan has best life expectancy and highest elderly rate in the world. In recent years, the concept of the frailty in the elderly has been proposed, a mortality was identified as a perioperative outcome associated with frailty in many fields. However, no reports have discussed frailty among elderly surgical patients in the neurosurgical field. Now, we discuss the surgical strategy for elderly meningioma by frailty concept.

Subjects, Methods and Results:
From 2000 to 2016, we experienced totally 266 surgeries of meningiomas in elderly patients over 65 year-old. We evaluated the age, sex, Karnofski Performance Status(KPS), American Society of Anesthesiologists(ASA)score, tumor location, size, pathology, body mass index(BMI) and serum albumin as the frailty associated item. The mean age was 72.1 years old with 178 cases of females. The mean size of meningioma was 37.6 mm in maximum diameter. The mean follow up periods were 35.1 months. Pathologically investigation revealed high incident rate (35.4%) of Grade II and III. The rate of KPS deterioration was 21.1%. Multivariate analysis revealed that age, preoperative KPS and postoperative brain complication were risk factors of ADL deterioration 3 months after surgery over 75 years old, and that the serum albumin was one of the risk factors for KPS deterioration after surgery.

Conclusions:
Preoperative serum albumin is useful factor as the frailty associated item. The frailty concept should be considered preoperatively in neurosurgical field. It is important to decide the best surgical timing and method after close follow up.

SS 7 – BRAIN 2: TUMOR

SECONDARY BRAIN TUMOR

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Central Nervous System (CNS) metastases, including parenchymal and leptomeningeal metastases are the most common causes of malignant tumor in the brain.
My early study on limited number of brain metastases, treatment decisions are based on prognostic factors to maximize neurologic function and survival. The treatment choice for patient with secondary brain tumor including surgery, chemotherapy and radiotherapy.
SS 7 – BRAIN 2: TUMOR
CENTRAL NERVOUS SYSTEM HEMANGIOBLASTOMAS: CLINICAL AND SURGICAL MANAGEMENT
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Introduction. Von Hippel-Lindau (VHL) disease is a genetic syndrome predisposing to central nervous system (CNS) hemangioblastomas and several lesions in many organs. The cases of all VHL individuals operated on at the Department of Neurosurgery of Modena University Hospital and Padova University Hospital since year 2001 were reviewed in order to define which features lead to surgical treatment and to examine surgical outcome during postoperative follow-up.

Methods. The authors evaluated all patients operated on to remove cerebellar, brainstem and spinal cord hemangioblastomas between 2001 and 2017. Based on the review of the clinical records and outpatient long-term follow-up visits, their clinical course was analyzed. Functional evaluation was measured with the Karnofsky Performance Scale (KPS) on admission, at discharge, and at the last follow-up. The average follow-up time was 45 months.

Results. The majority of the patients (95%) were symptomatic. Symptomatic hemangioblastomas were associated with a cyst or a syrinx in 80% of cases. Total removal, as confirmed by postoperative magnetic resonance imaging (MRI), was achieved in all but one lesion. Following surgery, at follow-up, patients improved their neurological status in 75% of cases, 20% remained stable and 5% worsened.

Conclusion. VHL-associated hemangioblastomas generally affect a young adult population and can be successfully removed, either when symptomatic, or when they reach a critical volume. Microsurgery of hemangioblastomas has a favorable impact on survival and quality of life of VHL patients, although it is strongly influenced by preoperative conditions. Transient surgical complications are possible, particularly with brainstem and spinal cord hemangioblastomas.

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SS 7 – BRAIN 2: TUMOR
MAXIMAL SAVE SURGICAL RESECTION FOR HIGH GRADE GLIOMA, HAVE WE GOT THERE?
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Rahadian Indarto Susilo, Joni Wahyuhadi
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High grade glioma is the most common primary malignant brain tumor, despite maximal initial resection and multimodality therapy, about 70% of GBM patients will experience disease progression within one year of diagnosis. Less than 5% of patients surviving five years after diagnosis. Maximal resection of malignant gliomas are favourable prognostic factor for survival. Maximal resection should be achieved, however, with preservation of the patient’s neurological functions. Pre-operative evaluation In surgery close to functional brain areas it is critical to have information about the relation of eloquent cortex or important white matter tracts and the lesion. Awake craniotomy is indication for with intra-operative mapping and monitoring include preservation of motor and language functions. With limited facility, human resource, team work, and build a good protocol are very important to achieve a good clinical outcome.
CERVICAL ARTHROPLASTY. EXPANDING INDICATIONS TO SLIT DISCS AND SEGMENTAL KYPHOSIS

Oscar L. Alves (Portugal)

ABSTRACT

SS 8 – SPINE 5: CERVICAL

ABSTRACT

BOOK

CERVICAL ARTHROPLASTY. EXPANDING INDICATIONS TO SLIT DISCS AND SEGMENTAL KYPHOSIS

Oscar L. Alves (Portugal)

ABSTRACT

BOOK

SS 8 – SPINE 5: CERVICAL

TRANSPECIDULAR APPROACH IN SUBAXIAL CERVICAL SPINE: A CHALLENGE IN CERVICAL FIXATION

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Introduction

Cervical spine decompression, fusion and fixation are required when different pathologies destabilize the spine. Many approaches have evolved to stabilize the spine. Transpedicular approach to cervical spine has been a new addition to the attempt.

Methods and materials

88 cases underwent transpedicular fixation in subaxial cervical spine from 2014 January to 2018 June. 53 cases were of trauma, 29 had severe multilevel spondylotic cord compression and 6 had tumors. Their age ranged from 24 to 76 years with 52 males and 36 females. The procedures were done in prone position. After exposing the pedicles, 3.5 mm by 22 mm titanium polyaxial screws where inserted through the pedicles under fluroscope using the technique described by Professor Abumi. The pedicle screws were connected by a connecting rod, and were bent in accordance with the normal cervical lordosis. Fusion was done using the bones obtained from the spinous process and laminae.

Results

Out of 874 pedicle screws that were put, 56 screws were mis-directed, and had to be immediately corrected. There was no significant pedicle penetration or injury to neuro-vascular structures. There was temporary weakness of upper limbs in 38 patients, which recovered in two months. There were 18 deaths due to uncontrolled septicemia triggered by chest infection. The rest were discharged between one to six weeks after surgery.

Conclusion

Transpedicular fixation of unstable cervical spine provides biomechanically a very rigid fixation, good correction of sagittal alignment with high-fusion rate and few surgical complications.

Key Words: Subaxial cervical spine, pedicle fixation, transpedicular approach
SS 8 – SPINE 5: CERVICAL
POSTERIOR APPROACH FOR ODONTOID FRACTURE TYPE II FIXATION

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Odontoid fracture account for approximately 20% of all cervical fractures. Type II odontoid fractures are the most frequent fractures compare the type I and type III. Type II odontoid fractures frequently go into non union that may develop atlantoaxial dislocation that can cause compression of the spinal cord, and worsening the clinical symptom. Beside multiple surgical options have been proposed, the management of type II odontoid fractures still remain controversial.

We describe the surgical management for the patients with neglected odontoid fractures by posterior instrumented fixation.

Cervical traction was applied several days before surgery to achieve reduction of the atlantoaxial dislocation. C2 nerve root was resected and atlantoaxial facet joint was released. Atlantoaxial fixation was performed according to Harms/Goel technique followed by transfacet arthrodesis. The patients showed marked improvement during the follow up.

Posterior approach with Harms/Goel technique may be an effective alternative of treating atlantoaxial dislocation with odontoid fracture type II

Keywords: atlantoaxial, dislocation, posterior approach, odontoid fracture

SS 8 – SPINE 5: CERVICAL
HOW TO CHOOSE BETWEEN ANTERIOR AND POSTERIOR APPROACH FOR OPLL? AN EVIDENCE BASED APPROACH

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Objectives:
Cervical OPLL is a common cause of cervical myelopathy worldwide. Several surgical techniques have been described to treat this condition. Controversy still persists regarding the choice of appropriate approach for this condition. The aim of this presentation is to provide an evidence based analysis to select between anterior and posterior decompression for cervical OPLL.

Methods:
This review will describe the evidence in the literature and provide clear cut guidelines to choose an appropriate approach for cervical OPLL. The surgical approaches for cervical OPLL include: anterior, posterior or combined. The commonly performed anterior approaches include: anterior cervical corpectomy and fusion; others being: skip corpectomy, oblique corpectomy etc. The posterior approaches include: stand-alone laminectomy, Laminoplasty – open door or double door and laminectomy with lateral mass fusion. Anterior approaches have the following advantages: 1. direct removal of the causative pathology, 2. Stabilization of the spine. The disadvantages of an anterior approaches include: 1. technically demanding, especially, if dural ossification is present, 2. higher incidence of complications like graft complications, increased blood loss, dysphagia, hoarseness. Posterior approaches have the following advantages: 1. technically easier, 2. Lesser complication rates. The disadvantages of posterior approaches include: 1. causeative pathology is not dealt with, 2. It provides only indirect decompression, 3. Suboptimal outcomes if the canal occupancy ratio is > 60%, 4. Postoperative kyphosis and instability, if instrumentation is not done.

Results:
This presentation will provide evidence based recommendations that the choice of approach should be based on the following factors: 1. Number of levels involved, 2 cervical alignment, 3. Canal occupancy ratio, 4. Presence of dural ossification, 5. "K" line, 6. Morphology of the ossification, 7. Range of motion of the cervical spine, 8. Comorbidities of the patient and 9. Age of the patient.

Conclusions:
On the basis of the evidence available in the literature, anterior approach is ideal for OPLL: 1. with canal occupancy ratio > 60%, 2. with kyphotic cervical alignment and, 3. “Beak” or “hill shaped” morphology. Posterior approaches are ideal for OPLL: 1. with canal occupancy ratio < 60%, 2. with lordotic or neutral cervical alignment, 3. “plateau-type” of OPLL and, 4. with extensive dural ossification. Emerging evidence
indicates that posterior decompression combined with instrumented fusion decreases the chance of postoperative alignment changes as well as progression of OPLL.
SS 8 – SPINE 5: CERVICAL
C1 C2 POSTERIOR FIXATION

Eko Agus Subagio (Indonesia)

CERVICAL DISLOCATION FRACTURE: ANTERIOR-POSTERIOR STABILIZATION TECHNIQUE

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ABSTRACT

Introduction: In the treatment algorithm for cervical spine fracture–dislocations, the recommended approach for treatment if there is a disc fragment in the canal is the anterior approach. The posterior approach is not common because of the disadvantage of potential neurological deterioration during reduction in traumatic cervical herniation patients. Anterior approaches can restore cervical lordosis, and cause less postoperative pain and less wound problems. Posterior approaches are useful for direct reduction of locked facet joints and provide stronger fixation from a biomechanical point of view. Combined approaches can be used in more complex cases.

Presentation of case: We report 1 cases patient with Spinal Cord Injury Frankel A et causa Fracture Cervical C5 with Dislocation C4-5, C5-6. Patient a Male, presented with tetraplegia after fall in waterfall, with syncope and vomiting. Motoric 3/3 0/0, without sphinter ani reflect. We diagnosis patient from clinical findings and imaging methods and CT Scan 3D Reformat and MRI is the best method for diagnosis and differential diagnosis. We treat a patient with Anterior Cervical Disectomy and Fusion with anterior cervical plate in C4,5,6 and posterior stabilization with Lateral Mass Screw C4,5,6, after follow up 2 years after surgery, clinical condition become improve.

Discussion: There are some clinical and radiological situations that indicate one approach may be preferentially used over the other. Considering that the level of evidence of the best treatment of cervical facet dislocations is inconclusive, surgeons who treat cervical spine trauma should be able to perform both procedures as well as combined approaches to adequately manage their patients and improve final outcomes.

Keywords: Spinal Cord Injury, Cervical Dislocation Fracture; Anterior – Posterior Stabilization Technique

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OSTEOPLASTIC PROCEDURES FOR FRONT TO TEMPORAL CRANIOTOMY

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<Summary>
Frontotemporal craniotomy is one of the most popular procedures in neurosurgery, and a variety of modified techniques have been reported. However, some postoperative deformity can occur, such as unexpected temporal depression or erosion of craniotomized flap. It is important to prevent these problems with simple methods.

To achieve esthetically good result, preservation of the periosteum, gentle treatment of temporalis muscle and craniotomy with less bony gap are needed. Bone adhesion can be expected even in elderly patients after the bony gap is filled with autologous tissue. Gentle treatment of temporalis muscle can prevent muscle atrophy and postoperative temporal depression.

These procedures can be performed using ordinary instruments, not special ones. Actual procedures expecting osteoplastic reconstruction will be introduced.

Key words: frontotemporal craniotomy, osteoplastic reconstruction, autologous bone graft

SERUM LEVELS OF TNF-A, IL-10 AND TNF-A/IL-10 RATIO ON TRAUMATIC BRAIN INJURY IN WISTAR RATS

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Abstract
Traumatic brain injury (TBI) is one of the leading causes of death and disability in the world. Cytokines have been shown to be involved in TBI. We conducted a study to assess the levels of TNF-α and IL-10 on TBI. This research uses experimental research design laboratory analysis on Wistar rats by using a design post test control design. The result showed that the group of rats with brain injury had a mean serum TNF-α levels were significantly higher (p<0.05) at 1st hour compared with the control group and decreased in the 3rd and 24 hours. Groups of rats with brain injury had a mean serum IL-10 levels were significantly higher (p<0.05) at 1st hour compared to the control group and decreased in the 3rd and 24 hours. The ratio of TNF-α/IL-10 serum was significantly increased in at 1:5 compared with the 3rd and 24 hours after TBI.
ABSTRACT

 PRIMARY NEUROSURGICAL LIFE SUPPORT (PNLS): EFFECTIVE SIMULATION TRAINING FOR NEUROSURGICAL MANAGEMENT

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Introduction) Primary Neurosurgical Life Support (PNLS) is the training tool to build up the learning environment of the medical examination and treatment not only to head trauma, stroke but all neurosurgical patients in acute stage. This course is designed to train for rapid response against the acute deterioration in emergency center, ICU and neurosurgical ward. PNLS is introduced through the result of recent courses in this paper. The effect and its reflection of PNLS is shortly discus. Materials and Methods) PNLS course which held in Japan and oversea were presented. The contents and the learning objectives were discussed. Result) PNLS course is arranged in four modules. The learning objectives were as follow. (1) A skill of cardiopulmonary resuscitation with the understanding of neuroresuscitation. (2) Airway managements (3) The understanding and its treatments of cerebral herniation. (4) Correct assessment of consciousness impairments. (5) Procedure of ICP placement. (6) Case reports discussion in neurosurgical disorders. Each modules were designed to skill station, simulation station and discussion table. Cases of head trauma is used more for courses in Asian area. Discussion) The participant of PNLS were a doctor, training medicine, a nurse and an emergency medical technician. The theme and objectives could be arranged to any level of medical staff using these contents flexibly. Many participants are satisfied with the result of PNLS course.

221 words

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ABSTRACT

To determine whether early decompressive (DC) or late decompressive for patient in traumatic brain injury is not easy. Late study was to analyze outcomes of the patients underwent surgery for traumatic brain injury (TBI) with critical Glasgow coma scale at Dr. Soetomo General Hospital Surabaya, Indonesia in term of mortality. All cases of critical TBI patients with hemorrhage was operated (evacuation craniotomy) from January 2015 - December 2016 at Dr. Soetomo General Hospital Surabaya, Indonesia. The data were retrospectively reviewed from the medical records. The results were 36 samples analyzed from the medical records of Dr. Soetomo hospital. The operation was performed for the patients with epidural hemorrhage (EDH), subdural hemorrhage (SDH) and intracerebral hemorrhage (ICH). In the postoperative period, 83.78% (30 patients) of patients died and only 16.22% (6 patients) survived. Survived patients were followed until six months according to Glasgow Outcome Scale (GOS). As regard with the six-month evaluation of GOS, only 2 patients came out with good functional outcome (GOS Extended), 2 patients came out with lower moderate disability (GOS Extended 5), and 2 patients with dead status (GOS Extended). We conclude that TBI patients with critical GCS should manage with surgery as indicated since good functional results can be obtained in some cases. A lot of journal still debate for the timing of DC. Early DC or late DC can prevent the patient from death. But every hospital, center, or Country have their own reason to use the early DC or late DC.

Key Words: Critical GCS, hemorrhage evacuation craniotomy, Early decompressive, Late Decompressive
SS 9 – BRAIN 3: TRAUMA

PROGNOSTIC VALUE OF CONVERGENT TYPE OF HEMORRHAGE VISUALIZED BY SUSCEPTIBILITY WEIGHTED IMAGE IN DIFFUSE BRAIN INJURY

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Susceptibility-weighted imaging (SWI) is a novel magnetic resonance imaging technique for visualizing the magnetic susceptibility differences in various compounds including deoxygenated blood, blood products, iron, and calcium. This study aimed to retrospectively investigate 21 patients (mean age: 39±24 years; 15 males and 6 females) with diffuse brain injury treated nonsurgically. However, we excluded death or persistent vegetative state patients. On SWI, all patients displayed small hemorrhages (microbleeds) with independent small or bead-like signal loss (hypointensity). We categorized all patients into two groups based on SWI findings; (a) C-group (n=14) showing convergent shape or distribution of lesions, and (b) S-group (n=7) showing only small spots or single bead-like lesions, which also existed in C-group. Small spots or single bead-like lesions in both groups were distributed over the entire brain including the brainstem, cerebellum, and corpus callosum. Lesions in the C-group were primarily detected in the white matter of the frontal and temporal lobes; however, these microbleeds were hardly detected on CT, which existed outside of the area showing hyperintensity on Diffusion-weighted imaging. The period required to recover from coma was 8.7 ± 9.3 days and 2.6 ± 3.2 days in the C- and S-groups, respectively (P=0.06). In conclusion, SWI is a highly sensitive imaging method, which is useful for the evaluation of microbleeds in diffuse brain injury. Presence of Convergent-Type Hemorrhage is considered to pay a key role in determining the severity of diffuse brain injury.
SS 9 – BRAIN 3: TRAUMA
MANAGEMENT OF NEUROSURGERY CASES IN LOMBOK ISLAND EARTHQUAKE 2018

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ABSTRACT
Introduction: Lombok earthquake may refer to the following 5 thrust type earthquakes, with epicentres north of Rinjani volcano, that caused significant damage and deaths; July 2018 Lombok earthquake (Mw and M L: 6.4, a foreshock); 5 August 2018 Lombok earthquake (Mw 6.9, M L: 7.0, the mainshock); A magnitude-7.0 earthquake has hit the Indonesian resort island of Lombok, killing 98 people; 9 August 2018 (Mw 5.9 aftershock, 6 deaths); 18 August 2018 23:10pm local time Lombok earthquakes (Mw 6.4 aftershock, 2 dead); 19 August 2018 Lombok earthquake (Mw 6.9 new earthquake, different fault.). Sunday, July 29th 2018. The 6.4 magnitude quake hit the central island of Lombok just before 07:00 local time. More than 160 people are injured and thousands of homes are damaged, officials say. More than 555 people have been killed and 1.478 injured by an earthquake which hit the Indonesian island of Lombok.

Presentation of case: In Lombok Island earthquakes, about more than 350 patients referred to General Province Hospital of West Nusa Tenggara. About 47 patients referred because of Brain injury. In Hospital, there are 3 big tents for the patients, still lacking, there are still many patients who are along the corridor of the hospital because they do not get a place in the tent. Of the 47 brain injury patients, 67% were from North Lombok, the rest were from East Lombok, Central Lombok and Mataram City; 67 % with mild traumatic brain injury, 25 % moderate and 8 % severe. 47 % children; 35 % depressed fracture. Of the 47 brain injury patients, 60 % operation and 40 % konservatif treatment.

Discussion: Indonesia is prone to earthquakes because it lies on the Ring of Fire - the line of frequent quakes and volcanic eruptions that circles virtually the entire Pacific rim. The death toll from the earthquake that rocked the Indonesian island of Lombok a week ago has passed 555 and the government is estimating economic losses of at least several hundred million dollars, more than 350 patients referred to General Province Hospital of West Nusa Tenggara. About 47 patients referred because of Brain injury; the majority of brain injury cases come from North Lombok; mild brain injury; children; depressed fracture; and 60% of cases we do surgery.

Keywords: Lombok Island earthquakes; traumatic cases; traumatic brain injury; neurosurgery treatment

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SS 10 – BRAIN 4: TECHNIQUE
MODERN SURGICAL MANAGEMENT OF PATIENTS WITH SYMPTOMATIC LOW GRADE GLIOMA IN ELOQUENT AREAS

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Objective:
Up to now there still has been no therapeutic standard for the heterogenic groups of low grade gliomas (LGG). Our tumor data bank demonstrates an incidence of 5 -10% LGG among averaged 180 primary surgically treated brain tumors per year with an increasing tendency. In this manuscript, we describe our operative procedure and its results on patients with symptomatic LGG in critical brain area.

Methods:
The analysis revealed 32 patients with LGG who were operated on in the last 3 years. Most patients had diffuse astrocytoma WHO grade 2 (17 patients). Rare tumors such as ganglioglioma (3), central neurocytoma (3) and subependymoma (1) were also diagnosed during this period. The tumor was mostly localized perisylvian (17) less in ventricle (5), brainstem (5), central region (4) or basal ganglia (1). All patients were operated on with navigation support, endoscopmic-microsurgical technique and intraoperative neurophysiologic monitoring (IOM) of different modalities. The morphologic data was fused with the functional one (fMRI, DTI, nTMS as well as PET) for navigation setting.

Results:
Total excision could be achieved in 14 patients. Subtotal (14) or part resection (4) has had to be performed due to the functional data and the IOM results. Temporary worsening of the neurological finding occurred in 11 patients for several days. The examination 3 months after surgery and later on demonstrates, however, an improvement status in comparison to that of before surgery in 26 patients. During this period, no recurrence surgery was needed. The seizures improve in 14/ 19 patients with or without antiepileptic drugs but in decreased dosage.

Conclusion:
Our results show that LGG in critical area can be operated on safely with good outcome thus improvement of the quality of life. This therapeutic option using modern morphologic and functional data should be offered to patients with symptomatic LGG.
SS 10 – BRAIN 4: TECHNIQUE

PITFALL ANTERIOR TRANSPETROSAL (KAWASE APPROACH) FOR COMBINE MIDLE AND POSTERIOR FOSSA LESION

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Multiple invasion lesion in the middle and posterior fossa is still challenging. The complex skull base neurovascular structures are the most potentially injured during surgery. The anterior transpetrosal approach (Kawase's Approach) is the only one that can access in one step surgery for the lesion in middle and posterior fossa tumor, such as meningioma, schwannoma, and other lesion. The angle of microscope and patient position is the most important during resection petrous apex (Kawase's triangle). The landmark of GSPN (Greater superior petrosal nerve), arcuate eminence, and trigeminal impression are the important border during drilling anterior petrosectomy. By cutting the temporal base duramater and cutting the SPS (superior sagittal sinus) are possible to expose the surgical field widely. By this approach, the view of CN III, IV, V, VI, VII, and VII are possible to be seen during surgery. However to mastering this approach need more learn and practice on the cadaveric study first, to knowing the pitfall and avoid the deficit of neurology after surgery.

Keywords: Anterior transpetrosal, Kawase's triangle, GSPN, arcuate eminence, trigeminal impression

SS 10 – BRAIN 4: TECHNIQUE

STRATEGY OF MINIMAL INVASIVE SURGERY IN SPONTANEOUS ICH

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Abstract Spontaneous Intracerebral Hemorrhage (SICH) is a devastating disease with multi-factorial co morbid, and there was still controversial, no specific medical treatment whether open surgery or minimal invasive surgery had been proven to decrease mortality rate. Minimal invasive surgery in selected patients with Neuroendoscopy may be benefit from hematoma evacuation and stop rebleeding by means of directly vision. Some of RCT results showed that minimal invasive surgery more superior to others conventional open craniotomy related with mortality and morbidity rate. Favoring early clot removal is evidence that the limited release of specific neurotoxin biomarkers associated with the breakdown products hemoglobin underlies secondary brain injury. Attention has therefore shifted to perilesional brain injury, especially brain edema, as a potential target for therapeutic intervention. However management of acute Spontaneous ICH in a Neurointensive Care Unit does appear to improve outcomes, suggesting that many available therapies to multifactorial co morbidity in fact provide benefit. Key words: spontaneous ICH, multi-factorial co morbidity, neuroendoscopy, perilesional brain injury, neuro ICU.
SS 10 – BRAIN 4: TECHNIQUE

A TECHNICAL METHOD OF EXTRADURAL ANTERIOR CLINOIDECTOMY. —MICROANATOMY AND ACTUAL OPERATIVE PROCEDURES—

Kazumi Ohmori

Removal of the anterior clinoid process is one of the most critical procedures to the successful and safe management of paraclinoidal lesions.

Technically, the first key step is the division of the frontotemporal dural fold, which is called meningo-orbital band (MOB).

Detachement of the MOB was accomplished using a four-step dissection based on the structure's detailed microanatomy and included (1) drilling of the lateral wall of the superior orbital fissure, (2) incising of the lateral periosteal dura of the superior orbital fissure, (3) peeling off the dura propria of the temporal lobe from the inner cavernous membrane, and (4) fully detaching the exposed MOB from the periorbita. Finally, lateral surface of anterior clinoid process can be exposed.

We recommend surgeons possess not only sufficient anatomical knowledge of this part but recognition of those words as surgical procedures.

We introduce microanatomy of anterior clinoid process and adjacent structures by using photos of cadaveric dissections, and show actual operative videos.

SS 10 – BRAIN 4: TECHNIQUE

ONE-AND-A-HALF CAVITY CONCEPT FOR SINGLE NOSTRIL ENDOSCOPIC ENDOVASAL TRAANSSPHENOIDAL HYPOPHYSECTOMY; A TECHNICAL REPORT

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ABSTRACT

Introduction
Endoscopic Endonasal Transsphenoidal Hypophysectomy (EETH) for Pituitary adenoma has now increasingly accepted by most neurosurgeons in many centers throughout the world. Single nostril EETH has minimal trauma of nose, at the expense of space within the operation. We describe one-and-a-half cavity concept for single nostril EETH that offer improved illumination and superior panoramic visualization of the sella and surrounding structures.

Objectives
The aim of the study was to analyze the outcome and the surgical technique to enlighten advantages and limitations of this procedure. We introduced this technique for pituitary adenomas with detailed technical description. A retrospective analysis was also performed on 50 consecutive patients who underwent EETH surgery at our institution.

Result
Key of one-and-a-half cavity concept for single nostril EETH is expansion of the sinonasal corridor by partially resecting superior turbinate and posterior ethmoidectomies to provide direct visualization of the optic apices and subsequently the optic nerve canal. It gives larger space for the endoscope and dissecting instrument.

Single nostril EETH was done in 50 cases of pituitary adenoma. Bleedings during the surgery were minimal; they were less than 50 cc in 11 cases, and 50 – 200 cc in 30 cases and 9 cases that over 200 cc. Post-operative LOS of most patients was 7 – 14 days and 9 patients can be discharged within 7 days. Re-operation was done in 6 patients. Those was due to post operative hemorrhage and profuse cerebrospinal fluid leakage in 4 and 2 cases respectively.

Conclusion
EETH procedure resulted in a safe, effective, and well-tolerated procedure. We conclude that one-and-a-half cavity concept for single nostril EETH provided sufficient surgical corridor for four hand technique and ensure minimal invasion of the nasal canal.

Key Words: * pituitary surgery * transsphenoidal approach * endoscopy * endoscopic endonasal * EETH * A-one-and-a-half cavity concept
SS 10 – BRAIN 4: TECHNIQUE
MICROVASCULAR DECOMPRESSION WITH KEYHOLE CRANIOTOMY

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<Summary>
Microvascular decompression (MVD) is a definite treatment for trigeminal neuralgia (TN) and hemifacial spasm (HFS). However, the procedure should be done in a less-invasive way, because MVD is an invasive treatment. MVD is performed with retrosigmoid craniotomy. Retrosigmoid craniotomy sometimes causes postoperative deformity or nuchal pain. To avoid these complications, gentle and less-invasive treatment of muscles are needed. Also, the craniotomy should be performed without undesirable size. The offending artery is a branch of cerebellar arteries in most cases of TN and HFS. In these typical cases, the transposition procedure of the offending artery can be achieved even with a keyhole size of craniotomy. Actual procedures will be introduced.

Key words: microvascular decompression, trigeminal neuralgia, hemifacial spasm, keyhole craniotomy

PLENARY LECTURE 3
SPINAL CORD TUMOR

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Introduction:
To study the relative frequency of primary spinal cord tumors and their features in Indian populations and comparison with other reports

Methods:
Data of primary spinal cord tumors operated between 2009 and 2016 was collected and analyzed.

Results:
Of the 224 patients operated at our center, 104 (45.83) patients were male and 120 (54.17) were females. The mean age at surgery was 45.09 years (range 5 years 11 months to 87 years). Of these tumors, 120 cases were intradural extra medullary (53.64%), 36 cases were intramedullary (15.63%), 18 cases (8.34%) were epidural tumors and 50 patients (22.40%) were dumbbell tumors. The histopathological diagnosis was 114 schwannomas, 27 neurofibromas, 21 meningioma’s, 15 ependymomas, 8 hemangiomas, 7 hemangioblastomas, 7 chordomas, 6 astrocytoma’s, 4 lipomas and 15 tumors of various other diagnoses including very rare malignant peripheral nerve sheath tumor transformed from ganglioneuroma developed 30 years after radiation (19th reported case). Outcome analysis was also done and 87.5% patients described good to excellent outcome. As against most Non-Asian studies, relative frequency of nerve sheath tumors (62.5%) appears higher than meningioma’s (14.17%).

Conclusions:
This is the largest single institutional review for spinal cord tumors in Indian population with demographic, histopathological and outcome analysis. Formation of spinal cord tumor registry is important to ascertain the demographic variations amongst different populations to indicate etiological agents.

Keywords: Spinal cord tumors, epidemiology, Indian population
There has been long-standing interest in spinal cord injury—in part, because of the devastating consequences to the patient. The early studies focused on treatment of patients with spinal cord injury then began to focus on spinal cord injury in an experimental setting. Although many models of spinal cord injury have been tried, the weight-dropping technique became the most frequently studied. Trauma was quantified by noting the weight (gms) and the distance the weight fell (cms) through a vertical tube and, thus, impact the spinal cord and was described as “gram centimeters.” It was believed that the model was a good one in that the trauma was “physically defined.” Variations in the response to trauma were explained as “biological variation.”

Biomechanics experts assessed the model (as will discussed in this presentation) and recommended a way to accurately quantify the trauma to the spinal cord. The resulting changes in the model, the reasons for the changes in the model, and the implications of the changes now and in the future will be discussed.
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Spinal instrumentation technique has undergone revolutionary progress over the past few decades. This progress has significantly changed the surgical strategy for spine disease, for not only spinal trauma, but also congenital diseases, cancer, infection, and aging degeneration. Hospitalization time has been reduced, patients are mobilized more rapidly, and the overall surgical outcome has improved. On the other hand, spinal instrumentation such as pedicle screws may carry a risk of neural or vascular injury. To avoid such surgery-related complications, intraoperative image guidance using fluoroscopy or CT-based computer navigation has been developed.

However, technical pitfalls and the means to avoid them need to be carefully considered. More recently, a 3D-CT-based navigation system using intraoperative cone-beam computed tomography with a flat panel detector angiography module, also referred to as hybrid operating room, has been actively developed to achieve more accurate and safe surgery. Real-time navigation with the O-arm system is also available. Intraoperative image guidance allowed us to achieve precise surgery, and well suited complex spinal fusion cases, although the associated radiation exposure to the patients and surgeons remains a major concern. The possible disadvantages of the intraoperative image guidance need to be carefully discussed, but image-guided neurospine surgery will surely help the establishment of advanced safety medicine.
ABSTRACT

BOOK

ABSTRACT

BOOK

Plenary Lecture 4

Anterior C1 C2 Fixation for Mobile AAD or Fracture Odontoid

Sushil Patkar (India)

Osteoporosis is a major health-care problem that is increasing in magnitude with the aging population. Such patients are more prone to develop painful and debilitating spinal deformities but are difficult to treat. Currently, no definitive treatment algorithm for osteoporotic spine has been established. Spinal deformities in patients with osteoporosis are difficult to treat because of their debilitating and progressive nature. Novel surgical approaches and instruments have been designed to decrease construct failures in this patient population by reducing implant pullout, subsidence, and incidence of revision surgery.

The surgical treatment options in osteoporotic spine are severely limited because of the tendency for instrument failure secondary to pullout and subsidence, leading to revision procedures; multiple levels and multiple fixation points are recommended to minimize the risk. Anterior approaches may provide another avenue of treatment, but only a few studies have been conducted on these implants in patients with osteoporosis. The literature supports the use of vertebroplasty in conjunction with pedicle screw-based instrumentation for treating more severe spinal deformities. Other techniques and modifications with evidence of reduced failure risk are bicortical screws, hydroxyapatite coatings, double screws, and expandable screws. The success of these techniques depends on integrating biomaterial, biologic, and biomechanical aspects with clinical considerations.

The purpose of this presentation is to review the novel surgical treatments for patients with osteoporosis with the goal of achieving a better mechanical stability and improving surgical care. Synthesizing this myriad of aspects will lead to improved treatment options for patients with osteoporosis who are suffering from spinal deformities.

Key Words: Osteoporosis, Vertebral fracture, Stability
PLENARY LECTURE 4
MINIMALLY INVASIVE MANAGEMENT OF METASTATIC SPINE TUMORS

Scott C. Robertson

Summary: Metastatic spine tumors and secondary compression fractures are an increasing problem faced by neurosurgeons. Historically, metastatic spine tumors were treated with radiation therapy, and neurosurgery was only involved when there was neurological deficit or significant fractures. Over the last decade, metastatic tumors with secondary compression fractures have been treated with vertebral augmentation. Recently, techniques involving ablation of the tumor followed by vertebral augmentation have been found to provide improved tumor control and good pain relief through a minimally invasive approach. We describe our experience and studies which have been performed describing the use of radio-frequency ablation for metastatic tumors, followed by a vertebral augmentation.

SS 11 – SPINE 6: TECHNIQUE
ROLE OF SPINAL NAVIGATION (O-ARM) IN LUMBAR FUSION PROCEDURES

Kresimir Rotim (Croatia)
<Introduction>
The image guided surgery including O-Arm navigation system has been more feasible and available for whole spinal fixation all over the world recently. These systems have been useful for insertion of pedicle screw and other screws. They have allowed less invasive surgery. In this paper, we would like to present the feasibility of MIS of spinal fixation using O-arm.

<Material and Methods>
From 2007 onwards until now, consecutive over 300 cases underwent spinal fixation surgery using navigation system. Among them, after 2012, we operated with O-arm for cervical pedicle screw percutaneously and percutaneous pedicle screw insertion of thoracolumbar spine and temporary fixation for spinal injury in particular. During operation we made small incision at proper position depending on the case, and made pinpoint exposure of insertion point of screw, after that, screws were inserted using full-time navigation system. For osteosynthesis of cervical spine fracture, such as lateral mass fracture, cervical pedicle screw was inserted so as to cross the fracture line. After bony fusion of fracture line was obtained three or four months after surgery, screws were removed.

<Results>
Most of patients got better without problems.

<Discussion and Conclusion>
we believe our procedure of MIS of spine using O-arm is much useful and feasible for patients.
Sabri Ibrahim
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Abstract
In 2015, 10.4 million new cases of TB worldwide were detected, 60% of the cases were diagnosed in 6 countries; India, Indonesia, China, Nigeria, Pakistan and South Africa. In neurosurgery department university of sumatera utara Medan 20 cases surgery spinal TB every year, most cases involve thoracic spine region. Pharmacotherapy must be combined with surgery in patients with spinal cord or nerve root compression, large abscess, or marked anterior column osteolytic with kyphotic and instability. The quality of debridement and bony fusion is optimal when the anterior approach is used. Posterior fixation is the best means of achieving reduction followed by stable sagittal alignment over time. One-stage posterior surgery can achieve the same efficacy as anterior-only or combined surgery, with less trauma, less blood loss, and shorter operative times.

Keywords
Pott's disease, Spinal tuberculosis, Paraspinal abscess, Kyphotic Deformity, Surgical Treatment Spondylitis

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The incidence of intraspinal tumors is 10 per 100,000 population. The most common primary tumors of the spinal cord are nerve sheath tumors, meningiomas, and astrocytomas. A significant number include metastasis to the spine and bony involvement of extraspinal tumors. Minimal access technologies such as hemilaminectomy, use of tubular retractors and endoscopic approaches are newer approaches which provide a safe and minimally-invasive operation. Some problems addressed by minimal access spine surgeries include (1) issues with time-consuming operations, (2) significant morbidities, (3) prolonged disability and hospital stay, (4) negative psychological sequelae, (5) risks associated with muscle stripping and denervation, (6) regional ischemia contributing to potentially prolonged recovery periods, (7) associations with chronic persistent back-pain, and (8) issues with instability.

With proper patient selection, preoperative evaluation and availability of adequate instrument systems, there are no reported increased complications arising from minimal access technologies. The relatively steep learning curve of dissection in a smaller field and suturing of the dura using finer needles and needle holders is easily overcome after approximately six to eight cases. The operating time is actually shorter for minimal access procedures than standard cases.

Minimal access spine surgery of intraspinal tumors can be a safe and effective approach with proper patient selection, preoperative evaluation, and adequate instrument systems. Minimal access surgery of intraspinal tumors via the unilateral muscle-splitting technique is an innovative alternative to laminectomies and bilateral paraspinal muscle dissection surgeries. There is a statistically significant decrease in VAS scores, blood loss, and hospital stay.

Keywords: Minimally invasive spine tumor surgery, minimal access spine tumor surgery, minimal access spine surgery
SS 11 – SPINE 6: TECHNIQUE
TRANSARTICULAR FACET SCREW FIXATION OF THE SUBAXIAL CERVICAL SPINE: ADVANTAGES AND LIMITATIONS

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Aim:
To present this author’s personal experience with transarticular facet screw fixation (TAFSF) of the subaxial cervical spine for posterior instrumented stabilization.

Methods:
Patients with degenerative cervical myelopathy due to cervical spondylosis and/ or OPLL with obliteration of cervical lordosis, reducible kyphosis and/ or subluxation were included in the study. Preoperatively and postoperatively, patients were evaluated using Nurick's grading, modified JOA score, plain radiographs, CT & MRI of cervical spine. TAFSF was done at the affected levels. Complications were recorded. Follow up ranged from 2 months to 2 years.

Results:
Period of study: 2010 - 2017. Number of patients treated - 26. All underwent TAFSF at the affected levels along with posterior decompression in the form of either laminectomy or laminoplasty, two underwent TAFSF alone without decompression following anterior decompression & stabilization. Initially, Takayasu as well as DalCanto’s techniques were used for 6 cases. However, this author’s modified approach described in 2013 was used for the later 20 cases. Takayasu and DalCanto’s techniques were associated with higher incidence of fracture of the facets. This author’s technique was associated with least incidence of facet fractures and the screw length was longer by 2mms. All the three techniques were able to achieve purchase of four cortices. There were no vascular or nerve root injuries or screw breakages during the follow up. Overall, the ability to combine posterior instrumentation with laminoplasty and lower implant profile.

Conclusions:
TAFSF is a biomechanically stronger, cost-effective and simpler way of posterior instrumentation of the subaxial cervical spine. This technique should be in the armamentarium of every spine surgeon.

SS 11 – SPINE 6: TECHNIQUE
CLINICAL OUTCOME OF TRANS-SACRAL EPIDUROSCOPIC LASER DECOMPRESSION (SELD)

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Objective: Nowadays, trans-sacral epiduroscopic laser decompression (SELD) using thin epiduroscope and the Holmium: YAG laser has been one of the good options for minimally invasive treatment in lumbar disc disease. However, SELD is still initial stage in global field of spine surgery, and not only the clinical outcome but also consensus for indication are not established yet. Therefore, authors investigated the patients underwent SELD to report the clinical result and ideal indication.

Methods: Between 2015 and 2017, a total of 62 patients undergone single level SELD for low back pain (LBP) and/ or radicular pain were enrolled. Clinical outcome were evaluated using visual analogue scale (VAS) for LBP and leg pain, Oswestry disability index (ODI), and Odom’s criteria.

Overall mean age was 41.2±14.7 years and minimum follow-up was 6.0 (range, 6.0-24.0) months. A retrospective review of clinical data was conducted.

Results: Back pain and leg pain were improved from an average of 5.9±1.1 and 6.3±0.9 to 2.6±0.7 and 2.9±1.6 at final follow-up (p<0.001). Mean ODI improved from 50 to 19 at one month after surgery, and further improved to 12 at final follow-up. According to Odom’s criteria, symptom improvement was significant at one month, and further improved at final follow-up.

There were no surgical related complications, such as, neurologic deficit, infection, epidural hematoma, and there were 3 cases of revision surgery and 5 cases of additional procedure.

Conclusion: Our findings showed that SELD achieved favorable clinical outcome without severe post-operative complication. The SELD can be a safe and effective minimally invasive surgery for lumbar herniated disc disease.

KEY WORDS: disc; lumbar spine; trans-sacral epiduroscopic laser decompression
Endro Basuki (Indonesia)

LESSON LEARNED FROM INDONESIAN STOCK EXCHANGE SPINE CASUALTIES: A NEUROSURGEONS PERSPECTIVE

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Background: Accidents can occur to anyone and anywhere, to a person or group of people. The prognosis of a person who is injured does not only depend on primary injury but is largely influenced by advanced therapy provided by the nearest helper / community and in the hospital care. This paper reviews the assistance given to mass accidents on the Indonesian Stock Exchange (Bursa Efek Indonesia/BEI) with many victims of spinal trauma.

Method: Descriptions of incident, treatment and clinical assessments of patients who had an accident falling from the 2nd floor of the BEI building which caused 4 cases of thoracolumbar fracture and paraparesis inferior.

Result: Twenty-eight of the more than 100 students in the BEI cases were treated at Siloam hospital semanggi Jakarta. Four cases of thoraco-lumbar fracture with severe paraparesis were apparently helped without stretching by the community around the time of the incident. At the emergency room the patients were waiting for a clinical and radiological examinations include taking more time for lumbar MRI. They operated in queuing for laminectomy decompression and posterior stabilization and physiotherapy. All patients experience clinical improvement after surgery.

Conclusion: Good knowledge is needed for the community in first aid in trauma, especially spinal trauma and mass trauma through training programs by neurosurgery associations, and universal caution by the national health department. Good hospital care and neurosurgeon readiness help the patient’s prognosis better.

Key word: Spinal trauma; community awareness; hospital care; neurosurgeon readiness

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Primary Central Nervous System Lymphoma (PCNSL): 7 Years’ Experience in Single Institution

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Abstract

BACKGROUND: Primary central nervous system lymphoma (PCNSL) is a rare neoplasm representing less than 3% of all non-Hodgkin lymphoma that is restricted in distribution to the brain, cranial nerves, leptomeninges, spinal cord, cerebrospinal fluid (CSF) and intraocular compartments. Despite a high chemo- and radiosensitivity, patients are at high risk of developing severe treatment-related toxicity. This article presents our seven years-experience in the management of PCNSL.

METHODS: A series of 28 PCNSL patients treated from 2010 to 2017 in Dr. Soetomo General Hospital - Department of Neurosurgery were reviewed.

RESULT: Baseline demographic data were included. From 28 patients, Thirteen patients underwent tumor excision, eleven patients underwent biopsy, and the other with only diversion of cerebrospinal fluid.

CONCLUSION: We conclude that PCNSL is an increasing case which need prompt treatment following chemo- and radiotherapy. The prognosis remains questionable with low chance of survival rate despite the multimodal and multidiscipline therapeutic approach.

Keywords: PCNSL, brain neoplasm, surgical, survival

Beyond the Pillars of Hercules: The Navigation of the Cerebral Aqueduct and the Fourth Ventricle to Manage Intraventricular Blood Clots and Arachnoid Cysts

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Introduction.
Intraventricular neuroendoscopy has rapidly developed over the recent years, due to its effectiveness in the management of several ventricular and paraventricular pathologies with a minimally invasive approach. Although many issues can be solved using a rigid endoscope, which has better image quality and more complete instrumentation, some procedures can be performed only with a flexible scope.

Methods.
Between 2014 and 2017, 68 patients underwent neuroendoscopic procedures with a flexible scope (Karl Storz, Tuttingen, Germany). Patients who underwent transaqueductal navigation were selected. For all these cases, preoperative imaging, intraoperative recordings, and postoperative imaging were reviewed. Preoperative clinical data were compared with postoperative outcomes.

Results.
With the use of the flexible scope, we were able to completely aspirate intraventricular clots in patients affected by intraventricular hemorrhage, setting free the third and the fourth ventricle. We could effectively manage arachnoid cysts of the fourth ventricle, and even cisterna magna from a precoronal paramedian burr hole.

Conclusions.
Flexible intraventricular neuroendoscopy offers the potential possibility to navigate all the four ventricles and the cerebral aqueduct. Despite the lower image quality compared to the rigid scope, and the lack of dedicated instrumentation, only the flexible scope allows complete navigation of the cerebral aqueduct and fourth ventricle for cyst fenestration or complete aspiration of intraventricular hemorrhage, using a single burr hole access. A non-stenotic aqueduct can be safely navigated by a well-experienced neuroendoscopist. In our experience, there is no risk of damage to the fornix using a flexible scope. Only in a few cases we noticed small blood spots on the aqueduct wall after navigating through it, without any clinical consequence.
ABSTRACT

MULTISEGMENTAL DIFFUSE INTRADURAL EXTREMEDULLARY SPINAL TUMOR

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Cases of glial tumors that arise from ependymal cells within the central canal of the spinal cord or filum terminale ("terminal thread") are rare in number of spinal tumor. From the past few years, an incidence of approximately 0.2/100,000 population. We review cases of this tumor have average length of between 3-4 spinal segments. There is standard goal as a neurosurgeon to tumor excision, that is total resection with preservation of healthy tissue, get tissue sample, hope to improve neurological function after operation. These tumors ("spinal ependymomas") have magnetic resonance imaging for the best modality to assess, but a definitive only made intraoperatively by getting a tissue sample.

During 2016-2018, we have a case, male (27 y.o.) with back pain and could not walk since 6 months before admission. From magnetic resonance imaging has shown multiple mass suspect benign intradural extramedulla, on V.Th2-V.S2 and syringomyelia on V.Th1 and V.Th6-9. Slowly over time, the patient felt the back pain worse and progressive legs or foot weakness, until patient could not walk. At the same time, sensory disturbance also found on chest to both limbs and bladder-bowel difficulty.

After had two times surgical phase, first is total laminectomy V.Th2-11 with tumor excision, and second is total laminectomy V.Th12-V.S2 with tumor excision + instrumentation with fusion; the motoric and sensory function gradually improve.

ABSTRACT

MIXED PAIN CONCEPT IN CHRONIC LOW BACK PAIN

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The prevalence of chronic low back pain (LBP) is continuously increased significantly, approximately 20-40% of the population. Chronic LBP affected the quality of life of the patient and family. The pathophysiology of back pain is complex. The nociceptive and neuropathic pain was thought to be involved in the pain-generating mechanism. The nociceptive sprouts within the degenerated disc, mechanical compression of the nerve root, or action of inflammatory mediators from the degenerated disc may be the source of neuropathic pain. The correct assessment and management of mixed pain can reduce the symptoms and the prevalence of chronic LBP. The management of neuropathic and nociceptive components have to be adequately addressed. The non-steroidal anti-inflammatory drug (NSAID) or opioid can be used to manage the nociceptive component, on the other hand, the adjuvant medications such as anticonvulsive and antidepressant were used in managing neuropathic component. We could not reach optimum result if we neglected one of these components. Besides pharmacological management, the non-pharmacological management should be considered as it can help to achieve a maximum effect.

Conclusion: Chronic LBP usually is a mixed pain. The correct management of nociceptive and neuropathic components along with a multidisciplinary approach play an essential role in the assessment and management of chronic LBP.

Keywords: Mixed Pain, Chronic Low Back Pain, Herniated Disk, Neuropathic, Nociceptive
SS 12 – MISCELLANEOUS

EPIDURAL ANALGESIA FOR POST SPINE SURGERY PAIN MANAGEMENT

Dr. dr. Tjokorda G. A. Senapathi, Sp. An, KAR

Introduction
Patients undergoing spinal surgery experience severe pain in the postoperative period, which may increase morbidity and incidence of complications and prolong rehabilitation.

Inadequate postoperative pain management itself is a risk factor for chronic pain development. The conventional pain management mainly used oral or intravenous opioids combined with nonsteroidal anti-inflammatory drugs (NSAIDs). Patients and doctors often feel uncomfortable using opioids because of its side effects such as respiratory depression, nausea, and vomiting. Many patients also felt insufficient pain control despite using high doses of opioids that can lead to other problem which is opioid tolerance. Postoperative pain after spine surgery causes functional interference and is one of the leading cause of readmission after ambulatory spine surgery.1

Regional analgesia technique such as epidural analgesia are shown to be more superior to intravenous analgesia because of better pain control, lower side effects to pulmonary, cardiac, and gastrointestinal system. Surgeon placed the epidural catheter intraoperatively and followed by infusion or intermittent local anesthetic with or without adjuvant such as opioid, this regimen can provide good analgesia after posterior spine surgery. Problems that emerges from epidural analgesia after spine surgery can include unpredictable absorption of the drugs and motor blockade, dislocation of the catheter can also happens.1, 2

A prospective double-blind randomized control study of epidural catheter insertion after major lumbar spine surgery found that patient who received continuous epidural infusion of 0.1% ropivacaine results in lower pain scores and opioid consumption and higher patient satisfaction when compared with placebo. Older studies found that epidural administration of morphine is superior to parenteral analgesia for laminectomy.1, 2

Acute Pain Physiology Following Spinal Surgery
Various pain mechanism contribute to postoperative pain, such as nociceptive, neuropathic, and inflammatory. Multiple tissues origins can cause pain in back such as vertebrae, intervertebral disk, ligaments, dura, nerve root sleeves, facet joint capsules, fascia, and muscles, these tissues also involved various nociceptors and mechanoreceptors that are capable of eliciting pain. Mechanical irritation, compression or postoperative inflammation causes pain that transmit via posterior rami of spinal nerves connected to sympathetic and parasympathetic nerves. Referred pain is common because of the extensive cross connectivity of these nerves.3, 4

Patients with previous chronic pain history usually complain of referred pain rather than local or diffuse pain. Localized pain are more common in postoperative period and visual analog scale (VAS) are higher in patients with history of referred pain. The more vertebrae involved thus make the pain more worse. Both central and peripheral sensitization play the part in this pain physiology. The location of vertebrae segment seems don't affect the pain severity. Medical therapy for acute postoperative pain are more susceptible to chronic pain because of its characteristic.4

The importance of achieving a successful postoperative pain is associated with complications such as poor early mobilization, deep venous thrombosis, urinary retention, and delayed return of bowel function. Due to these complications can delay leaving hospital and lead to increased hospital costs.4, 6

Several pharmacologic and nonpharmacologic modalities targeted to control postoperative have been use in the treatment of postoperative acute pain after spine surgery. Because of the complex physiology behind this type of pain, no single intervention appears to be more effective than others. This has led to the proposal of multimodal analgesia, the rationale behind this concept is the fact there is, as previously mentioned, a wide variety of pain receptors and intracellular pathways activated at the same time after the initial surgery. More important is the concept of using modalities to target peripheral, spinal, dan supraspinal pain pathways. The addition of nonsteroidal anti-inflammatory drugs (NSAIDs) to an opioid based regimen has been shown to improve postoperative acute pain after spine surgery.4, 6

Epidural analgesia for spine surgery
Continuous or intermittent epidural analgesia via catheters placed during surgery, under direct vision before wound closure, is a well-described technique after major spinal surgery. For posterior spinal correction, the catheter can be inserted directly through the ligamentum flavum by the surgeon. For anterior spinal surgery, the epidural catheter can be inserted percutaneously or under direct vision and tunneled to the skin. However, the exact route into the epidural space has not been described in previous studies and reports. Once inserted, analgesia can be established with a bolus of local anesthetic with or without additional opioid (fentanyl or morphine), which is give before the end of anesthesia. An infusion of dilute local anesthetic with or without opioid can be used to provide continuous analgesia for the initial postoperative period.4, 5

This approach has been shown to be safe and effective in elective procedures on adult, adolescent and paediatric patients, including spinal fixation for traumatic injury. Studies comparing the technique with patient controlled opioid infusions have shown comparable analgesia and suggested some advantages, including absence of opioid induced side effects, lessenteroparesis after posterior spinal surgery and low complication rates.4, 5
The cuff of dura mater surrounding the spinal nerves as they pass through the intervertebral foramen is continuous with that surrounding the spinal cord. An epidural catheter pushed through the foramen will be guided by this dural cuff into the epidural space, provided it is advanced gently so as not to breach the dura and lie intrathecally.5

Major spinal surgery may involve two body cavity procedures with the risk of significant postoperative pain and morbidity. These include respiratory complications (7%) and pulmonary embolism (0.8%), with much higher rates of venous thrombosis (15.5%) when no thromboprophylactic measures are used.5

Epidural infusions can provide excellent analgesia and have been demonstrated to produce a reduction in pulmonary morbidity after major abdominal and thoracic surgery, postoperative thromboembolic disease and paralytic ileus. They may be preferable to iv opioids in patients with serious respiratory and cardiovascular comorbidity. The placing of catheters surgically theoretically allows greater accuracy. Turner et al checked the position of epidural catheters after surgical placement with the injection of radio-opaque dye and related this to the quality of analgesia. They suggest that the variable rates of failure of analgesia in previous studies are due to catheter misplacement or poor spread of the solution.4,5

The risks associated with epidural catheters themselves must be considered. In addition to the possibility of superficial skin infection, epidural abscess and epidural haematoma, the technique reported carries the risk of dural puncture and intrathecal catheter placement. Epidural infusions may make the neurological assessment of patients after spinal surgery difficult.6

Conforming the correct position of the epidural catheter in the epidural space is difficult.

Without the injection of radioopaque dye and X-ray, placement under direct vision is the only way to confirm this intraoperatively. The fate of a conventionally placed epidural catheter inserted percutaneously can vary and may coil in the epidural space or exit via an intervertebral foramen with a spinal nerve. It may be argued that surgical placement under direct vision gives a better chance of correct positioning.1,6

Kumar R.J et al retrospective studies of the role of postoperative epidural analgesia in major spinal surgical procedures found that epidural analgesic regimens significantly reduce postoperative pain, and the requirement for supplementary parenteral analgesics was minimal. On this studies they mention the procedures that can potentially be manage with epidural analgesia, these procedures included:2

1. Anterior release of scoliosis
2. Anterior instrumentation for scoliosis
3. Posterior instrumentation for scoliosis
4. Anterior corpectomy and fusion for tuberculosis, tumour, and fracture

5. Posterior lumbar interbody fusion
6. Reduction and fusion of spondylolisthesis
7. Posterolateral decompression and fusion for tuberculosis
8. Combined anterior and posterior vertebrectomy and fusion for tumours or fracture
9. Laminectomies or expansive laminoplasties with instrumentation and fusion

Contraindication for epidural analgesia have also been mentioned, included:2
1. Acute pyogenic infections
2. Tuberculosis with abscess formation
3. Antituberculosis treatment of less than 6 weeks duration
4. Localized malignant tumour
5. Situations on which dural tears (traumatic or iatrogenic) were encountered

Drug combination used in Kumar R.J et al in his studies are the following:2
1. Bupivacaine 0.125% HCl @ 4-5 ml/h
2. Bupivacaine 0.125% HCl + morphine sulphate 3 mg @ 3-5 ml/h
3. Bupivacaine 0.125% HCl + fentanyl 100 μg @ 3-5 ml/h
4. Bupivacaine 0.125% HCl + buprenorphine 150 μg @ 3-5 ml/h
5. Fentanyl 200 μg in 50 ml normal saline @ 4 ml/h
6. Lignocaine 0.5% HCl + morphine sulphate 3 mg @ 4 ml/h
7. Buprenorphine 150 μg @ 4 ml/h

Epidural analgesia can also administered by patient controlled epidural analgesia (PCEA). Table 1. Recommended solutions and schedule of PCEA for spine surgery are described in Table 1.

**Table 1. Recommended solutions and schedule of PCEA for spine surgery**

<table>
<thead>
<tr>
<th>No.</th>
<th>Solution Basal</th>
<th>Rate Demand</th>
<th>Lock Interval</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Bupivacaine</td>
<td>3-7 ml/h 3-5 ml/h</td>
<td>10-15 minutes/4-6 doses per hour</td>
</tr>
<tr>
<td>2</td>
<td>Bupivacaine</td>
<td>3-7 ml/h 3-5 ml/h</td>
<td>10-15 minutes/4-6 doses per hour</td>
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<tr>
<td>3</td>
<td>Bupivacaine</td>
<td>3-7 ml/h 3-5 ml/h</td>
<td>10-15 minutes/4-6 doses per hour</td>
</tr>
<tr>
<td>4</td>
<td>Bupivacaine</td>
<td>3-7 ml/h 3-5 ml/h</td>
<td>10-15 minutes/4-6 doses per hour</td>
</tr>
</tbody>
</table>
On meta-analysis of eight studies to compare the efficacy and safety of patient controlled epidural analgesia (PCEA) and patient controlled intravenous analgesia (PCIA) in postoperative analgesia of spinal fusion surgery found that patients with PCEA had better analgesic effect on the first and second day, but there was no significant differences of postoperative VAS on the third day. Side effects incidents such as pruritus and paresthesia was higher in PCEA group compared to PCIA, but on the third day there was no statistical differences on nausea and emesis incidents.3

There are still controversies regarding the use of epidural analgesia because it can potentially mask early symptoms of epidural hematoma and make the diagnosis of this neurological complication difficult. Thus, it has been recommended to use a solution with a low concentration of local anesthetics or based on opioids only to avoid marked motor weakness. The use of epidural analgesia can reduced the incidents of patients with nausea and vomiting, pruritus, an accelerated bowel activity compare with placebo. Another potential advantage of using epidural analgesia is an early return of bowel function that has been demonstrated in several clinical studies. There are two possible mechanism to explain this phenomenon, first, a reduction of opioid consumption and, second, the sympathetic blockade associated with epidural analgesia.3,6

The use clonidine as an analgesic adjuvant has been shown to reduce the requirements for opioids; however, it may be associated with side effects such as hypotension, sedation, and bradycardia. A single dose of clonidine (1.5 μg/kg) followed by an infusion of 25 μg/h in the epidural space just before wound closure reduced the consumption of morphine compared to placebo by 43%. Several authors have recommended the addition of corticosteroids as part of the multimodal approach for pain management during spine surgery.6

**Conclusion**

Postoperative pain after spine surgery can lead to increased morbidity if not managed seriously. Traditional route of drug and high doses of opioid makes the patient and doctor reluctant to use it because the side effects and tolerance, but still results in poor control of pain. Epidural analgesia inserted intraoperatively by surgeon is now a regimen of choice for pain control as it provides good analgesia with fewer side effects. The use of morphine as adjuvant for local anesthesia in epidural regimen needs close observation of its side effects, other adjuvant such as selective alpha agonist and corticosteroid can be used in patients who cannot tolerate opioid.
LOW BACK PAIN AND SCIATICA, SURGICAL VERSUS NONSURGICAL TREATMENT

Wilco C. Peul (Netherlands)

INFLUENCE OF INDOCYANINE GREEN ANGIOGRAPHY ON MICROSURGICAL TREATMENT OF SPINAL PERIMEDULLARY ARTERIOVENOUS FISTULAS

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Introduction
The microvascular anatomy of spinal perimedullary arteriovenous fistulas (AVFs) is more complicated than that of dural AVFs, and occlusion rates of AVF after open microsurgery or endovascular embolization are lower in patients with perimedullary AVFs (29%–70%) than they are in those with dural AVF (97%–98%). Reports of intraoperative blood flow assessment using indocyanine green (ICG) video angiography in spinal arteriovenous lesions have mostly been for spinal dural AVFs. No detailed reports on spinal perimedullary AVFs are available.

Methods
Participants were 23 patients with spinal perimedullary AVFs. Intraoperative ICG video angiography was assessed by measuring the number of cases in which this modality was judged essential by the surgeon to correctly occlude the fistula.

Results
Of the 20 patients 9 were men and 11 were women, whose median age was 54 years (range 2–83 years). Spinal levels of involvement in perimedullary AVFs were as follows: cervical cord or root in 9 patients, thoracic cord in 1 patients, lumbar enlargement or the conus medullaris in 8, and the filum terminale in 4. In 18 of 20 patients, the main feeding arteries were pial branches of the anterior spinal artery fed by the artery of Adamkiewicz. In 13 of these 18 patients, pial branches of the posterior spinal artery fed by another segmental artery also flowed into the AVF. According to the system described by Anson and Spetzler, 20 patients were classified Type IVa (single feeder and single small AVF) in 10 patients, Type VIb (multiple feeders and multiple medium AVFs) in 9, and Type IVc in 2 (a single giant AVF).

In all patients, arterial feeders were identified and intravenous ICG video angiography was performed before and after blocking the feeders. In 5 patients, selective intraarterial ICG video angiography was also performed. The findings provided by ICG video angiography significantly changed the surgical procedure in 12 of 20 patients (60%). Postoperatively, total occlusion of the AVF was achieved in 85% of the patients.

Conclusions
Intraoperative ICG video angiography can have a significant impact on deciding surgical strategy in the microsurgical treatment of spinal perimedullary AVF.
Spinal metastases is increasing in the number of cases and hospital cost worldwide. In addition, the treatment options are still controversial. Fortunately, advances in oncological management have been able to reduce mortality and increase the patient's life expectancy. Therefore, improving the quality of life of the patients are needed. It is believed that surgical management will improve the quality of life. Here we present the profile of spinal metastasis cases who underwent surgical treatment during the 5 years.

**Key word:** Spinal metastases, surgical treatment
ABSTRACT

SS 13 – SPINE 7: TECHNIQUE

CERVICAL SPINE ANTERIOR APPROACH, DISCECTOMY, AND CORPECTOMY

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Anterior cervical discectomy and fusion (ACDF) has been used for almost six decades. First introduced in the 1950s, ACDF is now widely used to treat cervical spondylotic radiculopathy and myelopathy with long-term clinical success. ACDF enables removal of compressive lesions of the spinal cord, such as osteophytes, intervertebral disks, and ossified posterior longitudinal ligaments (OPLLs). It has also been used to treat a range of other cervical diseases (mainly between C2 and T1 vertebrae) related to cervical instability (degenerative, traumatic, oncological, infectious, inflammatory, iatrogenic).

The best predictor of good patient outcomes after surgery is proper preoperative patient selection based on clinical symptoms, physical examination, and imaging studies. ACDF surgery has been shown to have clinical success rates of 97% and 94% for one- and two-level fusions, respectively, at a mean clinical follow-up ≥ 12 months.

Overall, complication rates for ACDF operations vary from approximately 5% to 19%. Surgical complications may be categorized as occurring in the preoperative, intraoperative, or postoperative period. Avoiding irreversible complications is the only logical solution to their management. A majority of the complications that occur during an ACDF are avoidable with appropriate patient selection, careful preoperative planning, meticulous surgical technique, and close follow-up and monitoring of the clinical and radiographic conditions of the treated patient.

Finally, treatment plans must be individualized based on each patient's underlying pathology and associated medical condition.

Keywords: Cervical spine; Anterior approach; Anterior Cervical Discectomy and Fusion (ACDF); cervical pain; anterior approach; Discectomy; Corpectomy

SS 13 – SPINE 7: TECHNIQUE

INFECTIONS IN SPINAL INSTRUMENTATION: A PROPOSAL FOR MANAGEMENT ALGORITHM USING CLOSED-SUCTION IRRIGATION SYSTEM AND VACUUM ASSISTED CLOSURE (VAC)

Erliano Sufarnap, Muhammad Faris, Amiril Mukminin, M. Dwikoryanto, Eko Agus Subagio

The management of surgical site infection on the instrumented spine is problematic. The instrumentation is required to stabilize or to maintain spinal deformity correction, and removal could be dangerous.

A case of infections in spinal instrumentation using close-suction irrigation system (CSIS) and vacuum assisted closure (VAC) revealed good result is reported by the authors. The authors also reviewed scientific literatures for the efficacy using close-suction irrigation system (CSIS) and vacuum assisted closure (VAC) on post operative spinal infection.

Fifteen scientific literatures consist of close-suction irrigation system and vacuum assisted closure (VAC) showed good outcome. The spinal instrumentation retained in 75 – 95 % after complete healing from infection. The studies revealed that early postoperative spinal infections were recover completely. These studies reported decreasing number of debridement and irrigation that mandatory in instrumented spinal infection treatment to 30 – 40 %. Duration of hospitalisation also decreased as well.

The authors propose an algorithm for infections in spinal instrumentations based on own experience and those studies using close-suction irrigation system and vacuum assisted closure (VAC) on post operative spinal infection.

Keyword: Spinal Instrumentation, surgical site infections, VAC, CSIS
USEFULNESS OF PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY

Hiroto Kageyama

Percutaneous endoscopic lumbar discectomy (PELD) is introduced as a minimal invasive spinal technique for lumbar disc herniation by Mayer HM in Germany, and has gained popularity and shown successful results. The advantages of PELD is less invasive overwhelmingly as follows, short skin incision about 1 cm, less muscle injury because the diameter of endoscope is 7 or 8mm, less amount of bleeding. So, the procedure is sometimes performed under local anesthesia.

I illustrate two approaches transforaminal approach and Interlamina approach using schemas and operation video in this time. Usual disc herniation including upper or lower migrated type or any level will be removed by master the two approaches.

Although, it has been reported that there was no significant difference in postoperative back pain, neurological recovery rate, complication rate, operation time and reoperation rate but hospital stay or there are some issues such as narrow visual field, unaccustomed approaches, small surgical instrument and longer learning curve. Obtaining the accurate knowledge of surgical anatomy, surgical procedure and experiences, we can perform this minimal invasive procedure safely. Surgical procedure of PELD will be explained basically, usefulness and pit fall in this lecture.
ABSTRACT

**SS 14 – SPINE 8: TECHNIQUE**

**INTRADISCAL DECOMPRESSION FOR CONTAINED DISC HERNIATION IN LUMBAR AREA**

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Intervertebral disk herniation is a common problem in lumbar area, where around eighty percents of patients experiencing radicular pain. Many early cases of radicular pain has showed in MR imaging a contained disc herniation. With significant symptoms and signs, until now, many spine surgeons prefer to do surgical interventions (open / micro surgery or endoscopic surgery). With the availability of radiofrequency and laser technologies, currently surgeons has "a knife" for less-invasive treatment intradiscally for lumbar contained disc herniation. Radiofrequency disc shrinking methods, named DiscFX™ and laser intradiscal decompressions methods called PLDD (Percutaneus laser Disc decompression) have been done by several spine surgeons as one of treatment modalities for lumbar contained disk herniation.

Since the treatments performed percutaneously, these "less invasive" treatments are considered to have better outcomes than other minimal invasive surgeries. This presentation will shows some reviews and experiences regarding these two techniques.

**MULTIPLE INHERITED SCHWANNOMAS, MENINGIOMAS, AND EPENDYMOMAS (MISME) A REPORT ON RARE CASE OF NEUROFIBROMATOSIS TYPE 2 TUMORS**

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Neurofibromatosis type 2 (NF-2) is an autosomal dominant inheritance, at chromosome 22q12 mutations in periphery and central nervous systems. Several literatures have discussed rare cases of triple NF-2 tumor, known as multiple inherited Schwannomas, meningiomas and ependymomas or MISME. Incidence of MISME reported from many country, but never been reported from Indonesia; adding the evidence in world literature. A 15-year-old boy presented with a progressive bilateral hearing loss for 2 years and started to experience weakness of both lower extremities since 1.5 years. Patient underwent craniotomy tumor removal (CTR) with standard lateral suboccipital approach was performed and two months after CTR, we performed laminectomy spine-tumor removal and posterior stabilization. The spinal tumors were found in three places. Histopathological result showed Schwannomas, meningiomas and ependymomas. Diagnosis of MISME was made and had been treated with excellent clinical outcome. We are reporting a rare case of MISME syndrome, which is an extremely exceptional case in our center and the need to confirm the NF-2 diagnosis using biomolecular investigations.
**EVALUATION AND EMERGENCY TREATMENT OF THE NEWBORN WITH SPINA BIFIDA**

Dewa Putu Wisnu Wardhana

Spina bifida is the most common of neural tube defects which affect the spinal column including the central nervous system in more severe cases. Most babies born with Spina Bifida require early medical and surgical treatment. The newborn with spina bifida presents a difficult diagnostic and treatment challenge for the neurosurgeon. It is essential that a definitive diagnosis determined as quickly as possible so that an appropriate treatment plan can be established to minimize medical-related complications. The purpose of this presentation is to identify abnormalities, to suggest indications for further diagnostic measures as well as the role of emergency treatment for this condition.

**DEGENERATIVE CERVICAL MYELOPATHY: PRACTICAL GUIDE AND UPDATE ON CURRENT CLINICAL EVIDENCE IN INDONESIA**

Rully Hanafi Dahlan. Sevline Estethia Ompusunggu. Farid Yudoyono. Muhammad Kusdiansah

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Myelopathy describes any neurologic deficit related to the spinal cord. When due to trauma, it is known as (acute) spinal cord injury. When inflammatory, it is known as myelitis. Disease that is vascular in nature is known as vascular myelopathy. The most common form of myelopathy in human, cervical spondylotic myelopathy (CSM), is caused by arthritic changes (spondylosis) of the cervical spine, which result in narrowing of the spinal canal (spinal stenosis) ultimately causing compression of the spinal cord.[4] In Asian populations, spinal cord compression often occurs due to a different, inflammatory process affecting the posterior longitudinal ligament. Degenerative cervical myelopathy (DCM) is a common cause of spinal cord dysfunction that confronts clinicians on a daily basis. Research performed over the past few decades has provided improved insight into the diagnosis, evaluation, and treatment of this disorder. This Paper has a goal for clinicians with an update regarding the state of the art in DCM, focusing on more recent research pertaining to pathophysiology, natural history, treatment, consideration of the minimally symptomatic patient, surgical outcome prediction, and outcome measurement. The treatment and prognosis of myelopathy depends on the underlying cause: myelopathy caused by infection requires medical treatment with pathogen specific antibiotics.

Similarly, specific treatments exist for multiple sclerosis, which may also present with myelopathy. As outlined above, the most common form of myelopathy is secondary to degeneration of the cervical spine. Newer findings have challenged the existing controversy with respect to surgery for cervical spondylotic myelopathy by demonstrating that patients benefit from surgery. With respect to treatment, although there is a dearth of high-quality studies comparing surgical to nonoperative treatment, several large prospective studies have recently associated surgical management with clinically and statistically significant improvement in functional, disability, and quality of life outcome at long-term follow up. When selecting the specific surgical intervention for a patient with DCM, anterior (discectomy, corpectomy, hybrid discectomy/corpectomy), posterior (laminectomy and fusion, laminoplasty), and combined approaches may be considered as options depending on the specifics of the patient in question; evidence supporting each of these approaches is reviewed in detail. In the Spine world recently, forecasting of postoperative outcomes,
ABSTRACT

DEGENERATIVE CERVICAL MYELOPATHY: PRACTICAL GUIDE AND UPDATE ON CURRENT CLINICAL EVIDENCE IN INDONESIA

permitting enhanced communication and management of patient expectations in the preoperative setting. Finally, an overview of outcome measures recommended for use in the assessment of DCM patients is provided.

KEY WORDS: Degenerative cervical myelopathy, Cervical spondylotic myelopathy, Pathophysiology, Natural history, Outcome prediction, Review.

SS 14 – SPINE 8: TECHNIQUE

SURGICAL TREATMENT FOR OSTEOPOROTIC VERTEBRAL FRACTURE IN GERIATRIC PATIENTS

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Background In Japan, the prevalence of osteoporotic vertebral body fracture (OVF) is increasing with the aging social population. We came to be able to perform Balloon kyphoplasty (BKP) from April 2012, and good results have been reported as a minimally invasive treatment for OVF in the elderly. The treatment for the OVF with symptomatic spinal canal stenosis is controversial. Because BKP is not recommended for the cases with the vertebral posterior wall injury, we have selected highly invasive treatment. In this study, we examined the best minimally invasive treatment for the elderly OVF.

Methods The subject were patients with OVF with the symptom due to central spinal canal stenosis treated in our hospital between 2012 and 2017. As a treatment policy of our institution, we only perform BKP when the symptoms change dynamics, and add a laminectomy when there is no dynamic change and the symptoms are constant. For each treatment, we examined retrospectively the clinical outcome.

Results All cases were 10 cases with an average age of 75.1 years, a ratio of male to female of 4: 6. There were 6 patients who performed BKP only due to dynamic canal stenosis, there were 4 patients who underwent laminectomy at the same time as BKP due to constant canal stenosis. All patients showed postoperative pain relief. In one patient who underwent only BKP, numbness of the lower limb remained after surgery. There were no complications by surgery.

Discussion It was reported that BKP alone was effective treatment for the foraminal stenosis due to osteoporotic vertebral fracture. We thought our treatment which produced the indirect decompression by restoring the vertebral body height improved the symptom same as this report.

Conclusion We reported the minimally invasive treatment for the elderly OVF patient.
SS 14 – FUNCTIONAL
CRANIOVERTEBRAL FIXATION - A NEW TECHNIQUE OF OCCIPITAL CERVICAL FIXATION
Sushil Patkar (India)

SS 15 – FUNCTIONAL
HOW TO MAKE MVD SAFE & EFFICACIOUS - PERSONAL EXPERIENCE GAINED THROUGH 5120 CASES
Weiguo Zhao (China)
SS 15 – FUNCTIONAL
MAXIMIZING DECREASE IN DRUG DOSAGE AND INCREASE IN ON TIME FOLLOWING BILATERAL STN DBS USING CONSTANT CURRENT FOR ADVANCED PARKINSONS DISEASE

Sujoy K. Sanyal (India)

SS 15 – FUNCTIONAL
RADIOFREQUENCY ABLATION FOR CHRONIC KNEE PAIN, SINGLE INSTITUTE EXPERIENCES

Agus Turchan; Achmad Fahmi; Heri Subianto
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Chronic knee pain from knee osteoarthritis is the most common cause of disability for people aged 65 and older. Chronic knee pain is usually managed with pharmacological and non-pharmacological treatments. Interventional pain management for chronic knee pain was limited to intra-articular joint injections and hyaluronic acid supplementation. Radiofrequency ablation of genicular nerves has been described as an effective treatment for chronic knee pain. Here, we described our experiences in managing chronic knee pain with radiofrequency ablation of genicular nerves.

Key words: Osteoarthritis, chronic knee pain, radiofrequency ablation, genicular nerves ablation, long-term outcome.
DO’S AND DON’TS IN MICRO VASCULAR DECOMPRESSION SURGERY

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Microvascular decompression has become a standard method for the treatment of trigeminal neuralgia and hemi facial spasm. It is important to avoid operative complications, because operative field is narrow and there are many important nerves and vessels. To achieve satisfactory microvascular decompression surgery i.e complete and permanent cure of symptoms without recurrences and complications, correct diagnosis of symptoms and correct identification with appropriate repositioning of offending vessels to avoid incomplete cure or recurrences are mandatory. It is stressed that the tactics for repositioning of offending vessels is not to insert prosthesis between the root entry/exit zone and offending vessels, but to insert it between pons and the vessels. Straightening of the axis of the 5th cranial nerve is also necessary for complete cure of pain. Monitoring of the 8th cranial nerve function is also mandatory by recognizing its warning criteria. We presented important point of operative technique and intraoperative monitoring for complete and permanent cure and preventing operative complication.

Key words: MVD, trigeminal neuralgia, hemifacial spasm, neurovascular compression, operative technique

STEREOTACTIC SURGERY IN PARKINSON, TREMOR AND DYSTONIA

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BACKGROUND
Severe and refractory cases of Parkinson, tremor and dystonia have been treated with Stereotactic brain lesion and deep brain stimulation in National Hospital Surabaya. Number of successfully treated cases, which were treated with Stereotactic surgery, have been collected in our hospital. Clinical outcomes that we present explains the safety profile and overall efficacy analysis on our treated subject for the last five years.

OBJECTIVE AND METHODS
This study used a retrospective analysis of baseline (gender) and disease-specific parameters (diagnosis, type of surgical procedures and brain lesions), and outcomes (primary: complications, secondary: rate and degree of symptom recurrence) among our treated parkinson and movement disorders with severe and refractory cases. There are approximately 201 subjects that we use to perform the analysis, derived from Dr. Soetomo Hospital and National Hospital database in the last five years (2013-2018). Primary and secondary clinical outcomes in this study were related to the complications (safety aspect) and the rate and degree of symptom recurrence (overall efficacy), respectively.

RESULTS
Of the 201 subjects in this study among 131 men (65%) and 70 women (35%). The most frequent cases of severe and refractory parkinson and movement disorders at National Hospital is Parkinson’s disease-related bradykinesia and rigidity, followed by Parkinson tremor. Top two procedures being performed in our hospital were thalamotomies and pallidotomies. There were 16 cases treated with deep brain stimulation technique compared to 185 cases were treated with brain lesion. Complications found in 4% among all of our subjects, in detail subsequently temporary hemiparesis (2%), temporary dysarthria (1.5%), and tension pneumocephalus (0.5%). Symptom recurrence was detected in 2.5% of total subjects and among them 1.5% reversible recurrence and 1% total recurrence.

CONCLUSION
Stereotactic brain lesion surgery is the dominant intervention for severe and refractory parkinson and movement disorder cases at our hospital. The safety profile in this treatment of choice is outstanding with minimal complications, non-life-threatening. This technique is successfully carried out properly and safely, it is effectively suppresses symptoms in the long run with less than 2% of recurrence rate.
SS 15 – FUNCTIONAL
SECONDARY TRIGEMINAL NEURALGIA: CLINICAL FEATURE & SURGICAL RESULT
Weiguo Zhao (China)

SS 15 – FUNCTIONAL
SELECTIVE AMYGDALO HIPPOCAMPECTOMY WITH MINI CRANIOTOMY
Yuriz Bakhtiar (Indonesia)
ABSTRACT

SS 16 – BRAIN 5: VASCULAR 2
MINIMALLY INVASIVE STRATEGIES FOR CEREBRAL ANEURYSM SURGERY

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The minimally invasive surgery (MIS) for cerebral aneurysm has been established for recent era by using the concept of minimal damage to the surrounding brain structure during performing the operation. These procedures are included adequate of preoperative planning, surgical skill, techniques and modern equipment. The meaning of MIS is not only refers to small size of the opening wound or entry site but also along the surgical path should be achieved. For aneurysm surgery, we have to recognize how to approach the clipping surgery under the favor outcome condition especially unruptured patient who presented with a good clinical condition. We have described about our techniques how to deal with aneurysm surgery in generally and special morphology such as atherosclerotic cerebral aneurysm. For the part of general, all patients are discussed prior operation. The planning from 3-dimension compute tomography angiography (3D-CTA) and computational fluid dynamics (CFD) study in some cases are assigned. The benefits of these studies are helpful for making a decision of operation. Minimal approach to the aneurysm can be achieved after having a good planning. A neuroprotective anesthetic technique should be applied and the tractionless technique was applied for exposure of brain parenchyma. Indocyanine green videoangiography (ICG-VA) that compatible with microscopic software is used in all patients before and after clipping to check the anatomical architecture of the aneurysm and associated arteries such as the parent and perforating arteries. The patency of these arteries and the completeness of exclusion of the aneurysmal neck after clipping the aneurysm can be checked with this device. Additional software of this device, color map, and flow intensity were analyzed for blood flow dynamics which included the sequence of blood flow after aneurysm clipping in cases of suspected incomplete exclusion. Endoscope-assist microsurgery is used for anatomical safety to check before and after aneurysm clipping in case the neck or small perforator arteries could not be seen. Doppler ultrasonography was used to determine the characteristics of the blood flow after clipping of the aneurysmal sac and identify unintentional injury to small perforator or parent arteries.

By the way, the atherosclerotic aneurysm is defined as the detection of yellowish plaque located at the dome or neck of an aneurysm. The location of atherosclerotic change might influence the effect of embolic stroke during manipulation or adjustment of the clip force around this area and it is very difficult at that time to judge how to suitably place the clip to prevent emboli migration and obtain maximal exclusion of the aneurysm. Unstable plaque is very weak and easily migrates because of the force of the clip compression or manipulation around the plaque. Furthermore, we confirmed the atherosclerotic changes with ICG-VA application by the filling defect in the atheromatous calcification or the thickening of the aneurysm wall was seen. There is no area for placement of the clip, it necessary to perform a dome clip to decrease the risk of rupture in the future. We should leave some part of yellowish plaque because the risk of aneurysmal growth in this area is very low according to the low wall shear stress theory. This is the strategic treatment of this type of aneurysm with minimally invasive technique and minimal risk of complication.

Multimodality of assisted devices can be helpful during surgeries. The maximal exposure by excessive retraction reaches to aneurysm will be decreased including the effective technique to confirm the missing arteries before and after clipping by ICG-VA, endoscope or Doppler ultrasonography will improve the outcome of treatment and also regarding from the MIS techniques.
SS 16 – BRAIN 5: VASCULAR 2
FRONTLINE OF ENDOVASCULAR THERAPY FOR CEREBRAL ANEURYSM

Shinichi Yoshimura (Japan)

**Background.** Endovascular therapy for cerebrovascular diseases are increasing every year. Recently, flow diverter was introduced in our country. This time, current our practices for cerebral aneurysm will be introduced.

**Method.** Basically, treatment selection is made by neurosurgeons in our country, because majority of the treatment of cerebral aneurysm is done by neurosurgeons. Indication for endovascular therapy has been widened with the help of improvement of devices, especially introduction of stent. More recently, flow diverter was also introduced for carotid large/giant aneurysms. We analyzed treatment results of carotid artery aneurysms in our department from 2016-2017.

**Results.** A total of 224 patients were analyzed. Among them, 124 cases (55%) were treated by coiling, 62 cases (28%) by flow diverter, and 38 cases (17%) by clipping. In coiling group, 69 of 124 cases (56%) were treated by stent-assisted treatment. Compared to p-com or upper sites, paraclinoid aneurysms were more frequently treated by endovascular therapy. We predominantly performed semi-jail technique for paraclinoid aneurysms. There were no serious complications in this group. In flow diverter group, 62 patients with paraclinoid or cavernous aneurysms were treated. Average size of the aneurysms was 15mm, and intradural or symptomatic cavernous aneurysm were mainly treated. Majority of the patients showed favorable results after the procedure (98.6%), but some complications including hemorrhage were experienced.

**Conclusions.** In the near future, more patients will be treated by endovascular therapy based on introduction of new devices and patient requests. However, it is important to select appropriate treatment according to the anatomical features and patient's background to obtain good treatment results.

SS 16 – BRAIN 5: VASCULAR 2
STRATEGY FOR COILING OF WIDE-NECKED ANEURYSMS AND FUSIFORM ANEURYSMS


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**Objectives.** To study some strategy for coiling in the cases of wide-necked aneurysms and fusiform aneurysms

**Material & methods.** Serial case report

**Result.** There are several methods to occlude wide-necked aneurysm and fusiform aneurysm, including balloon / stent assisted technique and multiple microcatheter technique, also the usage of flow diverter. In most of our cases we did the cases using double microcatheter technique, in the cases of fusiform aneurysm we used the stent assisted technique or flow diverter.

We present some illustrated cases. We found that the double microcatheter technique is helpful to do coiling in wide-necked aneurysm cases. The advantage of this technique is simple, easy, safe and cheaper than the other technique. Also we present cases that used stent or flow diverter for fusiform aneurysms.

**Conclusions.** Double microcatheter and stent assisted coiling technique are feasible and helpful for coiling of wide-necked aneurysms. Meanwhile stent or flow diverter is are useful for fusiform aneurysms.

**Keywords:** Double microcatheter technique – Stent assisted coiling – Flow diverter – Wide-necked Aneurysm – Fusiform aneurysm.
SS 16 – BRAIN 5: VASCULAR 2
SURGERY FOR CEREBRAL AVM

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AVMs are abnormalities of the intracranial vessels that constitute a connection between the arterial and venous systems and lack an intervening capillary bed. AVM is associated with significant morbidity and mortality rate. The different management options available for AVMs such as medical management, microsurgical resection, stereotactic radiotherapy, and endovascular embolization. Cerebral AVMs may present with intracranial hemorrhage, seizures, headaches, and long-term disability. However, the appropriate treatment modalities for unruptured AVMs present a challenging clinical dilemma because of a poorly defined natural history and the seemingly low annual hemorrhage rates so the treatment option was led to the development of ARUBA (a randomized trial of unruptured brain arteriovenous malformations) which aims to compare the natural history with modern multimodal therapy especially to evaluate surgical intervention versus medical management for unruptured cerebral AVMs.

Invasive treatment modalities are the reasonable choice for ruptured cerebral AVMs due to the high rate of morbidity and mortality. The factors that dictate treatment options (which may include single or multimodal therapy) are operator skill, AVMs size and location, surgical or endovascular accessibility, venous drainage, and presence of high-risk features, such as a flow related or intradural aneurysm. The Spetzler-Martin Scale is used to estimate the risk of surgical resection of an AVMs with higher grades being associated with greater surgical morbidity and mortality. Microsurgical excision of the AVMs involves a craniotomy, careful dural opening with circumferential nidus dissection until complete AVMs resection is achieved. The surgical mortality and a permanent postoperative morbidity is associated with an increasing Spetzler-Martin grade. Furthermore, Stereotactic radiosurgery is the treatment option for AVMs smaller than 3.5 cm. The endovascular treatment of brain AVMs involves the delivery of liquid embolics, such as n-butyl cyanoacrylate and ethylene vinyl alcohol copolymer (Onyx) via superselective catheterization with flow-guided microcatheters. Preoperative embolization can reduce the size of an AVMs for microsurgical excision. The advantages of endovascular therapy include a minimally invasive approach and possible immediate occlusion but the disadvantages of endovascular therapy is usually incomplete embolization, intracranial hemorrhage, brain edema or hemorrhage.

The increasing use of advance imaging techniques will increase the incidence of asymptomatic AVMs. At the present moment, we do not fully understand the natural history of AVMs to precisely predict which AVMs will likely bleed and what the most appropriate optimal treatment option will be, single or multimodal therapy.

SAVE ACUTE STROKE PATIENT BY ENDOVASCULAR THERAPY

Shinichi Yoshimura

Background. Efficacy of endovascular treatment (EVT) in patients with acute ischemic stroke and large vessel occlusion (LVO) was established in 2015. However, the extent of EVT coverage in Japan remains unclear.

Objective. To report EVT utilization and geographical coverage in Japan overall and to analyze regional differences in the number of EVT offered, in operators, and in EVT-capable hospitals.

Design, Setting, Participants: A national survey of members of the Japanese Society for NeuroEndovascular Therapy (JSNET). Study office send an e-mail twice for JSNET members and collected the number of EVT cases on 2017 and 2018.

Main Outcomes and Measures: Total number of EVT cases per year, total number of hospitals offering EVT per year, the number of specialists per hospital, the number of EVT cases per hospital were measured. The number of EVT cases in 2016 year and 2017 year per 100,000 population calculated using the 2015 Population Census data. Using geographic analyses the distribution of treatment hospitals and JSNET specialists was mapped, and in combination with the census data the population coverage rate determined.

Results: The total number of EVT cases overall in Japan increased by 34.5% from 2016 (7,702 cases) to 2017 (10,360 cases). The number of EVT cases per 100,000 people was 6.06 and 8.15 in 2016 and 2017 respectively. There were 693 EVT-capable hospitals in Japan, with an average annual caseload of 14.9 EVT cases in 2017. The number of JSNET specialists per hospital decreased from 1.81 in 2016 to 1.76 in 2017. Only 50 (7.2%) hospitals had > 40 EVT-cases annually. The majority (97.7%) of the Japanese population live within 60-minute drive time of any EVT-capable hospitals. The total number of EVT cases overall in Japan increased by 34.5% from 2016 (7,702 cases) to 2017 (10,360 cases). The number of EVT cases per 100,000 people was 6.06 and 8.15 in 2016 and 2017 respectively. There were 693 EVT-capable hospitals in Japan, with an average annual caseload of 14.9 EVT cases in 2017. The number of JSNET specialists per hospital decreased from 1.81 in 2016 to 1.76 in 2017. Only 50 (7.2%) hospitals had > 40 EVT-cases annually. The majority (97.7%) of the Japanese population live within 60-minute drive time of any EVT-capable hospital, however only 70.4% live within 60-minute drive time of a high-volume center (>40 EVT cases annually).

Conclusions and Relevance: Utilization of EVT in Japan is increasing; however, the number of cases/hospital remained low and cases/specialist decreased. Centralization of EVT services may produce improved patient outcomes and benefit a health system like Japan that has a high number of EVT capable hospitals with low EVT volume, especially in urban areas.
Stroke is one of the most common causes of death in Indonesia. In 2017, of all deaths from cardiovascular disease, 38.3% were caused by strokes. The prevalence of stroke in Indonesia is 12.1 per 1,000 population. The estimated number of stroke patients in Indonesia is 479,243 people.

Health workers knowledge to early diagnose and manage of patients with ischemic stroke is needed to improve the outcome. Since 2017, Cipto Mangunkusumo National General Hospital has implemented “Code Stroke” as a management program for patients with acute ischemic stroke. This program starts by recognize of acute stroke symptoms, diagnosis enforcement, to definitive management in patients. This program involves a multidisciplinary team consisting of Emergency, Neurology, Neurosurgery, and Radiology Department.

Since launching in early 2018 to June 2018, “Code Stroke” has been activated 70 times in 70 patients, with an average door to CT number of 10-20 minutes per patient. Currently, the intervention of acute ischemic stroke was intravenous thrombolysis and thrombectomy with Stent-Retriever ‘Solitaire’ Device. Evaluation of “Code Stroke” implementation at Cipto Mangunkusumo National General Hospital is still being carried out to improve the outcome of patients with acute ischemic stroke.
OBJECTIVE:
The aim of this study is to clarify the efficacy and safety of early surgery using trapping of the affected internal carotid artery (ICA) and high-flow bypass between the second portion of the middle cerebral artery and cervical external carotid artery with radial artery graft for ruptured blood blister-like aneurysms (BBAs) arising from the anterior wall of the ICA.

METHODS:
Medical charts of 16 consecutive patients (7 men and 9 women; mean, 59 years) with subarachnoid hemorrhage (World Federation of Neurosurgical Societies grade I, n = 2; grade II, n = 5; grade III, n = 2; grade IV, n = 4; grade V, n = 3) caused by ruptured BBA surgically treated between July 2010 and October 2015 were retrospectively reviewed. Eleven patients underwent acute surgery within 24 hours after the onset, whereas surgery was performed between 3 and 17 days after the onset because of referral delay or associated vasospasm in 5 patients. All patients underwent the same surgical procedure.

RESULTS:
Elimination of the BBA and patency of the bypass were achieved in all patients. Postoperatively, 2 patients showed small infarction in the Heubner artery area, and 2 others suffered symptomatic vasospasm, but no patient suffered infarction in the posterior communicating/anterior choroidal artery territories. Identically, no patient showed ischemic optic neuropathy. At the last follow-up (mean, 36 months), favorable clinical outcome (good recovery or mild disability in Glasgow Outcome Scale) was achieved in 14 (88%) of the patients without rebleeding or refilling of the aneurysms.

CONCLUSIONS:
Early surgical repair of BBAs by trapping of the affected ICA with high-flow bypass is safe and effective treatment with satisfactory midterm outcome.
SS 17 – BRAIN 6: VASCULAR 3

DUAL STRATEGY APPROACH FOR MINIMALLY INVASIVE ANEURYSM SURGERY

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The concept of the minimally invasive keyhole approach in neurosurgery has been increasingly used in the past few years. For the treatment of brain aneurysms, a minimally invasive strategy is also needed to improve outcomes and reduce the number of complications. In Surabaya, we do a dual strategy approach with keyhole surgery techniques and endovascular neurosurgery in the treatment of brain aneurysms.

We will explain the data and handling strategies in Surabaya that we have been doing so far. Collaboration approach and in-depth discussion on each case is very important. These two actions were carried out by the team in the neurosurgery department.

Keywords: Minimally invasive, aneurysm, dual strategy

SS 17 – BRAIN 6: VASCULAR 3

LESSONS LEARNT FROM 200 AVM SURGERY: BATTLES AGAINST CEREBRAL AVMS

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BACKGROUND:
Management strategies of cerebral arteriovenous malformation (AVM) have undergone considerable evolution with the advent of surgical, endovascular, and radiosurgical technologies. However, controversy exists in the indication of invasive treatment, especially for unruptured lesions taking the results of a randomized trial of unruptured brain arteriovenous malformation (ARUBA) study.

OBJECTIVE:
This presentation will assess our current strategy and results of those complex lesions and illustrates recent futuristic technologies and techniques aiming to improve outcomes in AVM surgeries. Particularly, significance of patient selection, preoperative and intraoperative endovascular treatment (hybrid surgery) is discussed from author’s personal experiences with 200 surgical cases.

METHODS:
Between 2007-2018, 200 patients with cerebral AVMs underwent direct surgery. Spetzler-Martin grade was I-II in 118, III in 51, and IV-V in 31. ARUBA-eligible AVM was found in 66.

RESULTS:
Preoperative embolization was used in 76% of the patients. Majority of scheduled surgery was performed in hybrid suit. At surgery, embolized AVMs were easily dissected from adjacent brain with minimal bleeding. Intraoperative selective 3D-angiography (and subsequent intraoperative embolization in selected cases) was very helpful for understanding of the microstructure of the complex lesions, and preserving passing normal vessels. After surgery, preoperative mRS was maintained in 91% of the patients.

CONCLUSIONS:
Results of AVM management with our combined neurovascular team was satisfactory. Hybrid OR with multiple neurovascular intervention/monitoring is powerful tool for AVM resection. ARUBA shall not exterminate but centralize unruptured AVM surgical practice.
Kazutaka Uchida
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Background and Purpose: Endovascular therapy is effective against acute cerebral largevessel occlusion (LVO). However, many patients do not receive such interventions because of the lack of timely identification of the type of stroke. If the types of stroke [any stroke, LVO, intracranial hemorrhage (ICH), and subarachnoid hemorrhage (SAH)] were to be predicted at the pre-hospital stage, better access to appropriate interventions would be possible. Japan Urgent Stroke Triage score (JUST score) was clinical prediction rules to classify suspected patients of acute stroke into different types at the pre-hospital stage.

Methods: We obtained information for signs and symptoms and medical history of consecutive suspected patients of acute stroke at pre-hospital stage from paramedics and final diagnosis from the receiving hospital. We constructed derivation cohort in the historical multicenter cohort study from June 2015 to March 2016, and validation cohort in the prospective multicenter cohort study from August 2016 to July 2017. The derivation and the validation cohorts included 1,229 and 1,007 patients, respectively. We constructed multivariate logistic regression models with 21 variables to develop clinical prediction rules which distinguish between different types of stroke: any stroke, LVO, ICH, and SAH.

Results: Among the 1,229 patients (median age: 72 years; 55% men) in the derivation cohort, 533 stroke, 104 LVO, 169 ICH, and 57 SAH cases were observed. The developed rules showed that the areas under the receiver operating curve (AUCs) were 0.88 for any stroke, 0.92 for LVO, 0.84 for ICH, and 0.89 for SAH. The validation cohort of 1,007 patients (median age: 75 years; 56% men) showed that the AUCs of Any stroke, LVO, ICH, and SAH were 0.80, 0.85, 0.77, and 0.94, respectively.

Conclusions: These clinical prediction rules can help paramedics classify the suspected patients of stroke into any stroke, LVO, ICH, and SAH groups with excellent accuracy.

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The hematoma expansion is the most important factor contributing to prognosis. Recent studies of intracerebral hemorrhage (ICH) treatments have highlighted the need to identify reliable predictors of hematoma expansion. Several studies have suggested that the “spot sign” on computed tomography angiography (CTA) is a sensitive radiological predictor of hematoma expansion in the acute phase. However, the spot sign has low sensitivity for hematoma expansion. In this study, we evaluated the usefulness of a novel predictive method, called the “leakage sign.” We introduce the new method of leakage sign and reviewed the treatment concept for intracerebral hematoma.
ABSTRACT

TRANSFORAMINAL EPIDUROSCOPIC BASIVERTEBRAL NERVE LASER ABLATION (TEBLA) FOR CHRONIC BACK PAIN COMBINED WITH MODIC CHANGE

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PURPOSE:
Increasing life span of human, chronic low back pain (LBP) arising from degenerative spinal disease will be the important portion in the future of spinal treatment. The purpose of this study is to determine the efficacy of transforaminal epiduroscopic basivertebral nerve (TEBLA) ablation for the treatment of lumbar discogenic back pain combined with Modic change in a clinical setting.

MATERIALS AND METHODS:
Fourteen patients were enrolled in a study retrospectively using 1414 nm Nd:YAG laser assisted energy (Lutronic inc. South Korea) to ablate the basivertebral nerve (BVN) within the vertebral bodies adjacent to the diagnosed level. All patients of lumbar discogenic back pain combined with Modic change, unresponsive to at least 4 months. All patients were treated successfully following screening using MRI finding of Modic type I or II changes and confirmatory by discography to determine the affected levels. Self-reported outcome measures were collected retrospectively. Measures included the McNab's criteria and visual analogue scale score.

RESULTS:
A total of 14 consecutive patients were analyzed; mean age was 46 ± 9.95 (range: 31-63) years old, and there were 6 men and 8 women in the cohort. Patients had discogenic back pain respectively related to the discography and MRI, which correlated with clinical findings. The mean symptoms were 20.14 ± 22.7 months. The mean duration follow up was 6.07 ± 2.86 months, respectively. All patient had type I or II Modic change (Type I: 10 cases, Type II: 4 cases). VAS score pre-and post-operatively were 7.78 ± 0.97 and 1.93 ± 1.38. As per Mac Nab's criteria, 7 pts (50%) showed excellent, 6 (42.85%) good and one (7.14%) showed fair.

CONCLUSION:
TEBLA for the treatment of chronic lumbar discogenic back pain significantly improves the patient symptoms even though combined with Modic change.

SS 18 – SPINE 9
CV JUNCTION MENINGIOMA PRESENT WITH PREGNANCY. CASE REPORT AND LITERATURE REVIEW.

Novan Krisna Aji

ABSTRACT

BACKGROUND:
Cervical Meningioma in pregnancy were a rare condition, resulting progression of the symptom including motor weakness and breathing difficulties

CASE REPORT:
Thirty five years old women with 36 weeks pregnancy come to the hospital with motor weakness and difficulties in breathing. We diagnosed with C1-C2 meningioma. After pregnancy termination, the symptom alleviate, with motor score 3/3. After one month we done total laminectomy, fusion and tumour excision. Two month after operation motor score -5/-5 with the muscle regain it mass.

CONCLUSIONS
Cervical meningioma tumor with pregnancy was a rare case. With the symptom progression within pregnancy. The symptom will alleviate after termination. A wide exposure for tumour excision with fusion is a safe procedure for this case, and give good outcome.
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Abstract

Spinal column is combining from fungsional spinal (FSU) and becoming an integrated system. A functional spinal unit is the complex of anatomic structures comprising a single segment of the spine. It consists of the intervertebral disc, adjacent parts of the vertebral bodies, facet joints, ligamenta flava and longitudinal ligaments at a given level. All the components of an FSU may be affected by degenerative spinal disease to varying degrees then spinal column affected also. Spondyloarthrosis is one example of spinal degenerative disease, it mainly affects the facet joints and causes facet degeneration. Degenerative disc disease is another example of degenerative disease, mainly affecting intervertebral discs. Imagine screening of the whole spine can provide diagnostically significant information in a small percentage of patients. In our daily practice more than a half of lumbar degenerative have cervical degenerative also. One third of these have clinical symptoms and twenty percent need surgery. Its important to know this situations as a consideration to make good patient selection for surgery and long term evaluation after surgery.

Degenerative spine conditions can be asymptomatic but may present as back pain, leg pain, or both. Back pain is common, affecting over 80% of the population at some point. Many cases resolve with the passage of time, early rehabilitation and physiotherapy. Leg pain can either be referred, stenotic or radiculopathic in nature. Serious causes should be detected with the use of ‘red flags’ and surgery reserved for only the most severe cases that have not responded to conservative measures. The clinical features, investigations and management of the common degenerative spine pathologies are discussed he
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ENDOSCOPIC REMOVAL OF SPINAL INTRADURAL TUMOUR VIA INTERLAMINAR APPROACH

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BACKGROUND: One level cervical disc herniation interventionally required anterior discectomy. Commonly open procedure require to remove the herniated disc with fusion. Anterior cervical discectomy and fusion has been widely used for the treatment of cervical myelopathy or radiculopathy since it was first developed in the 1950s, but this procedure associate with some clinical risk. Endoscopy cervical discectomy (minimally invasive surgery) may be used as alternative to remove herniated disc. We present a case of Endoscopic anterior cervical discectomy.

METHODS: A 53 years old woman was diagnosed Herniated cervical disc. The chief complaint is pain (VAS 4) at neck since 2 year ago, pain radiating at the shoulder and arm which intensify in certain positions or after certain movements. From physical examination, revealed the motor strength of the upper limb was 4 (MMT), lower limb motor strength was 4, disturbance of sensory sensibility at below level C3-4 , increased physiological reflexes and autonomic function within normal limit. From MRI shows a disc herniation between the C2 and C3 vertebrae and spinal stenosis caused by bulging herniated disc.

RESULT: The patient was underwent surgery anterior cervical discectomy fusion by endoscopic approach in Dr. Kariadi general Hospital semarang. There were no intraoperative and post-operative complications. Patient shows clinical improvement after surgery. Decrease of pain (VAS 3) and increased motoric function (MMT-5).

CONCLUSION: Endoscopic surgery for ACDF can produce satisfactory results in patients with cervical disc herniation.

KEYWORDS: Herniated cervical disc, anterior cervical discectomy fusion, Endoscopy

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FAIL BACK SURGERY SYNDROME

ENDOSCOPIC REMOVAL OF SPINAL INTRADURAL TUMOUR VIA INTERLAMINAR APPROACH

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Abstract

Background: Endoscopic technique has widely accepted in spinal pathology. But there are a few report of its application in spinal intradura tumour. Conventionally, open surgery requires to remove this tumor with wide incision and muscle retraction. To reduce invasiveness and decrease associated risk, endoscopy spinal tumor removal may used for schwannoma resection. We present two cases of spinal intadura tumour removal with spinal endoscopic procedure.

Case Presentation: Decrease motor power found in booth patient. Spinal intradura tumour found in MRI examination. During the surgery, a small skin and fascia incision was made, a small muscle retraction and dissection followed by insertion of speculum as working channel. The interlaminar space was enlarged, ligamentum flavum remove in the side of tumor. Under endoscopic guidance, spinal intradura tumor were totally removed. Motoric power were Improved and no significant side effect on clinical follow up after surgery.

Conclusion: This report supports the application of endoscopic technique for spinal intradural tumour resection.

Keyword: Spinal tumour, Endoscopy
ONE STAGE TRANSPEDICULAR UNILATERAL CORPECTOMY STABILIZED BY CERVICAL TITANIUM MESH AND TRANSPEDICULAR SCREW FIXATION FOR TUBERCOSIS/TRANS THORACIC AND TRANSLUMBAR FOT TH 10-11-12 AND L1-L2 DISC PROLAPSE AFTER FAILED LAMINECTOMY SURGERY

Sahat Edison Sitorus

Using anterior approach the vertebra lesion can be removed and direct decompression and debridement of lesion and neurological decompression followed anterior reconstruction with an autograft, allograft or the use of body spacer and stabilization by supplemental trans-pedicle screw fixation can be carried out to provide immediate stability.

However for the patient with is in poor health status, anterior approach is not recommended due to pulmonary function and medical illness concurrent with his or her disease.

Transpedicular corpectomy offered to prevent such co morbidity while decompression to remove the vertebral lesion could be achieved by bilateral or unilateral depend on underlying disease and previously treatment.

Report of the a male 50 years old who has weakness of both leg caused by T 8 tuberculous of spine, and underlying diabetes mellitus.

Right transpedicular corpectomy to remove the infectious vertebra was done after insertion of left pedicle screw T7-9 with rod to distract the T7-T9 vertebra and insertion of right pedicle T7-T9 without rod to facilitate corpectomy. After placement cervical titanium mesh properly, T7-79 pedicle screw was connected with a rod to achieve compression.

Neurologic recovery was remarkably.

Key word: Tuberculous of vertebral spine– transpedicular fixation – unilateral transpedicular corpectomy– intervertebral spacer

Trans Thoracic and Translumbar for Th10-11-12 and L1-L2 Disc Prolaps after Failed Laminectomy Surgery

A thoracic disc herniation is an uncommon disorder especially concomitant with L1-L2 disc herniation is a very rare condition.

The clinical features may not be characteristic and can mistakenly be attributed to abdominal pain. Careful attention should be paid for possibility neurologic complaints. Thank to MRI use, disc disease could be confirmed clearly.

Decompressive laminectomy should be abandoned, posterolateral, lateral and offer more safety approach. The choices between these surgical techniques should dictate by the problems and complication.

We report a 45 year old men overweight, used to be the boxer with untreatable lower abdominal pain to the left. On examination slight spastic monoparese, with increasing physiologic reflex.

MRI on 5 March 2015 revealed slight protusion of T10-11-12. The patent came again 2 years after performing laminectomy surgery in other centre and became paralyzed both of the leg.

MRI on 22-6-2017 revealed multiple disc herniation T10-11-12 and L1-L2.

The patient is operated on by transthoracic and translumbar retroperitoneal, with fusion using interbody devices.

Neurologic recovery was remarkably and could walk without assistance. No complication after transthoracic and translumbar was found.

Keyword: Low thoracic and upper lumbar disc herniation – one stage transthoracic and tranlumbar retroperitoneal approach disc excision- interbody fusion

Lateral lumbar inter-body fusion approach for L1/L2- L4 disc disease. retroperitoneal offer avoidance psoas muscle, lumbar and sympathetic plexus especially abdominal viscera manipulation.
SS 18 – SPINE 9
PENETRATING GUNSHOT WOUND OF CERVICAL SPINE: DEBATES, RECOMMENDATIONS, STRATEGIES WITH ILLUSTRATIVE CASE IN CIVILIAN

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BACKGROUND: A gunshot wound in the spine contributes 13-17% of all spine injuries; after traffic accident and fall from height. It is a complex injury and the treatments are in debates for some cases. Recommendations and algorithms are varied but sometimes the choice of treatment depends on the surgeons' understanding about mechanism of injury and other biological factors.

OBJECTIVE: We had a case of civilian gunshot wound in cervical spine as the illustration for further direction to describe the debates and controversies about gunshot wound of cervical spine then review the recommendations and treatment strategies based on the literature.

CASE: A 21-year-old female, was referred to us with history of gunshot injury 6 hours back. She got the entry wound at the posterior neck and the exit wound at the anterior neck besides another entry wound at the scapular region. She was in spinal shock and not able to move all her extremities with level of spinal cord injury was documented. All the resuscitation and radiological examinations were performed and CT Scan of the cervical spine confirmed the lesion and bullet fragments around the lesion at C5-C6. We performed surgery from posterior approach and instrumentation.

DISCUSSION: Knowledge of mechanical factors such as ballistics combined with biological factors will lead to a better understanding of pathophysiology and treatments of gunshot wound. Type of injury, surgical indications, timing of surgery, choice of treatment, when to do instrumentations, efficacy of medications, complications, and role of surgery due to prognosis, are reviewed.

CONCLUSION: Gunshot wound is a significant cause of penetrating spine injury. Some common principles are still followed widely despite the differences of treatments. Prognosis and neurological recovery of spinal cord is commonly poor.

KEYWORD: gunshot wound, cervical spine, ballistic, civilian gunshot wound, penetrating injury

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SS 19 – SPINE 10: MINIMAL INVASIVE CHALLENGES AND COMPLICATION IN MINIMAL INVASIVE SPINE SURGERY

Deepak Bhangale (India)
ABSTRACT

SHORT AND MID-TERM FOLLOW-UP IN PDS

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Problem:
Degeneration in the lumbar spine is very common in India after the age of 60 years. Relentless degenerative process produces recurrence of symptoms in following Laminectomy. Instrumentation with pedicle screws is indicated in the presence of instability. Considering the large number of patients and knowing the complications and morbidity associated with instrumentation, its use is not justified in degenerated lumbar spine without instability.

Aim:
To evolve a surgical technique which is simple, safe, cost effective and which will stop degenerative process causing recurrence of symptoms shortly after surgery.

Biomechanics:
Following slightest degeneration in the intervertebral disc, facets are the first element in the motion segment to bare the burden of transfer load posteriorly. Facet cannot bare the unusual load and start degenerating producing hypertrophy and osteophyte causing lateral recess stenosis.

Surgical technique:
ChronOS strip made from ChronOS granules is used to achieve early osteosynthesis along the facet joints involved in stenosis.

Clinical data:
For a period of 15 months from March 2012 – June 2013, we have used this technique in 65 patients of which 51 are evaluated over a period of 12 months.

Results:
The results in term of VAS and Oswestry Disability Score, and overall satisfaction of the patient over a period of 12 months are very satisfactory. No complication has encountered in this series and patients are advised to resume their original work after 6 weeks. If the work is hard, their advice to resume the work after 3 months.

Conclusion:
Initial satisfactory results could be partly due to decompression and the long term results will confirm osteosynthesis of the facets and restriction of degenerative process.
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ABSTRACT

Background, the era of the National Health Insurance system for all treatments will be very limited in terms of financing, while the problem of spinal diseases, especially the lumbar segment, is increasing

Purpose, Providing simple handling services for disease bulging discs on the lumbar with the cost of using existing facilities.

Methods, almost every hospital has endoscopic and C arm, because it can be used by other specialist fields such as General Surgery, Urology, Orthopedic and even Obsgyn. If a neurosurgery asks for a microscope then the cost will be very high, and if a laminectomy technique is done it will open the wound which is quite large and requires implants for stabilization which are quite expensive.

Results, with the percutaneous endoscopic lumbar discectomy technique the hospital investment costs will be very minimal and the cost of operating costs will be greatly reduced. PELD is done with local anesthesia without skin sutures, the operating time is shorter, surrounding tissue damage is very minimal so the treatment will be very short.

Conclusion, investment efficiency, minimization of soft tissue damage, short hospital stay will greatly help reduce the cost of handling this disease in the era of JKN

Keyword: PELD, lumbar, discectomy, endoscopic

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Abstract

Background: Lumbar Discogenic pain is a serious medical and social problem, and accounts for 26%-42% of the patients with chronic low back pain. Discogenic pain typically increases with sitting, flexion, coughing, sneezing, or activities that increase intradiscal pressure. Lumbar discogenic pain cases tend to exponentially increase and this is caused by our lifestyle today. There are many ways to overcome this problem through minimally invasive techniques such as Pain Management, Trans-sacral Epiduroscopic Lumbar Decompression (SELD), Percutaneous lumbar Discectomy etc.

Methods: The technique chosen to treat the cases above depends on the degree of degeneration of the disc. In stage 1 disc herniation we use Pain Management technique (Diskit II) or Percutaneous Lumbar Discectomy (PLD), while on stage 2 disc herniation we use Trans-sacral Epiduroscopic Lumbar Decompression (SELD) technique.

Results: We performed Pain Management technique (Diskit II) on 112 Lumbar Discogenic Pain patients at stage 1, Percutaneous Lumbar discectomy (PLD) technique on the other 15 patients with stage 1, and Trans-sacral epiduroscopic lumbar decompression (SELD) on 10 patients on stage 2, the result shows good outcome in all patients.

Conclusion: All techniques used in cases of lumbar discogenic pain can treat the disorder

Key words: Lumbar Discogenic Pain, Pain Management, Diskit II, Percutaneous Lumbar Discectomy and Epiduroscopic Surgery
SS 19 – SPINE 10: MINIMAL INVASIVE
PERCUTANEOUS CERVICAL EPIDURAL NEUROPLASTY (PCEN) FOR TREATMENT OF MILD CERVICAL DISC HERNIATION: IS IT ENOUGH?

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Statistically, prevalence of cervical disc herniation is on the top in cervical spine problems, with the commonest chief complains are shoulder and neck pains radiating to the arm and fingers. Some cases have significant symptoms and signs, eventhough in MR imaging only shows a mild disc herniation. Since the pain has been disturbing the patient daily activities, the surgery previously has been chosen as treatment of choice. Starting in the 2000's, percutaneus cervical epidural neuroplasty by several spine doctors has been chosen as alternative treatment for cervical disc hernation, however, only several studies has published in the journal. Some studies showed epidural neuroplasty in cervical area gave good clinical outcomes in the treatment of mild disc herniation, but is it good enough?

In this review, we collect some studies and also our own experience to see whether this therapy can be considered as a treatment modality for mild disc herniation in cervical area.

Key Words: Percutaneus cervical epidural neuroplasty, mild disc herniation

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UTILIZATION OF ENDOSCOPY IN NEUROSURGERY CASES IN CIPTO MANGUNKUSUMO HOSPITAL, JAKARTA, INDONESIA

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Minimally invasive surgery has become a significant trend across specialties. Endoscopic approach for intracranial pathology represent an exciting minimally invasive option for some patients. The goal of it is to reduce patient's morbidity while maintaining effective treatment.

The first neuroendoscopic procedure reported in the literature was conducted by Victor Darwin Lespinasse and followed by Walter Edward Dandy that published the first endoscopic illuminated by an external light reflection in a mirror. Afterwards, William Jason Mixter, performed the first endoscopic third ventriculostomy in 1923. In 1960s, there were major technological advances that allowed the resurgence of endoscopic techniques. Harold Horace Hopkins, invented a system consisted a glass tube with thin lenses made of air, a rod-lens system, which is the basis of current rigid neuroendoscopy and is the technology purchased by Karl Storz.

The indications for endoscopic neurosurgery in paediatrics are obstructions in cerebrospinal fluid pathways, intraparenchymal cysts and intraventricular or intraparenchymal lesions. The techniques that can be applied for those conditions are endoscopic third ventriculostomy (ETV), septostomy, aqueductoplasty, cyst fenestrations, and tumor removals.

The principle of ETV is to make an alternative exit route for draining cerebrospinal fluid (CSF) from the ventricular system into the subarachnoid space. In this technique, a fenestration is performed in the third ventricle floor and in the membrane of Liliequist just below it, allowing the CSF to flow out to the interpeduncular and preoptonate cistern. Patency of the subarachnoid space and preservation of CSF absorption at the arachnoid granulations level are necessary conditions. According to Vogel, et al, the overall success rate is around 75% but this depends on the etiology of the hydrocephalus and age of the patient. According to Bouras and Sgouros, the overall complication rate of ETV is between 5-15% with mortality less than 1%.

Endoscopic septostomy is the fenestration of the septum pellucidum, allowing communication between the two lateral ventricles. It’s main indication is related to the asymmetric dilatation of the lateral ventricles that can be caused by obstruction of the foramen on Monroe due to inflammatory, congenital or tumoral causes. According to Tamburrini, et al, the success rate of this procedure
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UTILIZATION OF ENDOSCOPY IN NEUROSURGERY CASES IN CIPTO MANGUNKUSUMO HOSPITAL, JAKARTA, INDONESIA

is around 95%.

Endoscopic aqueductoplasty consist of opening the cerebral aqueduct in a patient whom the aqueduct is congenitally stenotic, stenotic after some inflammatory process, or stenotic due to tumor compression. According to Cavalheiro, et al. the success rate of aqueductoplasty is around 69-100% and the mortality rate is 0%.

Multiloculated hydrocephalus is associated in most cases with a prior infectious ventricular condition or intraventricular haemorrhage. The pathology are septations that are formed within the ventricular system and there are obstruction of the natural CSF pathways. Neuroendoscopy procedure in this pathologic condition, aims to open several septations or to connect as many cyst to cyst. Once all cavities or cyst are communicating, a single shunt system will be sufficient for CSF drainage. It is believed that the wider and the larger number of openings, the less chance there is of them closing.

Endoscopic biopsy for intraventricular or paraventricular lesions are an alternative other than biopsy through craniotomy, because it involves complex surgery and pose some risk. The biopsy is performed with biopsy forceps that pass through the working channel of the endoscope. Although there are no absolute conditions for the procedure to succeed, the ideal condition is for the lesion to be poorly vascularized, have a soft consistency, be up to 2 cm in diameter and have ventricular dilatation. Mohanty, Hayashi and Constantini reported that the positive result of endoscopic biopsies range from 82.8% to 94.7%. The complication rate is around 3.4-6% and mortality is around 0.3-4%.

Through this report, we would like to share our experiences in some paediatric neurosurgery cases treated using endoscopy in Neurosurgery Department, Cipto Mangunkusumo Hospital, Jakarta Indonesia.

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CURATIVE RESECTION FOR LESIONAL REFERACTORY EPILEPSY IN CHILDREN OUTCOMES AND LOCAL EXPERIENCE IN HOSPITAL KUALA LUMPUR

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Introduction
Refractory epilepsy can be progressive with potential risks of structural damage to the brain and nervous systems. It is associated with increased mortality from sudden unexpected death and morbidities related to psychological, learning disability, social stigma and occupation consequences.

Methodology
A retrospective study of all medical refractory epilepsy with MRI-defined lesions treated in the Department of Pediatric and Department of Neurosurgery, Hospital Kuala Lumpur from 2012 to 2017 was performed.

All patients were properly workup including MRI, EEG and PET scan for selected cases with consensus decision for surgical intervention made at the multidisciplinary board meeting.

Results
A total of 24 patients were included in the analysis, of which 12 cases (50%) with tumours, 9 (38%) with Hippocampal Sclerosis, 2 (8%) with Cortical Dysplasia and 1 with Autoimmune encephalitis. Tumours include Grade 2 Astrocytoma, dysembryoblastic neuroepithelial tumors (DNETs), gangliogliomas (GGs), and oligodendrogliomas (OGs).

Four (17%) cases underwent Lesionectomy and 20 (83%) had Anteromesial Temporal Lobectomy.

The median follow-up was 2.2 years with minimum 6 months followup after surgery. Of these, 13 cases (68%) have seizures free, 5 (21%) with significant seizures reduction and 1 had worsening seizure due to disease progression. Two patients (8%) developed transient hemiparesis and no mortality (0%).

Conclusion
Treatment of epilepsy requires a multidisciplinary approach and surgical resection has been proven to be effective especially in MRI-defined lesions. The short-term seizure outcome is comparable to those reported by established epilepsy surgery centres.
ABSTRACT

Craniostenosis is a congenital abnormality in the skull, caused by premature fusion of one or more sutures. The prevalence of craniostenosis ranges from 3.1 to 6.06 per 10,000 births, 9% of which are syndromic craniostenosis. Skull growth only occurs in normal sutures, if cranial growth is very limited, an increase in ICP can occur. Direct monitoring of ICP for at least 24 hours can help diagnose and make decision processes.

Craniostenosis is a complex disorder and management requires coordinated effort from a craniofacial (CF) multidisciplinary team. Initial management is the evaluation of CF team members to determine acute intervention, elective or just follow up. Acute neurosurgical intervention if an increase in ICP and visual impairment is found. If there is no acute action plan, an elective surgical plan is made, in the form of calvaria expansion to reduce ICT and FOA to enlarge the orbital cavity in a certain age period. If there is no elective intervention plan, the patient is monitored to anticipate changes that lead to reevaluation of the management plan.

Keyword: craniostenosis, multidisciplinary CF team, acute intervention, elective intervention, follow-up.
A REVIEW IN PEDIATRIC HYDROCEPHALUS TEN YEARS EXPERIENCE WITH VENTRICULOPERITONEAL SHUNT

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Hydrocephalus is increased CSF within the skull, a common disease and it may develop may due to various causes: congenital, infections, tumors, hemorrhage, trauma, etc. Appropriate therapy can prevent permanent brain damage, a ventriculopertoneal (VP) shunt is one option to treat this problem.

VP Shunt placement one of the most common operation in neurosurgical field. The most common shunt complication are infection and malfunction. Three hundred seventy eight surgery done during 2007-1017, one hundred forty nine case are pediatric population, cause by congenital, infection, hemorrhage, tumor etc. Some of them need some revision and several time for go back surgery.

PEDRIATRIC SPINAL DYSRAPHSYMS

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Abstract

Pediatric spinal dysraphic disorders demonstrate a broad spectrum of clinical findings and prone to the high risk of progressive neurological, urological, and orthopedic dysfunction due to congenital fixation or tethering of the distal spinal cord by the terminal filum. The management of a patient with spinal dysraphism and symptoms of a tethered spinal cord is complex. The most problematic issue in the literature is what patients and symptoms are best suited to surgical treatment.

Drawing from a detailed literature review and our own experience with this entity at the Hasan Sadikin Hospital Bandung, we review cases of childhood tethered spinal cord syndrome, present many of the clinically relevant aspects of this disease, and share our views on the management of this problem.

Keywords: spinal dysraphism, tethered cord
ABSTRACT

Traumatic brain injury (TBI) is a leading cause of death and disability in trauma patients. Patients with TBI frequently sustain concomitant injuries in extracranial regions. The effect of severe extracranial injury (SEI) on the outcome of TBI is controversial. For 8 years, we retrospectively enrolled 485 patients with blunt head injury with head Abbreviated Injury Scale (AIS) $\geq 3$. SEI was defined as AIS $\geq 3$ injuries in the face, chest, abdomen, and pelvis/extremities. Vital signs and coagulation parameter values were also extracted from the database. Total patients were dichotomized into isolated TBI (n=343) and TBI associated with SEI (n=142). The differences in severity and outcome between these two groups were analyzed. To assess the relation between outcome and any variables showing significant differences in univariate analysis, we included the parameters in univariable and multivariable logistic regression analyses. Mortality was 17.8% in the Isolated TBI group and 21.8% in TBI with SEI group ($p=0.38$), but the Glasgow Outcome Scale (GOS) in the TBI with SEI group was unfavorable compared to the Isolated TBI group ($p=0.002$). Patients with SBP $\geq 90$mmHg were frequent in the TBI with SEI group. Adjusting for age, GCS, and length of hospital stay, SEI was a strong prognostic factor for mortality with adjusted ORs of 2.30. Hypotension and coagulopathy caused by SEI are considerable factors underlying the secondary insults to TBI. To improve the outcome of TBI, it is important not only to treat the brain but to manage the systemic disorders caused by SEI.

Background

Traumatic brain injury (TBI) from unintentional blunt trauma is the leading cause of death and disability among younger population. Following a TBI there is an initial primary insult resulting from the biomechanical effect of forces applied to the skull and brain manifested in few seconds as a secondary brain injury. The efficacy and safety of most of the interventions used in the management of patients with TBI remain unproven. The mild hypothermia (34-36°C) induced in the first few hours after an ischaemic event can prevent or mitigate permanent neurological injury. There have been numerous studies of hypothermia in TBI without clear evidence of beneficial outcome, although the studies have been plagued by methodology and implementation issues, in particular controlling the known and expected side effects of therapeutic hypothermia in severe TBI.

Methods

We presented data from our recently research of the mild hypothermia therapy in severe TBI and we review of literature was performed to examine the evidence based behind this therapy.

Results

The mild hypothermia was improved the clinical outcomes significantly and decreased the expression level of the MMP-9 mRNA, MMP-9 and TNF-α protein in severe TBI within 72 hours.

Conclusion

Our research defined that the mild hypothermia should be considered one of the treatment for severe TBI.

Key words: hypothermia therapy, MMP-9 mRNA, MMP-9, TNF-α, TBI
SS 21 – BRAIN & PERIPHERAL NERVES: TRAUMA
THE ROLE OF AXONAL SUPERCHARGING IN CHRONIC PERIPHERAL NERVE INJURY

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Chronic peripheral nerve injuries often result in poor functional recovery. Mechanisms responsible for this poor outcome are chronic denervation and chronic axotomy. Various nerve repairs have been described to improve the outcome. Reverse end-to-side nerve transfer, also called axonal supercharging, is an emerging technique for nerve repair to which acts as motor axons donor while permitting spontaneous regeneration of the recipient nerve. Its use to improve motor recovery for chronic nerve injury in continuity is intriguing and requires further studies.

We present the results of an experimental study to evaluate the role of this new surgical technique for delayed nerve repair in sciatic nerve injury model using Wistar rats. Venous blood levels of presynaptic vesicles SV2B protein and the expression of SV2B mRNA are obtained to evaluate the results. The study showed that SV2B protein and mRNA expression are significantly higher in the axonal supercharging group. These results suggest that axonal supercharging promotes more robust axonal regeneration compared to conventional end-to-end nerve repair. Surgical technique and early clinical result are also presented.

SS 21 – BRAIN & PERIPHERAL NERVES: TRAUMA
MANAGEMENT OF BRACHIAL Plexus INJURY

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Brachial plexus injury is mainly caused by trauma, both directly and indirectly. Patients, especially young men, experience significant disabilities, such as experiencing useless hands. At present, the efforts of surgery are carried out intensively especially, first is to restore the ability of elbow flexion and then followed by shoulder abduction and shoulder stabilization as well. Although in general, the outcome of intrinsic hand muscle function is still poor but rather than not moving at all, the patient is still grateful.

The principle of handling brachial plexus palsy when conservatives fail is surgery, such as using autologous graft, neural transfer, neurolysis, and direct suture. Improvement of elbow flexion is the upmost priority and shoulder stabilization as well. Various techniques are used lately, but to date, they have not been able to improve the functioning of the patient's fingers.
Intracranial hypertension is a major cause of complications and deaths among many problems arising from traumatic brain injury. One attempt to control intracranial pressure (ICP) by performing Decompressive Craniectomy (DC) before definitive treatment. A common problem after DC is adhesion. Separated injured tissue surfaces by using bioabsorbable membranes over a critical / certain period are predicted to prevent fibrin bridge formation and adhesion. The purposes of this study is to prove effects of DC with mesh on TGF-β levels, fibroblast cell count, fibrosis size and clinical adhesions in wistar mice with traumatic brain injury.

This research uses animal model with randomized post-test only control group design. A total of 20 samples that met the eligibility criteria were included in the study and randomized. A total of 10 samples were grouped as control group and 10 samples were grouped as treatment group DC with mesh. On day 7, we performed euthanasia and peridural tissue were taken for examination of TGF-β levels, fibroblast cell count, and fibrosis size. TGF-β levels were examined with ELISA techniques, the number of fibroblast cells and the size of fibrosis was examined with histopathological techniques. Clinical adhesions is judged by the adhesions between the duramater and the temporalis muscle tissue, fascia or the overlying skin. Hypothesis test using unpaired t test for numerical scale data and Fisher’s exact test for categoric scale data, with significance level p <0,05.

The mean results of TGF-β in the treatment group were lower than the control group (81.8 ± 17.48 pg / dl vs 93.83 ± 9.51 pg / dl) although this difference was not statistically significant (p = 0.062). For the mean number of fibroblasts cells, there was a significant difference where the treatment group was lower than the control group (56.8 ± 20.59 cells / LP vs. 94.8 ± 18.56 cells / LP) with p <0.001. The mean size of peridural fibrosis also showed a significant difference where the mean size of peridural fibrosis in the treatment group was lower than the control group (1182.52 ± 347.05 μm vs. 1545.78 ± 378.28) with p = 0.038. Only DC samples (without use of mesh) had a relative risk 8 times greater for clinical adhesions compared to mesh (RR = 8 1K95% = 1,215-52,693; p = 0.005).

DC with mesh significantly resulted low rate of mean number of fibroblasts cells, the size of peridural fibrosis and the risk of clinical adhesions in wistar mice with traumatic brain injury.

**Keyword:** Traumatic brain injury, mesh, TGF-β, Fibroblast Cell counts, Fibrosis size, Clinical Adhesions, Peridural tissue
bone fragments, haemostasis, duraplasty.

**Conclusion:**
AGs injuries are probably more frequent, but they are regularly recorded as firearm injuries. AGs injuries to the head may be fatal due to brain injury following penetration of relatively thin areas of the skull since there is a potential for damage to the cerebrum, cerebral vessels or brain stem. We recommend that the cases suffering from AG injury be managed in accordance with the protocol for gunshot wounds. A rational management strategy should permit a good outcome. We have claimed that the foreign body or pellet should be removed if they are readily accessible. We suggested that the foreign body may be left if it is inaccessible.

**Keywords:** cranial gunshot wounds (CGW), Air gun (AGs), brain injury, surgery

**REFERENCES**
Bratton SL, Dowd MD, Brogan TV, Hegenbarth MA. Serious and fatal air gun injuries: more than meets the eye. Pediatrics 1997;100:609-12.
**SS 22 – BRAIN 7: TECHNIQUE**

**TANSNASAL ENDOSCOPIC SURGERY FOR PITUITARY ADENOMA**

Tomoko Iida  
Department of Neurosurgery, Hyogo College of medicine, Hyogo, Japan

The endoscopic surgery is becoming mainstream among neurosurgery. The greatest merit is less invasive than conventional surgery. Using endoscope can treat various midline skull base disease, for example the planum sphenoidale, tuberculum sellae, cavernous sinus, and so on. However limited operating space sometimes make it difficult for hemostasis.

The most common disease for transnasal endoscopic approach is a sellar lesion. In our hospital, we have used microscope about 300 cases for the sellar lesion until 2007, we use endoscope only for it since 2007. As of July 2018, 395 cases of sellar lesion are treated with endoscope only in our hospital. These diseases include pituitary adenoma, Rathke's cleft cyst, craniopharyngioma, meningioma, germinoma, and so on. Especially we perform extended transnasal endoscopic surgery. Among them, 284 cases are pituitary adenomas.

We indicate the transnasal endoscopic surgery for pituitary adenoma and further report perioperative management in our hospital.

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**SS 22 – BRAIN 7: TECHNIQUE**

**PREOPERATIVE EMBOLIZATION AS A BRAIN TUMOR’S RESECTION STRATEGY IN A YOUNG WOMAN WITH NO NEUROLOGICAL DEFICITS: A CASE REPORT**

Bilzardy Ferry Zulkifli, Andi Nugraha Sendjaja, Yogi Rosbianto, Achmad Adam, Agung Budi Sutiono, Roland Sidabutar, Muhammad Zafrullah Arifin*  
*Department of Neurosurgery, Hasan Sadikin Hospital/Padjajaran University Bandung-West Java-Indonesia

**Abstract**

Meningioma is an intracranial tumor generally involves meninges. Localization of this tumor can be found along the dura layers at the skull base. Meningioma has vast vascularization from the arteries near dura attachment. Preoperative embolization technique is an effective strategy to prevent intraoperative complications and better outcomes. The patient was a 24 year-old woman who complains of headaches since 2 months ago. A CT Scan shows a 12 x 9 x 7 cm isodense mass in left temporoparietal that enhanced homogenously by contrast. Pre-operative embolization is performed on the tumor feeding artery as a strategy to prevent intraoperative blood loss. A left fronto-temporo-sphenoidal craniotomy was performed 10 days after embolization to remove the tumor. A complete resection was successfully achieved with less intraoperative blood loss and without complication. The pathology results shows Meningoteliomatous meningioma. A follow up picture showed no recurrence of the tumor after resection and the patient has no symptoms and neurological deficits 6 months after surgery. Meningioma is a common intracranial tumor with a lot of blood supply. However, tumor resection can be safely and efficaciously performed with good preoperative strategy.

**Keywords**: Meningioma, Skullbase, Embolization, Resection.
Awake craniotomy is the gold standard for the identification and preservation of functional brain areas. This method helps to ensure both the quality of life and the neurooncological result are not compromised at the same time. Having the patient awake during surgery for intra-axial tumors in eloquent areas for mapping is superior in terms of the extent of resection and postoperative neurological status as compared to resections in patients under general anesthesia. It is a safe, faster, and less resources procedure that can be done by a good teamwork of neurosurgical, anesthetic and nursing teams. Nevertheless, the number of awake craniotomy cases in Indonesia is still relatively low. This serial case report and literature review is done to provide further encouragement in performing awake craniotomy.

Keywords: awake craniotomy, brain mapping, extent of resection
SS 22 – BRAIN 7: TECHNIQUE
MANAGEMENT OF PARASAGITTAL MENINGIOMA

Suzy Indarti (Indonesia)

SS 21 – BRAIN 7: TECHNIQUE
MICROVASCULAR DECOMPRESSION SURGERY “HOW TO DO IT SAFELY AND SUCCESSFULLY”?

Setiawan NB, Sofyanto M, Anab Agus C, Pramono G

Comprehensive Brain & Spine Center National Hospital Surabaya, Bedah Hospital Surabaya, Persada Hospital Malang

Microvascular Decompression (MVD) surgery is a technique that used in releasing vascular attachment on Cranial nerve in Fossa Posterior, especially Cerebellopontine Angle area (CPA). This surgery has many challenges and difficulties.

Our team has done 1,136 cases of MVD for Hemifacial Spasm, Trigeminal Neuralgia and Glossopharyngeal Neuralgia for 15 years with the success rate of 97% and the temporary complication of 1.46%. The average of surgery duration was 72 minutes. We will describe how to do MVD safely and successfully.

Key word: Microvascular decompression
SPECIAL LECTURE
CRANIOCERVICAL JUNCTION INSTABILITY: WHEN TO ADD OCCIPUT TO FUSION?
Mehmet Zileli (Turkey)

SPECIAL LECTURE
ROLE OF EPILEPSY SURGERY IN DEVELOPING BASIC RESEARCH IN NEUROSCIENCE
Gary W. Mathern (USA)
SPECIAL LECTURE
ETHICAL AND LEGAL ASPECTS IN SPINE SURGERY

Abdul Hafid Bajamal (Indonesia)
SCIENTIFIC SCHEDULE OF AESC
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<td>SESSION 1: Drug Refractory Epilepsy, How do We Diagnose DRE</td>
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<td>14.30 – 15.00</td>
<td>SESSION 2: Managing Antiepileptic Drug, Starting, Changing, and Stopping AED's</td>
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<td>SESSION 3: Neuroimaging in Epilepsy: Best Imaging Sequence for Best Detection of Epileptogenic Lesion</td>
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<td>SESSION 4: EEG and Semiology in Focal or Partial Seizures</td>
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<td>08.15 – 08.30</td>
<td>Opening Ceremony The 12th Asian Epilepsy Surgery Congress</td>
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<td>Presidential Lecture Establishing Advance Epilepsy Surgery Program in Developing Countries</td>
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<td>09.00 – 09.45</td>
<td>Special Lecture 1 Moderator: Zainal Muttaqin (Indonesia) Autonomic Changes in Patients with Intractable Epilepsy Gary W. Mathern (USA)</td>
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<td>10.00 – 10.30</td>
<td>Special Lecture 2 Moderator: Haruhiko Kishima (Japan) &amp; Asra Al Fauzi (Indonesia) Presurgical Planning of Intracranial Electrode Insertion in Patients with Cortical Migration Disorders Seung-Chyul Hong (Republic of Korea)</td>
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<td>11.30 - 12.40</td>
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<td>10.30 – 10.40</td>
<td>Identification of Genes Associated with Cortical Malformation using a Transposon-Mediated Somatic Mutagenesis Screen in Mice Hsin-Hung Chen (Taiwan)</td>
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<td>10.50 – 11.00</td>
<td>Multi-Institutional Study of Epilepsy and Glia in Japan Taketoshi Maehara (Japan)</td>
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<td>11.00 – 11.10</td>
<td>Stereo-EEG for Periventricular Nodular Heterotopia with Drug-Resistant Epilepsies Cheng-Chia Lee (Taiwan)</td>
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<td>11.10 – 11.20</td>
<td>Epilepsy Surgery for Tuberous Sclerosis Complex Haruhiko Kishima (Japan)</td>
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<td>11.20 – 11.30</td>
<td>Cavernoma Related Epilepsy: Controversy on Management Asra Al Fauzi (Indonesia)</td>
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<td>11.30 – 11.40</td>
<td>Fully-implantable Wireless ECoG Device Toshiki Yoshimine (Japan)</td>
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<td>11.40 – 12.40</td>
<td>Lunch Symposium Moderator: Seung-Chyul Hong (Republic of Korea) Vagal Nerve Stimulations (VNS) Kensuke Kawai (Japan)</td>
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<td>13.30 – 14.00</td>
<td>Special Lecture 3 Moderator: Chun Kee Chung (Republic of Korea) &amp; Yuriz Bakhtiar (Indonesia) Epilepsy Surgery for Tuberous Sclerosis Complex Hsin-Hung Chen (Taiwan)</td>
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<td>14.10 – 14.20</td>
<td>Chun Kee Chung (Republic of Korea)</td>
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<td>Endoscopic Epilepsy Surgery: Indication and Technique</td>
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<td>Microscopic Corpus Callosumy: Long Term Outcome</td>
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<td>15.00 – 15.30</td>
<td>Special Lecture 4: SEEG Investigation and Surgery Treatment for Insular Epilepsy</td>
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**ABSTRACT**

**INDONESIAN EPILEPSY SCHOOL**

**ABSTRACT BOOK**

**October 26th – 27th, 2018**

**Bali 2018**

**Bali, Nusa Dua Convention Center (BNDCC)**

**Bali, Indonesia**

**October 25th – 27th, 2018**
INDONESIAN EPILEPSY SCHOOL

DRUG REFRACTORY EPILEPSY, HOW DO WE DIAGNOSE DRE

Zainal Muttaqin (Indonesia)

INDONESIAN EPILEPSY SCHOOL

MANAGING ANTIEPILEPTIC DRUG, STARTING, CHANGING, AND STOPPING AED’S

Diah Mirawati (Indonesia)
Epileptic seizures are characterized by a variety of symptoms. Their typical semiology served for a long time as the major tool to classify epilepsy syndromes. The signs and symptoms of epileptic seizures include the following spheres: sensorial sphere, consciousness, motor and autonomic spheres. The predominant clinical features of a seizure determines the seizure classification. The following review gives an introduction into the semiological seizure classification. This approach enables us to better identify the epileptogenic zone of our patients and to choose the most effective medical or surgical treatment.

Video-EEG monitoring is essential for the pre-surgical evaluation of patients with intractable epilepsy. Many authors have described the characteristic features of seizures arising from different brain locations. Analysis of video recordings of seizures is usually descriptive and non-standardized in contrast to interictal/ictal EEG patterns or neuroimaging which often receive much greater attention. The value of seizure semiology has not been quantified relative to other modalities such as EEG, MRI or PET. The aim of our study was to review both the lateralizing and localizing value of seizure against results of other presurgical tests: scalp interictal and ictal EEG, MRI and PET.
Objective: to describe the challenge, opportunity and strategy for establishing an epilepsy surgery center in Surabaya, Indonesia.

Methods: patients with seizures were evaluated together between neurologist and neurosurgeon. We performed a detailed anamnesis, neurological evaluation, brain imaging, scalp video-EEG monitoring and neuropsychological evaluation. Patients with refractory to antiepileptic drugs were evaluated with long-term ictal video EEG, and surgery was performed when the findings were concordance with the clinical, brain imaging, and neuropsychological evaluations.

Results: 12 patients underwent comprehensive evaluation based on clinical condition, MRI and long-term video EEG monitoring. Surgery was done in 3 patients based on concordances in the pre-surgical examination, all were anterior temporal lobectomy and amygdala-hippocampectomy. Endoscopic assisted corpus callosotomy was done in 1 patient that is syndromic epilepsy (West Syndrome). 1 patient was seizure free, 2 patients had 1 seizure in 1 year follow up and 1 patient has good improvement in the severity of the seizures (head drop).

Conclusion: epilepsy should be treated in a multidiscipline team. Epilepsy surgery should be done in a selected patient based on concordance in the pre-surgical examination.

Keywords: Epilepsy; epilepsy surgery; multidiscipline team.
Surgical treatment is considered when appropriate two antiepileptic drugs with a sufficient amount fail to control the seizure within two years. In children, surgical treatment should be considered without waiting 2 years to prevent developmental delay if it is diagnosed as refractory.

For surgical treatment, it is necessary to estimate epileptogenic area and to assess surgical risk, through detailed interview to identify seizure symptom, physiological evaluation (longterm video-EEG, MEG), morphological evaluation (MRI/CT), functional image evaluation (SPECT/PET, fMRI, MEG), neuropsychological evaluation, and identification of language dominant hemisphere.

In focal epilepsy in which epileptogenic areas can be clearly identified, definitive surgery by excision of epileptogenic area is recommended. Application of the intracranial electrodes is required for resection of the cerebral cortex to identify the detailed epileptogenic area, except for medial temporal lobe epilepsy, epilepsy with intracranial lesions outside the eloquent area, infants and so on. Even in medial temporal lobe epilepsy, placement of intracranial electrodes should be considered if presurgical evaluations show contradictory seizure origin or if independent seizure discharges appear in both hemispheres. In addition, brain function mapping using intracranial electrodes is performed to evaluate the distribution of brain cortical functions such as language, movement, sensation, and vision, and it is confirmed whether the epileptogenic area can be resected or not. It is difficult to resect the epileptogenic area if it exists in the eloquent area. In these cases, multiple subpial transection (MST) or palliative surgery is adapted.

For generalized epilepsy, palliative surgery is considered to reduce the number and the degree of seizures. Callosotomy is applicable for drop attacks and tonic seizures, and it is also effective for West syndrome, atypical absence seizures. In cases of general seizures with focal findings, callosotomy is also considered for clarifying the localization. Neuromodulation therapy such as vagus nerve stimulation (VNS), trigeminal nerve stimulation (TNS), deep brain stimulation is also performed. VNS reduces attack seizure by more than 50% in about 50% of patients, and also improves cognition, behavior, and quality of life, regardless of seizure types.
PRESIDENTIAL LECTURE

ESTABLISHING ADVANCE EPILEPSY SURGERY PROGRAM IN DEVELOPING COUNTRIES

Zainal Muttaqin (Indonesia)
SPECIAL LECTURE 1
AUTONOMIC CHANGES IN PATIENTS WITH INTRACTABLE EPILEPSY

Gary W. Mathem

SPECIAL LECTURE 2
PRESURGICAL PLANNING OF INTRACRANIAL ELECTRODE INSERTION IN PATIENTS WITH CORTICAL MIGRATION DISORDERS

Seung-Chyul Hong
Department of Neurosurgery, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

Cortical dysplasia, or neuronal migration disorder is among the most important pathological substrates in surgically remediable intractable epilepsy.

Because these congenitally malformed heterotopic tissues are independently epileptogenic, complete resection of the lesion is essential to ensure an excellent outcome.

Complete resection is challenging, however, because margin is unclear from the surrounding normal brain tissue, the lesion is frequently located at eloquent areas, deeply located with normal vasculature and invisible satellite lesions can be associated beyond the main lesion.

Presurgical evaluation includes; sophisticated EEG analysis with semiology, high resolution MRI for identification of correct extent of the lesion, functional imaging for CBF and metabolic status of region of interest. For intracranial recording, insertion of multiple depth electrodes through the lesion together with subdural grids and strips is mandatory for stereoscopic analysis of seizure propagation and identification of extent of the lesion. Amount of electrodes needs to be negotiated between accuracy and surgical risk-taking.

We focused on complete or radical resection of the lesion, to ensure a better seizure outcome.

Seizure outcome was excellent. However, postsurgical neurological deficits were not insignificant though we operated under very strict intraoperative electrophysiological monitoring, immediately after surgery. Speech disturbance, impairment of fine hand movements improved gradually, but subtle clumsiness persisted.

Surgical treatment of cortical neuronal migration disorder is challenging because seizure outcome and postoperative neurological deficit are contradictory each other.

Key words:
Cortical dysplasia, Neuronal migration disorder, intracranial electrodes, brain function, neurological deficit.
ABSTRACT

**RELATIONED FREE PAPER**

**IDENTIFICATION OF GENES ASSOCIATED WITH CORTICAL MALFORMATION USING A TRANSPOSON-MEDIATED SOMATIC MUTAGENESIS SCREEN IN MICE**

J-I Ling Lu1, Chien Chen2,3, Chien-Yi Tung4,5, Hsin-Hung Chen3,6, Jia-Ping Pan4, Chia-Hsiang Chang1,7, Jia-Shing Chenq1, Yi-An Chen1, Chun-Hung Wang1, Chia-Wei Huang1, Yi-Ning Kang1, Hsin-Yun Chang1, Lei-Li Li1, Kai-Ping Chang3,8, Yang-Hsin Shih3,6, Chi-Hung Lin4,5,9, Shang-Yeong Kwan2,3 & Jin-Wu Tsai1,10,11

1 Institute of Brain Science, National Yang-Ming University, Taipei 112, Taiwan. 2 Department of Neurology, Neurological Institute, Taipei Veterans General Hospital, Taipei 112, Taiwan. 3 National Yang-Ming University School of Medicine, Taipei 112, Taiwan. 4VYM Genome Research Center of National Yang-Ming University, Taipei 112, Taiwan. 5 Institute of Microbiology and Immunology, National Yang-Ming University, Taipei 112, Taiwan. 6 Department of Neurosurgery, Neurological Institute, Taipei Veterans General Hospital, Taipei 112, Taiwan. 7 Taiwan International Graduate Program (TIGP) in Molecular Medicine, National Yang-Ming University and Academia Sinica, Taipei 112, Taiwan. 8 Department of Pediatrics, Taipei Veterans General Hospital, Taipei 112, Taiwan. 9 Institute of Biophotonics, National Yang-Ming University, Taipei 112, Taiwan. 10 Brain Research Center, National Yang-Ming University, Taipei 112, Taiwan. 11 Biophotonics and Molecular Imaging Research Center, National Yang-Ming University, Taipei 112, Taiwan

Mutations in genes involved in the production, migration, or differentiation of cortical neurons often lead to malformations of cortical development (MCDs). However, many genetic mutations involved in MCD pathogenesis remain unidentified. Here we developed a genetic screening paradigm based on transposon-mediated somatic mutagenesis by in utero electroporation and the inability of mutant neuronal precursors to migrate to the cortex and identified 33 candidate MCD genes. Consistent with the screen, several genes have already been implicated in neural development and disorders. Functional disruption of the candidate genes by RNAi or CRISPR/Cas9 causes altered neuronal distributions that resemble human cortical dysplasia. To verify potential clinical relevance of these candidate genes, we analyzed somatic mutations in brain tissue from patients with focal cortical dysplasia and found that mutations are enriched in these candidate genes. These results demonstrate that this approach is able to identify potential mouse genes involved in cortical development and MCD pathogenesis.

**RELATED FREE PAPER**

**UTILITY OF STATISTICAL PARAMETRIC MAPPING ANALYSIS FOR DETECTION OF EPILEPTIC FOCI IN [18F] FDC AND [11C] FLUMAZENIL PET STUDIES**

Motoki Inaj1,2), Satoka Hashimoto1), Shihori Hayashi1,2), Kei Wagatsuma2), Muneyuki Sakata2), Kenji Ishii2), Taetoshi Maehara1)

Department of neurosurgery, Tokyo Medical and Dental University, Tokyo, Japan

Positron Medical Center, Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan

Introduction

[18F]fluorodeoxyglucose (FDG) and [11C]flumazenil (FMZ) positron emission tomography (PET) studies are widely used to detect the hypometabolic or reduced binding epileptogenic focus for presurgical evaluation of drug-refractory epilepsy patients. However, it is not easy to detect the hypometabolic or reduced binding “cold lesion” in visual assessment. This study aimed to clarify the utility of statistical parametric mapping (SPM) analysis to improve the accuracy of focus detection rate in mesial temporal lobe epilepsy patients.

Patients and methods: We retrospectively reviewed fifty-two patients with refractory mTLE (mean age ± SD, 30± 12 y; age range, 12-62 y.o.). All the patients were received anterior temporal lobectomy (twenty-three right side, twenty-nine left side) and were achieved Engel class I. FDGPET and FMZ PET studies were evaluated by both SPM and visual assessment.

Results: 1) In FDGPET studies, SPM using a statistical threshold of P less than 0.01 provided 94.2% correct lateralization, which was better than visual assessment (64%). 2) In FMZ PET studies, epilepsy focus was accurately detected in 92% by SPM analysis, and 52% by visual assessment. 3) In all cases, the area of abnormality on FMZ PET image was smaller than the area of hypometabolism on FDG images.

Conclusion: SPM analysis can improve the detection rate of the epileptic focus compared to visual assessment. FDG and FMZ PET studies with SPM analysis may help the correct pre-surgical diagnosis of epileptic foci.

Key words: FDGPET, flumazenil PET, SPM analysis
**ABSTRACT**

**MULTI-INSTITUTIONAL STUDY OF EPILEPSY AND GLIA IN JAPAN**

Taketoshi Maehara1,2, Motoki Inaji2, Satoka Hashimoto2, Akiyoshi Kakita1,3, Akio Ikeda1,4
1Study group of Epilepsy and Glia by AMED (Japan Agency for Medical Research and Development)
2Department of Neurosurgery, Tokyo Medical and Dental University
3Brain Research Institute, Niigata University
4Department of Epilepsy, Movement Disorders and Physiology, Kyoto University Graduate School of Medicine

**Background:** Since epilepsy is caused by excessive firings of neurons, neurons have been main target of epilepsy study and treatment. Recently several reports pointed out importance of glia in epilepsy. In order to demonstrate the role of glia in epilepsy, we constituted study group of epilepsy and glia by AMED (Japan Agency for Medical Research and Development) since 2015. Our group included 5 epilepsy centers, 1 institute of epilepsy pathology, and 4 institutes of epilepsy research. Aim of present study is to construct clinical diagnostic guide for glia and neuronal abnormalities in epilepsy and then examine background pathological abnormalities in glia.

**Methods:** As clinical study, we analyzed characteristics of ictal DC shift as well as ictal HFO (wide-band) because the glia have important role in the ictal DC shift. After macro-invasive ECoG study, several investigators analyzed ictal ECoG data using our standardized method. Following surgical resection, focus areas with or without DC shift preceding ictal HFO were investigated by epilepsy pathologists. We specially focused on immunohistochemical staining of Kir 4.1 that our basic researchers pointed as an important receptor of glia and epilepsy through impaired K+ homeostasis.

**Results:** We analyzed 40 patients and proposed diagnostic guide of wide-band analysis in seizures. Immunohistochemical abnormalities in Kir 4.1 in glia was confirmed in several cases.

**Conclusion:** Our study suggested importance of glia in epilepsy; however, more accumulations of cases and pathological studies are needed before reaching a firm conclusion.

**ABSTRACT**

**STEREO-EEG FOR PERIVENTRICULAR NODULAR HETERTOPTIA WITH DRUG-RESISTANT EPILEPSIES**

Cheng-Chia Lee1,3, Chien-Chen Chou1,3, Hsiang-Yu Yu1,3, Hsin-Hung Chen1,3, Chien Chen1,3, Chun-Fu Lin1,3, Der-Jen Yen1,3, Yang-Hsin Shih1,3
1Department of Neurosurgery, 2Department of Neurology, Taipei Veterans General Hospital; and School of Medicine, National Yang-Ming University, Taipei, Taiwan

**Objective** Periventricular nodular heterotopia (PNH) is one kind of neuronal migration disorders, frequently associated with cortical dysplasia and drug-resistant epilepsy (DRE). Stereo-electroencephalography (SEEG) is considered an effective way to disclose the epileptogenic zone (EZ). Via the intracerebral electrodes, it is possible to guide the radiofrequency thermoacogulation (SEEG-guided RF-TC) with the aim of pre-resection test via disrupting the EZ.

**Methods** Nine patients with DRE related to PNHs were studied. These patients were diagnosed as drug-resistant epilepsy and PNHs (unilateral or bilateral, single or multiple nodules). SEEG recordings are used for the presurgical investigations, and patients completed surgical workup with SEEG-guided RF-TC with/without traditional neurosurgery.

**Results** Patients with a PNH usually have complex and various epileptic networks. Via SEEG study, some PNHs were identified as epileptogenic focus, and some were not. SEEG-guided RF-TC both into the nodules and/or the cortex was efficacious were decided by SEEG study. Single or multiple, unilateral or bilateral PNHs are the suitable for this procedure. On the other hand, patients with PNHs associated with covered cortex malformation obtained better outcome only with traditional resection surgery.

**Conclusion** Each patient had a specific epileptogenic focus and network, dependent on the SEEG study to disclose the epileptogenic zone, seizure onset zone, irritative zone, and symptomatic zone. The number, size, location of nodules, associated cortical malformation were independent of seizure onset. SEEG-guided RF-TC appears as an effective diagnostic approach for DRE related to PNHs.
SPECIAL LECTURE 3
FULLY-IMPLANTABLE WIRELESS ECOG DEVICE

Toshiki Yoshimine

RELATED FREE PAPER
CAVERNOMA RELATED EPILEPSY: CONTROVERSY ON MANAGEMENT

Asra Al Fauzi, Nur Setiawan Suroto, Zaky Bajamal

Neurovascular & Neuroendovascular Therapy Center
Department of Neurosurgery, Universitas Airlangga, Dr. Soetomo General Hospital,
Surabaya Neuroscience Institute,
Surabaya, Indonesia

Background: Brain cavernomas are the most common vascular malformations and can be found in many locations in the brain. If left untreated, cavernomas may lead to intracerebral hemorrhage, seizures, focal neurological deficits, or headaches.

Methods: The authors report the microsurgical strategy of brain cavernomas related epilepsy in a series of patients in Surabaya, Indonesia.

Results: The result of our series showed the result of seizure free after treatment is varies. Some issues should be considered in the management of cavernoma related epilepsy: site of cavernoma, epilepsy duration, and individualized approach with specific anatomo-electro-clinical requirement.

Conclusion: Cavernoma related epilepsy is still a challenging issue. The optimal surgical management that maximizes chances of seizure free with minimal risk is still a matter of debate. Recent published data shows a wide variety of attitudes on the surgical strategy and management.

Keywords: Cavernoma related epilepsy, microsurgical strategy, controversy
ABSTRACT

BOOK

LUNCH SYMPOSIUM

VAGAL NERVE STIMULATIONS (VNS)

Kensuke Kawai

Epilepsy surgery is always a good candidate for drug-resistant epilepsy after delicate multi-modality work-up. It is very safe now with the progression of contemporary microneurosurgery.
RELATED FREE PAPER

EPILEPSY SURGERY FOR TUBEROUS SCLEROSIS COMPLEX

Haruhiko Kishima

RELATED FREE PAPER

AUTOMATED BRAIN ANATOMY LABELING AND LOCALIZATION FOR STEREO-ELECTROENCEPHALOGRAPHY (SEEG ANATOMY LABELING)

Syu-Jyun Peng1 Cheng-chia Lee2 Chien-Chen Chou3 Hsiang-Yu Yu2

1Biomedical Electronics Translational Research Center, National Chiao-Tung University, Hsinchu city, Taiwan
2Neurological Institute, Taipei Veterans General Hospital, Taipei city, Taiwan
3Neurologists of the Institute, Taipei Veterans General Hospital, Taipei city, Taiwan

Precise localization of the implanted stereo-electroencephalography (SEEG) electrode contacts is critical to clinical diagnosing and treatment in patients with intractable epilepsy. In this study, we precisely extract intracranial contacts and label corresponding brain anatomy using pre-implant T1w and post-implant CT image. Automated brain anatomy labeling and localization was developed for SEEG by using Brodmann area or Eve atlas. The Brodmann area or Eve atlas was warped to match the shape of the subject based on the forward and backward flow fields to obtain personalized anatomical atlas through Deformation option of Statistical Parametric Mapping 8. SEEG electrode contacts were localized using a gradual approach reflecting the composition of tissue surrounding the contact centroid. The proportion of different anatomical structural MRI voxels contiguous to the centroid of each contact was estimated based on identified regions from the personalized anatomical atlas. The anatomy mix surrounding each electrode contact was defined using the proximal anatomy probability in a 3 x 3 x 3 mm³ volume surrounding the centroid of the electrode contact. FreeSurfer was used to reconstruct a 3D model of cortical surfaces based on the registered and reoriented pre-implant T1w image. Finally, MATLAB program was used to embed SEEG electrode contact locations within the reconstructed 3D model of the cortex. The technology is based on the experience of anatomy, providing the most automatic labeling of each contact of SEEG. Electrode localization accuracy was evaluated based on neurosurgeon knowledge and had high consistency. The automated brain anatomy labeling and localization algorithm was established for the basic and clinical researches to provide accurate 3D visualization of SEEG contacts. The algorithm has been looking forward to developing more efficient diagnosis protocols and more individualized treatment.
ENDOSCOPIC EPILEPSY SURGERY: INDICATION AND TECHNIQUE

Chun Kee Chung

Heri Subianto
RELATED FREE PAPER
MICROSCOPIC CORPUS CALLOSOTOMY: LONG TERM OUTCOME

M. Thohar Arifin

RELATED FREE PAPER
EVALUATION OF COGNITIVE FUNCTION IN TEMPORAL LOBE EPILEPSY

Yuriz Bakhtiar
Background: In the surgical treatment of medically refractory epilepsy, the insular lobe epilepsy is underestimated. Covered by the operculum and hidden behind a dense vascular curtain, the insular has long been an unexplored area to identifying the epileptic focus and operating. In recent years, many research shows that Stereoelectroencephalography (SEEG) is a reliable method to diagnose and positioning the insular lobe epilepsy. Unfortunately, because of the complex anatomic and function characteristics, the surgical treatment of the insular lobe epilepsy is difficult. The report is rare. Bipolar electro-coagulation on functional cortex (BCFC) technique is a good choice for drug-resistant insular lobe epilepsy which demonstrates good efficacy and does not result in permanent neurological deficits. These makes BCFC a good surgical choice for medically refractory insular lobe epilepsy.

Objective: To discuss the Stereoelectroencephalography (SEEG) in accurate locating the epileptogenic zone in insular epilepsy. To research the effectiveness of Bipolar electro-coagulation on functional cortex (BCFC) technique in surgical treatment of insular lobe epilepsy. There are 29 patients (17 male, 12 female) diagnosed as insular lobe epilepsy. 14 patients got surgical treatment through BCFC technique, 15 patients got surgical treatment through Cortex resection.

Method: Preoperative evaluation was performed precisely and thoroughly, including semiology and video-EEG monitoring, 1.5-T magnetic resonance imaging (MRI), magnetoencephalography (MEG), neuropsychological assessment, fluorodeoxyglucose positron emission tomography, Stereoelectroencephalography (SEEG). After accurate locating the epileptogenic zone in the insular lobe, corticectomy of insular lobe or Bipolar electro-coagulation on functional cortex (BCFC) technique is performed to treat the epileptogenic zone.

Result: Following up over 12 months, all patients has a good seizure control. In addition, postoperative neurological complications is rare. 73% of the patients got seizure free (Engle Ⅰ) after surgery; 96.6% of the patients got satisfactory seizure control (Engle Ⅱ) after surgery. 10.3% of the patients got temporary neurological deficit; 13.7% of the patients got permanent neurological deficit.

Conclusion: Medically refractory insular lobe epilepsy which is diagnosed and positioned by SEEG is rare. Bipolar electro-coagulation on functional cortex (BCFC) technique is a good surgical choice for insular lobe epilepsy which can lead to an excellent seizure control outcome. It also can minimize the postoperative neurological complications as far as possible.

Key words: Insular, Epilepsy surgery, Bipolar electrocoagulation on functional cortex (BCFC), Stereoelectroencephalography (SEEG)
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SPECIAL LECTURE 4
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Ryosuke Hanaya
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ABSTRACT ORAL

OP 001

DESCRIPTION OF 7TH CERVICAL VERTEBRAE LAMINA USING 2D CT-SCAN MORPHOMETRIC AND 3D VIRTUAL SIMULATION IN REFERENCE TO TRANSLAMINAR SCREW PLACEMENT REQUISITES


Neurospine, Peripheral Nerve and Pain Division of Neurosurgery Department Faculty of Medicine, Padjadjaran University – Dr. Hasan Sadikin Hospital, Bandung, Indonesia

ABSTRACT

Background: Laminar dimensions of cervical vertebrae are key factors to success in translaminar screw placement especially in 7th cervical vertebrae with relatively small laminar size. The purpose of this paper is to report C7 laminar dimension measurement using 2 different methods, which were 2 dimension morphometric and 3 dimension virtual simulation in reference to 3,5 mm translaminar screw insertion.

Method: The research used cross sectional numeric descriptive method. Information was collected from C7 CT-scan DICOM. Measurement was performed using the standard DICOM viewer from CT-scan CD ROM and Materialise Mimics Student Edition to reconstruct 3 dimension virtual simulation. Measurement was on right and left side of the lamina.

Result: The smallest value of lamina base thickness and screw lamina length measured from 2 dimension morphometric were 4,96 mm and 8,74 mm respectively; while from 3 dimension virtual simulation were 5,07 mm and 10,48 mm respectively. There were more than 1 mm measurement difference between 2 dimension morphometric and 3 dimension virtual simulation. Mean lamina base thickness decreased among older ages group. Male group had bigger lamina values than female.

Conclusion: All samples in this research (n=33) qualified for minimal requirement of translaminar screw placement with base lamina thickness and screw lamina length more than 4 mm and 7 mm respectively.

Keywords: C7 vertebrae laminar size, 2D morphometric analysis, 3D visual simulation, DICOM CT-Scan, translaminar screw.

OP 002

PREVALENCE OF COMPLICATIONS FOLLOWING CERVICAL UNILATERAL OPEN-DOOR LAMINOPLASTY IN CERVICAL SPONDYLOSIS PATIENTS: SYSTEMATIC REVIEW AND META-ANALYSIS

Puit Eka Mardhika1,2, Made Bhuwana Putra3, Tjokorda GB Mahadewa3

1Karangasem Public General Hospital, Bali, Indonesia
2Graduate of Faculty of Medicine, Udayana University, Bali, Indonesia
3Neurospine Division, Neurosurgery Department, Sanglah Public General Hospital, Faculty of Medicine, Udayana University, Bali, Indonesia

Background: Cervical spondylosis is a degenerative disease resulted from multi factorial degenerative changes. It can manifest as neck pain, radiculopathy and/or myelopathy. Cervical laminoplasty is considered as one of the safest technique to treat cervical spondylosis. However, this technique also has several complications following the surgery. It is important for neurosurgeon to know the complications of this technique.

Objectives: To determine the prevalence of complications following cervical unilateral open-door laminoplasty in cervical spondylosis patients through systematic review and meta-analysis.

Methods: This review includes all full-text articles that examine cervical unilateral open-door laminoplasty in cervical spondylosis patients. PubMed Central, BioMed Central, and Public Library of Science database were searched using keyword “cervical laminoplasty”. Included article was assessed for risk of bias.

Results: The prevalence of axial pain was 21%, C5 palsy was 6%, CSF leakage was 3%, hematoma was 2%, infection was 3%, dural tear was 3%, and kyphosis was 10%. There was high heterogeneity between studies.

Conclusions: The complication with highest prevalence was axial pain with 21% while hematoma was the lowest prevalence with 2%.
OP 003

SPINAL EPIDURAL ABCESS CAUSING FOOT DROP IN PRE-EXISTING BERTOLOTTI’S SYNDROME

Farid Yudoyono1, Hendra Gunawan1, Dewi Pratiwi 1, Deasy Herminawaty2

1 Minimally Invasive Spine Surgery and Spinal Pain Intervention Center, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia. on behalf of Minimally Invasive Spine and Pain study group.
2 Physical Medicine and Rehabilitation Center, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia.

Introduction: Lumbosacral transitional vertebra is an anatomical variation of the fifth lumbar vertebra in which an enlarged transverse process can form a joint or fusion with the sacrum or ilium. The association of that variant with chronic low back pain the change in the biomechanical properties of the lumbar spine is called Bertolotti’s syndrome. Foot drop in preexisting Bertolotti’s syndrome is very rare.

Case presentation: We report a case of a 50-year-old male patient with left foot drop proceed by one year chronic low back pain extending to the bilateral buttock, just above sacroiliac joint. Radiographic investigation revealed an anomalous enlargement of the bilateral transverse process of the fifth lumbar vertebra forming a pseudarthrosis with the ala of the sacrum. MRI examination showed thecal sac compression level L4-5 and hipointensity on T2WI MRI.

Conclusion: This case report highlights the importance of early diagnosis and early treatment of spinal epidural abscess. Isolated spinal epidural abscess is rare and can precede the development of spondylitis, which mandates long follow up.

OP 004

THORACIC MEDIAL BRANCH BLOCKS IN MANAGING CHRONIC FACET JOINT PAIN FOR MULTIPLE OSTEOPOROTIC COMPRESSION FRACTURE: CASE REPORT

Farid Yudoyono1, Hendra Gunawan1, Dewi Pratiwi 1, Deasy Herminawaty2

1 Minimally Invasive Spine Surgery and Spinal Pain Intervention Center, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia. on behalf of Minimally Invasive Spine and Pain study group.
2 Physical Medicine and Rehabilitation Center, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia.

INTRODUCTION

The prevalence of thoracic pain to be 13% of the general population, in contrast to 43% with low back pain and 32% with neck pain during the past year. The data in reference to mid back or upper back pain illustrates that it is less common than chronic persistent lumbar or cervical spinal pain.

MATERIAL AND METHOD

Female, 75 yo, midback pain > 6 months, Vas midback 7-8, ODI 30 %, stooping (+), local tenderness (+), no neurological deficit. Physical examination provoke facet joint pain (+). Neuroimaging revealed osteoporotic compression fracture and chronic facet joint degeneration on T1WI and T2WI MRI

RESULTS

Our study reveals that thoracic MBB might ensure substantial pain relief and decrease analgesic need in OVCf patients suffering from pain at 1-, 3- and 6-months post-thoracic double block MBB intervention, 65%, 60% and 68% of patients, respectively, gained >50% pain relief.

CONCLUSION

Thoracic MBB may provide effective and longer pain relief in patients with chronic thoracic facet joint pain.
ABSTRACT ORAL

OP 005

REFRACTORY DORSALGIA CAUSED BY SACRO-ILIAC JOINT DYSFUNCTION IN ELDERLY MANAGED SUCCESSFULLY BY PULSE RADIOFREQUENCY ABLATION

Farid Yudoyono1, Hendra Gunawan1, Dewi Pratiwi 1, Deasy Herminawaty2

1 Minimally Invasive Spine Surgery and Spinal Pain Intervention Center, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia. on behalf of Minimally Invasive Spine and Pain study group.
2 Departement of Physical Medicine and Rehabilitation, Santosa Hospital Bandung Kopo, Bandung, Jawa Barat, Indonesia.

BACKGROUND
Chronic refractory low back pain (CLBP) is the leading cause of disability in the United States. An estimated 15–25 % of low back pain may have sacroiliac joint (SI) joint pain as the source of their symptoms. Cooled Radiofrequency ablation (RFA) has become an option for those with chronic or refractory sacroiliac (SI) joint pain.

MATERIAL AND METHOD
This RFA using an alternating current with an oscillating frequency of 500,000 Hz. The current is delivered in pulses, each lasting 20 milliseconds, followed by a period of no activity for 480 milliseconds, allowing the heat to dissipate, thus avoiding temperature increases. Case 1. Female, 57 yo, right buttock pain, VAS 8-9, ODI 30 %, no radiating pain, no neurological deficit. Physical examination provoke SI joint pain. Plain X ray pelvis revealed subchondral sclerotic on SI joint right, MRI T2 osteochondrosis on right SI joint with synovitis. Case 2. Female, 82 yo, right buttock pain, VAS 8-9, ODI 20%, no radiating pain, no neurological deficit. Physical examination provoke SI joint pain. Plain X ray pelvis revealed grade III sclerosis on right SI joint, MRI T2 bony osteochondrosis and sclerosis on right SI joint.

RESULTS
Our study reveals that Cooled RFA of Si Joint innervation might ensure substantial pain relief and decrease analgesic need in patients suffering from refractory SI joint pain. At 1-, 3- and 6-months post-RFA intervention, 73%, 60% and 53% of patients, respectively, gained > 50% pain relief.

CONCLUSIONS
Pulsed RFA may provide effective and longer pain relief in properly screened elderly patients with painful sacroiliac joint dysfunction.

OP 007

A RARE CASE OF OCHRONOSIS PRESENTING WITH CERVICAL COMpressive MYELOPATHY

Dr Sandeep Talari MS.,MCh.
Department of Neurosurgery, CARE hospitals, Visakhapatnam, India

A 38-year-old female presented with features of cervical compressive myelopathy of 1-year duration.MRI of the cervical spine showed C3-4 and C6-7 central disc prolapse with cord compression.C3-4 and C6-7 discectomy were done and fusion was done with iliac crest graft.Intraoperatively the discs appeared black in color.Histopathology of the removed disc and urine analysis revealed it be a case of ochronosis.Surgical management doesn't differ from any other case of compressive myelopathy but awareness of the condition and its implications for the patient are very important.

Key-words: Ochronosis, Alkaptonuria,Cervical disc prolapse, Cervical Compressive Myelopathy
Key Messages: Ochronosis being the cause of the cause of compressive myelopathy is rare.Awareness of this condition is important for all neurosurgeons dealing with spinal pathology.
OP 009

ENDOSCOPIC REMOVAL OF SPINAL TUMOR VIA INTERLAMINAR APPROACH

ANTON M.J. SIRAIT

OP 010

PARASPINAL ABCESS OF SPINAL TUBERCULOSIS: WHICH IS THE BEST SURGICAL APPROACH?

S. Ibrahim, M.D. Nasution, R. Dharmajaya, Celia*

Department of Neurosurgery, Faculty of Medicine, Sumatera Utara University/H. Adam Malik General Hospital Medan, Indonesia

Introduction: Spinal TB (Pott disease) is the most common as well as the most dangerous form of musculoskeletal TB and accounts for 1% of all TB cases. The most difficult cases to treat are those with extensive spine involvement, vertebral body collapse, severe deformity, neurological injury and large abscess. Paraspinal Abscesses occur at all levels and may be on one side only in front of the spine.

Methods: All patients in this series had severe cases of spinal tuberculosis. The specific surgical procedure was selected based on degree of mechanical instability, location of the infection, presence of the largest abscess and spinal compression with neurological impairment. A single anterior cervical corpectomy was used in one case with spondilitis TB C5-6 and drainage paraspinal abscess on the lumbosacral has been carried on in one case. Another cases, 20 year old male with paraspinal abscess and spondilitis TB on the thoracolumbal underwent laminectomy+posterior stabilization+ evacuation of abscess. Anti-tuberculosis drugs was initiated at least two weeks before each surgical procedure. All patients completed two to four months of standard anti-tuberculosis drugs with isoniazid, rifampicin, pyrazinamide and ethambutol followed by an isoniazid and rifampicin regimen for a variable period. The average length of therapy was 14 months (range 10-20 months).

Results: All patients improved significantly after surgery with nor acute surgery complication.

Conclusions: Large abscesses and extensive vertebral column involvement, aggressive treatment with direct drainage and debridement, anterior reconstruction and posterior instrumentation can result in a rapid recovery and acceptable rate of complications combined with anti-tuberculosis drugs.

Key words: Paraspinal abscess, spinal tuberculosis.
SPINAL CORD STENOSIS DUE TO CERVICAL METASTASIS FROM PAPILLARY THYROID CARCINOMA: A CASE REPORT

Clinton1, Kevin Kristian Putra1, Yesaya Yunus2
1Intern at Department of Neurosurgery, Siloam Hospital Lippo Village
2Department of Neurosurgery, Medical Faculty of Universitas Pelita Harapan, Siloam Hospital Lippo Village, Tangerang
Corresponding Author: Dr.dr. Yesaya Yunus, SpBS(K)

Background
Bone is the third common site for the primary tumor to metastasize. Based on the high prevalence, breast, prostate, and lung cancer are more liable for metastasize. Spine is the most common site for bone metastasis, especially thoracic spine. Spinal metastasis may occur through several mechanisms, such as hematogenous, direct invasion, and through cerebrospinal fluid. In this case report, we report a case of spinal cord stenosis due to cervical metastasis from thyroid carcinoma.

Case
A Sixty-year-old male, suffered paresis and hypoesthesia from the leg to both arms and urine incontinence. CT scan with contrast shows destructive mass with spinal cord stenosis at C7 that involve corpus and posterior arch. Laminectomy and tumor resection was performed to decompress the stenosis, stabilize, and resect the tumor. Histopathology examination confirmed the metastasis from papillary thyroid carcinoma. Patient was discharge three days after surgical procedure with improvement of neurological function.

Conclusion
Cervical metastasis with spinal cord stenosis caused by metastasize of the papillary thyroid carcinoma is rare, therefore proper workup and examination is needed and followed by careful and considerate treatment.

Keywords: Spinal cord stenosis, spinal metastasis, papillary thyroid carcinoma
ABSTRACT ORAL

**OP 013**

**BIOMECHANICAL PROPERTIES OF INJECTABLE SILICON FOR NUCLEUS PULPOSUS REPLACEMENT: PRELIMINARY IN VITRO STUDY**

Muhammad Reza Arifianto¹, Amaliya Rasyida², Abdul Hafid Bajamal¹

¹Neurosurgery Department of Dr. Soetomo General Hospital, Surabaya, Indonesia
²Biomaterial Department of Institute Sepuluh Nopember, Surabaya, Indonesia

**ABSTRACT**

**BACKGROUND:** The overall objective of the Intervertebral Disc Replacement project was to provide a cure for lower back pain by developing porous scaffolds and technology which will repair a damaged intervertebral disc (IVD) by enabling its regeneration to a natural healthy state or better. For this purpose, cell-loaded and acellular injectable materials have been prepared for nucleus pulposus (NP) substitutes after the routine discectomy. Silicon emerge as promising material and we intend to use this material as NP replacement.

**METHODS:** The materials were designed based on mixture of silicone to allow its biomechanical properties as resemble as NP. Desired silicone material had to be injectable liquid with ‘semi solid’ curing time less than an hour, hardened to rubber-like consistency after injected into the cavity with the compressive strength close to 0.138 MPa, and the Poisson’s ratio is fixed at 0.49, and the Young’s modulus is varied from 0.5 to 100 MPa.

**RESULTS:** Three out of 7 materials are further study for the mechanical properties. Compressive strength, Poisson’s ratio and Young’s modulus of all materials were recorded during this study. Curing time from liquid to semi-solid rubber like consistency was also noted.

**CONCLUSION:** These findings suggest the importance of mechanical properties study to prepare the material for NP replacement. Desired material regarding its basic components may fulfill compressive strength, curing time, torsional shear, and flexion-extension of the NP. Further study is warranted to improve this preliminary study to achieve suitable mechanical and bioavailability of the material for NP replacement.

**Keywords:** Intervertebral disc replacement, artificial disc, injectable biomaterial, silicone

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**OP 014**

**COMPARISON OF SURGICAL VERSUS CONSERVATIVE TREATMENT OF SCIATICA DUE TO LUMBAR DISC HERNIATION**

Dr.Noor ul Huda Maria (main presenting author: FCPS resident neurosurgeon at Punjab Institute of Neurosciences, Lahore General Hospital, Postgraduate Medical Institute, Ameeruddin Medical College, Lahore Pakistan)

Dr.Qurrat ul Ain Siddiq (Asst.Prof. Biochemistry Punjab Institute of Neurosciences, Lahore General Hospital, Postgraduate Medical Institute, Ameeruddin Medical College, Lahore Pakistan)

Dr.Muhammad Anwar Chaudry (Prof. of Neurosurgery Punjab Institute of Neurosciences, Lahore General Hospital, Postgraduate Medical Institute, Ameeruddin Medical College, Lahore Pakistan)

**Objective:** To compare the outcome of surgical versus conservative treatment of sciatica due to lumbar disc herniation.

**Materials & Methods:**

After ethical approval, the study was conducted for 1 year, from January 2017 to January 2018. The study was a randomized control trial conducted at departments of neurosurgery Lahore General hospital/PINS Lahore. A total number of 72 patients were enrolled after obtaining consent and were divided equally into two groups based on those who underwent surgical treatment and those who those who were started with conservative management. The collected information will be entered and analyzed through SPSS version 20. Mean and standard deviation calculated for quantitative variables like age, weight and VAS score. Frequencies and percentages calculated for qualitative variables like, gender and satisfactory outcome. Effect modifiers like age, gender, weight and duration of disease controlled by stratification of data. Post stratification chi square test applied. P value of < 0.05 considered as significant.

**Results:**

A total number of 72 patients were included in this study, both genders. n=36 (50%) patients treated with conservative method and n=36 (50%) treated with surgical method. The mean age, height, weight, duration of disease, VAS score before and after treatment of the conservative group was 42.13±2.85 years, 176.77±2.0 cm, 70.50±3.15 kg, 8.88±3.09 weeks, 41.11±2.20 mm and 14.16±6.77 mm respectively. (Table 1). There were n=22 (61.1%) males and n=14 (38.9%) females. (Table 2). n=19 (52.8%) patients do physical work and n=12 (33.3%) do mental work. (Table 3). While, the mean age, height, weight, duration of disease, VAS score before and after treatment of the surgical group was 41.94±2.92 years, 176.77±2.09 cm, 71.22±3.0 kg, 10.33±3.06 days, 42.72±2.57 mm and 16.75±6.81 mm respectively. (Table 4). There were n=24 (66.7%) males and n=12 (33.3%) do mental work. (Table 4). While, the mean age, height, weight, duration of disease, VAS score before and after treatment of the surgical group was 41.94±2.92 years, 176.77±2.09 cm, 71.22±3.0 kg, 10.33±3.06 days, 42.72±2.57 mm and 16.75±6.81 mm respectively. (Table 4). There were n=24 (66.7%) males and n=12 (33.3%) females. (Table 5) n=19 (52.8%) patients do physical work and...
n=17 (47.2%) do mental work. (Table. 6). Satisfactory outcome was observed as n=24 (66.7%) and n=13 (36.1%) for conservative and surgical group respectively. (Table. 7). (Figure. 1). This difference was statistically significant (p=0.009). So, the conservative group is more efficient than surgical group.

**Conclusion:**
Conservative treatment of sciatica due to lumbar disc herniation is the better than surgical treatment. So, this study considering the fact that conservative treatment is safe and useful option for providing early relief in sciatica due to lumbar disc herniation and this intervention should be considered before surgical options.

**OP 015**

**THE EFFECT OF PSYCHOSOCIAL FACTORS IN THE SUCCESS OF CONSERVATIVE MANAGEMENT FOR LOW BACKACHE**

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**Objectives.** To study the impact of psychosocial factors in the success of conservative treatment for lowbackache

**Methodology:** Randomized controlled trials conducted at Lahore General Hospital, Pakistan. 150 patients with lowbackache were enrolled. Visual analog scales (VAS) for low back, Coping Strategies Questionnaire, Fear-Avoidance Beliefs Questionnaire and a questionnaire to inquire about the psychosocial environment of the patient that included the evaluation of education, family members living with the patient or away and their level of communication and relationships, social status, job satisfaction, environment, acute/chronic depression, anxiety, financial status, personality and view regarding surroundings. Followup done for 12months. Patients failing conservative treatment assed

**RESULTS:** In subjects with LBP, FAB correlated moderately with catastrophizing (r = 0.388) and disability (r = 0.398), and weakly with LP (0.139) not with LBP.

In the successful with conservative treatment group 85% satisfied with job, environment and financially, 80% well educated, 75% living with families, 70% calm personality, 67% had good social networking, 65% no major stress factor.

Out of 55 patients who failed 20% had disc issues necessitating surgery on clinical and radiological basis, 80% were anxious and apprehensive, 45% were females with apprehensions, 47% living alone, 53% were living in stressful environment, 65% unskilled, unemployed and dependent, 75% had no emotional support. Out of the 35% employed, 85% were not satisfied with job.

**Conclusion:**
From this study we conclude that psychosocial environment plays a very important role in the management of low backache using conservative measures. Low back pain is known to have a psychosomatic component. Increased bodily awareness referred to as somatization and depressive symptoms are two very
ABSTRACT ORAL

OP 015

important factors that may affect the outcome. Health personnel should always address the psychosocial factor in a given patient with low backache as an important factor for treatment outcome.

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ABSTRACT ORAL

OP 017

CORRELATION BETWEEN CLINICAL SYMPTOMS AND RADIOLOGICAL FINDINGS ON MODERATE AND SEVERE HEAD INJURY ASSOCIATED WITH ATLANTO-OCCIPITAL DISLOCATION

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ABSTRACT

Head injury associated with atlanto-occipital dislocation may cause fatality. It is caused by mechanism of traumatic accident forced or falling down from high building. Sometimes it is not detectable in the early phase after accident. Therefore this study aims to investigate the occurrence of atlanto-occipital dislocation in moderate and severe head injury in relation with clinical symptoms and radiological findings at Department of Neurosurgery Hasan Sadikin Hospital Bandung.

Within 50 samples, we collect 37 patients (74%) of moderate head injury and 13 patients (26%) of severe head injury. Of these, 10 patients (20%) were having atlanto-occipital dislocation, 19 patients (38%) had multiple intracranial lesion, such as epidural hematoma, subdural hematoma, subarachnoid bleeding, cerebral contusions, as well as intracerebral hematoma. Based on statistical analysis by using R 2.14.1 GUI 2011 CRAN, we found that cranial nerve deficits (P = 0.06695), anisocoria (P = 0.08974) and multiple intracranial lesion (P = 0.00647) are significant in the occurrence of atlanto-occipital dislocation. In logistic regression analysis, we found that, anisocoria (P = 0.0304; OR: 2.236) and multiple intracranial lesion (P = 0.0389; OR: 2.128) were significant with atlanto-occipital dislocation.

There were relations between clinical symptoms and radiological image in moderate-severe head injury associated with dislocation of atlanto-occipital junction. It is also necessary to evaluate carefully in skull X-ray and / or CT imaging, whether there is atlanto-occipital dislocation or not, in case there are anisocoria and multiple intracranial lesion.

Keywords: atlanto-occipital dislocation, head injury, skull X-ray imaging, pupil diameter, intracranial lesion
CRANIAL TRAUMA ASSOCIATED SCALP CEREBROVASCULAR LESIONS: OUR CLINICAL EXPERIENCE.

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Key words: Cranial trauma, cerebrovascular lesions, dural carotid cavernous fistulas, and Scalp arteriovenous malformation.

Traumatic cerebrovascular injury (TCVI) can occur secondary to blunt or penetrating cranial trauma. Blunt TCVI is uncommon, only (1%), yet it may cause severe brain insult with high morbidity and mortality.

Immediate TCVI in the form of intracranial hemorrhage or subgaleal hematoma can be diagnosed on a primary head CAT scan. 70% of subarachnoid hemorrhage (SAH) follows cranial trauma. Intracerebral hematoma secondary to direct brain contusion or cerebral vessel injury is a devastating common TCVI.

Delayed cerebrovascular lesions secondary to cranial trauma had been documented. Skull base fracture associated traumatic aneurysms (TA) and dural carotid cavernous fistulas (DCCF) are prime examples. Reported cases of scalp vascular lesions following head trauma were reprinted in the literature. Advanced investigations as CT angiogram (CTA), magnetic resonance angiogram (MRA) and digital subtraction angiogram are sought to help in proper diagnosis.

We document five cases of cerebrovascular lesions following cranial trauma. All cases were managed in our hospital from 2015 till 2018. Our aim is to scope out the management pitfalls and the prognosis.

Cerebrovascular lesions following cranial trauma should be anticipated, especially in severe head injuries. Proper line of management should be chosen and started at the suitable timing for good outcome. Many lines of treatment from surgical clipping, trapping, etc. up to endovascular embolization can achieve this.

EVALUATING THE IMPACT OF HELMET USE AND GOVERNMENT ROLE ON PREVENTING HEAD INJURY IN INDONESIAN REMOTE-BORDER REGION

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Background
Transportation needs in the modern era are increasing rapidly, especially two-wheel vehicles. Increasing motorcycle usage in this case also increases the likelihood of traffic accident incidents. Despite increased safety regulation in some regions of Indonesia, incidents of head injury in remote and border areas are still increasing. This study will evaluate the effects of helmet use on symptoms of head injury, trauma severity, head injury deterioration, and government role on preventing head injury by tracing the underlying causes of motorcycle accidents in border areas.

Methods
This study was a cross-sectional study of all patients who presented head injury related to traffic accident to Emergency Department at Marianum Hospital in Halliluk, Belu between January 2017 and June 2018. Data was analyzed using univariate and bivariate.

Results
We collected 79 cases for this study. The mean of age 28.65 ± 13.76 years, in which the male sample was 74.7% vs 25.3% in female. Helmet usage remains low at 22.8% and the main cause of accidents in this study is the problem of road infrastructure by (43%) that higher than recent alcohol use drivers (22.8%). Helmeted riders were more likely to have mild head injury (94.4% vs 91.8%) at presentation. Helmeted riders also had 3.74-fold higher odds of preventing more symptom in head injury (p<0.05). Although not statistically significant, lack of helmet usage was associated with 2.2-fold higher odds of experiencing deterioration in head injury.

Conclusion
Our study suggests prevention and management of head injury such as safety regulations and road infrastructure can have a measurable public health impact in Indonesian remote-border regions. Government has a big role in this situation to prevent head injury and meet the needs of diagnostic tools and experts to improve head injury patient's outcome.

Keyword: Head Injury, Helmet Usage, Government
ABSTRACT ORAL

OP 020

MANAGEMENT AND EVALUATION OF ORBITOCRANIAL PENETRATING BRAIN INJURY FROM A FISHING GUN: A RARE CASE REPORT

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Introduction
Penetrating brain Injury (PBI) is a traumatic event in the brain by a foreign body (FB) that have an entry wound without an exit wound. PBI is very lethal, even those who survive usually have a neurologic complication. As far we know, there are no papers that clearly reported PBI cases without any complication.

Case Description
A 20-year-old male accidentally fired his fishing-gun to the left eye. He feels pain, burns, bleeding, and blindness. The patient was fully conscious with 15/15 Glasgow Coma Scale (GCS), left globe rupture, good right pupil reflex, no neurological deficit found. The Computed Tomography (CT) Scan shows an arrow shape hyperdense FB diameter 4mm and 15cm long, from left orbital foramen to parietal lobe, brain edema without any cerebral hemorrhage.

The operation of the multi-discipline team runs smoothly without major bleeding and other complications. The systemic antibiotic was given too. Evaluation of 1-day, 1-month, 2-month, and 4-month shows no neurological abnormalities and other complication.

Discussion
No bad prognostic factor found in this case (low GCS and multiple FB), only PBI risk factor such as male, dangerous condition. The FB penetrates through frontoparietal lobe (main behavior control, motor, and sensory complex), but it didn’t cut any major blood vessels, brain cortex, tracts, and only cause small damage. The dull head tip and low speed of the fishing-gun compared to cause minimal secondary damage too. Proper surgery management from our team was also done very carefully. Those all condition lead to no-complication in this patient.

Conclusion
The indication of surgery for PBI based on proper anamnesis, physical examination, and imaging. The operative technique is highly dependent on the case, that can’t replicate another case. Although this is a very rare case, it proves that the PBI case was able to recover completely if managed carefully.

Keyword
Foreign Body, Orbitocranial, Penetrating Brain Injury, Traumatic Brain Injury

OP 021

CASE REPORT
COMPOUND OPEN DEPRESSED DISPLACED FRONTAL BONE FRACTURE AND CEREBRAL PROLAPSE OVER SUPORBITAL RIM

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Background
Compound open depressed displaced frontal bone fractures and cerebral prolapse over fragmented supraorbital rim fracture was uncommon variant of skull fractures and present a management challenge due to their anatomy and potential associated injuries.

Case
22 years old male with multiple trauma including moderate head injury presented to our emergency unit with decrease of consciousness and seizures. The initial GCS was E3M6V4 (13/15) Head CT Scan demonstrated a displaced depressed fracture at left frontotemporal with adjacent intracerebral hemorrhage and cerebral prolapse. The patient underwent an emergency surgery. The fragmented bones are removed, we left the prolapse untouched, followed by duraplasty using a pericranial flap, and we fixed the fragmented superior orbital rim. Within 24 hours follow up, the patient already gain a full consciousness (GCS 15/15). The patient discharged after 3 days with stable neurological condition.

Conclusion: Proper emergency surgery, and fixation on the superior orbital rim in may give a good results.

Keywords: open depressed fractures, cerebral prolapse, supraorbital rim
THE RELATION OF GLASGOW COMA SCALE TOWARD PT AND APTT VALUE AMONG HEAD INJURY PATIENTS IN EMERGENCY DEPARTMENT ULIN HOSPITAL

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During head injury, thromboplastin are released from brain parenchymal tissue to the systemic and further can create a coagulopathy. This situation probably have a relation to GCS score. One of the markers coagulopathy are PT’s and aPTT’s period. The purpose of this study was to determine whether there is a relation between GCS score toward PT’s and aPTT’s period among patients with head injuries in emergency department. This study was done by observational analytic with cross sectional approach. Total of 66 samples were obtained by consecutive sampling; 25 patients with Mild Head Injury (MHI), 22 patients with Moderate Head Injury, and 19 patients with Severe Head Injury (SHI). We observed patients with SHI and found 3 patient with longer PT and 2 patients with longer aPTT. Data was analyzed using the Kruskal-Wallis test with a confidence level of 95% and found a significant meaning of PT’s value only among MHI and SHI patients. The rest group weren’t. It was concluded that statistically, there was a relation of PT’s value among SHI and MHI patients. Patients who got SHI would encounter elongated period of PT compared to MHI.

Key words: Head Injury, PT, aPTT.

SURGICAL COMPLICATIONS AND LONG-TERM OUTCOME OF BIFRONTAL DECOMPRESSIVE CRANIOECTOMY USED FOR MANAGEMENT OF CASES WITH REFRACTORY CEREBRAL EDEMA FOLLOWING TRAUMATIC BRAIN INJURY

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Introduction: Elevated intracranial pressure (ICP) due to cerebral edema in traumatic brain injury is considered among the leading causes of poor outcome and higher mortality. Reduction of ICP is one of the major goals when treating severely head injured patients. Bifrontal decompressive craniectomy (BDC) is an important method for managing refractory intracranial hypertension in traumatic brain injury. We will evaluate outcome and surgical complications of BDC in persistent intracranial hypertension in traumatic brain injury patients.

Patients and Methods: This is a prospective study conducted between 2013 and 2017, including 18 patients subjected to BCD with the following Inclusion criteria: RTA cases. With traumatic brain injury, CT finding: based on Marshall Classification of traumatic brain injuries: diffuse injury III, and not improving or deteriorating within the first 48 hours in spite of adequate medical treatment. Exclusion criteria: associated injuries necessitate further surgical management, GCS: less than 5, bilateral dilated pupils, and age above 65 years. Glasgow Outcome Scale was used for evaluation of long term outcome.

Results: total number of patients: 18, 13 males and 5 females. Age ranged between 16 and 60 years, MSD was 31.7±14.1 years. Initial GCS ranged between 6-11, MSD was 88±1.74, while at time of surgery was ranging between 5-8, MSD was 6.22±0.94. Surgical complications were: Subcutaneous CSF collection: 3 cases (16.6%), hydrocephalus: 2 cases, 11%, subdural CSF collection with midline shift: 1 case (5.5%), intracranial infection: 1 case (5.5%). Follow up period: ranged between 8 to 24 months, MSD was 15.8±5.5 months. Long term outcome was: good recovery, 8 cases (44.4%), severe disability 3 cases (16.7%), vegetative state 6 cases (33.3%), death 1 case (5.6%).

Conclusion: bifrontal decompressive Cranioectomy is an effective procedure in lowering Morbidity and mortality in cases of refractory cerebral edema following traumatic brain injury. Unfavorable outcome seemed to be related to a lower GCS at admission.

Key words: bifrontal decompressive craniectomy, refractory cerebral edema, traumatic brain injury.

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ABSTRACT

OP 024

SUBDURAL HAEMATOMA AS A COMPLICATION OF SPONTANEOUS INTACRANIAL HYPOTENSION: A RARE CASE

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Background: Spontaneous Intracranial Hypotension (SIH) is a condition caused by cerebrospinal fluid leaks through a dural defect that can alter normal CSF dynamics. Chronic subdural haematoma (CSDH) could be a rare serious complication caused by SIH. We report a case of CSDH due to SIH and treated successfully.

Case report: A 38-year-old male who presented with a history of progressive orthostatic headache for 2 months without a history of trauma. Head CT Scan shows bilateral CSDH frontotemporoparietal with 7mm thickness. CT Angiography of intracranial vessels are normal. MRI and MR Myelography (MRM) showed CSF leaks from the posterior midline and posterior left side at the C1-C2 level and cerebellar tonsil herniation that suggesting a SIH. Patient underwent burr hole drainage for bilateral CSDH and surgical CSF leaks repair at the C1-C2 level. The orthostatic headache was alleviated soon after the surgery and he improved over one week.

Conclusions: Spontaneous CSDH in young adult with no history of trauma and no intracranial vascular anomaly, need to be suspected as SIH and should be proved otherwise. The clinical history is an important clue for diagnosis.

Keywords: subdural haematoma; spontaneous intracranial hypotension; complication; CSF leak repair

ABSTRACT

OP 025

SKULL FRACTURE AND MASSIVE EPIDURAL HEMATOMA SECONDARY TO THE MAYFIELD THREE-PIN SKULL CLAMP IN PAEDIATRIC PATIENT: A CASE REPORT AND REVIEW OF THE LITERATURE

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Cranial fixation using Mayfield (Ohio Medical Instrument Co., Cincinnati, OH, USA), a pin-type head-holder, has been widely use to preserve and stabilize the patient's head and neck in a particular position during neurosurgical procedure. But, like any other procedure, Mayfield instrument comes with several complications. Complications of the use of skull clamp includes scalp laceration, skull fractures, pin-site infection, epidural hematoma, dural laceration, air embolism, cerebrospinal fluid leak, brain parenchymal injury, traumatic middle meningeal arteriovenous fistula, traumatic aneurysm of the superficial temporal artery, sinus fracture, broken clamp, and also pressure alopecia. An 11-year-old girl diagnosed with non-communicating hydrocephalus due to cerebellar tumor underwent suboccipital craniotomy in prone position using Mayfield three-pin skull clamp. During the operation, brain suddenly bulged. Emergent CT scan showed bilateral skull fractures and a massive epidural hematoma. Risk factor, management and prevention are discussed all through the case report based on pertinent literature.

Keywords: Mayfield, skull clamp, epidural hematoma, paediatric
INFECTION OF CRANIOPLASTY SEEN NINETEEN YEARS LATER: A CASE REPORT AND LITERATURE REVIEW

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BACKGROUND: Cranioplasty is a method to close defects in patients after craniotomy, with functional and cosmetic purposes. One of complication that often occurs is late infection. Late infection after cranioplasty generally appears in the 3-10 months postoperative period. Infection of cranioplasty after nineteen years is rare case. Thus, the management of this case is interesting and challenging. We report a case of cranioplasty infection seen nineteen years later and literature review of its pathophysiology and management

CASE REPORT: a 62-year-old man with a complaint of open wound infection on the right head, the base of the wound appears acrylic and pus. A history of trepanation surgery 19 years ago, and cranioplasty was performed 3 months later. General physical examination is within normal limits as well as laboratory tests. CT scan features, suggesting a right temporoparietal epidural abscess. Then debridement, removing acrylic and evacuation of epidural abscesses were performed in this patients.

CONCLUSION: Infection of cranioplasty presented 19 years after the surgery is very rare. However, the possibility of late complication could occur and the follow-up period after cranioplasty surgery should be prolonged considering the late complication of infection.

KEYWORD: Cranioplasty, Cranioplasty Infection, Late Cranioplasty Infection

SUPINE POSITION RETROSIGMOID APPROACH: CASE REPORT

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Lesion In The Cerebellopontine Angle (CPA) Region Such As Hemi Facial Spasm (HFS), Trigeminal Neuralgia (TN), Vestibular Schwanoma, Meningioma Or Epidermoidgen Cyst Are Surgically Treated With A Retrosigmoid Approach. The Standard Position To Perform The Retrosigmoid Approach In CPA Lesions Is A Total-Oblique Positions To Remains The Head Position Is Ergonomically Straight. This Procedure Needs A Longer Time, Good Teamwork, And The Availibility Of Bed And Pillows. Another Difficulties For The Operator When Performing In The Total Tilt Position Is That The Shoulder Is Blocking So That It Is Needed To Be Retracted And Sometimes There Are Some Complications Such As Painful Feelings In The Armpit Of The Post-Operative Patients.

With These Obstacles, We Tried To Make Modifications Of Positions Especially For A Simple Retrosigmoid Approach Through Supine Positioning. Shoulder Is Propped Up To Reach A Slope Of 30 Degrees, The Head Is Positioned (Contralateral Rotation Of The Lesion) 60 Degrees And Anteroflexed 15-20 Degrees. As A Final Result The Head Is Rotated 90 Degrees To The Horizontal Line. This Modification Can Only Be Done On Patients Who Are Not Obese And Possess A Long And Flexible Neck To Reach The Ideal Position. This Modification Technique, If Not Properly Used, Has The Potential For The Disruption Of The Jugular Venous Flow And Could Cause An Edema During The Operation.

We Performed This Modified Position Technique For Simple Retrosigmoid Approach In 9 Eligible Patients Which Consists Of 2 HFS Cases, 3 TN Cases, And 4 Cases Of CPA Tumors. Our Evaluations During The Operations Were: Ergonomic Positioning Could Be Obtained, Better Maneuver For Instrument Handling Is Achieved, Good Microscope Visualization, No Edema Occurred During The Surgery And The Goal Of The Operation Is Achieved. After Surgery, No Patient Experiences Any Complications Due To This Positioning.

The Conclusion Is This Modified Position Can Be Used As An Alternative For The Standard Position For The Retrosigmoid Approach.
ABSTRACT ORAL

OP 028

POTENTIAL OF ENDOGENOUS CELL-BASED THERAPY FOR TRAUMATIC BRAIN INJURY

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Traumatic brain injury (TBI) is characterized by a disruption in the normal function of the brain due to an injury following a trauma, which can potentially cause severe physical, cognitive, and emotional impairment. It causes disability, death and huge economic losses in various countries of the world. Current guidelines for the management of severe traumatic brain injuries are primarily supportive, with an emphasis on surveillance (i.e. intracranial pressure) and preventive measures to reduce morbidity and mortality. The primary injury to the brain initiates secondary injury cascades consisting of multiple complex biochemical responses of the brain that significantly influence the overall severity of the brain damage, interfere the regeneration process capability which eventually becomes clinical sequelae.

Cell-based therapy have generated enthusiasm as a possible treatment option for traumatic brain injury. Neural progenitor/stem cells (NPSCs) that survive in certain parts of the brain, give the brain the ability to produce new neurons and glia. Neurogenesis occurs in the subgranular zone (SGZ) of the hippocampus dentate gyrus (DG). Some agent has a neuromodulatory effect, which has a modulation effect on the expression and activation of the BDNF / TrkB system in the hippocampus area which can be potential therapeutic target for neurological disorders in TBI.

Keywords: BDNF; TrkB; Neural Stem Cells; Neural Progenitor/Stem Cells (NPSCs).

OP 029

TEMPORO-PARIETAL SUBDURAL EMPYEMA IN AN ADULT MIMICKING CHRONIC SUBDURAL HEMATOMA: A CASE REPORT

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Background
Subdural empyema represents localized infection between the dura and the arachnoid matter. Early diagnosis, prompt administered of antimicrobial therapy, and surgical drainage are essential to determine the outcome. In this case, we present a case of subdural empyema, an intracranial complication from untreated sinusitis in adult that mimicking chronic subdural hematoma.

Case
A fifty-two-year-old male, suffered an altered consciousness, seizure, focal weakness. Clinically, NO obvious infection signs. History of mild head injury two years ago, followed with maxillary sinus infection and ipsilateral blindness in the last four years. Brain CT scan showed a hypodense lesion with moon crescent shape appearance over the left temporo-parietal. Patient underwent emergency burr hole drainage. Unexpected result showed purulent materials. Subdural drainage was inserted and kept for one week. Empirical antibiotics was given until the culture result available. Patient was discharge 10 days after surgical procedure with improvement of neurological function.

Conclusion
Subdural empyema should always be considered in the differential diagnoses, until it proved otherwise.

Keyword: Subdural empyema, Chronic subdural hematoma, Sinusitis.
ABSTRACT ORAL

OP 030

COMPLICATIONS FOLLOWING CRANIoplastY: iNciDENCE AND PREDICTORS aT RSUP DR. SARDJITO YOGYAKARTA

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INTRODUCTION:
Skull defects and craniofacial bone abnormalities that necessitate reconstruction are common in a variety of neurosurgical procedures. From the patient’s perspective, the primary reason for repair of these defects may be cosmetic. However, cranial bone provides important support and maintains normal flow dynamics of cerebrospinal fluid (CSF), thereby reducing the risk for formation of pseudomeningoceles and protecting vital structures. Craniofacial reconstruction and cranioplasty have a long history, but new surgical techniques and a multitude of material options have fueled advancement in this area. The factors that contribute to periprocedural complications following cranioplasty, including patient-specific and surgery-specific factors, need to be thoroughly assessed. The aim of this study was to evaluate risk factors that predispose patients to an increased risk of cranioplasty complications and death.

METHODS:
The authors conducted a retrospective review of all patients at our institution who underwent cranioplasty following craniectomy for spontaneous intracerebral hemorrhage, subarachnoid hemorrhage, epidural hematoma, subdural hematoma, and trauma between January 2017 and July 2018. The following predictors were tested: age, sex, diabetic status, hypertensive status, tobacco use, reason for craniectomy, urgency status of the craniectomy, graft material, and location of cranioplasty. The cranioplasty complications included reoperation for hematoma, hydrocephalus postcranioplasty, postcranioplasty seizures, and cranioplasty graft infection. A multivariate logistic regression analysis was performed.

RESULTS:
On Progress

CONCLUSIONS:
On Progress

OP 031

SURGICAL iNTERVENTIONS MANAGEMENT FOR TRAUMATIC BRAIN INJURIES AND SPONTANEOUS ICH IN THE ELDERLY PATIENTS IN SARDJITO HOSPITAL

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Introduction:
The surgical management in acute conditions (traumatic brain injury and spontaneous ICH) in the elderly (age ≥ 65 years) is still preferable. The purpose of this study is to investigate for factors that may predict outcome of operative treatment in this group of patients.

Material and Methods:
A retrospective analysis was conducted on 56 elderly patients who had been operated in a Sardjito Hospital from January 2017 to July 2018. Patient’s age, Glasgow Coma Score (GCS), pupillary responses, imaging findings, medical conditions, and the use of anticoagulant agents on patient outcomes were studied.

Results:
On Progress (compare between trauma and non-trauma outcome)

Conclusions:
On Progress

Keywords: Elderly, Surgical procedures, Brain injuries,
ABSTRACT ORAL

OP 032

S100B SERUM LEVEL AS A MORTALITY PREDICTOR FOR TRAUMATIC BRAIN INJURY: A META-ANALYSIS

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ABSTRACT

Introduction: The pathogenesis of inflammatory neuronal cell damage will continue after traumatic brain injury in which contributed to subsequent mortality. Serum S100B levels were shown to be an early predictor of mortality due to traumatic brain injury.

Methods: This study presents a meta-analysis of the role of serum S100B as a predictor of mortality in traumatic brain injury. The study design follows the PRISMA guidelines for meta-analysis. This Meta-Analysis will analyze the mean and diagnostic strength of serum S100B levels between survived and died subjects with head injuries based on the various follow-up time of nine studies.

Results: The results of the meta-analysis showed a significant difference in S100B levels between survived and died subjects with head injuries on overall follow-up timeline (0.91, 95% CI 0.7-1.12, I² = 98%, p < 0.001), during treatment (1.43, 95% CI 0.97 to 1.89, I² = 98%, p < 0.001), or 6 months (0.19; 95%CI 0.1-0.29, I²=76%, p < 0.001) with an average threshold value that varies according to the study method used. The mean diagnostic strength was also promising to predict early mortality (sensitivity of 77.18% and 92.33%, specificity of 78.35% and 50.6%, respectively).

Conclusion: S100B serum levels in the future will be potential biomarkers and it is expected that there will be standardized guidelines for their application.

Keywords: traumatic brain injury, S100B serum level, mortality

OP 033

GIANT FACIAL NERVE SCHWANNOMA INVOLVING MIDDLE CRANIAL FOSSA

Case Report
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ABSTRACT

Introduction: The Facial Nerve Schwannoma is a rare tumor and it seldom involved the middle cranial fossa. Facial nerve schwannomas (FNS) are uncommon tumors of the temporal bone. Most facial nerve schwannoma are intratemporal and often involve the labyrinthine or geniculate segments. They compose only 0.8% of all intrapetrous mass lesions. Symptoms include slowly progressive facial paresis or paralysis and hearing loss, although tinnitus, pain, vestibular symptoms, or an ear canal mass may be present. Facial twitching followed by progressive paresis is very characteristic of these tumors.

Presentation of case: We present a case of giant facial nerve schwannoma involved the middle cranial fossa without facial nerve paralysis. Thirty-five year old male patient was presented with progressive left side facial paralysis and left side hemiparesis for 3 months. Patients also complained of blurred vision since 2 weeks ago, in addition to blurred patients often watery, itchy, sore, and red. Then, the patient complained of headache on the left side of the head. Left sided facial nerve paralysis with House-Brackmann grade 6. Head CT Scan with contrast showed a large tumor image in the middle fossa; heterogene contrast enhancing, resembling glioblastoma multiforme. Patient had surgical excision and extradural mass was obtained. Histopathologic examination was obtained schwannoma. One month postoperative condition improving patient condition.

Discussion: Facial nerve tumors are benign, slowly enlarging, and rare lesions. Despite the fact that it is a rare cause of facial paralysis, the presence of a facial tumor should be suspected, especially in recurrent and progressive paralysis. In about 5% of patients with Bell’s palsy, a facial nerve neuroma is found to be the cause. Surgical excision is the definitive treatment for facial nerve neuromas. The surgical strategy should be designed based on the location and the extension of the lesion. The patient underwent to subtemporal approach.

Keywords: Facial Nerve Schwannomas; facial paralysis; Surgical excision

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PRE-OPERATIVE MEASUREMENT OF DIPLOPIA USES STRABISMIC-DEVIATION VALUES IN SPHENOOBITAL MENINGIOMA PATIENTS


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Purpose.
The aim of this study was to measure deviation of ocular axis uses strabismic-deviation values. Diplopia has ocular axis deviation. Clinical sign and symptoms of sphenoorbital meningioma are: (1) unilateral, non-pulsating, progressive proptosis, (2) visual disturbance, and (3) diplopia. Strabismus is abnormality of ocular axis that produced diplopia. Tolerable ocular axis is defined as 2 - 4° or 8 – 10 ▲ (prism dioptery) temporally or nasally.

Materials and Methods.
Research was begun in December 2016-May 2017 in 40 sphenoorbital meningioma patients. Research was done by examined: the ocular gaze, HIRSCHBERG light reflex test and measured its deviation. SPSS v.22.0 was used in hypothetical approval with Chi-square test and Spearman’s-Rho equation correlation test.

Results.
Subjects were: ocular proptosis without diplopia were 15 patients (37,5%), and ocular proptosis with diplopia were 25 (62,5%). The results from measuring ocular axis with Hirschberg test were found exotropia 15 subjects (37,5%) and exoforia 13 subjects (32,5%) with mean deviation was 0,645 ± 0,442 mm, ocular angle was 6,837 ± 4,68°, and 14,19 ± 9,72 ▲. We performed Chi-square test to test for correlation. The result was Chi-square count (26,618) > Chi-Square table (19,68), with probability/significant 0,000 (p<0,05). We used Spearman’s Rho test for correlation coefficient (r) 0,667 (r : 0,5 – 0,74) with p value 0,000 (p<0,05).

Conclusion.
Ocular axis deviation can be measured by strabismic-deviation in Sphenoorbital Meningioma patients pre-operatively.

Keyword: diplopia, sphenoorbital meningioma, strabismic deviation, ocular axis deviation

CASE REPORT
AWAKE CRANIOTOMY FOR SUPRATENTORIAL TUMOR RESECTION

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Background
Surgical treatment of brain tumors, especially those located in the eloquent areas causes high risk of eloquent impairment. Awake craniotomy displays major rule for maximum resection of the tumor with minimum functional impairment of the central nervous system.

Case
59-year-old male presenting with seizure of left extremity, and ipsilateral extremity weakness and hypesthesia. Contrast Head MRI demonstrated an supratentorial tumor at right parietal due to suspect Low grade glioma. We performed awake craniotomy to that allows maximal resection of lesions in close relationship to eloquent cortex and to minimize damage by providing electrical stimulation to the tissue. Dexmedetomidine was used for main drug, and fentanyl for rescue analgesia; to provide optimal mapping, adequate analgesia and sedation while we assess neurology concerned on frequent intervals. The patient was in stable condition during surgery, tumour resection was done until gross total resection without comprising any neurological function

Conclusion:
Tumor surgery under conscious sedation, associated with cortical stimulation with repetitive neurologic and language assessments, can be a safe and reliable technique that allows’ maximal resection of lesions in close relationship to eloquent cortex

Keywords: seizure, awake craniotomy, eloquent
ABSTRACT ORAL

OP 036

PROFILE OF GLIOMA PATIENTS IN DR. CIPTO MANGUNKUSUMO NATIONAL HOSPITAL JAKARTA-INDONESIA: A DESCRIPTIVE STUDY

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Abstract

Background: Gliomas make up 30% of all brain and central nervous system tumors and 80% of all malignant brain tumors. The objective from this study is to investigate glioma patient’s characteristic in Neurosurgery Department of DR. Cipto Mangunkusumo National Center Hospital to provide better understanding of glioma risk through descriptive studies, and contribute to further studies.

Methods: Sample were taken retrospectively by consecutive sampling method, from neuro-oncology registry in Neurosurgery Department of DR. Cipto Mangunkusumo National Center Hospital in 2012 - 2017 diagnosed by histopathology examination as Glioma.

Results: The majority of Glioma patients were male (56.3%) and from the age group 31-40 years old (31.3%). More than half of patients came from Jakarta (52.7%). Most frequent symptoms were headache (33.9%) and the majority of Karnofsky Performance Score were above 70 (63.4%). MRI were the most common imaging modality used for diagnosis (45.5%) with most of the tumor location found in frontal region (48.2%). Craniotomy were done to treat majority of cases (81.3%). The most frequent histopathology findings in this study is glioblastoma (38.7%).

Conclusion: The characteristic of Glioma patients in DR. Cipto Mangunkusumo National Center Hospital from 2012-2017 were predominantly occur in males and between 31-40 years old. And the most common symptoms were headache. They mostly diagnosed by MRI, located in frontal region, and undergo craniotomy. The most frequent tumor type found by histological examination is glioblastoma.

Keywords: brain, tumor, glioblastoma,

OP 037

IMMEDIATE RECOVERY OF SEVERE VERTIGO IN PATIENT WITH BILATERAL CEREBELLOPONTINE ANGLE ARACHNOID CYST FOLLOWING MICROSURGICAL TREATMENT

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Abstract

Arachnoid cysts are benign, rare. These benign cysts, which contain cerebrospinal fluid, develop in the intra-arachnoid space. Even the pathogenesis of those cysts is unknown; they are thought to be congenital. Symptoms are produced by the mass effect of the cyst on surrounding structures. The presenting symptoms are frequently nonspecific. The management of arachnoid cysts of the cerebellopontine angle is controversial. Asymptomatic arachnoid cysts do not require treatment, and such patients should be monitored clinically and radiologically. But serious symptoms need to be performed an operation. We report a 19-year-old man with an bilateral arachnoid cyst of cerebellopontine angle that led to severe vertigo. One months after Microsurgical surgery, the patient is symptom free

Key words: Bilateral Cerebellopontine Angle Arachnoid Cysts; Severe Vertigo; Microsurgical Treatment
ABSTRACT ORAL

OP 038

PROGESTERONE AND ESTROGEN RECEPTORS POSITIVE STATUS IN SPHENOORBITAL MENINGIOMA IN 16-YEAR-OLD MALE: A CASE REPORT

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ABSTRACT

Introduction: Sphenoorbital meningiomas (SOMs) are rare and unusual location in children, only 5.2-5.9% meningiomas on sphenoid were reported in children. In our center, meningiomas patients mostly are sphenoorbital location, middle-aged females with history of progesterone injection contraceptive, and have progesterone receptors positive status. In children patients, the data is still unremarkable.

Case: A 16-year-old male presented with progressive proptosis of left eye for 6.5 months before surgery. No risk factors were identified in the patient. In physical findings, only the proptosis and palpable bony mass on temporal region were found. Imaging studies showed a left SOM with hyperostosis. Patient underwent surgery resulting Simpson grade II. Histopathology revealed a meningioma WHO grade I, progesterone receptor (PR) and estrogen receptor (ER) status were positive by immunohistochemical staining. At follow-up, the proptosis was reduced.

Conclusion: Sex hormones and PR/ER status might play a role in childhood meningiomas. A further large study is needed to investigate that using multicenter research, because of the small numbers of childhood meningiomas. Keywords: meningioma, children, receptors, hormone

ABSTRACT ORAL

OP 039

EMERGENCY PRESENTATION, MANAGEMENT AND PRIMARY OUTCOME IN PATIENTS WITH GliOBLASTOMA MULTIFORME

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Introduction: Glioblastoma multiforme (GBM) is an aggressive primary malignant brain tumour with high mortality especially in old age. Surgical excision followed by adjuvant therapy till the standard protocol treatment based on good karnofsky performance scale (KPS) score. We will focus our study on GBM patients with very low KPS score regarding presentation, emergency management and primary outcome.

Patients and methods: we conducted a retrospective review for patients with GBM presenting to neuroemergency unit at Cairo University Hospitals during the period from October 2016 till June 2018. Their initial KPS was 30% or less. Dehydrating measures were given and MRI with contrast was done for all patients. We did large decompression craniotomy and duroplasty, hospitalization was in intensive and intermediate care units. Cases below 12 years were excluded.

Results: GBM patients represent 38% (50 cases) of the total brain tumour patients (132 cases) presenting to our emergency room. Males: females (30:20), age ranged from 12 to 81 with median age 54 years. Disturbed conscious level was found in 35 patients (70%), acute limb weakness in 33 patients (66%) and convulsions in 5 patients (1%). Initial KPS score was 20% in forty patients (80%), five patients KPS score was 10% and another five patients having their KPS score 30%. Total excision was achieved in 23 cases (46%), subtotal in 12 cases (24%). Most common site was parietal region in 19 patients (38%) followed by frontal lobe in 13 cases (26%). We have five mortalities and overall survival rate is 90%. Primary outcome (discharge KPS score) reached 50% - 60% in 35 patients (70%), ten patient their KPS score 40%. Forty-five patients (90%) were transferred to oncology department for adjuvant therapy.

Conclusions: Glioblastoma multiforme patients with very low KPS (30% or less) are commonly presenting with DCL and acute limb weakness. Young age, intravenous dehydration, large decompression craniotomy, duroplasty and attempts of total excision probably are linked with obvious improvement of KPS by 30-40 points and low hospital mortality rate. Future studies including longer follow up may settle management protocol for GBM patients with emergency presentation.

Key words: emergency, very low karnofsky performance scale score, glioblastoma multiforme.

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ABSTRACT ORAL

OP 040

MALE MENINGIOMAS CHARACTERISTIC IN DR. KARIADI GENERAL HOSPITAL, SEMARANG: A DESCRIPTIVE STUDY


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BACKGROUND: Meningioma is a disease considerable morbidity and is more commonly diagnosed in females than males and show incidence peak at 45 years of age. Although most meningioma are slow growing and histologically benign, some of them recur and exhibit malignant transformation. Although less frequent, some authors believed that male mengingioma have high grade histologically profile which tendency to recur. The purpose of this study is to describe the characteristic of male meningioma patients in Dr. Kariadi General Hospital Semarang.

METHODS: The data was collected retrospectively from meningioma patient’s medical records between January 2013 until December 2017. The data was analysed descriptively to describe the characteristic of Male Meningioma patients age, site, and histopatology.

RESULTS: There were 33 male meningioma patients from total 461 meningioma patients diagnosed and underwent surgery in our institute. 3 cases are recurrent (WHO grade I (2), II (1)) and 30 cases are primary meningioma. The mean of age was 41 years (range 15-63 years). The most common site was cranial base, followed by convexity (51.5% and 48.5%, respectively). Histologically the number of male patients with world health organization (WHO) grade I, II, III were 27 (81.8%), 5 (15.1%) and 1 (3%).

CONCLUSIONS: The ratio of female and male meningioma patients in Dr.Kariadi general hospital are 12.9:1. The most location was cranial base. The distribution of profile histological results between male and female patients didn’t show a significant difference.

KEYWORDS: Male meningioma, Characteristic profile, Semarang

OP 041

CLINICAL OUTCOME AFTER A WAKE CRANIOTOMY FOR GLIAL TUMOR RESECTION IN THE SUPPLEMENTARY MOTOR AREA

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The goal of gliomas resection is to prolong the survival time and improves the patient’s quality of life. Various techniques had been studied to maximize the outcome. Thus, the tumors resection as completely as possible without additional postoperative neurological deficits could be achieved. We performed awake craniotomy in 9 patients for glial tumor resection, which the location is in eloquent area. The procedure also supervised by intraoperative neuromonitoring, during the operation, the supplementary motor area (SMA) was included to extent tumor resection. The result was no mortality during the operation. Improvement of preoperative deficit in 7 patients. There is only one case suffered post-operative neurological deficit such as hemiparesis which is only transient and getting better in first month observation. We also reviewed the literature of reported cases to elucidate the characteristics and outcomes of motor preservation after surgical tumor resection involving supplementary motor area.

Keywords: Glial tumor, awake craniotomy, supplementary motor area
CASE REPORT: SELLAR TERATOMA IN YOUNG CHILDREN WITH PROGRESSIVE VISUAL LOSS

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Introduction

Intracranial Teratomas are rare, account for up to 50% of fetal brain tumors. In neonates, they comprise 33% of intracranial tumors but only 2%-4% of intracranial tumors in other patients in <15 years.1 One study found the age range for central nervous teratomas to be from 16 to 45 years, with the mean age being 15.9 years.2 Teratomas usually found in the pineal region. Teratomas arising from the sella turcica are uncommon, intrasellar teratoma comprising of only mature elements is extremely rare.3

When teratomas occur in the suprasellar region, they usually present with a classic triad of visual disturbances, diabetic insipidus, and hypopituitary.m.4

Case Presentation

We present a case of 12 years old female, with chronic headache and progressive visual loss in 2 months before admission. There is no symptom about hormonal related condition, and hormonal laboratory showing normal result.

Head CT scan with contrast showing a hiperdense lesion, homogenous contrast enhance in the sellar region with irregular shape with differential diagnosis craniopharyngioma.

Head MRI with contrast showing a solid hiperintense lesion intrasellar and parasellar, chiasma opticus pushed upwardly, and encase right and left ICA, suggesting pituitary macroadenoma.

Patient underwent craniotomy tumor excision with subfrontal interhemispheric approach. Tumor is grey yellowish, hard consistency, and attached tightly to surrounding tissue.

Pathological examination result from tumor specimen is teratoma.

After surgery, visual acuity improve from 1/∞ to >2/60 with diabetes insipidus complication.

Discussion

The difference interpretation from pre-operative diagnostic showing that rare tumors must remain included in differential diagnosis, even it’s a unusual tumor in unusual place.

sellar region tumor in pediatric cases needs an early diagnostic and thorough consideration for pre-operative planning for optimal patient outcome.

Keywords: Intracranial teratoma, Parasellar, Suprasellar tumor
ABSTRACT ORAL

OP 044

Glioblastoma, Osteoplasty Versus Decompression? - Serial Case

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The management of glioma cases, especially glioblastoma (GBM), is still a work on progress up to this day. Standard therapy applied today is total excision, chemotherapy and radiotherapy (if the molecular biology marker of the tumor is radio or chemo-sensitive). The act of performing osteoplasty or bone decompression after tumor excision remains a controversy, especially in Indonesia. A group of neurosurgeons stated that tumor will quickly re-grow after the surgery. Moreover, if access to radiotherapy or chemotherapy is limited, bone decompression could buy “more time” for the patients. Other neurosurgeons disagree with the decompression method and rather suggest an osteoplasty after total tumor removal. Evaluation was done by a serial MRI every 1-2 months to evaluate the possibility of re-excision if tumor resides significantly. An informed consent then was done for the bad prognosis even after a standard therapy.

We evaluated several GBM cases from 2017 to 2018 in Saiful Anwar Hospital (RSSA). Our standard therapy is selective radical tumor removal with bubbling technique (without 5 ALA, neuro-navigation and IOM/Awake Surgery due to facilities) and direct osteoplasty. We review 4 cases of GBM (Glioblastoma) for about 4 months after surgery. Evaluation was done clinically and also radiologically to monitor tumor’s progressivity. Half of these patients already had chemo and radiotherapy, and the other half only had chemotherapy. The results showed 2 non-residive cases and 2 other cases showed a residive tumor with a size about the same as before the surgery was performed.

We also followed 5 other cases that were referred to RSSA with GBM post-excision, bone decompression, and chemotherapy. There was no information available on previous surgery and none had received radiotherapy due to the lack of facilities. All of these 5 patients came to Emergency Room with decrease of consciousness and significantly larger bulging tumor. Patient’s history stated that surgery was performed between 4-5 months ago.

Due to the bias factors, we cannot make a direct comparison between these two groups. From the author’s personal experience, the author concluded that osteoplasty is recommended to be performed wherever possible. And a serial radiological examination is mandatory to monitor any residive tumor. The author suggests further study with greater amount of samples, complete clinical and radiological evaluation along with standardized procedure of operation for both groups is necessary.

ABSTRACT ORAL

OP 045

Challenges Faced in Operating Intracranial Epidermoid Cysts: A Case Series

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Background: The authors present two cases of intracranial epidermoid cysts of different locations and their outcomes.

Results: In the first case, a 33 year old male came with worsening headache for 2 weeks, while the first onset of headache was 7 years ago. He also suffered from double vision, nausea and dizziness. On diffusion weighted images (DWI), the lesion shows typical restricted diffusion and on MRI T1W shows hypointense and T2W shows hyperintense mass of ± 5.75 x 6.8 x 5.4 cm at left posterior horn of lateral ventricle. Microscopic tumor surgery removal was done. Histopathologic examination shows wide keratin mass with 1-2 lymphocytes. The patient recovered without any sequelae however post-operative MRI shows some residual lesions at tumour bed. In the second case, a 54 year old female came with progressive tinnitus in the right ear and chronic headache for 1 year. MRI study shows cystic mass in the basal cistern and left prepontine cistern (±2.7 x 3.64 x 4.75 cm) while the DWI shows restricted diffusion. White gelatinous mass was removed during microscopic tumor surgery and the histopathologic examination shows stratified squamous epithelium cysts and their lumens are filled with keratin masses arranged in a lamellar fashion. The patient recovered without any sequelae while the post-operative MRI shows small residual lesions.

Conclusion: Epidermoid cyst is a slow growing tumor yet sometimes it is difficult to remove the tumor entirely due to adhesions of the capsule to adjacent brain and vessels, or its extension and it might be covered by normal brain. Hence, it is important to have the patient controlled every year with MRI of the brain to monitor the progress of the cyst.
ABSTRACT ORAL

OP 046

A CASE SERIES OF SUSPECTED SOLITARY BONE PLASMACYTOMA: LIMITED MODALITIES FOR COMPREHENSIVE MANAGEMENT

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Background: Solitary Bone Plasmacytoma (SBP) is a clonal proliferation of immunoglobulin-secreting plasma cells which locally manifest in axial skeleton without any evidence of systemic manifestation. SBP is a rare disease whose annual incidence is 0.15:100,000 in the United States. Pathologically, SBP resembles myeloma and the two are differentiated by several further tests. In a rural hospital in Indonesia, those tests are often disregarded due to their incompatibility with Indonesia's national health insurance. We report two cases of suspected SBP at frontal and parietal region to illustrate the obstacles in diagnosing and treating such case in a limited setting.

Methods: This is a case-series which consist of two cases of suspected SBP. Both were patients of neurosurgery outpatient clinic at RSUD Dr. Harjono Ponorogo. Patients' personal and medical information were obtained during their visit to the clinic, from the laboratory and radiology unit, and from their medical record.

Result: Both patients came with chief complaint of progressively growing mass on the head without developing neurological or another systemic symptoms. CT scan revealed extra-axial mass of frontal and parietal bone with a density similar to that of a bone's. There were no evidence of intracranial lesion. Both patient underwent surgery, after which the mass was sent for histopathologic examination. Suspicion toward SBP were made based on their clinical presentation and histopathology as we were not able to exclude any systemic involvement.

Conclusion: Diagnosis of SBP requires tests which are not readily available at some hospitals in Indonesia, especially those in rural area. In such situation, clinical presentation plays a vital role in diagnosis.

ABSTRACT ORAL

OP 047

3D PRINTING AS A TOOL PERSONALIZED MEDICINE IN HYPEROSTOSIS SPHENOORBITA MENINGIOMA

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Background: In particular, 3D printing has contributed greatly to the development of personalized medicine. It has emerged to play a unique role in the fabrication of personalized implants as well as in surgical planning and simulation, assisting in the consent process, and providing an educational tool for medical students, residents and neurosurgeons. This study describes about the 3D Printing as a tool for pre operative planing on Hyperostosis Sphenoorbita Meningioma (HSOM).

Methods: Using data from a high-resolution preoperation brain CT scan of patients with HSOM that was taken in 2017 with 11 patients underwent surgery in Cipto Mangunkusumo Hospital. We also established questionnaire and interviews with the skull phantom and mold of 3D printing to neurosurgeons who performed the surgeries of HSOM.

Result: The skull phantom and mold were successfully fabricated with the 3D printer. We acknowledged that the neurosurgeons were highly pleased and considered very useful with the 3D Printing as a personalized medicine tool for the treatment of HSOM.

Conclusion: 3D printing has opened up a new and exciting avenues within the fields of anatomical education and modeling, surgical training and mostly with the discipline of neurosurgery and also considerably beneficial for surgeries.

Keyword: 3D Printing, Hyperostosis Sphenoorbita Meningioma
ABSTRACT ORAL

OP 048

DISTRESS IN GlioBlastoma Multiforme Patients and Caregiver: A Qualitative Study of the Status of Medical Knowledge for Psychosocial Distress Condition.

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Background: Glioblastoma multiforme (GBM) is a malignant central nervous system tumor with a considerable prevalence in Indonesia. The prognosis of GBM patients is dismal because there are no new therapies to overcome to date, so that the quality of patients life is determined more by controlling morbidity factors other than tumors. The important morbidity factor is distress factor. Research on psychosocial aspects of GBM patients and those closest to them (caregiver) is still very limited. Until now, according to the author, there has been no study describing the relationship between distress status and the status of medical knowledge of GBM patients (P) and caregiver (C).

Method: A cross sectional study with convenient sampling was conducted at Neurosurgery Clinic, Mochtar Riady Comprehensive Cancer Center Jakarta with observation, questionnaires and in-depth interviews with P and C GBM. Four new P-C GBM pairs with various medical knowledge (D/doctor) and non-medical (nonD) statuses were included in the study. Two pairs of P-C nonD who have undergone surgery-chemotherapy-radiation therapy modalities were also included in the study. Distress is measured with a distress thermometer (DT) and a checklist of the National Comprehensive Cancer Network (NCCN). Respondents were measured at 2 sample points, namely T1 (initial stage of radiation) and T2 (post-chemotherapy stage).

Results: Study found that physical problems are the dominant problem faced by P and C. While related to daily problems encountered vary from financial problems, therapeutic decisions, and relationships with partners, and also emotional problems such as fear, anxiety, depression, and spiritual. Based on an analysis of DT scores at T1; P-D was higher than P-nonD; C-D is higher than C-nonD; P-D is higher than C-D; P-nonD T2 is higher than P-nonD T1; and C-D will be stable along T1-T2. Almost all respondents stated that early detection of distress and comprehensive management both physically and psychologically would benefit. In the interview, it was found that the medical knowledge possessed by the respondents became input for respondents in dealing with GBM, both as a supporting factor as well as a factor that caused distress.

Conclusion: Diagnosis of GBM along with all its problems could become distress, which will affect the quality of life for patients and caregivers in addition to patient own illness. Providing wise information according to the level of medical knowledge, routine screening and evaluation of distress in GBM patients is needed for the comprehensive management, so that the goal of therapy to treat patients as a whole and the quality of life of patients can be achieved optimally. Further research is needed with a larger number of samples to get a clearer picture of the need to fulfill the management of psychosocial aspects of GBM patients and caregiver.

Keywords: Glioblastoma multiforme; Status of medical knowledge; Caregiver; Distress

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A REVIEW OF BRAIN IMPLANT DEVICE: CURRENT DEVELOPMENTS AND APPLICATIONS FACULTY OF MEDICINE, JENDERAL SOEDIRMAN UNIVERSITY, PURWOKERTO, INDONESIA

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The burden of brain-related disease is very high. The Parkinson Disease (PD), Mental Health Problem, or Paralysis of extremities patients usually had a low quality of life and low chance to fully recover, mainly the treatments for those conditions are still limited as our understanding of the brain function is insufficient. Brain Implant Technology had given hope to help in treating this condition. In this paper, we examine the current update of the brain implant technology.

The United States Food and Drug Administration (FDA) has approved the use of Deep Brain Stimulation (DBS) as a brain implant in humans, and cochlear implant and retinal implant as the neural implant. All of them had shown a promising result. This device is planted surgically into a very specific region of the brain and worked by stimulating that region with electricity. FDA had approved DBS for the treatment of PD, Pain Management, Epilepsy and Obsessive Compulsive Disorder (OCD). DBS has been showing the promising result for other conditions such as Alzheimer, Mental Health Problem (Major Depression, Tourette Syndrome), etc. DBS itself had a very satisfying result as long as the subject criteria to be implanted this device based on indication and strictly selection.

Other than DBS, there are several brain implant devices that still under development such as the implant for paralysis (In Spinal Cord Injury/Amyotrophic Lateral Sclerosis), enhance memory, reduce obesity, treat the mental health problem.

The potential of neurotechnology is unlimited. When brain function and brain implant were fully developed, it may be one of the major breakthroughs in human history like when human find “fire” for the first time. Support from every sector for further research is very needed to develop and unveil the true potential of this technology.

NEURONAL MIGRATION DISORDERS IN EPILEPSY: A CASE REPORT


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BACKGROUND: Neuronal migration disorders (NMDs) are a group of birth defects caused by the abnormal migration of neurons in the developing brain and nervous system. Epilepsy is often present in patients with neuronal migration disorders and tends to be severe. Patients with neuronal migration disorder have been described associated with epilepsy, but the incidence of epilepsy due to NMDs have yet to be determined clearly especially in Indonesia.

METHODS: A 8 year-old girl was diagnosed with epilepsy since 7 years ago. The chief complaint was drop attack. The patient has taken two kinds of anti-epileptic drug during treatment yet there was no significantly improving of her seizure. In the last one year the frequency of seizure almost four times per day. Magnetic Resonance Imaging (MRI) found that there is double layer of gray matter. Callosotomy was done.

RESULTS: after 12-months follow up, the patient showed seizure free based on Engel criteria.

CONCLUSION: Neuronal migration disorders are a group of disorders that cause structural brain abnormalities, resulting abnormal neuronal migration during brain development. Due to structural abnormalities of the brain, seizure become one of the symptoms that appear in neuronal migration disorder’s patients and this is related to epilepsy. To reduce frequency of seizure or even free seizure, surgical therapy is the treatment of choice.

KEYWORDS: Neuronal migration disorders, NMDs, Epilepsy
SURFACE ELECTROMYOGRAPHY AS AN OBJECTIVE TOOL FOR EVALUATING TREMOR IN PARKINSON DISEASE: PRE AND POST VIM THALAMOTOMY


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Abstract:

Background: This study set out to determine whether surface electromyography (EMG) could be utilized as an objective tool to evaluate the change in tremor in Parkinson diseases (PD) pre and post Vim thalamotomy. We hypothesized that the change in tremor will be detected in surface EMG, giving an alternative as a new objective tool to evaluate the tremor.

Methods: We collected and described surface EMG data of 11 PD patients with tremor who underwent Vim thalamotomy in our center, before and after surgery.

Results: We found decreased in tremor amplitude after Vim thalamotomy which detected in surface EMG.

Conclusion: Our study suggest that surface EMG should be utilized as evaluation tool for tremor in Parkinson disease patient who underwent Vim thalamotomy. Its utilization will provide objective data and be useful rather than merely evaluate from clinical sign of tremor which very subjective and clinicians dependent. Keyword: surface electromyography, tremor, objective tool, brain lesion surgery, Vim thalamotomy.

THERAPEUTIC BENEFIT OF PALMITOYLETHANOLAMIDE IN THE MANAGEMENT OF NEUROPATHIC PAIN

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Background: Neuropathic pain is defined by International Association for the Study of Pain (IASP), "Pain caused by a lesion or disease of the somatosensory nervous system." Elderly patients generally have high incidence of chronic Neuropathic pain. The safe and effective treatment for chronic pain is a large public health concern. Palmitoylethanolamide (PEA) is an endogenaly produced amide cannabimimetic compound with tissue protection and anti-inflammatory activity.

Objectives: The aim & objective of this study is to evaluate the effectiveness and safety of Palmitoylethanolamide (PEA) in the patient, suffering from Neuropathic/ Chronic Pain.

Study Designed: Prospective Study

Materials and Methods: The Study was conducted in the Neurosurgery unit of Surgery Department in Gandhi Medical College & Associated Hamidia Hospital Bhopal. A total no. of 150 patients aged 20-78 years were included in the study and divided into two groups group I (study group) and the group II (Controlled group) to evaluated the effect of PEA in Neuropathic Pain. PEA was admission to group I together used in the treatment of Neuropathic Pain.

Result: we have studied 150 patients with PEA for 60 days in a dose of Palmitoylethanolamide 354 mg orally Three times (TDS) a day for first 10 days than Two times (bid) a day which is available in India in the Name of Palmiges. PEA was associated with greater pain reduction in Study Group compare to the placebo controlled group. The primary outcome measure was the mean pain reduction evaluated by VAS scale.

Conclusion: PEA seems to be useful in the treatment of Neuropathic / Chronic pain and it is well tolerated in patients with Study Group I, Palmiges. PEA reduces the inflammation in Neuropathic Pain, which results in lowering/ reduction of neuropathic pain. The controlled trials are further needed to prove be efficacy and reliability and also to find out the adverse reaction associated with the drug. Thus, what is needed at this critical juncture is a Solution which corroborates to the care of Neuropathic Pain with No side Effects.

Keywords: PEA, Palmitoylethanolamide, Neuropathic Pain, Analgesics, VAS (Visual Analogue Score)
ABSTRACT ORAL

OP 054

SURGERY IN STURGE–WEBER SYNDROME WITH UNCONTROLED EPILEPSY: A CASE REPORT


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BACKGROUND: Sturge–Weber syndrome (SWS) is the association of the facial port-wine birthmark with malformed leptomeningeal blood vessels and abnormal venous eye vessels. Most of patients with SWS have epilepsy that presenting in the first 2 years of life. The incidence is about 1: 50,000 per year

METHODS: A 21-year-old male was diagnosed with Sturge Weber syndrome 20 years ago based on clinical signs: port-wine nevi on the left side of the face along the distribution of the trigeminal nerve, and partial seizures. The patient has treated with Phenytoin and divalproex sodium for years but has seizures with facial twitch that lasted five minutes 3 times per month. Magnetic resonance imaging showed sclerotic left hippocampal and left cerebral atrophy. Left anterior temporal lobectomy and left Amigdolo-hipokampektomi was done.

RESULTS: patient have seizure free based on Engel criteria after 24 months follow up

CONCLUSION: Most cases with Sturge–Weber syndrome are not life threatening. This is a progressive disease, associated with continuous neurological decline. With vigorous control and treatment of symptoms, such as seizures, visual problems, and paralysis, quality of life can be preserved. Surgery is one promising choice for alternative treatment to control seizures in uncontrolled epilepsy with Sturge–Weber syndrome

KEYWORDS: Sturge–Weber syndrome, SWS, Epilepsy

ABSTRACT ORAL

OP 055

TRIGEMINAL NEURALGIA MANAGEMENT: SOME CHALLENGES IN MICROVASCULAR DECOMPRESSION SURGERY AND LITERATURE REVIEW

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Introduction: Trigeminal neuralgia (TN) in most cases is caused by vascular compression of trigeminal nerve. Microvascular decompression (MVD) of the offending vessel is considered as a safe and effective option for TN and generally possessed good prognosis. However, TN cases that were complicated with non-vascular etiologies, in addition to the primary origin, evidently added challenges to the MVD procedures. This report tried to address some structural difficulties which may be encountered during the surgery and influenced the clinical outcome for those who underwent MVD.

Method: National Brain Center, Indonesia, is a national tertiary referral hospital, has performed MVD in a total of 53 TN cases from July 2014 until June 2018. Among those, some cases were considered difficult and had factors that complicate the surgery. In addition, literature reviews regarding the management of the difficulties were also discussed.

Result: Five TN cases were highlighted which involved: dermoid cyst mass, narrow cerebello-pontine angle cistern, intervening superior petrosal vein, tortuous vertebra-basilar artery, hyerostosis of suprameatal tubercle prominence. The difficult cases can be further divided in to vascular origin and secondary TN.

Conclusion: To yield a better measures in anticipating post-operative complications and thus produce a favorable surgical outcome in difficult TN cases, the surgery team should consider a multidisciplinary approach, a more precise radiologic examination of the cerebello-pontine angle, a comprehensive pre-operative planning, a resourceful knowledge of potential obstructions during surgery, and a good intraoperative decision plan. MVD is still a preferred treatment method for TN with complicating factors.

Keywords: Trigeminal neuralgia, Microvascular decompression, Surgery, Challenges
ABSTRACT ORAL

OP 056

THE ROLE OF NEURONAVIGATION IN SURGICAL MANAGEMENT OF CEREBRAL Cavernoma Malformation Related Epilepsy: Case Series From National Brain Center Hospital, Jakarta

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Background: Epileptic seizure are known to be one of the most complain symptoms of cerebral cavernoma (CCM). The treatment for this condition can be done through either conservative or surgical method. However there is no accepted guideline regarding management of this condition. More than 20% CCM related epilepsy cases were found to be drug-resistant and indicated for surgery. Surgical management for CCM has been proven to have good outcome, 60-90% cases were seizure-free completely. The goals of the surgery are to achieve complete lesion resection and avoid additional neurological damage. Neuronavigation is highly recommended to assist the surgeon on planning the incision and localize the lesion especially in difficult anatomical region. It is proved to be reliable when applied in an early stage of operative procedure with minimal brain retraction.

Method: From January 2015 until April 2018 in National Brain Center Hospital, Jakarta, there were 11 cases of cerebral cavernoma with five cases have deep unusual location in mesial temporal and basal ganglia.

Result: From four mesial temporal lesions, two of them have unclear superficial hemosiderin landmark as the sign of their location in the brain surface. Also, there is a patient with a deep structure lesion in basal ganglia. His MRI was reconstructed for surgical planning. Neuronavigation was used as additional tool for contributing to the procedure safety and planning.

Discussion: Neuronavigation can help to plan the incision, identify proper place for craniotomy and flap size, determine ideal entry angles, designate critical anatomic structures, and protect these structures. The disadvantages are the inconsistency of the images because of brain shift due to intraoperative tumor resection or cerebrospinal fluid drainage.

Keywords: cerebral cavernoma, CCM, epileptic seizure, neuronavigation, surgical management

ABSTRACT ORAL

OP 057

A CASE REPORT OF TEFLON WRAPPING FOR UNCLIPPABLE INTRACRANIAL ANEURYSM IN CHOROID ARTERY WITH GIANT THROMBUS

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Background: Intracranial aneurysm prevalence in general population is 4-6%. In Southeast-Asia, asymptomatic unruptured intracranial aneurysms prevalence is 3.5% and higher in women than men. The most common location of intracranial aneurysm is the anterior communicating artery (35%) and internal carotid artery (30%). Symptoms usually subtle unless it ruptures and cause subarachnoid hemorrhage. However, 10-15% of unruptured aneurysms also can create symptoms due to mass effect or minimal blood leakage irritating meninges. Spontaneous thrombosis can also develop in 1-2% of aneurysms because of their growth, recanalization, and rupture or thromboembolic event. This study aims to report our experience on surgical management of unclippable aneurysm with giant thrombus using teflon wrapping and correlated literature review about it.

Method: This study was done in National Brain Center Hospital, Jakarta on 2018. From cases of aneurysm clipping, there is a unique case of intracranial aneurysm that found unclippable intraoperative and wrapped with teflon.

Result: A 45-years-old male patient had a chief complaint of worsen headache (VAS8-9) for 3 weeks. There was ptosis and negative light reflex on his left eye suggestive paresis of left third cranial nerve. MRA and DSA showed a saccular aneurysm in choroid artery without any sign of thrombus. Craniotomy was done using pterional approach. But, close to the aneurysm, a giant thrombus was found intraoperative causing the aneurysm unclippable. Teflon was used for wrapping.

Discussion: CT can be better modality to show intracranial thrombus as hyperdense lesion since contrast will not penetrate to the clotted blood. MRI showed thrombosis as layers with different signal intensities. Wrapping can be an alternative technique if clipping is not feasible or satisfactory. Teflon is nonresorbable yet biocompatible and good for wrapping. It can be used for the residual near the clipped aneurysm, the artery itself and for protecting surrounding structure compressed by the aneurysm or the clip grip.

Keywords: aneurysm, choroid artery, clipping, teflon, thrombus, unclippable wrapping
ABSTRACT ORAL

OP 058

CEREBRAL CAVERNOMA MALFORMATION RELATED EPILEPSY CASES IN NATIONAL BRAIN CENTER HOSPITAL, JAKARTA: A DESCRIPTIVE STUDY

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Introduction: Cerebral cavernoma malformations (CCM), especially the supratentorial lesions that count for 80% cases of CCM, are known to often generate epileptic seizure. The most common locations are in temporal (20-27%) and frontal lobe (12-22%). The CCM related epileptic seizure is more likely to become medical intractable and indicated for surgery. Surgical management for CCM has been proven to have good outcome with 60-90% cases were seizure-free completely. This study aims to describe about CCM cases found in National Brain Center Hospital, Jakarta, as a new center of neurology health service in Indonesia.

Method: This study was done in National Brain Center Hospital in Jakarta with patient data from January 2015 until April 2018. Diagnosis was done through anamnesis, physical examination, imaging modality using Magnetic Resonance Imaging (MRI), electroencephalography (EEG) and also confirmed by pathology anatomy.

Result: There were 11 patients with average age 25.3 years old (range 15-63), equal proportion of women and men, and mean size 24 mm (range 13.1-38). From those patients it was found that temporal lobe was the most common location (46%), with 80% of them was located in the mesial subtype. The mesial temporal lesions tend to have longer seizure onset, generalized seizure type, more intractable to antiepileptic drugs and worse outcome after surgery. Lobar location has better post-surgical outcome (ILAE 1-2).

Discussion: Epileptogenic of the lesions was known to be due to microhemorrhages of CCM and exposure of the particular iron hemosiderin and subsequent gliosis reaction from the blood breakdown products. Similar with other studies, temporal was the most common location, moreover the mesial temporal lesion is associated with worse post-surgery prognosis. Late surgical treatment also associated with worse prognosis and should have been referred for surgery earlier. Better outcome can be related to minimal hemosiderine deposit.

Keywords: anatomical distribution, cerebral cavernoma malformation, epileptic seizure, ILAE, outcome.

OP 059

NARROW CISTERN AS AN ANATOMICAL CHALLENGE IN MICROVASCULAR DECOMPRESSION SURGERY FOR TRIGEMINAL NEURALGIA: CASE REPORT

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Introduction: Trigeminal neuralgia (TN) is still one of the most painful and debilitating neurofunctional diseases. Microvascular decompression (MVD) surgery is the definitive therapy for TN, but it is an invasive option and there are risks. Sometimes there are even some anatomical challenge during the MVD surgery that could not only complicate the surgery but even affecting the outcome. The aim of this case report is to present narrow cistern as an anatomical challenge in MVD surgery of two patients with trigeminal neuralgia in National Brain Center Hospital (NBC), Jakarta, Indonesia.

Methods: We conduct retrospective review of two trigeminal neuralgia patients whose MVD surgeries were considered difficult in our hospital. Retrospectively, we found out that both patient has narrow cisterns in their T2 weighted and 3D-CLSS MRI. We also conduct postoperative follow-up to see the outcome of the surgery.

Results: Two female patients aged 52 and 37 years old with unilateral idiopathic TN showed narrow cistern in their imaging. We find that narrow cistern significantly causing the MVD surgery more difficult because the structures were overlapping, the maneuvers are restricted to the space available and the risk of bleeding is higher. In the postoperative follow-up fortunately we find both patients are well and pain free.

Conclusion: We believe narrow cisterns volume has a role in neurovascular compression of the trigeminal nerve thus causing TN. In patient with narrow cistern, during the MVD surgery it is more difficult to identify the structures, it is also difficult to do maneuvers and risk of bleeding is higher. MRI modalities can be used to visualize neurovascular relationship and measure the cisterns volume. This information could gives an early warning to the surgeon about the difficulties and risks that may arise during the surgery.

Key Words: Cerebellopontine angle cistern; Trigeminal neuralgia; Microvascular decompression surgery; Magnetic resonance imaging; Narrow cistern
ABSTRACT ORAL

OP 060

CORRELATION BETWEEN FERRITIN AND GLASGOW OUTCOME AT DISCHARGE SCALE IN SPONTANEOUS INTRACEREBRAL HEMORRHAGE PATIENTS WHO UNDERWENT SURGICAL TREATMENT

ABSTRACT
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Background: Spontaneous Intracerebral Hemorrhage (ICH) is a vascular lesion with high prevalence and devastating outcome, especially related to morbidity. Heterogeneity of ICH case caused by various factors pose problems, one of which is predicting outcome. Serum ferritin has shown to have a significant value in terms of predicting outcome in ICH patients.

Method: This is an analytic study with prospective cohort design. Outcomes measured using Glasgow Outcome Discharge Scale (GODS).

Result: 60 subjects with spontaneous ICH who underwent surgical treatment was enrolled with a mean age of 54,50 years old, 29 patients (48,3%) assigned to poor GODS and 31 patients (51,7%) assigned to good GODS. Mean value of serum ferritin in poor GODS group is 342,75±336,019 as for good GODS group the mean ferritin value is 308,30±660,968 with P value > 0.05 (P>0,05).

Conclusion: There is no significant correlation between serum ferritin value and GODS score in patients with spontaneous ICH who underwent surgical treatment. Further study with larger and less diverse subjects is needed.

Keyword: Intracerebral Hemorrhage, Ferritin, Glasgow Outcome at Discharge Scale

OP 061

MOYAMOYA DISEASE: A CASE REPORT TREATED WITH ENCEPHALO-DURO-MYO-ARTERIO-PERICRANIO-SYNANGIOSIS (EDMAPS), AN INDIRECT ANASTOMOSIS

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Abstract
Moyamoya disease is a stenosis at the terminal ICA or proximal areas of anterior and middle cerebral artery with formation of abnormal vascular networks near the stenotic lesions. 10 years-old girl with recurrent transient ischemic attack (TIA) that became worsen since this one year. MRA and DSA showed typical feature of moyamoya disease with bilateral stenosis at terminal ICA and abnormal vascular networks. Patient was treated with indirect anastomosis surgery using encephalo-duro-myo-arterio-pericranio-synangiosis (EDMAPS) technique. Direct anastomosis or STA-MCA anastomosis can’t be performed due to too small artery size. EDMAPS procedure was performed first to the more impaired hemisphere. Same procedure was performed to the other hemisphere after one month interval. EDMAPS was developed to revascularize ACA and MCA territory. 3 months follow up after surgery showed progressive decreased of TIA. TIA was diminished one year after surgery and showed significant improvement. EDMAPS is a safe and effective procedure to improve long term prognosis in moyamoya disease.

Keywords: Moyamoya disease, transient ischemic attack (TIA), encephalo-duro-myo-arterio-pericranio-synangiosis (EDMAPS), anastomosis
ABSTRACT ORAL

OP 062

MICROSURGERY FOR GRADE II-III SPETZLER-MARTIN ARTERIOVENOUS MALFORMATION WITH HEMORRHAGIC PRESENTATION AND CYST FORMATION IN A PEDIATRIC PATIENT: A CASE REPORT

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Background: Spetzler-Martin grade II-III AVM is the most heterogenous subgroup in the AVM classification due to their variety in terms of size, location, and type of venous drainage. The indication for this microsurgical resection was based on lifetime risk of recurrent intracerebral hemorrhage, patient's young age, and the location.

Case: A nine-years girl who suffered spontaneous intracerebral hemorrhage in the occipital lobe with no history and signs of head injury, had an immediate decompressive craniotomy with hematoma evacuation. After a month of postoperative period, the patient undergone MRI followed with DSA and an AVM was found in occipital lobe. Located in noneloquent brain regions, has superficial venous drainage, and uncertain size of the nidus, this AVM is considered as grade II-III Spetzler-Martin with feeding artery arise from the posterior cerebral artery (PCA). Microsurgical resection was decided as a definitive treatment to this AVM. A horseshoe skin incision was made and muscular fascia was separated to find the cyst wall formed as intracerebral hemorrhage evacuation in prior surgery. Tracing the medial wall of the cyst, the feeding artery was found at the medial edge of the cyst wall. It arises from PCA as the only main vessel supplying the nidus. To make certainty whether this vessel is an artery or vein, a temporary clip is used to clamp the vessels. Then the draining veins from the nidus is clamped and bipolar forcep is used to coagulate the feeding artery and the draining veins. Total excision of the nidus was performed after securing the feeding artery and draining veins from rebleeding. After the surgery was done, the patient’s hemodynamic was thoroughly observed and found stable. 2 weeks following the surgery, clinical examination showed a favorable outcome with a modified Rankin Scale score of 2.

Discussion: Microsurgery for this Spetzler-Martin grade II-III AVM has chosen as the definitive treatment due to several factors. Pre-operative embolization prior to surgical treatment carries a high risk of hemorrhage and must be performed immediately prior to surgery. A study conducted by Mohan N et al. showed that AVM treated by microsurgery and endovascular embolization are likely to have higher rates of post-operative neurological deficits compared with microsurgical treatment only. The aim of AVM surgery is the obliteration of the feeding artery, but recanalization and recurrences can occur as the major complication of endovascular embolization. A study conducted by Qingqing R et al. for 445 patients with AVM treated with microsurgery, 344 (77,3%) patients had a favorable outcome (modified Rankin Score of 0-2). 388 patients achieved complete obliteration of the AVM’s. The 1 and 5-year overall survival rates for patients with microsurgery were 95.3% and 92.1%, respectively.

Conclusion: Microsurgery is the choice of treatment for this Spetzler-Martin grade II-III AVM.

Keywords: arteriovenous malformation, spetzler-martin grade II-III, microsurgery
ABSTRACT ORAL

OP 063

CLINICAL IMPROVEMENT OF PATIENTS UNDERGOING ENDOVASCULAR EMBOLIZATION IN TRAUMATIC CAROTID CAVERNOUS FISTULA: CASE SERIES

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Introduction
A carotid-cavernous sinus fistula (CCF) is a clinical condition when an abnormal communication between the internal carotid artery (ICA), external carotid artery (ECA) or any of their branches to the cavernous sinus. Traumatic CCF (TCCF) are the most common type of all CCF. This study attempts to find clinical improvement of traumatic carotid cavernous fistulas (TCCF) after endovascular embolization. We predict degree of clinical recovery, in an attempt to make the treatment of TCCF safe and effective.

Report
This study reported a series of 28 patients with TCCFs undergoing coiling and ballooning in period of 3 years i.e. from December 2014 to December 2017. We performed clinical, angiographical, and radiological assessment before and at regular time periods after the procedure until 6 months. All the patients had a partial and complete occlusion of fistula. Angiographic occlusion of fistula, visualization of ophthalmic artery and disappearance of bruit predicted a good clinical outcome. All patients made recovery different in time; it depends on the degree of fistulas and treatment.

Conclusion
Improvement in clinical symptoms had direct correlation with the degree of occlusion. Treatment was divided into coiling and ballooning depend on patient's condition and angiographic examination. TFCA is still very important diagnostic tool in diagnosis and treatment of TCCFs.

Keyword: TCCF, cavernous sinus, endovascular embolization, TFCA

ABSTRACT ORAL

OP 064

MINI OSTEOPLASTIC CRANIOTOMY FOR SPONTANEOUS INTRACEREBRAL HAEMATOMA AS ALTERNATIVE TO MINIMALLY INVASIVE TECHNIQUE

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Cases of Spontaneous Intracerebral Haematoma (SICH) are increasing in number. Not all cases of SICH evacuation require a bone decompression, thus creating a chance for minimally invasive approach to thrive. However, not all health facilities have minimally invasive equipment such as endoscopy and stereotactic (which is currently developing), so we performed a minicraniotomy as an alternative procedure. In this study, we conducted a mini craniotomy (3cm in diameter) for SICH evacuation using a microscope and osteoplasty.

In January 2018 to July 2018, 9 typical cases of SICH with initial GCS of 7-11 and clot volume between 30-80cc were evaluated. Clots were located mostly in basal ganglia area and surgeries were done using mini craniotomy, microsurgery evacuation and osteoplasty.

We performed radiological evaluation 6 hours following the surgery and obtained 8 cases of improvement and 1 re-bleeding case. Clinically, on day 4, there were 3 cases of non-optimal GCS improvement and 6 cases with significant improvement.

From the available data, we can conclude that there is a place for microsurgery evacuation with minicraniotomy and osteoplasty as alternative to minimally invasive technique. Yet, the prognosis for SICH cases doesn't depend only on the intracranial factors; instead, the extracranial factors play an important role too.
ABSTRACT ORAL

OP 065

AGGRESSIVE TYPE DURAL ARTERIOVENOUS FISTULA OF TRANSVERSE-SIGMOID SINUS JUNCTION: SURGICAL DISCONNECTION AS AN OPTION

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Background
Dural arteriovenous fistula (DAVF) is an abnormal connection from dural arteries to dural veins or sinus originating from dural layer. These connections can be asymptomatic or present with symptoms ranging from benign headache to progressive neurologic deficits, even a fatal hemorrhage. Treatment options depend on the type of DAVF, including endovascular, surgical, or radiosurgical therapy, which goal is to disconnect the fistula completely from the venous draining. An aggressive type DAVF requires more aggressive treatment rather than conservative observation.

Case Illustration
Female patient, 51 years old, with history of severe headache followed by seizure two weeks before admission. The headache was abrupt in onset, without vomiting, followed by two episodes of two minutes generalized tonic seizure with 30 minutes interval between seizures. After seizure patient shows weakness on the right extremities, no slurred speech nor other neurological deficits. Patient underwent non-contrast brain CT, CT angiography, and digital subtraction angiography (DSA), which reveals two fistulas from left occipital artery to left transverse-sigmoid sinus, with retrograde flows to superior sagittal sinus and left Sylvian vein through Labbe vein. We perform craniotomy and disconnect the Labbe vein from a dilated vein emerging from the left transverse-sigmoid junction, leaving one permanent clip behind on the disconnected vessel. We did nothing to the fistula of the left occipital artery. Postoperative DSA shows a complete obliteration of the dilated vein and no fistulas of the left occipital artery was seen.

Discussion
Patient exhibits an aggressive type DAVF with severe headache and history of seizure due to hemorrhagic episode. Surgical disconnection to the Labbe vein was chosen to reduce cortical vein reflux, which is the hallmark of an aggressive type DAVF. Fistula from occipital artery was not treated to provide means for postoperative evaluation, but then shrink by itself possibly due to lack of flow demand.

Keywords: DAVF, aggressive type, surgical disconnection

OP 066

MIDDLE CEREBRAL ARTERY INFARCTION DUE TO TRAUMATIC INTERNAL CAROTID DISSECTION: A RARE CASE

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Background: Craniocervical artery dissection is potentially disabling condition caused by intimal tear allowing blood to enter and dissect the media in the cranial direction which can occur spontaneously or as result of trauma. When the dissection extends toward the adventitia, it can form protrusion from the weakened vessel wall called a pseudoaneurysm, which may become a nidus for distal thromboembolism or cause mass effect on adjacent structures. Here, we reported a rare case of traumatic internal carotid artery (ICA) paraspetrous dissection and pseudoaneurysm formation with resultant contralateral hemiparesis and hemicranial nerve palsy in patient with minimal head trauma.

Conclusion: The development of hemiparesis and other focal cerebral sings in patients with head trauma often suggest intracranial hemorrhages or cerebral contusions. However, these signs are occasionally related to traumatic occlusion of the carotid and cerebral arteries from thromboembolism of traumatic dissection and pseudoaneurysm of ICA.

Keywords: ICA, traumatic dissection, pseudoaneurysm
ABSTRACT ORAL

OP 067

PHARMACORESISTANT TEMPORAL LOBE EPILEPSY CONTROLLED BY BILATERAL ANTERIOR THALAMIC NUCLEI THALAMOTOMY

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Introduction: Several potential targets have been suggested for the treatment of pharmacoresistant epilepsy, including the medial parts of temporal lobes, caudate nucleus, cerebellum, centromedian nucleus of the thalamus, subthalamic nucleus and anterior thalamic nucleus (ATN). The effectiveness of bilateral ATN thalamotomy as a treatment option for pharmacoresistant temporal lobe epilepsy is a considerable approach in this recent advances.

Method: Case report.

Result: A 24-year old male patient presented with unknown onset of generalized tonic clonic seizures and serials of drop attacks since 4 years of age. He was also diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) and a history of febrile seizures. Brain MRI was normal. He has been treated with so many combination of antiepileptic drugs (AEDs) with last combination were Valproic acid 500 mg twice daily, Clonazepam 2 mg thrice daily and Zonisamide 100 mg twice daily. Despite all polytherapy AEDs given, he was still having recurrent seizures. Vagal Nerve Stimulation (VNS) was then conducted and seizures were slightly better. After maximal VNS voltage given, seizures became more frequent. ATN bilateral thalamotomy was done five years after, where seizure was better controlled. Levetiracetam 500mg twice daily and phenobarbital 15 mg once was given in concordance to the surgery, and the patient is doing well until now.

Conclusion: In pharmacoresistant temporal lobe epilepsy where AEDs and VNS showed no significant improvement, ATN bilateral thalamotomy is considered to be a compelling treatment option.

Keywords: Pharmacoresistant epilepsy; temporal lobe epilepsy, ATN thalamotomy

ABSTRACT ORAL

OP 068

EVOLUTION OF THE BONY ORBIT AND ITS LEGACY FOR PREDATION: THE SUPRAORBITAL-TORUS’ APPEARANCE AND DISAPPEARANCE RIDDLE

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Introduction: For many Surgeons, the bony orbit is a major boundary of consideration; 30% of human birth defects are categorically cranial-facial malformations. The bony orbits intersect with these cranial-facial boundaries.

Methods: This paper explores the orbit’s evolutionary legacy and lifestyle for predation, addressing the enigmatic supraorbital-torus (SO-T) “appearance and disappearance” riddle.

Results/Discussion: A century-old anthropological riddle, the SO-T presaged a possible functional common-ancestor human-ape-link; 1857 Neanderthal hominin discovery in Germany began a fossils’ investigation-wave posting predatory attributes: savage life, flared nostrils, intimidating orbital stare, notably ginormous SO-T, hoping these latter shared prominences between frontal and orbital bones might now link human-hominin-ape phylogenetic branch-valence on cladograms.

Concurrent empirical primate studies sought SO-T-prominence causation; varieties of previous in-vivo facial bone strain-gauge-analyses had given most compelling data and perhaps could again play into possible biomechanical heavy-masticatory-force predation themes, but correlations in these new orbital strain–gauge investigations proved trivial, reductionist, as primates' overbuilt SO-T “buttressing-beam” approached up to 20 times orbital bones’ functional-need. The SO-T was just not subject to evolutionary remodeling through mastication.

A mid-sagittal profile investigation of primates’ and hominins’ frontal-bones nailed SO-T’s structural integration: 2 independent inner-and-outer frontal bone evolutionary growth processes functionally integrate orbital bones with cerebral-lobes; the hominins’ SO-T gauges, fills, spans any inner-outer space disjunction of the 2 separate processes, maintaining structural continuity, p<0.0001. Though both Neanderthal hominins and modern humans’ orbits are positioned below their frontal bones, p=0.01, only modern humans evolved significantly larger brains with notably smaller faces; modern humans’ inner frontal bone growth-pattern had switched from a facial (somatic) to a neural growth-pattern, an evolutionary transformation. Predation had become an executive-cognitive process in gracile SO-T modern human.

Conclusion: Predatory themes have dominated SO-T evolution, embellishing its tapestry, richly.
ABSTRACT ORAL

OP 069

THERMOREGULATION, PARIETAL LOBE, AND FEBRILE SEIZURES IN AN EVOLUTIONARY QUEST

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Introduction: Febrile seizures (FS) have remained a relevant topic; thermoregulation and febrile-responses, complex processes, are important aspects of the unsolved puzzle.

Methods: Here, thermoregulation, the parietal lobe and FS are explored from evolutionary-pressure datasets for insights/contributing-factors to FS age-dependent-vulnerability.

Results/Discussion: Human thermoregulation evolutionary-quest is for maximal- performance at optimal-temperatures; for insects/viruses the quest is not performance, but population-growth, Exotherms external heat-sources define a narrow range-of-per-formance; their thermal-sensitivity-quest, explained only by natural selection, never any thermodynamic-properties; endotherms (birds/mammals) evolved thermally-constrained internal-set-points promoting heat-loss; some mammals have selective-brain-cooling (SBC), separating brain temperature (Tbrain) regulation independently from body temperature (Ttrunk), keeping Tbrain < Ttrunk, p<0.01. Because the human brain has no heat- storage-facility, Tbrain is dominated by cerebral-blood-flow (CBF), which couples Tbrain and Ttrunk, For maximal performance, continual incoming CBF, optimally warmed by the Ttrunk supports/replenishes Tbrain, perfusing its vascular-channels, which work as a hydraulic-network-exchange.

Unique to human-species, early ontogeny, 4th-6th-month window-timeframe, the parietal lobe begins to grow/develop/reorganize in space; this is a noteworthy evolutionary-step, a structure-and-function biological-signal; changes in geometry/architecture/patterned connections induce new intrinsic relationships for energy-efficiency/balance/ thermoregulation. The emerging/ maturing parietal lobe becomes a prominent-hub, a primary integration-center, and also a meeting-point for 4-neurocranial vascular-systems to integrate as a connective-network-exchange with increased radiations/anastomoses/re-ticulations of blood-vessels. Evolution's principle of variability in timing of parietal tissue/vascular development applies. Even in adulthood, the parietal-lobe variability is 18%.

As a common pediatric-neurological-disorder worldwide, and epidemiology ranging 2-5% (Western-countries), 7-9% (Asian-Pacific), FS susceptibility focuses specifically on childhood, 6-months to 5-years. Genetic-mutations have accounted for only a minority of children with FS; most cases underlying-basis remains unsolved. In an evolutionary quest, thermoregulation may be the common factor linking parietal developmental- morphology-variability with its vasculature changes for heat-dispensation. FS are a starting point to discover this.

Conclusion: In return, a puzzle may be solved.
ABSTRACT ORAL

OP 070

NEUROSURGERY EDUCATION FOR MEDICAL STUDENT IN INDONESIA

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Background:
Medical educators are faced with challenge to provide a curriculum which can sufficiently prepared their undergraduates to become a general practitioner (GP). Consequently, time constraint makes exposure towards subspecialties education, such as neurosurgery, during undergraduate program limited. Advancement in neurosurgery technology and improvement in interdisciplinary communication will accelerate the management of patient which will eventually result in better outcome. The aim of this study is to describe neurosurgery curriculum for medical student in Indonesia.

Methods:
This cross-sectional study used consecutive sampling to give representation of all faculty of medicine across Indonesia. The inclusion criteria are doctor who are still in the “internship” program or maximum of 1 year after the “internship” program. Data about the demography, pre-clinical and clinical curriculum, and head and trauma-related experience during general practice are collected.

Results:
A total of 72 graduates from all 72 school of medicine in Indonesia were collected. Only 52.8% of respondents had neurosurgery curriculum in their pre-clinical years, but 58.3% of them were given neurosurgery curriculum during their clinical years curriculum. Only 2% of respondents received neurosurgery curriculum as a separated subject from the surgery curriculum. A total of 41.7% of respondents who received neurosurgery course in their pre-clinical curriculum and those who did not (p=0.021). Similar results were also shown between who received neurosurgery course in their clinical curriculum (p=0.02).

Conclusion:
There are still many school of medicine in Indonesia which does not have neurosurgery as a part of their curriculum. This lack of exposure may have an impact on the confidence/bravery level of the GPs to treat neurosurgery patients in the emergency room.

ABSTRACT ORAL

OP 071

HOW TO FACE THE STRUGGLES AND OVERCOME THEM, WHILE ESTABLISHING NEUROSURGERY AT A RURAL MEDICAL COLLEGE

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Introduction – Neurosurgery is needed at every multi-speciality hospital and medical college. The patients of RTAs and spine diseases are increasing exponentially. Most neurosurgeons are providing services at metro or urban areas. There is a term “periphery”, which means small cities and rural areas. Neurosurgery is undeveloped in periphery. It is because of scarcity of resources, tendency of patients to migrate big cities, low living standard and many more things. Even if a neurosurgeon wants to do something, he/she doesn’t know how to begin and do something.

Objective – The objectives are to give insight about what are the types of struggles and how to overcome while establishing fresh neurosurgery department at a rural medical college.

Method and results – Maharaja Agrasen medical college is a rural medical college in Haryana. It is surrounded by hundreds of villages. Nearby big cities are Delhi, Chandigarh and Bikaner, which are more than 200km far. In August 2016, Neurosurgery department was started from level zero. There were three phases – beginning, establishment and progress. With limited resources, alternate methods and awareness program (electronic media, newspaper), in last 2 years, more than 12,000 cases have been treated on OPD basis and around 300 cases have been operated here.

Conclusions – To establish a department, patience is must. Only clinical skills can’t help, public dealing, knowledge about equipment, proper use of limited resources are needed to establish and convert it into progressive department. Those neurosurgeons, who want to do something different, should consider it as an option.
THE EFFECT OF CURCUMIN EXTRACT TOWARD MATURE BRAIN DERIVED NEUROTrophic FACTOR (m-BDNF) EXPRESSION AFTER TRAUMATIC BRAIN INJURY

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Background: Traumatic Brain Injury (TBI) causes disability, death and huge economic losses in various countries of the world. TBI incident varies between 67 –317 per 100,000 population, with 4-7% mortality rate in moderate brain injury, and 50% in severe brain injury. The mature BDNF (m-BDNF) pathway system is a potential therapeutic target for neurological disorders in traumatic brain injury. Curcumin extract has a neuromodulatory effect which has a modulation effect on the expression and activation of the m-BDNF system in the hippocampus area.

Methods: Laboratory experimental study in Faculty of medicine University of Brawijaya which used thirty male Sprague-Dawley rats. Rats were divided into three treatment groups, group A (negative control), group B given traumatic brain injury, group C given traumatic brain injury and Curcumin administration. Rats’s brain tissue was immunohistochemically processed, to observe the number of cells expressing m-BDNF in the subgranular zone (SGZ) of the hippocampus dentate gyrus (DG). Data were analyzed with SPSS and ANOVA analysis.

Result: In ANOVA analysis, mean expression of m-BDNF group C compared to group A and group B were increased significantly (p=0.0001). Curcumin Through Induction of m-BDNF and activation of its intracellular receptor TrkB can produce neural regeneration, reconnection, and dendritic sprouting, and can enhance synaptic efficacy.

Conclusion: Curcumin can increase the expression of m-BDNF in the subgranular zone of the hippocampus dentate gyrus.

Keywords: Curcumin, TBI, m-BDNF, Neuroplasticity
ABSTRACT ORAL

OP 074

VENTRICULO-SAGITTAL SINUS SHUNT FOR HYDROCEPHALUS: A CASE REPORT

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Background: Ventriculo-sagittal sinus shunt is a technique of shunting the lateral ventricle to superior sagittal sinus and used as an alternative treatment of hydrocephalus as the ventriculo-peritoneal shunt often experience shunting malfunction. This report gives an example of complicated course of ventriculo-peritoneal shunt and discuss the alternative procedure of cerebrospinal fluid (CSF) diversion with ventriculo-sagittal sinus shunt as well.

Case: An eight-months infant who had ventriculo-peritoneal shunt inserted since her infancy to treat communicating hydrocephalus, had multiple shunt revisions that ended with the insertion of peritoneum shunt. She did well for a day after each shunt revision, then developed ventriculo-peritoneal shunt malfunction due to absorption disorder of the peritoneum that lead to accumulation of CSF in the abdomen, and had repeated vomiting. However, there was no CSF ascites observed during the clinical course. Ventriculo-sagittal sinus shunt was performed by inserting the distal catheter into the anterior third of sagittal sinus through a cross incision on anterior fontanelle. To avoid malfunction, a thorough evaluation during the surgery is performed and a patent sinus with no CSF reflux is well observed. After 2 weeks of postoperative period, no increase in head circumference was found.

Discussion: This case demonstrates a complication of ventriculo-peritoneal shunt due to absorption disorder of the peritoneum, and no CSF ascites developed suggests there is no CSF overproduction. We performed ventriculo-sagittal sinus shunting as an alternative treatment for the failure of ventriculo-peritoneal shunting. Minimal complications, simple technique, and reduces operating time have been reported as the benefit of ventriculo-sagittal sinus shunt. However, several reports described the possibility of either acute or chronic thrombosis of the sagittal sinus as a threat for this procedure.

Conclusion: Ventriculo-sagittal sinus shunt is viable and promises good clinical outcomes for the treatment of hydrocephalus.

Keywords: Communicating hydrocephalus, Superior sagittal sinus, Ventricular Shunt

ABSTRACT ORAL

OP 075

CLINICAL PROFILES OF CLOSED SPINA BIFIDA PATIENTS UNDERGOING SURGERY IN CIPTO MANGUNKUSUMO GENERAL HOSPITAL FROM JANUARY 2014 – JUNE 2018

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Introduction: Spina bifida is a common birth defect involving the neural tube. Patients with closed spina bifida are asymptomatic and diagnosed accidentally by clinician. Therefore it is often called a silent disease. Spina bifida is the most common pediatric neurosurgery case encountered at Cipto Mangunkusumo General Hospital Jakarta. This study aimed to describe the demographic characteristics and clinical findings from closed spina bifida patients, which could be used as a reference in diagnosing patients with spina bifida, especially in closed spina bifida patients.

Materials and Methods: Patients with a diagnosis of closed spina bifida and had a surgery from January 2014 until June 2018 were the target of this study. Patients with a complete medical record data consisting of patients’ identity, spina bifida profile, clinical photos, and radiological data were then included in this study.

Results: From 43 patients with closed spina bifida who were operated between Januari 2014 until June 2018, 22 patients (51.2%) were female, 17 patients (39.5%) were less than one year old, and 21 patients (48.8%) lived in Jakarta. In addition, 27 patients (62.8%) was lipomyelomeningocele. Sixteen patients (37.2%) had a defect in Lumbar V and mostly covered by the epithelium (n=38; 88.4%). Twenty-six patients (60.5%) had swelling and 25 patients (58.1%) had lipoma in local status presentation. Twenty-three patients (53.5%) had bladder problems as complication.

Conclusion: Proper assessment of clinical symptoms and complications can lead to early diagnosis of spina bifida, which can improve the patient’s outcomes and quality of life.

Keywords: Closed spina bifida, Clinical profile, Demographic characteristics, Clinical findings
ABSTRACT ORAL

OP 076

OUR EXPERIENCE IN SURGICAL TREATMENT OF ARNOLD CHIARI MALFORMATION TYPE 1

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Introduction: There are four types of Arnold Chiari Malformation type 1 described in the literature. Due to the fact that it is a common finding in the general population (true Chiari being present in 0.75% of the population), Arnold Chiari Malformation type 1 was also called Chiari anomaly.

Material and methods: In the last 7 years 9 patients with Arnold Chiari Malformation type 1 have been treated in our institution. There were 6 women and 3 men. The mean age was 36.3 years (between 19 and 58 years).

Surgical treatment: According to recent literature patients respond best when operated within 2 years from the onset of symptoms. We recommend early surgery for symptomatic patients. Surgical treatment of Chiari I malformation should accomplish several goals. First of all, there is the obvious need to decompress the lower part of the cerebellum. Chiari I malformation being related to a small posterior fossa, the surgical treatment should realise enlargement of the total volume of the posterior fossa. The approaches were used in the last seven years in our Institution for the treatment of symptomatic patients is osseous decompression with dural grafting and intradural dissection of adhesions in all patient

Results: The long-term (6 months postoperative) surgery-related result was considered excellent if symptoms resolved. The result was considered good if the patient experienced significant improvement but also residual symptoms (8 patients). A poor result indicated no change in symptoms (1 patient).

Conclusions: Regarding Chiari I malformations, the author considers that a proper patient selection is critical to prevent unnecessary procedures and maximize the outcome. In light of this study results and recent literature, the author considers that the surgical gold standard consists in three key steps: posterior fossa craniectomy followed by durotomy and subarachnoid decompression of CSF flow and last duroplasty.

Key words: small posterior fossa, osseous decompression, dural graft, syringomyelia

ABSTRACT ORAL

OP 077

A CASE SERIES OF HYDROCEPHALUS AS CLINICAL INDICATOR OF CENTRAL NERVOUS SYSTEM RELAPSE IN ACUTE LYMPHOBLASTIC LEUKEMIA IN RSUP DR. SARDJITO

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Background: Hydrocephalus is one of clinical problem found in pediatric neurosurgical RSUP dr. Sardjito. This condition involves dilatation of cerebral ventricular system due to various etiologies. It is classified into two conditions, communicative and obstruction type. Various etiologies cause different clinical features and need different modality of treatments. Acute lymphoblastic leukemia (ALL) is the most common cancer diagnosis in children. While current treatment has greatly improved survival rates, relapse occurs in 15-20% of patients. Signs and symptoms are similar to those found at initial presentation. However, in some patients, relapse can occur in the central nervous system (CNS), even if they did not have previous CNS involvement. Many cases of CNS relapse are clinically silent and are discovered at the time of bone marrow relapse. These patients can be asymptomatic or show signs of mass effect or increased intracranial pressure. Classic Head CT Scan findings dilatation of cerebral ventricular system. In this case report, we describe a child with limfoblast in ALL with CNS involvement.

Methods: Patients younger than 10 years diagnosed with ALL and hydrocephalus. Three cases were confirmed based on histopathology of Bone Marrow Punture (BMP). Laboratory studies, initial pathology, and imaging were abstracted.

Results: on progress

Conclusions: on progress

Keywords: Hydrocephalus, ALL, childhood cancer.
ABSTRACT ORAL

OP 078
CVJ ANOMALY: AN OVERLOOKED CAUSE OF STROKE IN YOUNG

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Background
Craniovertebral junction anomalies (CVJA) are more common in the developing part of the world. They are an often-overlooked cause of posterior fossa stroke. We present a rare series of 13 cases, which highlights the importance of timely diagnoses of this treatable condition.

Methods
We retrospectively reviewed medical records of 13 patients, who were presented with posterior circulation stroke (PCS) and eventually were diagnosed to be having CVJA. 11 of these patients had undergone posterior fixation at our center. We reviewed their clinical, radiological findings and post-operative outcome. We also reviewed PUBMED and Medline for similar cases and the published case reports/series were also reviewed thoroughly.

Results
Thirteen patients of CVJ anomaly, who had presented with PCS were included in the study. All except one were young males (Age ranged from 1-35 Yrs, Mean = 18 Yrs) Some of the most common symptoms were of PCS i.e. headache, vomiting, gait ataxia, vertigo and slurring of speech. Episodic hemiparesis and loss of consciousness were other rare symptoms. The median duration of symptoms was 7 days (range 1 day to 10 months). PCS was also documented in all patients, along with CVJA. CT or 4 vessel angiography (CTA) in all cases revealed abnormal course of vertebral artery. All patients underwent posterior fixation and had no further worsening.

Conclusions
Young males with PCS, in developing countries, must undergo evaluation for CVJA. Proper imaging is integral for surgical planning. Timely diagnoses and posterior fixation can prevent progression of deficits.

ABSTRACT ORAL

OP 079
GIANT INTERPARIETAL ENCEPHALOCELES: HOW WE MANAGED THEM

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Abstract
Encephalocele is a type of neural tube defect characterized by a herniation of the brain and meninges through structural defect in the bony structures of the skull. Classification is based on defect of the skull area. Almost 80% of all encephalocele case occur in the occipital area, wherein in Asia abundant cases occur in the frontoethmoidal area. A midline defect of interparietal area is a rare skull defect which may lead to an encephalocele pathology. Surgical management is mandatory to achieve long term good outcome in encephalocele patients. The author report two cases of ‘giant’ interparietal encephalocele which was managed with surgical approach. The author performed cele reduction with coronal incision and duramater was dissected with preservation of blood vessel. Cerebro-spinal fluid (CSF) was drained to decompress the intracranial cavity. Promulgate brain parenchyma was preserved and titanium-mash was applied to protect the brain parenchyma. Post-operative the patient gain fully recover without neurological deficit and scar infection.

Keywords: Congenital anomaly, Interparietal encephalocele, Vertex encephalocele
SHORT-TERM FOLLOW-UP OF ADDITIONAL GRAVITATIONAL VALVE IN THE MANAGEMENT OF SYMPTOMATIC OVERDRAINAGE IN CHILDREN WITH FIXED DIFFERENTIAL PRESSURE VALVE SHUNTS

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Background
Overdrainage of CSF remains a common adverse effect in ventriculoperitoneal shunt therapy with fixed differential pressure valves. However, the use of additional gravitational valve for relieving symptoms associated with overdrainage in previously shunted children has not yet been evaluated. The aim of this study was to evaluate the efficacy of insertion gravitational valve into the fixed differential pressure valve shunts for the treatment of symptomatic overdrainage.

Methods
Five children with a fixed differential pressure valve shunt system and symptomatic overdrainage (orthostatic headache, slow shunt valve refill, slit ventricle, or subdural hematoma / hygroma) were treated by insertion of additional gravitational valve into the fixed differential pressure valve shunt in retroauricular region. Clinical and radiological outcome were monitored for a minimum 6 months after surgery.

Results
The median age of patients at the time of insertion of the gravitational valve was 3 years (range 11 months – 9 years). Four patients with congenital hydrocephalus, one patient with hydrocephalus caused by pineal tumor. We followed the patients 6 months after gravitational valve insertion. Insertion of a gravitational valve resulted in either resolution or improvement of the symptoms in all patients. Neither clinical worsening nor proximal catheter obstruction after implantation of the gravitational valve could be observed. All patients demonstrated prompt refill of the shunt valve after surgery.

Conclusion
Insertion gravitational valve into fixed differential pressure valves shunt system was effective in improving symptomatic overdrainage in the majority of patients in the present study.

Keywords: gravitational valve, hydrocephalus, overdrainage

MODIFIED REVISED TRAUMA-MARSHALL SCORE: A PROPOSE TOOL PREDICTS OUTCOME IN MODERATE AND SEVERE TRAUMATIC BRAIN INJURY

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Background:
Traumatic brain injury (TBI) is a common healthcare problem related to disability. An easy-to-use trauma scoring system informs physicians about the severity of trauma and helps deciding the course of management. A good trauma scoring system quantifies the severity of injury, predict patient’s outcome, and useful for research purpose. The purpose of this study is to used the combination of assessment physiological and anatomical factors that predict the outcome, and develop a modified prognostic scoring system in TBIs.

Patients and Methods:
In this prospective observational study, 181 subjects admitted to emergency department (ED) of Sanglah General Hospital were eligible. Both Marshall CT scan classification score and Revised Trauma Scores (RTS) were documented upon admission. Glasgow Outcome Score (GOS) was then documented at six months after brain injury. A new Modified Revised Trauma-Marshall score (m-RTS) was developed using statistical analytic methods.

Results:
The total sample enrolled for this study was 181 patients. The mean RTS upon admission was 10.2 ±1.2. Of the 181 subjects, 110 (60.8%) were found to have favourable GOS (GOS score >3). Best Youden's index results were obtained with any of the RTS of < 10 with area under receiver operating characteristic (ROC) curve of 0.2542 with risk ratio of 2.9 (CI95%=1.98-4.28; p=0.001), and Marshall score £ 2 with area under ROC curve of 0.2249 with risk ratio of 3.9 (CI95%=2.52-5.89; p=0.001). The RTS-Marshall combination has higher sensitivity with risk ratio of 4.5 (CI 95%=2.55-8.0; p=0.001) for screening tools of unfavourable outcome. The Pearson's correlation between RTS and Marshall classification is 0.464 (p<0.001).

Conclusion:
Combination of physiological and anatomical score improves the prognostic of outcome in moderate and severe TBI patients, formulated in this accurate, simple, applicable and reliable m-RTS prognostic score model.

Keywords: head injury, CT scan, revised score, prognostic score
ABSTRACT ORAL

OP 082

DEMOGRAPHY, HISTOPATHOLOGY AND SURGICAL OUTCOME OF SPINAL TUMORS IN DEPARTMENT OF NEUROSURGERY FACULTY OF MEDICINE UNIVERSITAS INDONESIA – RSUP NASIONAL DR. CIPTO MANGUNKUSUMO

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Introduction
Spinal tumor is a diverse pathological and anatomical group of neoplasms, which in their progression give compression to spinal cord and/or nerve root, presenting as similar clinical presentation, such as myelopathy and/or radiculopathy. The aim of this study to establish the profile and outcome of spinal tumors in tertiary hospital.

Methods
We performed retrospective descriptive analytic for cases with spinal tumors, operated between 2014 and 2018 in Department of Neurosurgery Cipto Mangunkusumo National General Hospital. Registry data from Spine Division Department of Neurosurgery Faculty of Medicine Universitas Indonesia were collected and analyzed. Surgical outcome was assessed by comparing pre-operative and post-operative functional outcome (JOA, NDI, ODI).

Results
Of the 81 cases operated at our center, 38 (46.9%) patients were male and 43 (53.1%) were females. The mean age at surgery was 43.7 years (range 4 years to 69 years). Of these tumors, 45 (55.5%) cases were intradural extramedullary, 14 (17.3%) cases were intramedullary, 22 (27.2%) cases were extradural tumors. Thoracal vertebral segment was involved in 43 (53.1%) cases. The histopathological diagnosis was 30 (35.8%) nerve sheath tumors, 13 (15.5%) meningiomas, 6 (7.1%) ependymomas, 5 (6%) astrocytomas, 2 chordomas, 3 hemangiopericytomas, 15 spinal metastasis, and 5 other spinal tumors (lipoma, hemangioblastoma, and ganglioglioma). Duration of follow up was 28.7 months (range 2 – 54 months). Outcome analysis was also done and 85.9% patients described good functional outcome.

Conclusions
There was similar sex prevalence in spinal tumors. Thoracal-segment involved, intradural extramedulldary tumors, and nerve sheath tumors were the most prevalence in spinal tumors. The surgical outcome, in terms of recovery and spinal stability of benign tumors, is comparatively better than malignant ones.

Keywords: histopathology, epidemiology, spinal tumor, surgical outcome

ABSTRACT ORAL

OP 083

HEMICHOREA POST STROKE CONTROLLED WITH UNILATERAL PALLIDOTOMY.

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Background: Abnormal involuntary movements following stroke can be hyperkinetic as hemichorea and hemiballism or can be hypokinetic as Parkinsonism. Hemichorea is a unilateral continuous, random, and distally predominant jerking movement that may involve proximal muscles, while hemiballism is a unilateral, involuntary, and large amplitude proximal movement. Poststroke hyperkinetic movement disorders have an incidence extremely low and have been associated with both infarct and cerebral hemorrhage. We report one such interesting case here posing difficulties in management of the patient.

Method: Case report

Result: A 64-year-old female presented with history of sudden onset involuntary movements in the left arm and leg. There was no history of similar movement in the right limbs. The movements were unilateral were suggestive of left hemichorea. Magnetic resonance imaging of the brain showed hyperintensity with restriction on diffusion-weighted imaging in right basal ganglia suggestive of infarct. This patient remained refractory to all the drugs described in literature for 4 months and adequate control of it achieved only with Gpi contralateral pallidotomy.

Conclusion: We report a patient who presented with sudden onset, hemichorea of left limbs due to acute right basal ganglia infarction who intractable for medical treatment but well controlled with right Gpi pallidotomy.

Key word: Hemichorea; post stroke; pallidotomy

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INCIDENCE OF INTRACRANIAL MENINGIOMA IN PATIENTS WITH FAMILY HISTORY OF SOLID ORGAN MALIGNANCY

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Objective: To Know the Incidence of Intracranial Mengioma in Patients with Family History of Solid Organ Malignancy

Methodology: Study was a randomized control trial conducted at Punjab Institute of Neurosciences (PINS)/Lahore General Hospital (LGH) /Postgraduate Medical Institute (PGMI) from January 2015 to July 2016 incident intracranial meningioma. A total of 170 patients, both genders, with age range of 18-52 were enrolled that were equally divided into cases and controls based upon family history of presence of solid organ malignancy (cases) and without any family history of malignancy (control). A trained senior postgraduate resident neurosurgeon and a house officer were given identical standardized and structured history forms to take a proper history from the enrolled cases and controls and their histories were matched in order to countercheck by the registrar. Individuals with a prior history of a brain or nervous system tumor were excluded. Controls were selected from individuals admitted to the study hospitals during the same time period who were diagnosed with nonmalignant conditions and were matched to meningioma cases on age, sex, race, profession and residence so that the distribution of these variables would be.

Calculations for ORs and 95% confidence intervals (CIs) were performed to estimate the relative risk of meningioma among persons who reported the occurrence of a solid organ malignancy in a relative, compared without using conditional logistic regression. Adjustment for the matching variables race/ethnicity, sex and age and excluded respondents who could not provide information about first-degree relatives.

Results: Relatively few studies have examined meningioma risk in relation to family history of cancer. We conducted a hospital-based case-control study in patients with meningioma cases (n = 85) were identified at three regional referral hospitals from January 2015 to July 2016. Controls (n = 85) admitted to the same hospitals for nonmalignant conditions were frequency-matched on age, sex, race/ethnicity, hospital, and proximity of residence to hospital. Participants were questioned elaborately through thorough history taking in with special emphasis on any family member who has/had cancer. Odds ratios (ORs) were calculated to estimate the risk of meningioma associated with family history of cancer. Participants with family history of any solid organ tumor (n=57, Mean= 0.67, SD=19.79, OR= 2.03; confidence interval 95% CI, 3.5–4.8).

Shared environmental or genetic factors in families may influence risk. Our findings suggest that individuals with a family history of solid organ cancers may have an increased risk for meningioma. Proper history was taken using standardized history form from two different doctors, a junior house officer and a senior medical officer to countercheck the accuracy.

Conclusion: From our study we concluded that the incidence of intracranial meningioma is highest in people with a family history of solid organ malignancy. Such patients should be recorded and counseled. A thorough history regarding any systemic signs/symptoms and examination of the patient should be performed in order to rule out presence of systemic malignancy in the subject. This study emphasizes a high level of suspicion of meningioma in patients with signs/symptoms suggestive of intracranial mass lesion with history of familial history of solid organ malignancy.
ABSTRACT

OP 085

LATE ONSET SEIZURE ND LEFT HEMIPARESIS AFTER UNUSUAL CRANIOCEREBRAL PENETRATING INJURY BY A RUSTY SICKLE (CASE REPORT)

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Introduction
Penetrating injuries of the skull and brain are relatively uncommon, representing about 0.4% of head injuries. Approximately 70-90% of these victims die before arriving at the hospital. Penetrating head injuries generally occur as the result of violence, including self-inflicted wounds, unexpected events, worker’s accidents, etc. A knife blade is the most common agent, but wooden objects, scissors, firearms, and recently nail-guns have all featured.

Case Report
A 26-year-old male came with rusty sickle penetrated into his skull head after fought with his friend. He was brought to the hospital with conscious condition. Brain CT scan showed that the rusty sickle was located at the right side gyrus precentralis with underlying tract hematoma. We found a small amount of subarachnoid hemorrhage and subdura hemorrhage and performed craniectomy evacuation subdura hemorrhage and debridment. After 16th postoperatively, the patient was complain seizure and left hemiparesis.

Discussion
Late-onset seizures, can present as focal seizures or focal seizures with secondary generalization in as many as 50% of patients. Heme and iron have both been shown to have effects on synaptic transmission that may cause epileptogenesis. Vascular complications are among the most common and most devastating and can include cerebral vasospasm. Subarachnoid hemorrhage can result in delayed cerebral vasospasm and delayed cerebral ischemia. CT Angiography has become the first-line technique to confirm vasospasm, showing the narrowing of vessels, and to assess it’s ischemic.

Conclusions
Late seizures are thought to be caused by cortical damage due to iron deposition and elevated levels of excitatory amino acid Glutamate. Heme and iron have both been shown to have effects on synaptic transmission that may cause epileptogenesis. Delayed vasospasm in TBI is thought to relate to hemoglobin degradation and subsequent inflammatory cascade. There are several theory regarding the mechanism of CCF formation, one theory stated that in CCF carotid artery is torn either by a bony fracture or by shear force during trauma. Another theory proposed an alternative theory; there is an sudden increase in intraluminal pressure of the ICA with concurrent distal artery compression, which the forces rupture of the vessel wall. Traumatic CCF could also caused by projectile or slash injuries that result in laceration of the cavernous carotid artery. Also rarely happen there’s also report of CCF caused by iatrogenic injury during

Keywords: Penetrating injury; seizure; left hemiparesis; cerebral vasospasm

ABSTRACT

OP 086

CAROTID CAVERNOUS FISTULA

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Carotid cavernous fistulas are vascular shunt allowing blood to flow from the carotid artery into the cavernous sinus.1,2 The clinical feature of this fistulas is mainly are sequale of hemodynamic dysfunction within the cavernous sinus. On average, the cavernous sinus measures 2 cm anteroposteriorly, with 1 cm in lateral width , and 1.3 cm in vertical dimension. Cavernous sinus contain major neural and vascular structures such as Internal Carotid Artery, Cranial nerve III, IV, V, VI.3,4 The vascular and neural structure in the cavernous sinus is responsible for the clinical feature found in CCF such as cranial nerve palsies, chemosis, proptosis, pain, reduced visual acuity and blindness.1

Carotid-cavernous fistula classification were based on etiology, hemodynamic, and anatomy. Etiological classification distinguishes spontaneous lesions from those occurring due to trauma. Anatomical classification defines direct CCFs as those arising directly from the carotid artery, while indirect CCFs are those originating from carotid artery branch vessels. Hemodynamic classification separates CCFs into high-flow and low-flow fistulas. Barrow et al defined 4 types of CCFs (Type A-D).1,3 Type A CCFs are direct, high-flow lesion connecting the ICA directly to the cavernous sinus. Type B CCFs is high flow and direct, arise from ruptured ICA, type C arise from meningeal branches of the ICA, and type D arise from meningeal branches of the ICA and ECA.1,3-6

Etiology

Traumatic CCF

Traumatic etiology of CCF is the most common type, accounting for up to 75% of all CCF.1 Typically this type of CCF occur as a result of a closed head injury associated with skull base fracture. There are several theory regarding the mechanism of CCF formation, one theory stated that in CCF carotid artery is torn either by a bony fracture or by shear force during trauma.2 Another theory proposed an alternative theory; there is an sudden increase in intraluminal pressure of the ICA with concurrent distal artery compression, which the forces rupture of the vessel wall.3 Traumatic CCF could also caused by projectile or slash injuries that result in laceration of the cavernous carotid artery. Also rarely happen there’s also report of CCF caused by iatrogenic injury during

Keywords: Carotid cavernous fistula; trauma; etiology; hemodynamic; anatomy.
ABSTRACT ORAL

OP 086

Cranioectomy, carotid endarterectomy, traspernoidal procedure, and endovascular procedure.1–3

Spontaneous CCF

Spontaneous CCF account for 30% of all CCF, mostly found in older, female patient.1–3 The most common cause of spontaneous CCF is ruptured cavernous ICA aneurysm.2 In addition to carous aneurysm, genetic conditions such as fibromuscular dysplasia, Ehlers-Danlos syndrome and pseudoxanthoma elasticum are known as predisposing factor of spontaneous CCF. In individual with cavernous aneurysm or predisposition syndromes it has been theorized that microscopic venous thrombosis or increases in venous sinus pressure may facilitate fistula formation by causing microscopic breaks in dural vessel to the cavernous sinus.1

Clinical Presentation

Direct irritation or associated trauma to the cranial nerves traversing the cavernous sinuses can result in third, fourth, fifth, and sixth nerve palsies. Retrograde flow of arterialized blood through the superior and inferior ophthalmal veins into the orbit may cause proptosis, chemosis, pain, and reduced visual acuity. Retinal perfusion pressure can be compromised to the extent of inducing permanent blindness. These ocular symptoms may be exacerbated by hypoplasia or thrombosis/occlusion of the inferior petrosal sinuses that can occur as a result of prolonged arterovenous artery-vein communication.

Treatment Option

The goal of CCF treatment is to completely occlude the fistula while preserving the normal flow of blood through the ICA. Historically ligation of the CCA was the surgical intervention of choice for the treatment of patients with CCF. Benjamin Travers is credited with performing the first successful surgical CCA ligation in 1809 for a patient with pulsatile exophthalmus.1 A century later in 1908 DeSchweinitz and Holloway reported the results of 114 patients treated with CCA ligation for pulsatile exophthalmos and found a 56% success rate and an 11.7% mortality rate.2 Other research in 1994 also reported the results of 351 patients treated with either CCA ligation (82 patients) or cervical ICA ligation (69 patients) and found that 52% of the patient had a successful outcome, 12.6% of the patients developed hemiplegia, and 5.3% died.3 The high morbidity and mortality rates seen with these procedure clearly necessitated further treatment refinements.

CCF may be treated using direct surgery, conventional radiation therapy, stereotactic radiosurgery, intermittent manual self-compression of the affected ICA with the contralateral hand, or even occlusion of the ipsilateral ICA.1,4,5,6 In general, however, endovascular embolization is the optimum treatment for these lesions that produce progressive or unacceptable symptoms and signs including visual loss, diplopia, an intolerable bruid, severe proptosis, and, most importantly, cortical venous drainage.

Transarterial or transvenous embolization is the firstline treatment modality for the treatment of most CCFs. Metalic coils and/or liquid embolic agents are now most commonly used for this purpose after the withdrawal of detachable ballons from US market in 2003.2–4 Transarterial access is often used when the CCF originates from branches of the ECA as well as in select cases of direct fistulas. When the CCF originates from branches of the ICA, transarterial embolization is significantly more difficult and carries an increased risk of stroke due to embolic reglux into the ICA. In these case, a transvenous approach is used, and fistulas is occlude using either a coil or liquid embolization of the cavernous sinus.2–4

Prognosis

After a successful intervention with complete closure of a CCF, symptoms such as chemosis and proptosis generally resolve within hours to days. Cranial nerve palsies will resolve over the course of several weeks.2–4 The prognosis in CCF case is mostly dependent on the pathogenesis, severity, and duration of the preintervention deficit. Recurrence of CCFs can be found in several cases but can typically be treated by repeat embolization.

Conclusion

Neurovascular embolization is the preferred treatment for both types of Carotid cavernous fistula. In cases in which endovascular cure is not possible, embolization alone can be palliative. Or it can be used preoperatively for minimization of intra operative hemorrhage. Future advancement in endovascular equipment and technique will improve Carotid cavernous fistula management and minimized management related complication.

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ABSTRACT ORAL

OP 086


ABSTRACT ORAL

OP 087

HIGH FILAMIN-C EXPRESSION PREDICTS ENHANCED INVASIVENESS AND POOR OUTCOME IN Glioblastoma Multiforme

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Abstract

Background. Glioblastoma multiforme (GBM), the most common brain malignancy in adults, is generally aggressive and incurable, even with multiple treatment modalities and agents. Filamins (FLNs) are a group of actin-binding proteins that regulate the actin cytoskeleton in cells. However, the role of FLNs in malignancies—and particularly in GBM—is unclear.

Methods. The overall survival of 90 GBM patients at Kagoshima University Hospital was evaluated by Kaplan Meier analysis and by in silico analysis of The Cancer Genome Atlas (TCGA) data. FLNC-overexpressing U251MG and LN299 GBM cells and U87MG and KNS81 FLNC knockdown cells were used to assess FLNC function in GBM. Cell migration and invasion were examined with the transwell assay. The gelatin zymography assay was used to estimate matrix metalloproteinase (MMP)2 activity.

Results. In silico analysis of GBM patient data from TCGA and immunohistochemical analyses of clinical GBM specimens revealed that increased FLNC expression was associated with poor patient prognosis. FLNC overexpression in GBM cell lines was positively correlated with enhanced invasiveness but not migration and was accompanied by upregulation of MMP2.

Conclusions. FLNC is a potential therapeutic target and biomarker for GBM progression.

Keywords: Filamin, glioblastoma, prognosis, invasion, MMP2
RAPID IMPROVEMENT IN MOTORIC STRENGTH AFTER CRANIOLAPSY IN PATIENT WITH SINKING SKIN FLAP SYNDROME: A CASE REPORT

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Abstract

Background
Sinking skin flap syndrome (SSFS) is a rare and poorly understood complication of craniectomy, characterized by improved neurologic symptoms after cranioplasty. A number of theories have been proposed for the pathophysiology behind SSFS, including direct effects of atmospheric air on the brain, alterations in cerebrospinal fluid hydrodynamics and changes in cerebral blood flow and metabolism. We present a case of patient who was suspected of having SSFS with sunken brain flap and no motoric improvement after decompressive craniectomy surgery, then experienced immediate improvement of motoric strength following early cranioplasty.

Case Report

We report a 24-year-old male who underwent cranioplasty to correct his cranial defect. Patient with history of decompressive craniectomy 2 months earlier because of traumatic intracerebral hematoma, cerebral contusion and brain edema. Before the surgery, patient presented with decreased consciousness and right hemiparesis (motoric strength: 0000 and 0001 for right arm and leg correspondingly). After surgery, consciousness improved gradually but motoric strength remained the same. One month after surgery, patient started to develop a sucked in left frontotemporoparietal scalp flap over the craniectomy defect. We suspected patient as having SSFS. Early cranioplasty was done 2 months after the first surgery. Following cranioplasty, motoric strength immediately improved, and showed even more improvement in the 6 months follow-up.

Discussion

In this case, patient had sunken skin flap and, although there were no arrest of rehabilitation or acute neurological deterioration, patient had no motoric improvement after decompression, therefore SSFS was suspected. An early cranioplasty led to a remarkable improvement in patient’s motor deficit. Cranioplasty improved brain perfusion and haemodynamic. This reflected the importance of early recognition of SSFS and that cranioplasty also served as a therapeutic procedure beside a cosmetic one.

Keywords: sinking skin flap syndrome, cranioplasty, syndrome of the trephined, decompressive craniectomy

OP 089

SURGICAL MANAGEMENT OF TUBERCULOSIS OF THE SPINE: A RETROSPECTIVE ANALYSIS OF 127 CASES IN A TERTIARY CARE HOSPITAL OF BANGLADESH.

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Abstract

Introduction: Tuberculosis was a leading cause of mortality in the beginning of the twentieth century. Improvement in the socio-economic status led to a major decline in the prevalence even before the introduction of anti-tubercular drugs. However, it continues to be a major public health problem in developing countries like Bangladesh. The objective of current study is to observe the results of surgical treatment of tuberculosis of the spine.

Materials and Methods: This is a retrospective study. This was carried out in the department of Neurosurgery, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh during the period of January 2013 to December 2017. The patients were divided into two groups. One group was treated by surgery without instrumentation and other group was treated by surgery with instrumentation. All patients given anti-tubercular drugs for 18 months. The outcome of the treatment were recorded and analyzed.

Results: Total number 127 cases were treated during the study period with the diagnosis of tuberculosis of the spine. The mean age of the patient was 32 years. Among them in 72 cases only surgical decompression done and other 55 cases were treated by surgical decompression and stabilization. Significant neurological improvement observed in the both groups of patients. Only one patient failed to improve neurologically. Two patients developed resistant to first line anti-tubercular drugs and one patient showed hardware failure.

Conclusion: Early surgical intervention is optimum mode of treatment. Surgery without instrumentation is the preferred option in developing country like Bangladesh.

Key words: Tuberculosis of the spine, surgical management, instrumentations
ABSTRACT

CASE REPORT

POST TRAUMATIC MEMORY FUNCTION DISTURBANCE ASSOCIATED WITH DEPRESSED SKULL FRACTURE

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ABSTRACT

Background Post traumatic memory function disturbance after depressed skull fracture was uncommon case as a sequelae of traumatic brain injury. Impairment of memory was directly related to severity of acute head injury as reflected by the Glasgow Coma Scale (GCS) score on hospital administration and by duration of impaired consciousness. Here we report a case of adolescence with memory impairment associated with depressed skull fracture and improvement after perform surgical management for the fracture.

Case A case of 17 years old boy with GCS 15 and memory impairment on admission after two weeks motor vehicle accident is reported. Head CT Scan demonstrated a displace depressed fracture at left frontoparietal with cerebral infarction below the fracture segment and cerebral prolapse. The patient underwent a surgery for fracture elevation, fragmented bones was removed, followed by duraplasty using a pericranial flap, and we performed cranioplasty with titanium mesh and fixated with screws. Improved memory was achieved after 24 hours surgery. Memory function test was performed before and after surgery, and show significant improvement. The patient discharged after 1 week with stable neurological condition.

Conclusion: Depressed skull fracture may lead to direct damage or compression to underlying brain structure. After the operation, damage or compression was disappear and memory impairment as a sequelae condition was improved.

Keywords: memory impairment, depressed fracture

OP 091

NON SURGERY TREATMENT ON MASSIVE CORPUS CALLOSUM HEMATOMA WITHOUT DISCONNECTION SYNDROME: A CASE REPORT

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Introduction Hematoma of the corpus callosum is a rare case. Many cases of corpus callosum injury present with permanent disconnection syndrome. The mechanisms are poorly understood with many theories are proposed.

Case Report We present a case of a 42-year-old female suffered moderate traumatic brain injury after traffic accident resulted in massive corpus callosum hematoma which was managed non-surgically. The patient initially had decreased of consciousness. After few days, the patient had conscious without symptoms of disconnection syndrome.

Conclusion Disconnection syndrome is rare but possible event and should be suspected in case of Hematoma of the corpus callosum. The management of corpus callosum hematoma is controversial.
ABSTRACT ORAL

OP 092

IATROGENIC SPINAL SUBDURAL HAEMATOMA AS A COMPLICATION OF LUMBAR PUNCTURE: A CASE REPORT

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Introduction: Spinal Subdural Hematoma (sSDH) is a rare condition which associated with trauma, lumbar puncture, hemorrhagic disorder, anticoagulant therapy, spinal surgery, tumor, vascular malformations, and spinal or epidural anesthesia. Signs of acute or progressive, painful paraparesis and/or paraparesis with sphincter dysfunction are well-known indications for emergency MRI of the spine. Rupture of the vasculature within the subarachnoid or subdural space has been proposed as a potential pathogenic mechanism in certain cases. Early diagnosis and treatment result in a better prognosis.

Case Report: A 46-year-old woman, came with a headache and blurry vision for 5 months, suspected having bacterial meningitis and currently receiving therapy. Then the patient performed a lumbar puncture three times. Two days after the procedure, the patient complained of pain from the waist to the legs, numbness in both legs, difficult to move especially in left leg, and difficulty in urinating. On examination, the patient was found paraparesis UMN, with grade 5/5 strength in bilateral upper extremities and grade 3/3 strength throughout bilateral lower extremities. Thoracolumbar MRI was done, which revealed a subacute hematoma in the subdural space starts at L1 to L5 level with the widest L2 0.97 cm causing canal stenosis at these levels. The lesion was hyperintense on T2 and T1 imaging. Postcontrast application, show an intrasessional increase and in sequence, T2 appears hypointense. Then the patient got an emergency laminectomy and hematoma evacuation. Postoperatively patient improved.

Conclusion: Our case illustrates an iatrogenic spinal SDH after a lumbar puncture procedure. Recognition of blood products on MRI helps in diagnosis and management planning. Laminectomy with an evacuation of spinal SDH should be performed before permanent damage to the spinal cord occurs.

Keywords: Lumbar puncture, Neurosurgery, Spinal Subdural Haematoma

References:
**NEUROSURGICAL LESIONING FOR CANCER PAIN**

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Neurosurgeons have been involved in pain management since the birth of our specialty. We have been able to treat successfully conditions such as trigeminal neuralgia and back pain due to herniated disc. We have also been involved in interventional pain management for various acute and chronic pain conditions. Intractable chronic pain forms a unique condition that is distinct from other pain syndromes. They are refractory to other known therapies and sometimes requires neurosurgical intervention. Neurosurgical intervention is divided into ablation and neuromodulation. In this talk, we will discuss various forms of neurosurgical lesioning (e.g., Mesencephalotomy, Thalamotomy, Cingulotomy, Cordotomy, Myelotomy, DREZ, Rhizotomy) since it will be more applicable in the socio-economic conditions of Indonesia.

**MULTIPLE MENINGIOMAS TREATMENT IN DR. CIPTO MANGUNKUSUMO HOSPITAL: A CASE REPORT**

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**Introduction**

Multiple meningiomas are rare and choice of treatments should include consideration for both the risks and benefits. We present a case of a patient who was diagnosed as multiple meningiomas, underwent surgery and radiotherapy.

**Case Illustration**

A 58-year-old female patient first came with multiple seizures, headache, and weakness on the right side. Initial MRI showed extraaxial mass in left frontoparietal lobe. Only subtotal tumor resection was performed because of intraoperative bleeding. Histopathological examination showed meningotheliomatous meningioma WHO grade 1 and chordoid meningioma WHO grade 2. Patient then underwent radiotherapy treatment. Four years later, patient came with decrease of consciousness. The MRI showed a new mass in the left temporal lobe and enlargement of the frontoparietal meningioma. Patient immediately underwent a live-saving surgery to remove the temporal tumor, which shows meningioma WHO Grade 1 in histopathological examination. Three months later, patient back with multiple seizure, then underwent third operation to remove the remaining tumor with Simpsons Grade 1 resection and atypical meningioma WHO grade 2 histopathological examination result.

**Discussion**

Multiple meningiomas are defined as the presence of >2 spatially separated synchronous or metachronous lesions. Symptomatic, progressively enlarging tumors or cerebral edema are candidates for treatment, the gold standard of which is complete surgical resection. Following neurosurgical interventions, recurrence and progression in WHO grade may occur. In this case, there was recurrence after previous surgery. The second surgery was performed in the temporal region as a live-saving surgery. Histological examination shows that the tumor is not radiosensitive and removal surgery is performed on the remaining tumor.

**Conclusions**

Management of multiple meningiomas is similar to the approach taken for solitary tumors. The use postoperative radiotherapy was prescribed exclusively for cases of partial removal with recurrence and tumors with grades other than WHO grade 1.

**Keywords:** brain neoplasm, multiple meningiomas, craniotomy
ABSTRACT ORAL

OP 095

CEREBRAL COLLATERAL CIRCULATION IN TOTAL OCCLUSION OF THE RIGHT INTERNAL CAROTID ARTERY

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Abstract

Background
Collateral circulation was often found in patient with total occlusion of internal carotid artery (ICA), but collaterals between external and internal carotid arteries was a rare case. We present a case of patient with collateral circulation between external and internal carotid artery following total occlusion of right ICA caused by microcatheter entrapment.

Case presentation
We present a case of 23 years-old male with AVM Spetzler-Martin grade III. During embolization procedure, we did selective microcatheterization of arterial feeders from the right anterior cerebral artery (ACA). Embolization of the arterial feeder by Onyx was performed using Echelon microcatheter placed through the guiding catheter. However, patient had seizures during the procedure so embolization was discontinued. The microcatheter was severed when being pulled out and left embedded in the Onyx cast. 3 days later, CT angiography was performed and microcatheter was found in the cervical segment of right ICA to the right ACA. No further intervention was done. In 1.5 years follow up, patient had not developed any neurological deficit. Seizure was controlled with medication. From DSA evaluation, the right ICA was found to be totally occluded. There was also the appearance of collateral, which was not visualized before, from the branches of the maxillary artery to the right middle cerebral artery.

Discussion
Cerebral collaterals were seen in more than 50% of patients with the most severe stenosis. The cerebral collateral circulation plays an important role preserving brain tissue perfusion. The protective role of the collateral circulation depends on several factors including anatomical variations, systemic arterial pressure, age and the rate of development of occlusive disease. In this patient, we suspected that collateral formed due to long-standing obstruction caused by microcatheter entrapment, and this collateral maintained sufficient blood supply so there wasn’t any neurological deficit in this patient.

Keywords: cerebral collateral, microcatheter entrapment

ABSTRACT ORAL

OP 096

CHIARI TYPE I MALFORMATION PROFILE IN CIPTO MANGUNKUSUMO NATIONAL GENERAL HOSPITAL FROM 2014 TO 2018

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Introduction
Chiari malformations are a heterogenous group of disorders that are defined by anatomic anomalies of the cerebellum, brainstem, and cranio cervical junction, with downward displacement of the cerebellum, with or without lower medulla, into spinal canal. Chiari type I malformation (CM-I) is characterized by abnormally shaped cerebellar tonsils that are displaced below the level of the foramen magnum. The clinical sign of CM-I are elevated intracranial pressure, myelopathy, cerebellar dysfunction, syringomyelia, or axial pain mainly in cervical or occipital area. The true frequency of CM-I in Indonesia is remain unknown. The aim of this pre-eliminary study is to know the epidemiology of CM-I especially in Jakarta.

Material and Methods
A retrospective review over the last 5 years of patients with CM-I was conducted at our institution. There were 18 patients with CM-I from 2014 to 2018. The diagnosis of CM-I was made from clinical sign and MRI. We classified patients to age, sex, surgery procedures, health cost, and length of stay.

Results
From 18 patients, 13 patients (72%) were female; the age range at the time of surgery between 27 to 54 years old; 16 patients (88%) underwent posterior foramen magnum decompression; all patients use Jaminan Kesehatan Nasional (JKN) to cover their medical expense, and the average length of stay was 6 days.

Conclusion
From this pre-eliminary study, we conclude that CM-I was more frequent in female, with age range from 27 to 54 years old. More samples are needed for better study result. Long-term follow up is needed to determine the success of CM-I treatment.

Keywords: Chiari malformation, syringomyelia, foramen magnum decompression
ABSTRACT ORAL

OP 097

SACRAL CHORDOMA: OPERATIVE MANAGEMENT, RADIOTHERAPY AND OUTCOME IN CIPTO MANGUNKUSUMO HOSPITAL (CASE SERIES)

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Background: Chordoma is rare bone tumors, locally invasive and has poor prognosis. It is usually present on the midline cerebrospinal axis and the most common locations are the sphenoid clival region and the sacrum. The tumors are slow growing and often evade detection because symptoms can be nonspecific until late in the course of the disease. The treatment of primary sacral tumors represents a challenge because of large tumor mass at presentation and a hemorrhage risk in surgery and high cost. Depending on the tumor size, the extent of the operation can vary from simple to total removal tumor and instrumentation. The poor sensitivity of sacral chordomas to chemotherapy and radiotherapy has rendered surgical resection as the primary treatment modality. The gold standard treatment for chordomas of the sacrum is en-bloc excision with wide margins and postoperative external-beam radiation therapy. This fact underlines the importance of obtaining a wide surgical margin, which is the crucial factor in achieving long term control and cure.

Case presentation: We present two cases of sacral chordoma treated with removal tumor and radiotherapy: a 39-year-old man has performed partial tumor removal, and a 63-year-old woman has total removal tumor (re-surgery), these case underwent internal debulking with piece meal.

Conclusions: We describe the sacral chordoma operative management performed at Cipto Mangunkusumo Hospital. Then the outcome of the management in both patients, was based on our scoring results using pain (VAS), clinical changes, Karnofsky, SF 36 and control imaging. Surgical technique is a safe and significant patient recovery for treatment of sacral chordoma.

Keyword: Sacral chordoma, Removat Tumor, Radiotheapry

OP 098

MANAGEMENT OF DELAYED CSF LEAKAGE AFTER FRONTAL BASED TUMOR REMOVAL: A CASE REPORT

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Background: Cerebrospinal fluid leakage (CSF) is a complication that sometimes happen unavoidably in skull base procedures. Many studies have been conducted covering several clinical aspects such as: risk factors, types of lesions, management, and prevention. CSF leakage can occur directly or delayed postoperatively. In this case report, it is explained the management of delayed cases of CSF leakage after tumor removal.

Case Report: Female, 27 y.o, diagnosis of delayed CSF leakage after tumor removal on frontal based. Intraoperatively, the tumor occupied the whole frontal bone ranging from its curve into the base, the whole bone was removed with the result was Meningioma WHO gr 1. The first three days postoperatively, the surgical wound was good and no salty sensation, up to day 4 the patient complained about the clear liquid coming out of the nose while sleeping and sitting with a salty sensation. Betadine test positive. Then with bed rest, antidiuretics, antibiotics, there was no improvement in 2 weeks. It was decided to perform lumbar drainage.

Discussion: Management of CSF leakage can be done conservatively or operatively. Intraoperatively, the tumor occupied the whole frontal bone ranging from its curve into the base, the whole bone was removed. There is a suspicion that CSF leakage can occur. Water tight suturing of the dura was performed, frontal sinus mucosal coagulation and putting bone wax at the frontal sinus with fibrin glue. Due to the damage of periosteum and fascia above the tumor and the sizes of the tumor we cannot find any vascularize tissue than can be used to cover up the defect. That is why the delayed CSF leakage was occured. Lumbar drainage followed by bed rest for 7 days to reduce CSF flow in frontal base defects in order to accelerate the healing process by reducing CSF flow through the defect.

Conclusion: CSF leakage can occur several days after surgery. Meningitis can be avoided by giving the right antibiotics. Lumbar drainage management in this case is very useful and is proven to bring maximum results in resolving CSF leakage.

Keywords: Rhinorrhea, CSF Leakage, Lumbar Drainage
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CASE SERIES: GAMMA KNIFE PREOPERATIVE PREPARATION FOR ARTERIOVENOUS MALFORMATIONS (AVMs)
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Introduction
Management of Arteriovenous Malformations (AVM) is controversial and complex. Gamma knife radiosurgery (GKRS) is one option of the AVM treatment and generally provides a 70–85% obliteration rate after 3–5 years and low morbidity rate. Gamma knife preparation for AVMs is different to another cases. This study was conducted to explore and analyze the preoperative preparation of gamma knife for AVMs patient in our centre.

Method
We report four cases of AVMs treated with gamma knife surgery, consisting of three Spetzler Martin (SM) grade 2 and one SM grade 3. Three patients are treated using local anesthesia and one patient underwent general anesthesia. After placing head frame for DSA, we performed digital substraction angiography (DSA). We change the ordinat frame and adapter than apply MRI before the Gamma Knife. The result of DSA and MRI are analyzed to determine the dose and target of the Gamma Knife surgery.

Result and Discussion
Placement technique of head frame for AVMs is different from another cases. From the DSA, all patients have nidus less than 3 cm, located in eloquent area. Three AVMs have MCA as its feeder artery, and one from P Comm and MCA. Three AVMs have vein drainage to cortical superficial vein and one to galen vein. DSA and MRI determiner more precise target area. No new neurological deficits were found after the Gamma Knife procedure.

Conclusions
Head frame placement is important to help the accuracy of gamma knife radiosurgery. DSA was used to analyze the real time nidus, eloquent area, anterior and posterior feeder and drainage of the AVMs. DSA of Anterior and posterior circulation of the cerebral should be performed for AVM that have more than one feeder. MRI was used to analyzed more precise location of the AVMs.

Keywords: Gamma knife, preoperative, AVMs

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AN UNUSUAL CASE OF THROUGH-AND-THROUGH STAB PENETRATING HEAD INJURY TO TEMPORAL LOBE WITHOUT NEUROLOGIC DEFICIT: A CASE REPORT

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Introduction
Penetrating trauma of the brain is one of the most damaging and lethal forms of trauma. Prognosis is generally poor and it conveys various sequlae such as pneumocephalus, meningitis, intracerebral hemorrhage and/or direct blood vessel or nerve injury. In this case we are to report an unusual case of penetrating stab wound to temporal lobe without any complications and sequlae.

Case Report
A 17 years old female came to emergency department with penetrating stab wound (knife) from the left temporal through the brain and right petrous bone. Initial GCS was 15 without any active bleeding and neurological deficit. Head CT scan reveals no hemorrhage, no compression of the sulci and gyri, no compression of sylvian fissure. We performed corpus alienum removal and debridement. Intraoperatively we found the knife stabbed 6 cm inside the brain, with 6 cc of ICH. We found no structural damage in the brain parenchyma. Post operatively the patient had no neurological deficit, and discharged at postoperative day 5 without any complications.

Conclusion
Penetrating head injury is a lethal form of injury, but in rare occasion of penetrating stab wound, the injury may missed the important structure of the brain and result in no complications or any sequlae for the patient.

Keywords: Penetrating trauma, brain injury, neurological deficit.
ABSTRACT ORAL

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ENDOSCOPIC FENESTRATION WITH UNEXPECTED INTRAVENTRICULAR SLOUGH DEPOSIT FOLLOWED WITH IVEL & EVD IMPLANTATION IN INFANT WITH INFECTED MULTILOCULATED CONGENITAL HYDROCEPHALUS: A CASE REPORT

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BACKGROUND
Management of multiloculated hydrocephalus is both surgically and clinically challenging, thus standard treatment for this particular case is not yet well-known. The author’s report a case of multiloculated hydrocephalus that was managed with endoscopic fenestration, intraoperatively found intraventricular abscess and performed intraventricular Endoscopic Lavage (iVEL) continued with external ventricular drain (EVD) implantation.

CASE DESCRIPTION
A two month old male infant presented with decrease of consciousness and intermittent fever, preceded with abnormal enlargement of head circumference since 1-month-old. Apart from a decreased consciousness, thorough physical examination of the patient acknowledged an upward vertical gaze palsy, and frontal bossing. Head ultrasound revealed enlargement of all ventricles, while contrasted computed tomography identified the presence of multiple septa. Preoperative planning for this patient was to perform an endoscopic fenestration and septostomy, followed by an implantation of ventriculoperitoneal (VP) shunt. Unexpectedly, intraoperative findings revealed abnormal ependymal deposits in the floor of both lateral ventricles and significant amount of yellowish slough on the third ventricle floor. In order to prevent further blockage of the ventricular flow, ependymal deposits and slough lavage was performed. Despite removal of the slough with infant NGT suction from the third ventricle floor, anatomical landmark was difficult to identify. After that septostomy was done, and surgery was immediately concluded with the implantation of external ventricular drain (EVD). 8 hours after the surgery, the patient’s consciousness is optimal, suggesting drainage has efficiently decreased intracranial pressure. In the ward, the patient was planned to receive intrathecal antibiotics.

CONCLUSION
Neurosurgical management of multiloculated congenital hydrocephalus remains challenging. From this case, we learnt that despite the importance of careful preoperative planning, intraoperative findings should be the main considerations in choosing the neurosurgical techniques that are eventually performed. Long-term evaluation on the described patient, and future prospective trials are necessary to assess the optimal management for this complicated type of congenital hydrocephalus.

Keywords: Multiloculated hydrocephalus, intraventricular slough, endoscopic fenestration, external ventricular drainage, Intraventricular Endoscopic Lavage,
**Conclusion:** Olfactory groove meningiomas are treatable. After surgical resection, reversal of the cognitive impairment and behavior changes can be expected.

**Keywords:** Olfactory groove meningioma, Giant meningioma, Neurological dysfunction, Frontal lobe syndrome, Prefrontal medial syndrome, Abulia, Abulia, Apathy.

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**SURGERY OF LEFT TEMPORAL REGION ARACHNOID CYST WITH NEUROENDOSCOPY (CASE REPORT)**

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**Background**

Today, the development of minimally invasive neurosurgery technique, has become a choice of treatment for many neurosurgical disease. Dr.Suyoto Hospital, Rehabilitation Center, Ministry of Defence of the Republic of Indonesia and Indonesian Airforce Hospital Dr. Esnawan Antariksa, Halim Perdanakusuma, Jakarta, Indonesia, has responsibility in public health services for military and civilian community. Therefore, to make better quality of neurosurgical health services, Dr. Suyoto Hospital and Indonesian Airforce Hospital Dr. Esnawan Antariksa, has provide minimally invasive neurosurgery services, including intracranial neuroendoscopy technique as a choice of treatment of many special and selective neurosurgical diseases. This paper has an objective to share experience in giving treatment with intracranial neuroendoscopy technique for patient with left temporal region arachnoid cyst.

**Methods and Result**

**Case Report:**

Girl, 17th years old, with headache. There was no neurological deficit, and from brain CT Scan, there was a cystic lesion at the left temporal region. The diagnosis was arachnoid cyst. She performed neuroendoscopic cystotomy and insertion of Omaya reservoir. After surgery, she had no headache, and there were no post-operative complications. Histopathology finding was arachnoid cyst. From follow up of brain CT Scan, there was improvement. We used intracranial neuroendoscopy device from B-Braun Aesculap, Germany, 2015.

**Conclusion**

Intracranial neuroendoscopy technique can be applied for the treatment of many special and selective neurosurgical diseases, including arachnoid cyst. In this patient, intracranial neuroendoscopy had good result. We still need more many of cases for determine the success rate of this intracranial neuroendoscopy technique statistically.

**Keywords:** intracranial neuroendoscopy arachnoid cyst cystotomy Omaya reservoir
INCIDENCE AND CLINICOPATHOLOGICAL FEATURES OF MENINGIOMA IN RSUP DR. SARDJITO DURING 2017

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Meningioma are the most common benign intracranial neoplasm. The tumors is slowly growing and originate from meningothelial cells found within arachnoid granulations. The incidence was 24-30% from intracranial tumors in all over the world (perry, 2007). From Central Brain Tumor Registry of the United States (CBTRUS) during 2016-2017 there was 3.76/100.000(men) and 8.44/100.000 (women) every year in the US. In indonesia there is still limited prevalency data of meningioma, especialy in RSUP Dr. Sardjito,Yogyakarta.

The aim of this study is to find out characteristic of meningioma base on gender, age when the tumor was found, clinical symptoms and histopathological findings and also intracranial location of the tumors. This research is descriptive study. We collected data retrospectively of Meningioma patients in Dr.Sardjito General Hospital from medical charts from January until December 2017. The variables were analysis used chi square test.

The incidence of intracranial meningioma in RSUP Dr. Sardjito jogjakarta, indonesa was reviewed during january until december 2017. 22 tumors was diagnosed, with male: female ratio was 1:10. History and physical finding was on progress. The age-specific annual incidence rate increased with age up to ninth decade with the peak was fifth decade. The distribution of histopathological benign subtypes (WHO grade 1) was meningotheliomatous (31.8%), Transitional (27.4%), fibroblastic (13.7%), angiomatous(4.5%) and unknown(9.1%). Distribution of malignant meningioma (WHO grade II and III) was clear cell (4.5%), chordoid (4.5%) and anaplastic (4.5%). The clinical history, signs and simptoms and also intracranial location of the tumors was on progress.

Keywords : Meningioma, histopathology, tumor classification, brain neoplas

SUBFRONTAL CRANIOTOMY APPROACH FOR MANAGEMENT OF CRANIOPHARYNGIOMA : CASE REPORT

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Background: Craniopharyngioma has a higher annual incidence of 5.25 cases per million in the pediatric population, it accounts for 2.5–4% of all brain tumors; about 50% occur in childhood. Peak incidence: age 5–10 yrs. Craniopharyngiomas most commonly arise in the sellar/ parasellar region, and characteristically manifested as three clinical syndromes: visual dysfunction, disturbance of the hypothalamic-pituitary axis, and raised intracranial pressure as a result of obstruction of flow of cerebrospinal fluid (CSF) and manifested as hydrocephalus. Complete surgical resection appears to be an important prognostic factor for recurrence and is the best management method for craniopharyngioma. Surgical approach for resecting a craniopharyngioma is determined by numerous factors, one of the tecnical approach is subfrontal approach.

Objective: To determine the one of the approach for management of pediatric craniopharyngioma.

Settings and Design: This is a case report of management of craniopharyngioma in DR. Sardjito General Hospital, a major referral center for brain tumor in Special Distric of Yogyakarta.

Conclusion: We performed gross total resection with subfrontal approach. We choose this method ensure midline orientation and access to both the optic nerves and internal carotid arteries.
A GIANT PITUITARY ADENOMA: SURGICAL EXCISION VIA SUBFRONTAL APPROACH.

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Pituitary tumours are the third most common primary intracranial tumours out of which 5–10% are giant pituitary adenomas (GPA). The operative management of giant pituitary adenomas represents a significant challenge for neurosurgeons. This challenge is amplified by the degree of local tumour infiltration into adjacent structures such as the cavernous sinus. The degree of parasellar tumour extension can be classified according to the Knosp grading system. We report a 36 years old female with a Knosp grade 3B, giant pituitary adenoma in surgical excision via subfrontal craniotomy was achieved. Typically, resection rates of less than 50% have been reported following surgery on giant pituitary adenomas. The various surgical approaches described for GPAs include transsphenoidal, transcranial and combined transsphenoidal and transcranial approaches. This case serves to illustrate surgical management of giant pituitary adenoma via subfrontal approach.

Keywords : Pituitary Adenoma, Giant, Subfrontal approach.

PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY (PELD) FOR LUMBAR DISC HERNIATION IN DR. SARDJITO GENERAL HOSPITAL 2017-2018

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ABSTRACT

Background: Percutaneous endoscopic lumbar discectomy (PELD) is one of the less invasive treatments for lumbar disc herniation which does not needs general anesthesia and has different approach from the others open discectomy methods. Lumbar disc herniation is a displacement of disc material beyond the intervertebral disc space and a major cause of back pain and sciatica.

Methods: In this study we collected data retrospectively of lumbar disc herniation patients who underwent PELD in Dr Sardjito General Hospital from medical records over August 2017 to October 2018, and the data were evaluated regarding demographic, symptom, level of LDH and primary outcome with Pain Visual Analogue Scale (VAS) and secondary outcome with blood loss, operation time, and post-operative length of stay.

Results: The total number of LDH patients who underwent PELD in Dr.Sardjito General Hospital over August 2017 to October 2018 was 14 cases. Gender of male and female was 50% - 50%, The mean age was 48,2 years, 8 patients (57%) had medium work and 2 patients (15%) heavy work. The most dominant body mass index was normal weight 57%, overweight 21%, and obesity 15%. There was significant reduction in the severity of pain with mean VAS pre-operative 4,7 to 1,1 on post-operative. The mean operative time was 95,7 minutes, mean blood loss was 12,5 cc, and mean post-operative hospital stay was 1,3 days.

Conclusion: PELD can now be considered an alternative to perform discectomy with the advantages are local anesthesia, small incision, short hospital stay, limited blood loss, rapid recovery and less-post operative pain.

Keywords: Percutaneous Endoscopic Lumbar Discectomy (PELD, Lumbar Disc Herniation (LDH), Pain.