The management of osteomyelitis at mandible due to neglected fracture: A case report from Hasan Sadikin Hospital, Bandung-Indonesia

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ABSTRACT

Introduction: Osteomyelitis is an inflammation of bone and bone marrow. It occurs more frequently in mandible compare to the maxilla and usually associated with suppuration and pain. This condition caused by many factors such as odontogenic infection, trauma, inadequate treatment of fracture or radiation. The purpose of this case report is to describe the management of osteomyelitis in a young adult patient due to neglected jaw fracture.

Case: A 27 years old male came to Departement of Oral and Maxillofacial Surgery – Hasan Sadikin Hospital with an extra-oral draining sinus at his right mandible region after a motorcycle accident about six months ago. OPG revealed a radiolucent mix radiopaque image surrounded by a radiopaque cortical border, large sequestra and loss of trabeculate internal structure.

Conclusion: This case shows that sequestrectomy is a definitive method of treating osteomyelitis with satisfying clinical and radiologic result.

Keywords: fracture, osteomyelitis, sequestrectomy.


INTRODUCTION

Fractures are discontinuity of bone, joint cartilage, cartilage epiphysis, or both total and partial which are generally caused by trauma where there is excessive pressure on the bone, either in the form of direct trauma and indirect trauma, usually accompanied by injury in surrounding tissues.1 The maxillofacial fracture is a fracture that affects the middle third of the face and the lower third of the face or mandible.2 This region is the most prominent position of the human body. Therefore it becomes the most susceptible areas of fracture.3 Many etiologic factors cause maxillofacial fractures, such as traffic accidents, work accidents, sport-related accidents, accidents from warfare as well as a result of violent acts. However, the most causes are traffic accidents.

Osteomyelitis is a state of infection that occurs in bone and bone marrow that can occur in the jaw bone due to chronic infection. Infections that occur can be caused by odontogenic infections. Osteomyelitis can be classified as suppurative or non-suppurative and as an acute or chronic process.4 Acute osteomyelitis occurs when an acute inflammatory process spreads into the medullary space while the body doesn’t have enough time to react to the onset of inflammatory infiltrate. Chronic osteomyelitis will occur when there is a defense response of the body resulting in a granulation tissue that will become dense scar tissue in an attempt to maintain and isolate the infection area. The isolated necrotic region serves as a bacterial reservoir where it is difficult for antibiotics to reach the area.

Nowadays, the incidence of osteomyelitis has declined due to better anti-microbial agents and better dental care that has been widely available. Improper use of antibiotics, lack of awareness of oral and dental hygiene, malnutrition, and the development of microorganism strains resistant to some antibiotics may be associated with the osteomyelitis cases of the jaw. In addition to the virulence factors of microorganisms, systemic conditions affecting the immune system and conditions that alter jawbone vascularisation play a major role in the onset and severity of osteomyelitis.3

Significant delays in the treatment of fractures increase the risk of infection and therefore develop into osteomyelitis. According to some journals, the optimal time between 3-5 days after trauma can reduce the risk of infection. Other factors contributing to the healing process of the jaw fracture are the level of contamination from a pre-existing fracture, abnormal or dentoalveolar disease, the presence of the tooth on the fracture line, the general poor condition of the patient due to comorbid disease and rapid alveolar bone resorption pattern.2
CASE REPORT

A 27-year-old male patient with no systemic abnormality came with a complaint of extraoral sinus drainage in the right mandible. From the history, the patient claimed to have a motor accident that involved a fracture about six months earlier which eventually resulted in the sinus drainage appearance in the right mandible. Since the complaints did not resolve, the patient went to Oral and Maxillofacial Surgery Department at Dr. Hasan Sadikin Hospital. The routine preoperative clinical examination was performed. The patient's clinical examination showed asymptomatic, afebrile, pulse and blood pressure within normal limits, and no lymphadenopathy. There was no difficulty opening the mouth, and no paresthesia was found in the lower right lip area and mental area. Then the adjunctive examinations such as complete blood test, thorax photos, and panoramic photos were done.

Intra-oral examination of the patient exhibits anterior open bite malocclusion condition, partially edentulous mandible due to the extraction of the lower right molars. A fistula is present in the right mandible that aches upon palpated.

Panoramic photographs show the mixed region of radiolucent and radiopaque image with radiopaque cortical edges, large sequestrants and loss of internal trabecular structures as well as fracture lines in the corpus region of the right mandible.

Based on anamnesis, clinical and adjunctive examination, the clinical diagnosis made was a fracture of the right mandible corpus with chronic suppurrative osteomyelitis.

The management included necrotomy debridement, sequestrectomy, dental extraction of 48 teeth and fistulectomy in general anesthesia. The flap incision was performed in the intraoral vestibule area of the 43 tooth to the posterior region of 48 teeth, then the flap was elevated. Teeth 48 was extracted, aided by elevator, and the sequester tissue was removed with the help of bur bone accompanied

Figure 1 Extraoral swelling is seen in the right mandible

Figure 2 Intraoral initial presentation and extraoral cutaneous fistule in right mandible

Figure 3 Intraoral panoramic

Figure 4 Surgery Durante images

Figure 5 Patient’s condition seven days post operation

Figure 6 Intra oral panoramic radiograph 3 months post operation
by irrigation with 0.9% NaCl solution. The granulation tissue under the sequester was cleansed until a healthy bone with bleeding appeared. In the extraoral section, a sequestrectomy and fistulectomy were performed on the right mandible by making an incision pattern, then flap was elevated. After cleansing until the bone appeared healthy, a normal bite adjustment was performed by intermaxillary fixation rubber. Then a mini plate and a 2.0 sized titanium screw were installed according to champy law. The intraoral flap was done. The intraoral primal suture was performed 4.0 silk and extraoral with 6.0 silk, followed by a histopathological examination of tissue samples.

During inpatient treatment, patient’s intraoral was cleaned daily with 0.9% NaCl solution. Injectable drugs of 2x1 gr Ceftriaxone antibiotic, 2x30 mg Ketorolac, 2x50 mg Ranitidine were administered for two days. The patient was then allowed to go home and prescribed 2x500 mg Cefadroxil antibiotic capsules, 2x400 mg Ibuprofen analgesics, and 2x150 mg Ranitidine to take home for five days. Patients came for control one week later without any complaints. The intra-oral state showed epithelialized tissue at the post wound sutured area. The patient was then advised to take Clindamycin capsules 3x300 mg for two weeks. The result of tissue histopathology examination confirmed that the tissue examined conformed with the diagnosis of chronic mandibular supplicative osteomyelitis.

DISCUSSION

Chronic osteomyelitis of the mandible is a rare condition, yet has been reported for potential complications of chronic infection due to negligible maxillofacial fractures. There is tissue damage due to proteolytic enzymes produced by dead bacteria with vascular thrombosis and ischemia. Puss is formed, which then undergoes accumulation that causes increased intramedullary pressure and leads to local vascularization disorders. Accumulation of pus under the periostium will push the periostium from the bone cortex so that the vascularization supply is further disrupted. If this process continues then the pus will penetrate the periostium and the mucosa, then the subcutaneous abscess and fistula will be formed. In this case, what may be the cause of chronic supplicative osteomyelitis is an odontogenic infection of the partial dental impaction of the lower right mandibular molars with gangrene due to caries and pericoronitis. Chronic osteomyelitis of the jaw can be caused by low virulence infections such as caries, periodontitis, tooth eruption and the post-extraction area.

Clinical symptoms of mandibular suppurrative chronic osteomyelitis include local pain, malaise, fever, and anorexia. After 10-14 days after suppurrative osteomyelitis appears, the involved teeth begin to have mobility and are sensitive to percussion. The pus emerges around gingival sulcus or through the mucosal and cutaneous fistula. Halitosis, enlarged bone dimension due to increased periosteal activity, erythema, soft when palpated are commonly found. Trismus can sometimes occur whereas lymphadenopathy is common. In this case the patient came with complaints of local pain and extraoral fistulas in the right mandible.

Radiological image shows partial eruptive of 48 teeth. There is fracture line at the mandibular corpus region. The presence of sequester image and periosteal lamination of new bones are typical features of osteomyelitis. However, these characteristics may change due to self-medication with anti-inflammatory drugs and antibiotics, which can complicate the diagnosis.

Osteomyelitis of the jaw is dominated by cases of osteomyelitis occurring in the mandible, with the highest frequency occurring in the mandibular angulus and corpus. Osteomyelitis is more common in the mandible than the maxilla because of the mandibular bone thickness, the low vascularization of the cortical plate, the blood supply that only comes from the inferior alveolar nerve-vearvascular bundle. Chronic osteomyelitis of the jaw generally requires medical and surgical therapy, although sometimes the use of antibiotic therapy alone can be successful.

In this case, surgical sequestrectomy and debridement are performed to remove the necrotic bone and open healthy bones that have good vascularization. This will facilitate the healing process and allow antibiotics to reach the target area. Therefore surgery and antibiotics are the main treatment for this case. At the time of postoperative control, the patient subjectively had no complaints, and from intraoral physical examination, it can be seen that the post-extraction wound was covered by healthy tissue. Topazian recommends continuing postoperative therapy for 2-4 months after symptom resolution while Bamberger recommends minimum duration of administered antibiotic therapy for at least two weeks. Principles of osteomyelitis management involve the elimination of the source of infection, adequate antibiotics, sequestrectomy, debridement, decortication, and if there are extensive lesions, resection and reconstruction are performed and evaluate as well as improve the immune system by increasing nutritional or supplements and multivitamins intake.
CONCLUSION

This reported case of osteomyelitis suggests that sequestrectomy is a definitive treatment for mandibular osteomyelitis cases due to neglected fractures, with satisfying clinical and radiological postoperative results. Treatments for mandibular suppurative chronic osteomyelitis are by eliminating the source of infection, administrating of antibiotics accompanied by surgical sequestrectomy and debridement. Proper diagnosis and a good treatment plan are paramount in treating the chronic suppurative osteomyelitis of the mandible.

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REFERENCES


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