A successful pregnancy complicated with ovarian cyst torsion in the first trimester

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ABSTRACT

Introduction: Ovarian cyst torsion is a rare gynecological emergency characterized by acute abdominal pain due to torsion of the ovarian vascular pedicle. Most cases are associated with several risk factors including pregnancy, ovarian cyst size, and pelvic organ anatomy. Despite the incidence of detected ovarian cysts during pregnancy increasing along with better antenatal care, the clinician needs to consider appropriate management for the safety of the mother and fetus.

Case description: A 25-years old woman who was pregnant with a gestational age of 10 weeks was referred to the Emergency Department of Zainoel Abidin General Hospital. The patient complained of sudden abdominal pain at the lower right abdominal quadrant within the last 5 hours before hospital admission. The patient stated the history of the ovarian cyst based on previous ultrasonography assessment on previous antenatal care. Abdominal tenderness on the relevant quadrant was positive during the physical examination. A vaginal examination revealed a regular non-tender cystic mass with a diameter of 5 cm on the right adnexa. The ultrasonographic finding showed the presence of a cystic mass on the right ovary with a size of 6.52 cm x 5.6 cm x 4.06 cm and a positive whirlpool sign. The patient was diagnosed with ovarian cyst torsion in the first trimester of pregnancy. Due to the patient refractoriness to conservative management, the patient was treated surgically by cystectomy laparotomy in an emergency setting. Histopathology examination of the intraoperative specimen revealed a luteoma. The pregnancy was successfully maintained until full-term pregnancy and the baby was delivered by caesarian section due to malposition.

Conclusion: Appropriate supportive management was required to maintain pregnancy and prevent fetal loss.

Keywords: ovarian cyst torsion, pregnancy, cystectomy, first trimester, successful pregnancy.

INTRODUCTION

The presence of a fluid-filled sac on the ovary characterizes the ovarian cyst.1 It is estimated that the global incidence of ovarian cysts was 16.7% of all ages and higher at reproductive ages.2 Ovarian cyst tends to be asymptomatic and diagnosed accidentally, resulting in inaccurate epidemiological data.3 The exact aetiopathogenesis on how a cyst can be formed is still obscure. Based on their pathomechanism, an ovarian cyst can be divided into a functional and neoplastic ovarian cyst.3 Functional ovarian cysts are caused by abnormal hormone stimulation while neoplastic cysts are developed due to cellular hyperproliferation.3 Patient with ovarian cysts hardly reports any symptoms until further complications such as torsion, rupture, or hemorrhage occur.4 Ovarian cyst torsion is one of the gynecological emergencies that is hardly seen (3%) compared to other emergencies.5 Normally, ovarian mobility is limited by infundibulopelvic and uteroovarian ligament which connects the ovary to surrounding organs. Right ovarian torsion is more common (64%) than left ovarian torsion due to the longer right uteroovarian ligament and narrower space on the left pelvic organ cavity because of the sigmoid colon presence.6 The risk of ovarian torsion increases when the ovarian size is more than 5 cm (80%). Other risk factors include pregnancy (10-22%), dermoid cyst, history of abdominal surgery, high mobility cyst, longer pedicle, and history of tubal ligation.6,7 Those factors are the potential to initiate axial rotation which causes vascular compression and necrotic of tissue.1 While the protective factors include breastfeeding, parity, and using Combined Oral Contraceptives (COC).8

About 1 – 4% of pregnant women are diagnosed with adnexal mass including ovarian cysts.9 Routine antenatal care plays a significant role in the increasing rate of ovarian cyst diagnosis during pregnancy.10 Adnexal torsion is five times more likely to occur in the first and second trimesters of pregnancy (5 per 100,000 pregnancies).9 Patient usually complains of nonspecific abdominal pain symptoms, making the diagnosis difficult. Hence, additional diagnostic tests such as ultrasonography and laboratory examination are required.11

The treatment of ovarian cyst torsion during pregnancy is challenging because the safety of the mother and child needs to be considered. As laparoscopic management imposes higher challenges due to an enlarged uterus and the safety of the fetus, laparotomy is preferred if conservative methods no longer give benefits.12 This case report discusses a
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A 25-year-old pregnant woman with a gestational age of 9 – 10 weeks was referred to the Emergency Department Room at Zainoel Abidin General Hospital with a chief complaint of sudden right lower abdominal pain 5 hours before hospital admission. The patient also complained of heartburn, vomiting, and nausea more than 5 times per day in the last week, and was aggravated in three days. Other symptoms such as fever, bleeding from the birth canal, and vaginal discharge were refuted. Based on the patient history, it was known that the first day of her Last Menstruation Pregnancy (LMP) was October 23rd, 2021 and the Expected Date of Delivery (EDD) was July 30th, 2022. The patient admitted that she attended routine antenatal care with midwives and an obstetrician, and a right ovarian cyst was detected on the first ultrasonography examination. History of previous gynecological disease, appendicitis, asthma, hypertension, and diabetes mellitus was refuted. The patient also denied a history of contraception.

The patient was hemodynamically stable with a blood pressure of 100/60 mmHg, heart rate of 122 bpm, respiratory rate of 12 times per minute, body temperature of 36 °C, and Visual Analogue Scale (VAS) score of 9 – 10. The Body Mass Index (BMI) was known to be underweight (16.6 kg/m²). During the physical examination, abdominal tenderness on the relevant quadrant was positive and vaginal examination revealed a regular non-tender cystic mass with a diameter of 5 cm on the right adnexa. Laboratory test results showed no significant abnormality other than hypokalemia. The ultrasonographic finding showed the presence of a cystic mass on the right ovary with a size of 6.52 cm x 5.6 cm x 4.06 cm and a positive whirlpool sign (Figure 1). The patient was diagnosed with ovarian cyst torsion in the first trimester of pregnancy.

Initially, the patient was managed conservatively with close monitoring and symptomatic treatments including metoclopramide 10 mg/8h, omeprazole 30 mg/12h, tramadol 50 mg drip, progesterone 400 mg, and intravenous fluids. After 6 hours of observation, the patient complained of severe pain that did not respond to tramadol. The patient was finally treated surgically by laparotomy cystectomy in emergency settings. Intraoperatively, a cystic mass with the size of 7 x 7 x 6 cm was identified on the right ovary which was twisted once (Figure 2). After the surgery was completed, the patient was in a stable hemodynamic state hence patient can be discharged one day after surgery.

Histopathology examination using an intraoperative specimen showed that the cyst developed into a luteoma. Based on this finding, the patient was advised to have routine antenatal care and intensive monitoring. The pregnancy successfully continued to 40 weeks (full-term pregnancy). The initial effort to deliver the baby by vaginal delivery. After 7 hours of expectancy, the baby was finally delivered by caesarian section due to malposition.

DISCUSSION

It is crucial to identify ovarian cyst torsion as it needs special medical attention. Without torsion, ovarian cysts in pregnancy are rarely identified and spontaneously regress. During
pregnancy, the risk of ovarian cyst torsion compared to an ovary without a cyst is five times higher. Patient mainly complains of sudden severe acute abdominal pain so optimal diagnosis and management need to be delivered immediately.

We reported a case of ovarian cyst torsion during the first trimester of pregnancy that was characterized by sudden severe abdominal pain on the right lower quadrant (VAS 9 – 10). Hence, clinicians need to consider several differential diagnoses including ovarian cyst torsion, ectopic pregnancy, appendicitis, tuboovarian abscess, ovarian carcinoma, Pelvic Inflammatory Disease (PID), and nephrolithiasis. Clinically, patients with ovarian cyst torsion will complain of radiating abdominal pain (>88%), nausea and vomiting (59 – 85%), fever (20%), and abnormal uterine bleeding (4.4%). During the physical examination, abdominal tenderness was positive on the right lower quadrant and vaginal examination revealed a regular non-tender cystic mass with a diameter of 5 cm on the right adnexa. The presence of tender mass leads to the exclusion of several differential diagnoses other than ovarian cyst torsion and ovarian carcinoma.

Ultrasonography is the first-line diagnostic tool to confirm gynecological diagnoses, with a sensitivity of 92% and specificity of 96%. The diagnosis of ovarian cyst torsion needs to be considered when findings such as whirlpool sign, ovary enlargement, ovarian edema, blood flow rate < 5 cm/s, abnormal ovary location, and free pelvic fluid are identified with a sensitivity of 82%, 85%, 21.2 – 100%, 16.2 – 92.8%, 18.8 – 77.8%, and 66.7 – 91.3%, respectively. In 60% of the case, a positive blood flow rate can still be discovered.

The patient had acknowledged a right ovarian cyst based on the first ultrasonography during previous antenatal care. Initially, the ovarian cyst was expected to resolve spontaneously with conservative management. Ovarian cysts in pregnancy might undergo several fates, including resolution, and torsion, until intracystic hemorrhage. The management decision is quite challenging because both pregnancy and fetus need to be maintained. The risk of ovarian cyst torsion during the first trimester of pregnancy is 75% and the risk of emergency explorative laparotomy is 50%. Several predisposing factors to torsion include anatomical change of pelvic organs, increased ovary or cyst size, sudden physical movement, uterine contraction, and bowel movement. Besides, ovarian cyst torsion mainly happens on the right side (64%) with the following explanation: 1) Longer right uteroovarian ligament, 2) Presence of sigmoid colon on the left pelvic cavity, and 3. Ovarian cyst hypermobility.

Based on ultrasonographic findings in the emergency department, a cystic mass on the right ovary with the size of 6.52 cm x 5.6 cm x 4.06 cm and a positive whirlpool sign was identified. Epidemiologically, about 80% of ovarian cysts with a size of more than 5 cm will be furtherly twisted. A study by Verma et al. showed that the incidence of ovarian cyst torsion on ovarian cysts with the size of < 5 cm, 5 – 10 cm, and > 10 cm were 14.38%, 60.71%, and 25%, respectively. Conservative management for ovarian cysts is the most recommended treatment for asymptomatic ovarian cysts during pregnancy. The best time for surgical management is in the second trimester of pregnancy if the cyst does not resolve spontaneously. Hence, routine monitoring such as ultrasonography, CA-125, β-hCG, or alpha-protein is recommended. When acute abdominal pain is present and ovarian cyst torsion is diagnosed, emergency laparotomy is the treatment of choice. Patient with severe abdominal pain needs to receive adequate analgesia within 20 minutes since hospital admission. In this case report was treated initially with tramadol. Although the teratogenic risk is present, the expected benefit was more favored. However, the patient did not respond to tramadol hence the decision to hold an emergency cystectomy laparotomy was made.

Surgical management during pregnancy with a gestational age of fewer than 10 weeks is highly risky for pregnancy and fetal loss. Cystectomy or oophorectomy is the potential to reduce progesterone concentration which is important in maintaining pregnancy. Therefore, continuous progesterone supplementation until 12 weeks gestational age must be given continuously. The recommended postoperative observation includes routine ultrasonography for pregnancy with gestational age less than 26 weeks, while pregnancy with gestational age more than 26 weeks needs to be observed routinely by ultrasonography and cardiotocography. However, the future risk of ovarian cyst retorsion will still exist by as much as 19.5 – 37.5%.

The histopathology examination of the intraoperative specimen revealed that the tissue was identified as a luteoma. Luteoma is a rare non-neoplastic lesion of the ovary which is developed only during pregnancy. As the disease is commonly asymptomatic, this tumor can only be identified using histopathology examination. Only several cases such as ovarian torsion which requires advanced treatment can cause severe symptoms. Research regarding luteoma is still limited and the etiology remains unclear. This tumor was known to be related to human chorionic gonadotrophin (hCG) stimulation inducing hyperplasia of the stromal cell. The formation of luteoma can also release more testosterone, leading to male characteristics in the mother such as acne, hair growth, and a deepening voice. It is also able to cause fetal masculinization. A study also stated that the tumor might already exist before pregnancy and be stimulated uncontrollably by hCG during pregnancy.

After intensive monitoring and routine antenatal care, the pregnancy can finally be maintained until full-term pregnancy is achieved. Mother had successfully delivered the baby after 40 weeks of gestation. The fact that the pregnancy was supported by the previous study which stated that luteoma does not interfere fetus. It is also believed that pregnancy luteoma will regress spontaneously. However, the baby was finally delivered by the caesarian section due to fetal malposition. It is still unclear whether pregnancy luteoma is associated with malposition so further study is required.

CONCLUSION

Ovarian cyst torsion requires special medical attention, especially when it comes to pregnancy. The patient mainly...
complains of sudden severe acute abdominal pain so optimal diagnosis and management need to be delivered immediately. Surgical management should only be made if conservative management fails to give significant improvement. Appropriate management needs to be delivered to maintain pregnancy and prevent fetal loss.

DISCLOSURES

Funding
This case report received no external funding.

Conflict of Interest
We affirm that we did not have any conflict of interest. The patient has been informed that the case will be presented in a case report paper.

Author Contribution
The authors confirm their contribution to the paper as follows: case identification and study conception: Ima Indirayani; data collection: Ima Indirayani, Hilawah Nora, Roziana, Cut Rika Maharani, Intan Chaharunia Mulya, Rauzatul Jannah, Dara Meutia Ayu Febrina; analysis and interpretation of case: Ima Indirayani, Intan Chaharunia Mulya, Rauzatul Jannah, Dara Meutia Ayu Febrina; draft manuscript preparation: Intan Chaharunia Mulya, Rauzatul Jannah. All authors reviewed the results and approved the manuscripts.

Ethical consideration
Patient had received signed written informed consent regarding publication of medical data in scientific medical journal with confidentiality of patient personal information.

Acknowledgments
We would like to express our gratitude to all participants elaborated in this study.

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10.15562/bmj.v12i2.3951