CASE REPORT

Isolated tubal torsion in the third trimester of pregnancy: A case report and review of the literature

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Isolated torsion of a fallopian tube in the third trimester of pregnancy is an uncommon event. Its common symptoms are lower abdominal pain, vomiting, and nausea. Because these symptoms are nonspecific, isolated torsion of a fallopian tube may be misdiagnosed, delaying treatment and the opportunity to preserve the tube. This is a case report of a primipara in her third trimester, whowas misdiagnosed as having acute appendicitis and ovarian cyst torsion. The ultrasound-assisted examination was useful, but the specific diagnosis was made after laparotomy and histopathology. The patient was managed by simultaneous salpingectomy and cesarean section. This surgical intervention prevented adverse obstetric sequelae. We summarize our experience, provide our conclusions, and review 17 relevant studies from the literature to aid clinicians in understanding, diagnosing, and managing this condition in a timely fashion.

Key words: Isolated torsion of a fallopian tube, misdiagnosis, pregnancy, treatment

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CASE BACKGROUND

Isolated torsion of a fallopian tube in pregnancy is a rare event in women of reproductive age.[1] The etiologies of torsion of the fallopian tube are unknown. The clinical diagnosis is commonly based on symptoms, and a physical examination can be useful in the diagnostic process. Ultrasound and magnetic resonance imaging (MRI), if accepted by the pregnant patient, can be useful accompanying examinations for diagnosis.[2,3] Common symptoms of the disorder include lower abdominal pain, vomiting, and nausea. Because these signs are nonspecific, the cases are frequently misdiagnosed as having other causes of acute abdominal pain, such as appendicitis, which may delay treatment and result in salpingectomy.[1,4-7] Laparotomy and laparoscopy are important tools in the diagnosis and prognosis of isolated torsion of a fallopian tube, and can help to preserve the fertility of these patients.

CASE SUMMARY

A 32-year-old primipara was admitted to the Third Hospital of Hebei Medical University on March 27, 2012, at 36 weeks and 4 days of gestation with complaints of lower abdominal pain for 3 days. This pain was situated in the right lower abdomen, and the pain was constant and acute. Vomiting and nausea were associated with the pain. There was no history of fever. The patient had no previous history of a similar pain or of any previous illness. She had regular menstrual periods, and her last menstrual period started on July 15, 2011. She was gravid 3, para 0, and she had undergone two induced abortions before the pregnancy. She had been attending an antenatal clinic regularly. Until the occurrence of the pain, her pregnancy had been uneventful. The patient's vital signs were stable, and she was afebrile.

Abdominal examination revealed tenderness in the right lower abdomen and a soft abdomen. The uterine fundal height corresponded to the period of gestation. No uterine contractions or tenderness was found. The fetal heart rate was regular and normal. The vaginal examination showed that the cervix was closed, with intact fetal membranes and without any evidence of bleeding or abnormal discharge.

An ultrasonogram showed a single live fetus in cephalic presentation. The parameters corresponded to a term gestation, and the position and thickness of the placenta were normal. An anechoic mass (74.7 mm × 51.2 mm) was observed in the right lower abdomen, with evidence

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of good posterior enhancement [Figures 1 and 2]. There was no abnormal vascular flow on Doppler examination. The laboratory blood parameters were as follows: 10.26 × 10^9/L white blood cells (WBCs), 3.15 × 10^{12}/L red blood cells (RBCs), 103.80 g/L hemoglobin (HGB), and 349.0 × 10^9/L platelets (PLTs). The laboratory parameters for urine and liver function were normal.

A provisional diagnosis of acute appendicitis was made in the surgical clinic of our hospital after 2 days. The patient refused to undergo an operation because of concerns for her fetus. The patient's pain was unchanged after she was given antiemetic and other symptomatic treatments for 2 days. Due to her special status and the insufficient basis for a definitive diagnosis of appendicitis, the patient was re-admitted to the obstetric clinic. A diagnosis of the right ovarian cyst was considered, and operation was decided upon. The patient underwent an emergency exploratory laparotomy and cesarean section. The findings were as follows: isolated 360° torsion of the right fallopian tube had occurred at the proximal end of the isthmus, and part of the right tube from the isthmus to the fimbriae showed complete infarction. The right ovary, the uterus, and left adnexa looked healthy. A partial right salpingectomy and cesarean section were performed. The newborn was female and normal, with a weight of 3100 grams and an Apgar score of 10. The patient was put on intravenous antibiotics for two days. The histopathology report [No. 1201586, Figures 3 and 4] indicated that part of the right fallopian tube showed hemorrhagia and necrosis. The operation course and puerperium were uneventful, and the patient was discharged on the seventh postoperative day in good condition. The follow-up parameters on the 42nd postpartum day were normal and included examination of the uterus, lochia, and temperature. The patient had no further complications.

CASE DISCUSSION

Isolated torsion of the fallopian tube is a rare but noteworthy cause of lower abdominal pain in women of reproductive

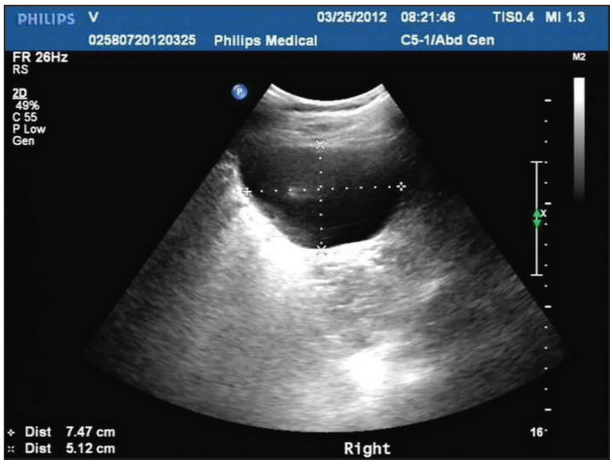

Figure 1: An anechoic mass was seen in right lower abdomen, and there was no vascular flow on Doppler examination

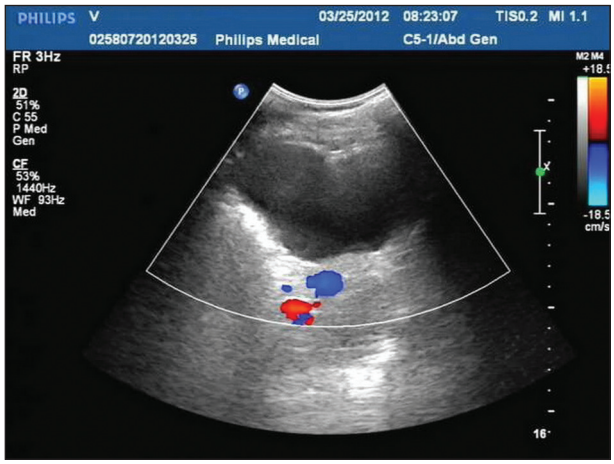

Figure 2: An anechoic mass was seen in right lower abdomen, and there was no vascular flow on Doppler examination

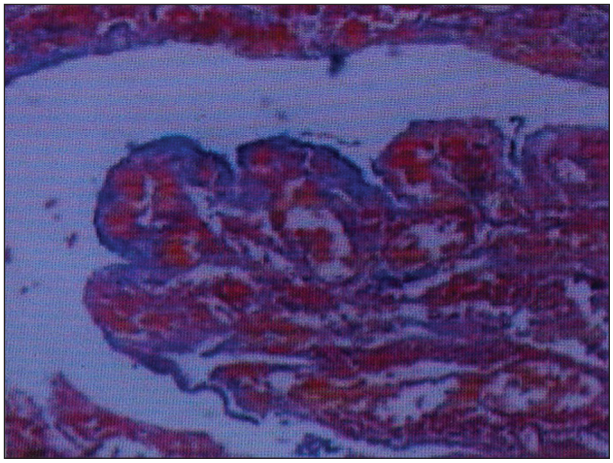

Figure 3: Partial right fallopian tube showed hemorrhagia and necrosis (H&E ×100)

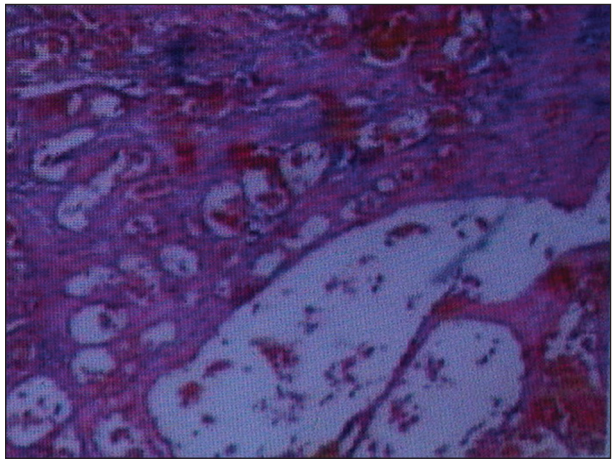

Figure 4: Partial right fallopian tube showed hemorrhagia and necrosis (H&E ×100)

age.[1] Krissi *et al*., noted the incidence of fallopian tube torsion was 1/1.5 million women.[4] Isolated twisted fallopian tube in pregnancy is very rare, with only 12% of cases being identified during pregnancy.[5] Phupong *et al*., observed only 1 case in 120,000 pregnancies over a ten-year period (1991-2000) at their institute.[6] Others reported only 16 to 20 cases of isolated fallopian tube torsion in pregnancy from 1936 till today.[8-10] Cases of isolated torsion of the fallopian tube in the third trimester of pregnancy are especially rare.

Etiologies

The etiologies of torsion of the fallopian tube are unknown. Possible causes have been proposed including the following: anatomic abnormalities (e.g., hematosalpinx and hydrosalpinx); physiological abnormalities (e.g., intestinal peristalsis); hemodynamic abnormalities (venous congestion in the mesosalpinx); Sellheim theory (sudden body position changes); trauma, previous surgery, or disease (e.g., tubal ligation and pelvic inflammatory disease); and gravid uterus.[5,11] Because the patient had a history of good heath, the cause of tubal torsion may have been gravid uterus, hemodynamic abnormalities, or sudden body position changes.

Diagnosis

Lower abdominal pain is the most common symptom of torsion of the fallopian tube, which can present as a constant dull or acute radiating pain to the thigh or groin.[1] This symptom may be accompanied by nausea, vomiting, bowel and bladder complaints, occasional fever, a normal or slightly elevated white blood cell count, and vaginal examination may palpate a tender adnexal mass.[1,5,6] Ultrasonographic findings show a supernormal echoic mass in the ipsilateral adnexa.[1] Reversal or absence of vascular flow in the tube has also been reported, although, in practice, spectral Doppler analysis of the tubal wall may be difficult.[1] Although fears of adverse fetal effects have limited its acceptance by patients, MRI has been used as an assistant examination for the diagnosis of fallopian tube torsion during pregnancy.[2,3] As a noninvasive examination method, MRI may be combined with specific imaging findings on preoperative and color Doppler ultrasonography to aid doctors in making an early diagnosis in the preoperative period.[3,12]

The right fallopian tube is commonly affected, which may be due to the presence of the sigmoid colon on the left side, or it may be due to slow venous drainage on the right side, resulting in congestion.[1,6,13] The case evaluated in this report presented with right lower abdominal pain, vomiting, nausea, and an anechoic mass in right adnexa, with evidence of good posterior enhancement and without abnormal vascular flow. All of these characteristics matched the clinical features of the disorder that we reviewed in the literature. When doctors encounter pregnant patients similar to this case with complaints of right lower abdominal pain, vomiting, and nausea, they should pay close attention to them and consider the possibility of torsion of the fallopian tube. Additional examinations, such as ultrasound and MRI, are necessary.

The above symptoms are relatively nonspecific during pregnancy, so cases may be misdiagnosed before operation. The possible misdiagnoses commonly include appendicitis, onset of delivery, abruption of the placenta, torsion or ruptured ovarian cyst, and urinary tract infection.[1,6] In fact, sometimes two of the above problems may occur in one case.[14] In view of the above findings, diagnosing torsion of the fallopian tube during pregnancy is difficult. Ultimately diagnosis is generally made at the time of surgical exploration.[12] The patient in this case study was initially misdiagnosed with appendicitis, followed by ovarian cyst torsion. The diagnosis of torsion of the fallopian tube was ultimately made after laparotomy. Thus, exploration is vitally important for correct diagnosis of this disorder.

There are several reasons why the present case was misdiagnosed. Initially, the doctor paid no attention to the specificity of the pain in the right abdomen during pregnancy. Secondly, the doctor did not perform an ultrasound in time because of the nonspecific imaging findings on preoperative color Doppler ultrasonography. Due to insufficient evidence of MRI use during pregnancy, we did not choose this examination in the present study. Use of MRI may have enabled the correct diagnosis to be made earlier.

Management and prognosis

Torsion of the fallopian tube during pregnancy is rare but noteworthy, and because most of the patients are in their reproductive years, early surgical intervention will decrease adverse obstetric sequelae. A correct early diagnosis is important for patients to preserve their fertility if ischemic damage appears to be reversible. When the tissue is gangrenous, a salpingectomy is necessary.[1,4-6] Thus, we suggest that the indication for surgery in these cases should be relaxed, especially during the third trimester of pregnancy.

Laparotomy is the common, traditional surgical procedure, and it is currently the most specific tool for diagnosis and treatment. Laparoscopic surgery has been confirmed to be safe for use in the different trimesters of pregnancy.[4,15-17] However, if the pathology is deemed "complicated" during laparoscopy, conversion to laparotomy is warranted to avoid an increased rate of fetal loss, especially in the first and second trimester.[16] Although several previous studies have used laparoscopy,[15,16] we did not consider laparoscopy to be ideal for use in the third trimester because of the patient's large uterus. Therefore, laparotomy was considered the best

choice, especially for a mature fetus, as cesarean section may be done at the same time. Above all, if the patient misses the opportunity for surgical intervention, this delay may result in a gangrenous tube because of the misdiagnosis. Because the present patient was in her third trimester with a gangrenous right fallopian tube and the fetal parameters corresponded to a term weight, laparotomy, cesarean section, and salpingectomy were performed. Ultimately, this strategy resulted in a good outcome for both, patient and child.

CASE CONCLUSION

Isolated torsion of the fallopian tube during pregnancy is very rare, and this disorder has nonspecific symptoms. Thus, clinical doctors may misdiagnose these cases as having appendicitis or ovarian cyst torsion. Clinical doctors should pay close attention to a sudden onset of lower abdominal pain with an adnexal mass during pregnancy. Ultrasound may be suggestive, assist the clinical diagnosis, and help confirm the indication for operation. If accepted by the patient, MRI can also be used as an accompanying examination. The use of ultrasound combined with MRI may increase the likelihood of a correct early diagnosis, and both methods are noninvasive.

Laparoscopy is a microinvasive diagnostic approach that can also be used simultaneously to manage the disorder. However, use of laparoscopy for diagnosis and treatment should be carefully evaluated in the third trimester of pregnancy. The indications for laparotomy should be relaxed in the third trimester of pregnancy. Different surgical interventions may be preferred in different weeks of pregnancy. Efforts should be made to preserve fertility if the damage appears to be reversible.

AUTHOR'S CONTRIBUTION

YS contributed in the conception of the work, conducting the study, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work. LLL contributed in the conception of the work, conducting the study, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work. JMD contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.

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