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Isolated torsion of the fallopian tube in a 16-year-old girl: A case report and review of the literature

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ABSTRACT

Torsion of the fallopian tube is when the tube twists on the axis created between the infundibulopelvic ligament and the utero-ovarian ligament. It most commonly presents with appendicitis-like symptoms, such as abdominal pain, nausea and vomiting. Because of its rarity and non-specific symptoms, it is usually misdiagnosed initially, which delays therapy, at the expense of the preservation of fertility. This case report of a 16-year-old girl who had never had sexual intercourse presents an example of the misdiagnosis of fallopian tube torsion. The definitive diagnosis was based on laparoscopy. We summarize our experience and provide our conclusions after reviewing the literature.

1. Introduction

By definition, isolated fallopian tubal torsion (FTT) is the rotation of the tube around its longitudinal axis, while the ovary and blood flow and lymphatic flow are not affected. FTT was first described by Bland-Shunton in 1890 and has a prevalence of only 1 in 1,500,000 [1]. It is even less frequent in the pediatric population [2], with only a few cases reported in the literature [3]. The first premenstrual case was reported by Hansen in 1922 [4]. Although in many cases the pathophysiology of the isolated torsion is not determined with certainty, several pathologic conditions have been described as risk factors. Furthermore, a variety of pathologic conditions can produce a similar clinical picture and thus make diagnosis problematic.

Isolated FTT is a rare cause of acute abdominal pain in women [5]. Torsion of the right tube is much more commonly encountered than torsion of the left tube, which could be related to fixation of the left tube in the left hemipelvis by the sigmoid colon and mesentery [6], or to more frequent imaging evaluations of right pelvis pain to investigate possible appendicitis [7]. The present case is interesting because of the young age of the patient; in addition, the non-specific manifestations of the condition made it difficult to reach the correct diagnosis and direct the patient to the appropriate specialist care [8].

2. Case Presentation

A 16-year-old girl, accompanied by her parents, presented in the emergency department with nausea, vomiting and convulsive pain in the right lower abdomen. At home, the patient had a temperature of 38.5 °C and chills; she reported a loss of appetite for the past 3 days and dysuria. She had a regular menstrual cycle of 28 days since her menarche at the age of 11 years, with normal menstrual bleeding. She had not had intercourse and had not undergone any gynecological or abdominal surgery. Parental consent was given for any diagnostic and therapeutic intervention.

When she was admitted, her vital signs were normal, with a blood pressure of 110/75 mmHg, a pulse of 81/min, body temperature of 37.5 °C and normal percentage of oxygenated hemoglobin. She was of normal height (160 cm) and weight (60 kg). Auscultation demonstrated normal bowel movement. No vaginal examination was performed, as the patient had not sexual intercourse and no bleeding was reported.

Blood examination showed severe inflammation, with a leukocytosis level of 16.4 G/l and a C-reactive protein (CRP) level of 98 mg/l. The hemoglobin level was normal. Transabdominal ultrasound showed a small unilocular cyst about 35 mm in diameter in the right ovary and a little ascites in the pouch of Douglas, but no other abnormality was evident. However, the appendix vermiformis could not be distinguished with certainty. Considering the clinical examination and the blood results, there was a high suspicion of acute appendicitis and therefore the surgeons opted for laparoscopy.

In order to perform the surgery, general anesthesia was administered and the patient was intubated for ventilation. For laparoscopy three trocars were used: one of 10 mm diameter at the umbilicus and

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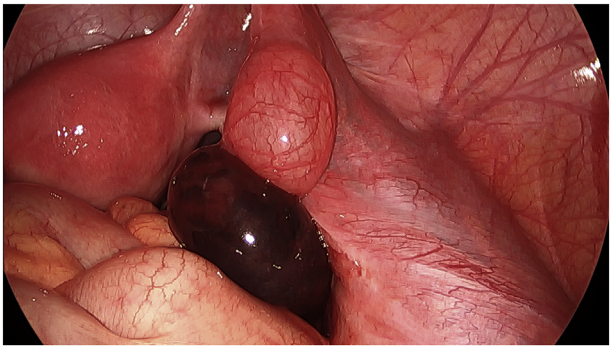

Fig. 1. Intraoperative photograph of the gangrenous right fallopian tube.

two of 5 mm in the lower abdomen, one on each side. The diagnostic laparoscopy showed hemorrhagic ascites in the lower abdomen, while the appendix appeared completely normal. Within the pelvis a conglomerate tumor was seen, consisting of a massively enlarged fimbrial funnel and a para-oval cystic tumor, which where both hemorrhagically infarcted and partially gangrenous (Fig. 1). There was multiple torsion of the middle part of the fallopian tube.

In order to preserve the ovary and its ligamentum suspensorium the necrotic conglomerate tumor was resected at the level of the corresponding mesosalpinx and the transition from the middle to the distal part of the fallopian tube (Fig. 2). The cystic conglomerate tumor was later sent for histopathological analysis. Pronounced acute hemorrhagic congestion and a normally structured, inflammation-free appendix vermiformis were described.

The patient recovered from the surgery without any complications and was discharged two days after the laparoscopic procedure. She has not experienced any significant recurrence of the pain or had any medical problem since the surgery.

3. Discussion

The etiology of isolated FTT has not been clearly determined but several predisposing factors have been suggested. Intrinsic (fallopian tube) risk factors include hydrosalpinx, hematosalpinx, endometriosis, tubal neoplasms, tubal ligations, hypermobility, spasm, autonomic dysfunction of the fallopian tube and hydatid cyst of Morgani. Extrinsic factors include paratubal and para-ovarian masses and neoplasms, trauma, pelvic inflammatory disease, adhesions and uterine enlargement [4–14]. If the FTT is not secondary to any of these pathologies, some authors recommended the term 'primary FTT' [3,9–13].

The preoperative diagnosis of isolated FTT is challenging because of the non-specific sign and symptoms. Liang-Ming Lo et al. [15] found that none of 17 patients suffering from isolated FTT were diagnosed before the operation. According to the same study, all of the patients had lower abdominal pain. The second most common clinical manifestation was nausea and vomiting (41% of cases). A similar high prevalence of these symptoms (53%) was reported in a case series of 45 pediatric patients [3]. Other symptoms include urinary tract symptoms (24%) [15].

The presence of leukocytosis was observed in 29,4% of the patients in the study by Liang-Ming Lo et al. [15], and in 63% in the study by Faid Gaied et al. [3].

For most women with acute pelvic pain the initial mode of diagnostic imaging is ultrasound (US) [15], because of its lack of radiation exposure, cost-effectiveness and non-invasiveness. Typical findings in cases of isolated FTT are a dilated tube with thickened echogenic walls, internal fluid with debris and surrounding inflammation [16], although these are not sufficient to establish a firm diagnosis. Another specific sign is the beak sign, characterized as a dilated tubular structure with internal debris and a tapered end [17]. The whirlpool sign can be seen by moving the endovaginal sonographic transducer over the twisted vascular pedicle [20]. Furthermore, sonographic identification of a normal ovary is helpful for the diagnosis, as well as the assessment of perfusion with color Doppler [18,19].

Computerized tomography (CT) is a very useful examination to exclude appendicitis [21]. Typical findings on multiplanar CT images in cases of FTT include a dilated fluid-filled structure, tapered ends and configuration of the mass in the fallopian tube [6]. A thickened fallopian tube (greater than 10 mm), twisting of the adnexal pedicle, eccentric thickening and a septal appearance of the fallopian tube are associated with FTT [22,23].

Magnetic resonance imaging (MRI) has been used in only a few cases in the literature for the preoperative diagnosis in acute settings [16]. It is particularly useful in the young or pregnant patient with equivocal ultrasound findings, as MRI provides excellent soft-tissue contrast and lacks radiation exposure [24].

The gold standard for establishing the diagnosis and therapy of these patients is laparoscopy, as the minimally invasive surgery affords fast recovery and minimal morbidity; it is also recommended for women in the first or second trimester of pregnancy [15,27,28].

Early diagnosis is very important for the preservation of the salpinx; moreover, if the diagnosis can be made within 24 h of patient presentation, preservation of the fallopian tube is much more likely [17]. The duration and extent of the torsion determine the viability of the fallopian tube. Initially, venous return is blocked, leading to engorgement and thrombosis. If torsion is left untreated, the arterial circulation is also affected, leading to necrosis and gangrene and increasing the risk of hemoperitoneum and peritonitis [6].

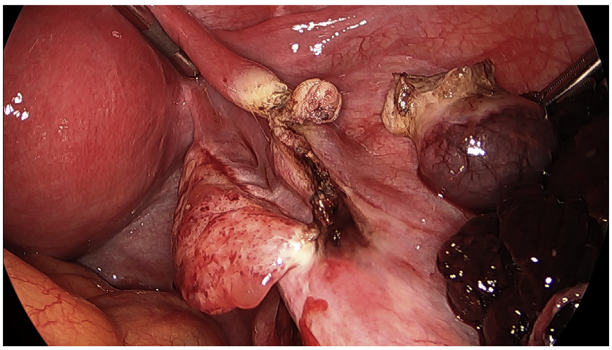

Fig. 2. Intraoperative photograph after removal of the fallopian tube.

4. Conclusion

Isolated FTT is an extremely rare entity. Its presentation with non-specific signs raises difficulties in the differential diagnosis but it should always be suspected in women or children with acute onset of lower abdominal pain with or without nausea and vomiting. Sonography with Doppler should be the first-choice imaging modality, but laparoscopy is the 'gold standard' diagnostic and therapeutic intervention.

Contributors

Georgios N. Kolovos was responsible for preparation of the manuscript and contributed to data collection.

Emmy Meytap contributed to data collection and patient care.

Nicolas Samartzis was responsible for the conception of the case report and for data analysis and interpretation.

Dimitrios Rafail Kalaitzopoulos was responsible for the conception of the case report and contributed to patient care.

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Provenance and Peer Review

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Consent Statement

Consent for publication was obtained from the patient in accordance with local legislation.

Declaration of Competing Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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