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Isolated fallopian tube torsion in an early adolescent

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Abstract:

Isolated fallopian tube torsion is a rare but significant gynecological cause of lower abdominal pain in adolescent females with or without risk factors. A 12-year-old female was initially treated as urinary tract infection, acute appendicitis, and a possible ovarian pathology. Intraoperatively, it was isolated fallopian tube torsion. The entity is difficult to recognize preoperatively because of its vague clinical presentation and lack of specific laboratory and imaging findings, and diagnosis is done ultimately during surgery. Isolated tubal torsion should be considered in cases of acute lower abdominal pain since awareness and early detection of the condition, especially in children and adolescents, allows early surgical intervention that may render preservation of the tubes.

Keywords:

Adolescent, case report, fallopian tube, isolated tubal torsion, torsion

Introduction

Isolated fallopian tube torsion is an infrequent cause of pelvic pain in female patients, with literature approximating its overall incidence as 1 in 1.5 million women, and the incidence of which in pediatric and adolescents is difficult to determine.^[1,2] Locally, there has never been a published paper regarding the condition in young adolescents, emphasizing its rarity, and local data from a tertiary hospital state two cases of isolated fallopian tube torsion in the past 13 years.^[3] It is characterized by torsion of the fallopian tube alone without any torsion of the ovary, is most often unilateral, and may occur with or without the presence of risk factors.^[4] Clinical findings are often nonspecific, leading to a delay in the diagnosis and the subsequent necessary management. The goal is to impart further insight and awareness into this rare condition, which may aid in prompt diagnosis and timely surgical intervention that may prevent

the removal of tubes and preservation of fertility.

Case Report

A 12-year-old nulligravid, sexually inactive, with a sedentary lifestyle, known with bronchial asthma, not in acute exacerbation, and obesity Class I, on day 15 of a 30-day menstrual cycle, presents with a 2-day history of sudden-onset, nonradiating, sharp, right lower quadrant pain visual analogue scale (VAS) 7. This was accompanied by two episodes of nonbilious and nonprojectile vomiting, anorexia, and terminal dysuria with no febrile episodes. On examination by a general physician, the documented abdominal examination was unremarkable. Complete blood count showed normal white blood count at $7.1 \times 10^9/L$ with a neutrophilic predominance of 92%, and urinalysis showed pyuria of 3–6/high-power field (hpf) with all other parameters within normal limits. The assessment was urinary tract infection, and the patient was prescribed with cefuroxime axetil oral suspension every 12 hours (13.9 mg/kg/day) and paracetamol oral

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suspension every 4 hours (6.9 mg/kg/dose) and was subsequently discharged.

The following day, due to the recurrence of the nonradiating, sharp, right lower quadrant pain (VAS 6) with no other accompanying symptoms, a whole abdominal ultrasound was done by self-request, which showed a cystic structure in the mid-pelvic region, considering ovarian etiology, measuring about 10.1 cm × 7.7 cm, an inflamed appendix measuring about 3.4 cm in anteroposterior diameter, and a poorly visualized uterus and ovaries due to obscuring bowel gas. She was seen by a pediatrician and was assessed with acute appendicitis. The patient was advised to transfer due to the unavailability of a pediatric surgeon.

Upon consultation at our institution, the patient was seen by Pediatrics and she was noted to be febrile at 37.9°C with the rest of the vital signs normal. On physical examination, the abdomen was flabby and soft, with direct and rebound tenderness at the right lower quadrant area, with positive obturator, psoas, Rovsing's, and Dunphy's signs. The assessment was acute appendicitis, and a complete blood count and urinalysis were requested, which revealed leukocytosis of $21.93 \times 10^9/L$ and pyuria of 2–5/hpf with all other parameters within normal limits. The patient was referred to the service of General Surgery and Adolescent Gynecology.

For the service of General Surgery, the assessment was acute appendicitis, and the plan was to do a whole abdominal computed tomography (CT) scan with contrast since the previously noted ultrasound result of an inflamed appendix at 3.4 cm was not confirmatory. For the service of Gynecology, the patient was seen hemodynamically stable. On physical examination, the abdomen was flabby and soft, with direct and rebound tenderness at the right lower quadrant and hypogastric area, and the presence of an abdominal mass was not fully evaluated due to voluntary guarding. On rectal examination, there was tight sphincteric tone and a smooth rectal mucosa, the cervix was firm and short, and the uterus and adnexa were not fully evaluated due to voluntary guarding. The assessment was a consideration of adnexal pathology vs. acute appendicitis. Given that the patient's symptoms and manifestations were more compatible with that of acute appendicitis and the whole abdominal ultrasound results were inconclusive, the service agreed to the plan of a whole abdominal CT scan. It revealed a 10 cm × 8.4 cm × 7.4 cm thick-walled cystic pelvic mass, probably ovarian, and a normal appendix measuring 0.6 cm. The patient was brought to the operation room for emergency pelvic laparotomy.

Pelvic laparotomy was performed through a low transverse abdominal incision. Upon opening the

abdomen, there was a hemorrhagic pelvic-abdominal mass which measured 13 cm × 11 cm × 8 cm and was found to be the right fallopian tube [Figure 1]. The cystically enlarged right fallopian tube was twisted once on its vascular pedicle, and upon untwisting, the fimbriated end of the fallopian tube was visualized and was noted to be necrotic [Figure 2]. The left tube, left ovary, and the uterus looked normal. Right salpingectomy was performed. The right fallopian tube was cystically enlarged, measuring 13 cm × 11 cm × 8 cm with a smooth and intact outer capsule and no point of rupture, and on cut section, it exuded serous fluid with blood clots. The inner capsule was smooth, with no noted solid areas or papillaries. An intraoperative referral was done to the service of General Surgery for inspection of the appendix, which was noted to be hyperemic and was assessed as reactive and so no appendectomy was warranted.

Pathology showed hemorrhagic necrosis, which confirmed her diagnosis [Figure 3]. The postoperative course was uneventful, and her 2-week postoperative clinic follow-up examination was normal.

Discussion

Isolated fallopian tube torsion remains a rare cause of pelvic pain in female patients, primarily affecting pubertal adolescents, but may also be seen in older ovulating women and rarely in postmenopausal patients.^[5] The entity was first described by Bland-Sutton in 1890, and the exact mechanism remains unknown.^[6] A postulated mechanism involves obstruction of the adnexa's venous and lymphatic system leading to pelvic congestion, edema, and enlargement of the fimbrial end, thereby causing the torsion of the fallopian tube.^[7] Thus, the fallopian tube can undergo torsion while the ipsilateral ovary maintains normal arterial blood flow.^[5,7] Risk factors for tubal torsion include tubal



Figure 1: Right fallopian tube converted into a hemorrhagic pelvic-abdominal mass

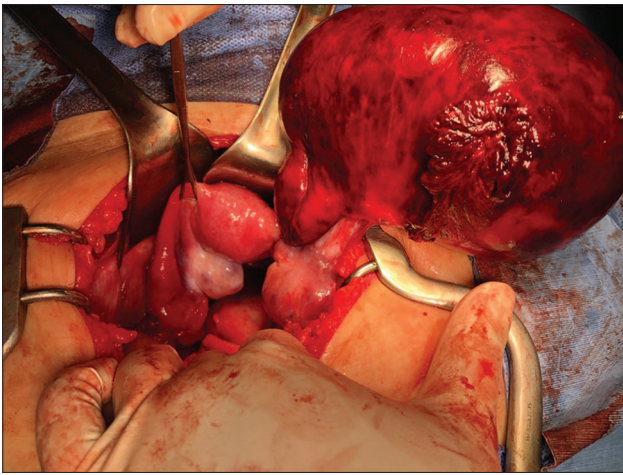


Figure 2: Visualization of the right fimbriated end of the fallopian tube upon untwisting

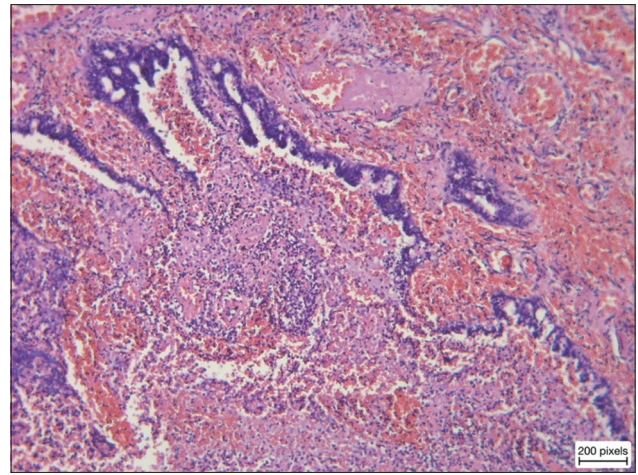


Figure 3: Low power magnification photomicrograph of the right fallopian tube with wide areas of hemorrhage and necrosis

pathology (e.g., hydrosalpinx, hematosalpinx, segmental tubal agenesis with resulting proximal hydrosalpinx, broad ligament cyst, paratubal cyst, neoplasm, tubal ligation device, ectopic pregnancy, and congenital anomaly), ovarian mass, infection, ectopic pregnancy, altered tubal function (e.g., abnormal peristalsis and spasm), extrinsic lesions (e.g., adhesions and endometriosis), uterine enlargement due to pregnancy or tumor, or the Sellheim theory relating to sudden body position changes.^[1,7] However, isolated fallopian tube torsion may still occur in patients with no previous medical history or known risk factors, similar to our early adolescent patient.

The clinical presentation of tubal torsion is nonspecific, posing a challenge to the clinician to diagnose it early.^[2] Presenting symptoms and physical examination findings include severe abdominal pain that may be generalized or nonspecific, nausea, and occasionally fever.^[1,8] Abdominal tenderness may present with or without peritoneal signs, and there may be adnexal tenderness, but a mass is not always palpable.^[1,8] Laboratory findings are also nonspecific and may include leukocytosis and elevated sedimentation rate or C-reactive protein.^[1,7] Radiologic diagnosis is also limited, and the most consistent finding on either pelvic ultrasound or CT was a midline cystic mass (either in the posterior cul-de-sac or superior to the uterus) associated with a normal ipsilateral ovary.^[8,9]

Diagnosis of isolated tubal torsion is ultimately confirmed during exploratory surgery, and it is documented to be more common on the right side.^[4-8,10] This may be secondary to a more stable position of the left fallopian tube as its proximity to the sigmoid mesentery partially immobilizes it.^[2,7] Our study is consistent with previous reports, as the case also presents with a right isolated fallopian tube torsion.

Overall, isolated tubal torsion, although rare, still needs to be part of the differential diagnosis in female patients presenting with abdominal pain and nonspecific symptoms. Early consideration can lead to early surgical intervention, maximizing the chance of salvaging the torsed fallopian tube, and delays can further cause irreversible ischemic damage leading the tubes to undergo tube necrosis and gangrenous transformation, requiring salpingectomy and possibly salpingo-oophorectomy.^[7] These procedures, in turn, alter the patient's future fertility, and are of particular concern, especially to the premenarchal pediatric and adolescent patients.

With the awareness of the existence of this disease and its variable clinical presentations, in correlation with the diagnostic modalities, early detection may be done and treatment can be optimized for each individual patient, especially that of preservation of infertility.^[9]

Declaration of patient and guardian's consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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