



**An Incidental Finding of Isolated Fallopian Tube Torsion (Ifft)
In Adolescents with Unique Ultrasound Findings: Two Case
Reports and Literature Review**

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Abstract

Tubal torsion commonly occurs in association with ovarian torsion; however, isolated fallopian tube torsion (IFTT) is an extremely rare condition that occurs independently from the ovary.

IFTT tend to be one of the most challenging diagnoses to be made in an emergency room due to its vague presentation. This condition has seldom been diagnosed preoperatively, which leads to tubal destruction and loss. For that reason, to improve the clinical judgment of our physicians, we report two cases of IFTT. The first case is a 17-year-old female presented with acute right iliac fossa pain, with nonspecific transabdominal ultrasound findings. The second patient was a 23-year-old female who presented with right iliac fossa pain. Appendicitis was suspected; hence, computed tomography (CT) was done which revealed swollen appendix and right adnexal cyst. Both patients were managed surgically with different preoperative diagnoses as compared to the postoperative ones. Therefore, it is essential to have high clinical suspicion for IFTT, to take in consideration the importance of thoroughly explaining to patients the possible surgical options, including fallopian tube preservation and fertility issues.

Introduction

Isolated fallopian tube torsion (IFTT) is defined as the rotation of the fallopian tube on its own, in a longitudinal axis without ovarian involvement. The prevalence of IFTT is around 1 in 1,500,000 cases, which was first described by Bland-Shunton in 1890.[1] The risk factors for IFTT includes anatomical abnormalities of the tube, adnexal mass, physiological peristalsis or periovulatory spasm, trauma, previous pelvic surgery, pelvic adhesions, and pelvic inflammatory disease.[2]

This condition lacks its own specific clinical presentation; therefore, it is often misdiagnosed due to the huge range of differential diagnoses which can mimic IFTT. Consequently, most of the cases were misdiagnosed pre-operatively or discovered late intraoperatively which mostly result with necrotic tube, irreversible tube damage, or infection.[3] Herby, to raise awareness of IFTT diagnosis among

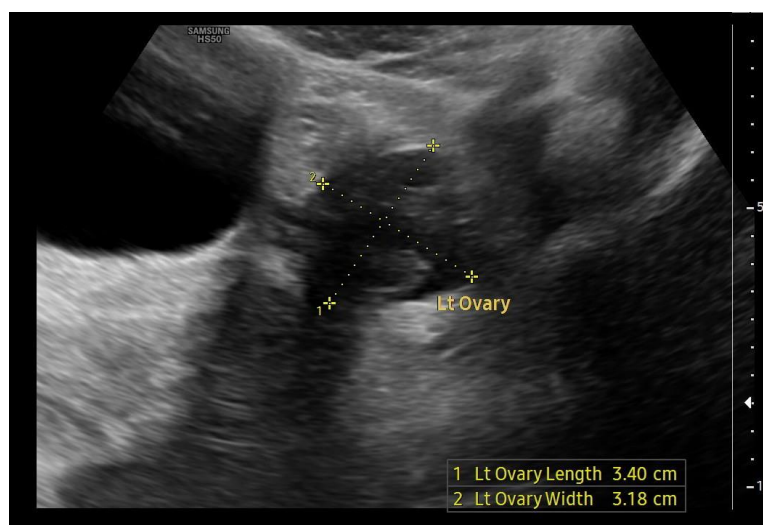
physicians, we present an interesting case of an adolescent girl with emphasis on ultrasound findings and surgical treatments.

Case presentations Case 1

A 17-year-old single female, who is medically and surgically free with insignificant family history, presented to the emergency department with sudden moderate-to-severe right iliac fossa pain for more than one day. Pain was associated with nausea and multiple episodes of non-projectile vomiting with food content. There was no history of fever, diarrhea or loss of appetite. The patient has had a regular 28-day menstrual cycle since the age of menarche.

Upon physical examination, the patient was oriented and conscious with normal vital signs. Blood pressure was 132/84 with a pulse rate of 86, respiratory rate of 19, oral temperature of

36.7 celsius and normal percentage of oxygenated hemoglobin. Her abdomen was soft, but deep palpation revealed tenderness in the right iliac fossa with no palpable masses. Transabdominal ultrasound demonstrated both ovaries are polycystic in appearance. The right ovary measured 34 x 18 x 38 mm with a volume of 11.6 ml while the left ovary measured 34 x 31 x 34 mm with a volume of 17.9. Vascular flow was detected in both ovaries on color Doppler. There was a simple cystic structure seen anterior to the uterus measuring 65 x 49 mm with normal detected color doppler. There was also free fluid within the pouch of douglas. (figure 1) Upon reviewing the patient's medical record, two previous visits to the emergency department were found with the same complaint, in which the diagnosis was missed.



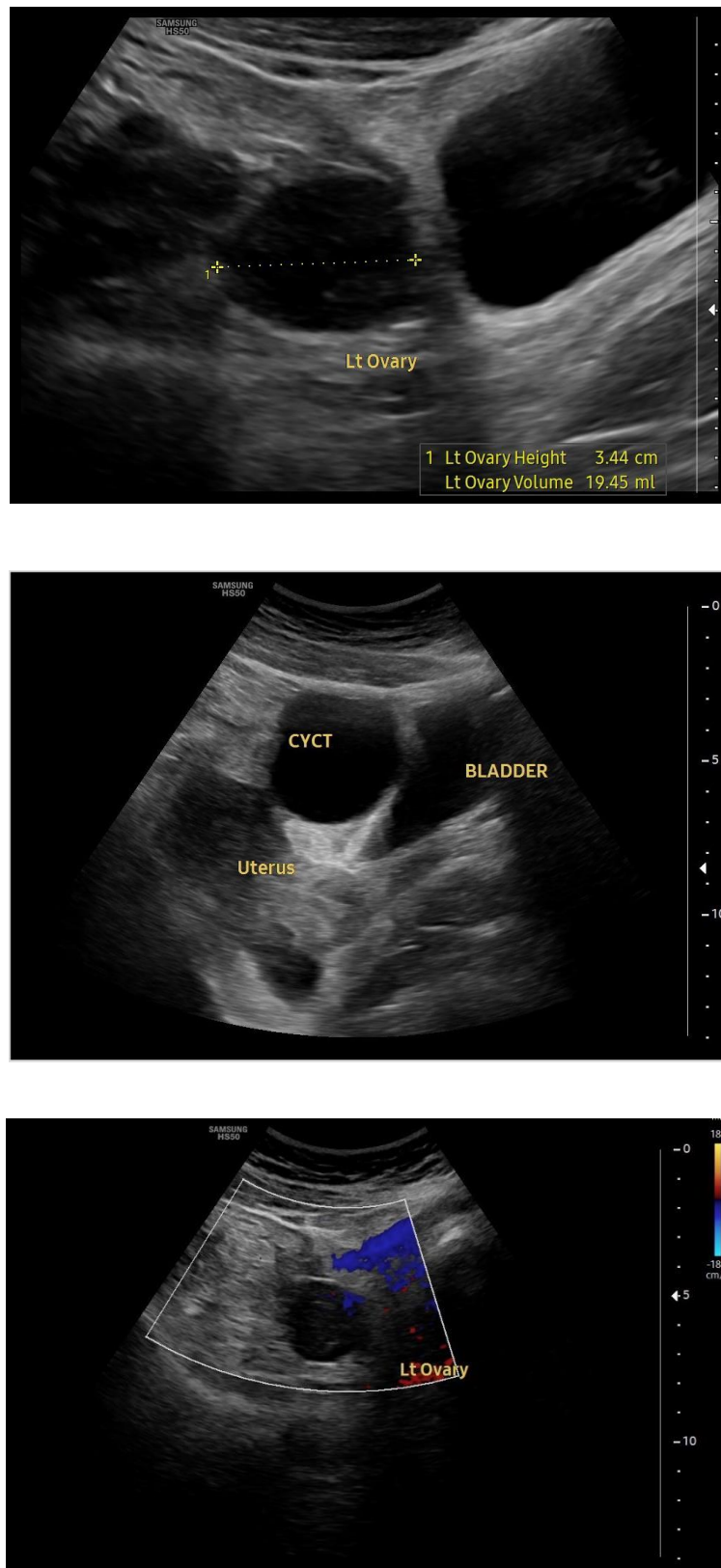


Figure 01 Transabdominal gray scale and doppler ultrasound of the pelvis demonstrating a well-defined cystic structure seen anterior to the uterus without detected internal flow, Case 1.

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Cumulatively, the sudden onset of severe pain, physical findings and detection of an adnexal cyst raised the possibility of right adnexal torsion. Therefore, it was decided to push the patient to the operating room for urgent laparoscopy with preoperative diagnosis of adnexal torsion. The international standard laparoscopic technique was performed initially then general anesthesia was initiated and the patient was intubated for ventilation. For laparoscopy, four trocars were used: one of 10 mm in diameter at the umbilicus and three trocars of 5 mm in diameter at right lumbar, supra pubic and left lumbar.

Diagnostic laparoscopy revealed normal ovary and tube on the left side. In contrast, right side revealed five times adnexal tubal torsion in which the tube was blocked, swollen, and dark in color with 5 cm gangrenous cyst (grade 3 based on Parelkar grading for ischemia). Detorsion then cystectomy was done at the distal part of the tube with preservation of the tube and ovary. No signs of malignancy, adhesions, and ascites. There is no free fluid seen in the pelvis and appendix was normal. Peritoneal cytology was taken and sent for cytology with no malignant cells. The cystic conglomerate tumor was later sent for histopathological analysis resulting in a paratubal cyst and necrotic fallopian tube with hemorrhage, which came back negative for any malignancy. (figure 2)

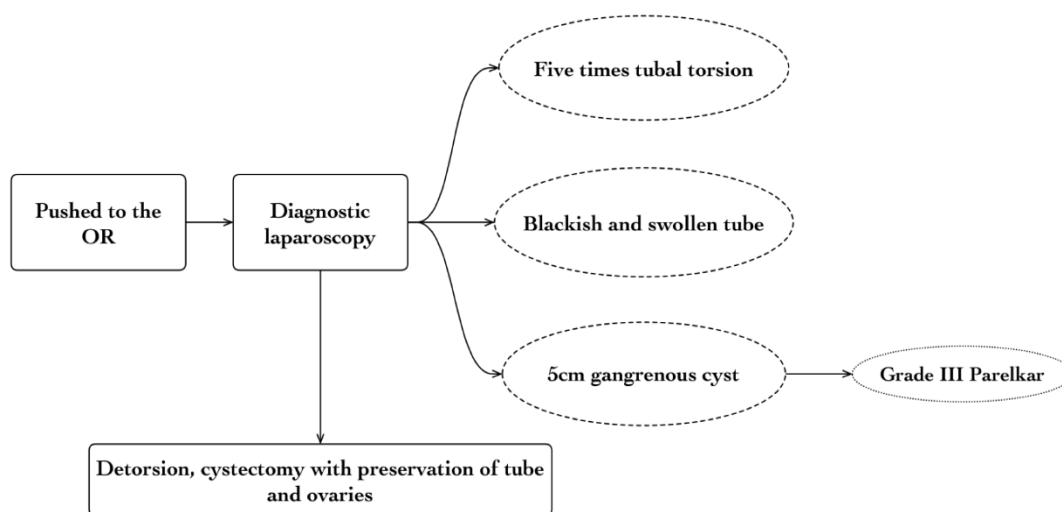


Figure 02 A summary of the treatment approach for case 1.

The patient recovered from surgery without any complications and she was discharged in a good condition on the second day post right laparoscopic salpingectomy without complaint.

Postoperative follow up assessments after a couple of months including clinical examination in the clinic was uneventful without further investigations needed.

Case 2

A 23-year-old single female, who is medically and surgically free with insignificant family history, presented to the emergency room with severe right iliac fossa pain for two days associated with loss of appetite. The pain does not radiate to other sites without associated nausea or vomiting. The patient had a similar episode of pain two times within this year. Upon physical exam, the patient was vitally stable with marked tenderness on the right iliac fossa.

Blood work-up showed normal WBC measuring 9.95 cells per liter, slightly low hemoglobin (Hb) measuring 8.7 grams per deciliter (g/dl), and slightly high neutrophils of 92.6 cells per microliter. Computed tomography (CT) scan was done, which revealed a fluid-filled appendix measuring 0.7 cm, without free air or fluid. Additionally, a right adnexal cyst was found, likely ovarian in origin, measuring 5 x 3.8 cm with surrounding minimal amount of fluid. The radiological impression was a picture of acute uncomplicated appendicitis. Therefore, the general surgery team decided to take the patient for laparoscopic appendectomy. The gynecology team was consulted intraoperatively as a right adnexal hemorrhagic cyst was detected with three times tubal torsion and distal gangrenous right fallopian tube, which was classified as grade 3 based on Parelkar grading for ischemia. (figure 3) Intraoperatively, the cyst was aspirated then tubal detorsion was done. The patient recovered well and was discharged home two days later.

Postoperative follow up assessments after a couple of months including clinical examination in the clinic was uneventful without further investigations needed.





Figure 03 Intraoperative findings of case 1: Right adnexal hemorrhagic cyst was detected with three times tubal torsion and distal gangrenous right fallopian tube (grade 3 based on Parelkar grading).

Authors	# of patients	Presentation	Labs	Diagnosis
Liang-Ming Lo et al. ⁵	17	- LAP (100%) - N/V (41%) - Fever (17.6%)	↑ WBC (29.4%)	- US (100%) - CT (3%)
Gaied et al. ⁶	45 (pediatrics)	- Fever (27%) - Uni/bilateral LAP - N/V	↑ WBC (63%)	- US (22%) - MRI (40%)
Ramadan M. et al. ⁷	2	- Right LAP & periumbilical radiating to right lower quadrant - N/V	↑ WBC (100%)	- US (100%) - CT: i. Minimal pelvic free fluid ii. Twisted tubular right adnexal structure suggestive of acute appendicitis.

LAP: Lower abdominal pain | N/V: nausea and vomiting | WBC: white blood cells | US: ultrasound | CT: computed tomography
MRI: magnetic resonance imaging

Figure 04 Analysis of isolated FTT in present and previous reports

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Discussion

One of the rarest causes of lower abdominal pain in females is the IFTT. It has been reported in females of all ages, but it occurs most often in ovulating females with predisposing factors. The etiology behind its frequency among women of reproductive age is due to the infrequent occurrence of its risk factors before menarche or during menopause.[4]

The several etiological factors can be categorized as either internal (i.e., within the tube) or external. Internal factors include tumors of the fallopian tube, tubal ligation, hydrosalpinx, hematosalpinx, pelvic inflammatory disease and other tubal abnormalities. The external causes include pelvic masses, pregnancy, adhesions, venous congestion, and medication. [2]

In our cases, the main two complaints were lower abdominal pain and vomiting, that was very similar to what Liang-Ming Lo et al. found, in which the most common manifestation among 17 patients (in comparison with 41% in our cases) was lower abdominal pain followed by nausea and vomiting, none of which were diagnosed before the operation. Liang-Ming Lo et al also observed the presence of leukocytosis in 29.4% of the patients while Faid Gaied et al observed it in up to 63%. [5]. However, our patient showed normal white blood cells (WBC).

The ultrasound findings tend to be nonspecific and vary significantly; therefore, it is used as a tool to aid in the diagnosis but is not able to definitively include or exclude the presence of torsion. On the other hand, ultrasound is suboptimal in the assessment of salpinx; hence, tubal abnormalities can still be detected. For example, it can reveal a dilated salpinx, an echogenic mass, thickened tubal walls, and free fluid in the Douglas space or around the tube. Color Doppler ultrasonography can show disrupted blood flow. For better evaluation of tubes, CT or MRI can be useful for diagnosis, especially to exclude other abnormalities and to confirm an ipsilateral normal ovary. [5]

To the best of our knowledge, a challenging diagnosis like IFTT tend to have variable and nonspecific presentations. Therefore, we present these two case reports to emphasize the importance of considering IFTT in the differential diagnosis of all females presenting with lower abdominal pain, a pathological adnexal structure and normal ovaries. Transabdominal or transvaginal gray-scale and doppler pelvic ultrasound is a helpful but limited tool for the recognition of this gynecological emergency. Urgent diagnostic laparoscopic intervention is the gold standard to achieve fertility preservation. With more published case reports and series, the diagnosis, intervention, and fertility outcome of IFTT would dramatically improve and have a better future implication.

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