

Isolated Fallopian Tube Torsion as a Cause of Acute Abdominal Pain in Children: A Case Report

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Article Info

 [10.30699/jogcr.7.6.578](https://doi.org/10.30699/jogcr.7.6.578)

Received: 2021/08/30;

Accepted: 2021/09/20;

Published Online: 09 Sep 2022;

Use your device to scan and read the article online



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ABSTRACT

Isolated fallopian tube torsion is a rare situation in reproductive-aged women. The gold standard for diagnosis is laparoscopic evaluation, and the treatment of choice is salpingectomy without oophorectomy to preserve fertility. Still, inpatient with a presentation of the acute abdomen or hemodynamically unstable, urgent laparotomy is the treatment of choice. Here, we reported a 15-year-old virgin girl presented with acute abdominal pain and evidence of adnexal torsion on the abdominal ultrasonography. Urgent laparotomy revealed an isolated right fallopian tube torsion. Due to irreversible necrosis of the tube, right salpingectomy was performed. It's crucial to consider isolated fallopian tube torsion as a potential cause of abdominal pain in reproductive-aged women and use appropriate diagnostic measures to diagnose it early and preserve their future fertility.

Keywords: Abdominal pain, Fallopian Tubes, Laparotomy, Ovarian torsion

Introduction

Rotation of the ovary on its ligamentous, known as ovarian torsion, is one of the most common gynecologic surgical emergencies in females of all ages (1). Isolated fallopian tube torsion (IFTT), with an estimated incidence rate of 1 in 1.5 million in adolescents and the reproductive age group, is characterized by the rotation of the fallopian tube on its axis without twisting the ipsilateral ovary (2-4). IFTT mostly occurs in the left tube than in the right one, with an estimated rate of 63.2% and 36.8%, respectively. IFTT is an uncommon cause of acute abdominal pain, usually associated with nonspecific symptoms like fever, nausea, and vomiting (3). We may use a combination of symptoms, physical examination, laboratory, and radiologic evaluation to diagnose the IFTT, but surgical exploration remains the only method for definitive diagnosis (5-9). Diagnosing IFTT through standard diagnostic modalities like abdominal ultrasonography, MRI, or CT scan is challenging. In patients whose IFTT is associated with hydrosalpinx, definitive diagnosis is obtained only through laparoscopy. Operative procedures can vary from conservative management with detorsion of the affected tube to salpingectomy because of the Presence of necrosis or rupture of the tube. However, the surgical

remedy of the torsed tube is controversial (5). During an evaluation, if we don't face necrosis or rupture, we may detort the affected tube laparoscopically to preserve the patient's fertility (5, 10-13). Herein, we reported an IFTT in a 15-year-old virgin girl who presented to the emergency department with acute abdominal pain.

Case Presentation

A 15-year-old virgin girl presented to the emergency department with abdominal pain from the last night of admission. It had insidious onset, then became persistent and located in the right lower quadrant of the abdomen. She also mentioned nausea and vomiting, and anorexia. She didn't say any aggravating or relieving factor or radiation of pain to the other part of the body. Her last menstrual period was one month before, and the onset of the menarche was at 14 years old with irregular cycles. Her past medical history was negative, except for thalassemia minor and her familial and sexual history was also negative. There was no psychosocial problem or ant genetic disorder in her familial history. The initial physical examination showed a blood pressure of 90/60 mmHg without

orthostatic hypotension, pulse rate of 86 beats per minute, respiratory rate of 20 per minute, a temperature of 37.9°C, and body mass index of 21.35 kg/m². There was no abnormality in head and neck and chest examination, but abdominal examination revealed rebound tenderness in the right lower quadrant of the abdomen and generalized abdominal guarding. Laboratory evaluation, including complete blood count, serum β -HCG, and urine analysis, was performed and revealed a white blood cell count of 11600/ μ L (neutrophil 78%, lymphocyte 20%), hemoglobin of 10 mg/dL, hematocrit of 33 %, low MCV of 62.1fL (normal range of 79-98), platelets of 248000/mL (normal range of 150000-450000), serum β -HCG level of 1 unit/mL and regular urine analysis. We first performed abdominal ultrasonography to rule out the most common differential diagnoses, such as appendicitis, ovarian torsion, and ectopic pregnancy. Abdominal Ultrasound revealed a 59×37-millimeter uterus with normal echogenicity and endometrial thickness of 5-millimeter, left ovary with a dimension of 29×32×15 millimeter and volume of 7 CCs, right ovary with an extent of 42×20×30 millimeter and volume of 22 CCs including some peripheral follicles. There was a cystic lesion of 55×60 millimeters and a maximum thickness of 2 millimeters adjacent to the right ovary. On the color Doppler sonography, the left ovary had normal and low resistance blood flow, but the right ovary had no detectable vascular flow. There was no sign of appendicitis, but mild free fluid (about 20 CCs) in the pelvic was detected. Due to high suspicion of ovarian torsion, the patient underwent exploratory laparotomy with Pfannenstiel incision, revealing 100 cc bloody fluid in the abdominal sac, normal uterus, and normal left adnexa. In evaluating the right adnexa, there was a 10×10 cm cystic mass with an intact wall and necrotic appearance originating from the right fallopian tube ([Figure 1](#)).

The Right ovary had a normal appearance with some peripheral follicles. The mass was twisted four times around its stalk, including the mesosalpinx ligament ([Figure 2](#)). We detorted the mass and decided to perform the right salpingectomy because of no change in its appearance. The Right ovary was intact, so we didn't need an oophorectomy. Resected mass sent to pathology for further evaluation. After repairing the incision, the patient was transformed into recovery and the ward.

Pathologist evaluation revealed the multi-loculated cystic lesion with ciliated flat to cuboidal cell lining accompanied by extensive bleeding in the cyst wall, compatible with benign serous cystadenoma with extensive bleeding. Still, because of finding an intact ovary during surgery, a re-evaluation of the specimen by another pathologist was requested, which revealed that the origin of the resected cyst was a fallopian tube. The postoperative period was uneventful, and the patient was discharged from the hospital two days after surgery.



Figure 1. Isolated torsion of the right fallopian tube with hydrosalpinx and intact ovary



Figure 2. Gangrenous right adnexal torsion after resection

Discussion

IFTT is an infrequent cause of acute abdominal pain in children, with an estimated rate of 0.27% of all emergency department children with acute abdominal pain complaints (14). Through a literature review, we found one retrospective study from 2007 to 2016 at a single children's hospital in Houston, Texas, including 237 children (14), and another multicenter retrospective study from 1991 to 2017 at five Italian centers of pediatrics surgery, including 20 patients with this diagnosis (6), and a case series study in turkey including ten patient from 2003 to 2018 (15) but Iran. We just found two case reports with the diagnosis of IFTT, one of them reporting a 23-year-old woman and the other a 32-year-old woman (16, 17). As far as we know, our study is the first case report on IFTT in adolescents in Iran. The Median age at diagnosis was 13.1, 12.4, and 14.5 years; in three different studies (6, 14, 15). Here we reported a 15-year-old virgin girl with the onset of menarche from last year with an irregular pattern. The Situation that leads to IFTT may vary from twisting the tube's mid-portion around itself or the

supporting ligamentous of the tube to the Torsion of Paratubal, broad ligament, or Para ovarian cysts (18, 19). There are many Possible predisposing factors for IFTT, including long mesosalpinx, hydro/hematosalpinx, adnexal mass, tubal mass/neoplasm, abnormal peristalsis, periovarian spasm, the Sellheim theory, pelvic inflammatory disease, trauma, pelvic adhesion, tubal ligation, and enlarged uterus mass (20). In a case series of 10 children with IFTT, 70% were accompanied by Para ovarian cysts (15). In another study with 20 children with IFTT, 50% had associated pathologic conditions (6). In a survey of 245 children, 79% of cases had associated lesions, most commonly Paratubal cysts and mature teratomas (14). Paratubal cysts are often connected with a stalk with the mesosalpinx, around which torsion may occur (18). In our case, it's due to the Paratubal cyst, which was twisted four times around the mesosalpinx ligament and confirmed post-operatively through pathology evaluation of resected mass. IFTT can occur in both fallopian tubes (FT). In some studies, right side FT was more affected (14), while in others, right and left FT involvement was equal (15). In our case, the right fallopian tube was involved, and there was no abnormality in the left adnexa. As we said earlier, the clinical presentation may vary from acute abdominal pain to chronic abdominal pain with nonspecific symptoms like nausea and vomiting. In most cases, abdominal pain was noticed (6, 14), and the most associated symptoms were nausea and vomiting (14). In most cases, abdominal pain was localized to the right lower quadrant of the abdomen and usually started three days before evaluation (6, 15). Our patient also had abdominal pain, starting from the last night of admission, which later localized to the right lower quadrant of the abdomen, with nausea and vomiting as associated symptoms. The Presence of this typical clinical presentation in a reproductive woman would increase suspicion of adnexal torsion and lead to early diagnosis to preserve the function of the affected ovary or fallopian tube. In reproductive-aged women with acute abdominal pain, ectopic pregnancy, appendicitis, and torsion of the adnexa are some of the most important differential diagnoses. In the suspected diagnosis of IFTT, blood test values aren't specific enough to diagnose IFTT. For example, in one study (6), 65% of cases had leukocytosis, 50% of patients had increased neutrophils levels, and 60% had a high level of CRP, but in some studies, elevated WBC was not a frequent finding (14). Our patient had an elevated level of WBC (11600/ μ L), a neutrophil count of 78%, and normal CRP. We face a diagnostic challenge for a definite diagnosis of the IFTT since it has no pathognomic features (13). Considering the lack of radiation and usefulness of abdominal Ultrasound to evaluate other causes of acute abdominal pain makes it the best modality of choice to perform at first. However, accurate diagnosis of IFTT with this modality is possible in only 30% of the cases, and the torsed tube may mimic a multicystic adnexal or ovarian

cyst (8). We performed abdominal ultrasonography In our case due to high suspicion of ovarian torsion, which was affirmative for the IFTT. Accurate diagnosis of IFTT is only possible by laparoscopic evaluation. However, because of varied presenting symptoms in patients, and nonspecific imaging findings, the diagnosis is rarely made preoperatively and salpingectomy is the only available choice during surgery in underdiagnosed patients (13). We performed surgery as soon as possible, but because of necrosis and ischemia, detorsion was not successful, and we decided to perform salpingectomy as a therapeutic intervention. Since the ovary was intact, and had a normal appearance, oophorectomy was not done, which leads to preserving the fertility of the patient. In this case, awareness of all available differential diagnosis in a woman with acute abdominal pain, and early use of abdominal ultrasonography, leads to perform surgery as soon as possible, but unfortunately, because of the patient's inattention to his symptoms and came late to the emergency department, the right fallopian tube was necrotic, and detorsion was not successful. Furthermore, despite the pathology report of the ovarian origin of resected mass, we didn't perform oophorectomy because of seeing a normal appearance right ovary. Day after surgery, we requested revision on the pathology report, which showed the mass was originated from the fallopian tube. We successfully managed patient without any unwanted damage to her ovary.

Conclusion

IFTT is a rare condition whose preoperative diagnosis is often missed because of nonspecific clinical presentation and radiologic findings. Sometimes, it's misdiagnosed with ovarian torsion and leads to unnecessary oophorectomy, which adversely affects the patient's future fertility. It is vital to consider IFTT as a differential diagnosis of abdominal pain in reproductive-aged women and perform necessary evaluation workups as soon as possible. We should perform urgent laparotomy and choose an appropriate technique due to the finding during the surgery, especially considering the ovarian appearance, to avoid further complications and preserve fertility.

Acknowledgments

The authors have no acknowledgment.

Informed consent

Written consent for publication of this case report was obtained from the patient's parents.

Conflict of Interest

The authors have no conflict of interest to declare.

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How to Cite This Article:

Amir Khanloo F, Esmaelzadeh S, Adnani M, Shafizadeh F. Isolated Fallopian Tube Torsion as a Cause of Acute Abdominal Pain in Children: A Case Report. J Obstet Gynecol Cancer Res. 2022; 7(6):578-82.

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