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Isolated Fallopian Tube Torsion: An Overlooked Diagnosis Cause of Pelvic Pain in a Young Girl

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ABSTRACT

Isolated fallopian tube torsion (IFTT) is an exceptionally rare gynaecological emergency, especially in adolescents, with an estimated incidence of 1 in 1.5 million. Clinical presentation is often nonspecific, and radiologic findings may be subtle, leading to delayed diagnosis. A 12-year-old girl presented with acute left lower abdominal pain of four days' duration that had not resolved with supportive management. Laboratory tests were unremarkable. Ultrasonography showed a tubular anechoic structure in the left hemipelvis suggestive of hydrosalpinx, while both ovaries appeared normal. Contrast-enhanced computed tomography (CECT) of the abdomen confirmed these findings with areas of mural hypoenhancement. Persistent, disproportionate pain prompted diagnostic laparoscopy, which revealed a 540° torsion of the mid-portion of the left fallopian tube with gangrene, while the ipsilateral ovary remained viable. A left salpingectomy was performed, and postoperative recovery was uneventful. This case emphasises that IFTT should be considered in adolescent females presenting with acute, localised, non-migratory pelvic pain, particularly when laboratory results are normal, together with radiological findings of an extra-ovarian thin-walled cystic structure with a normal ipsilateral ovary. Areas of mural hypoenhancement, as observed in this case, should raise concern for gangrenous fallopian tube. Early recognition of these radiological signs may facililtate timely imaging diagnosis and surgical intervention, which may help to prevent irreversible tubal damage and preserve future fertility.

Keywords: Fallopian tube; torsion; emergency; surgery; radiology; paediatric

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INTRODUCTION

Isolated fallopian tube torsion (IFTT) is an exceptionally rare gynaecological emergency in adolescents, with an estimated incidence of approximately 1 in 1.5 million (Hansen, 1970). Its diagnosis is often challenging, both clinically and radiologically (Amirkhanloo *et al.*, 2022). Although IFTT can occur across a broad age range, it predominantly affects women of reproductive age, with a reported mean age of 28.1 ± 11.3 years (Balasubramaniam *et al.*, 2020). However, cases have also been reported in paediatric and adolescent populations.

The clinical presentation is often nonspecific, mimicking other abdominal emergencies. Patients may present with abdominal or pelvic pain, nausea, vomiting, changes in bowel or bladder habits, lower abdominal tenderness, an abdominal or adnexal mass, fever, or tachycardia. Preoperative diagnosis is frequently missed due to the rarity of the condition and subtle imaging findings—often manifesting as a midline cystic pelvic mass with minimal or absent free fluid (Gross *et al.*, 2005). Although several authors have attempted to characterise the imaging features of IFTT, most reports are limited to individual case studies or series, and no distinctive radiological hallmark has been identified that reliably establishes the diagnosis (Bulut, 2024) particularly in cases of gangrenous IFTT.

In this report, we describe the case of a young girl presenting with isolated torsion of the left fallopian tube with a preserved ipsilateral ovary. A definitive diagnosis was not established on preoperative imaging and was confirmed only during laparoscopic evaluation.

CASE REPORT

A previously healthy 12-year-old girl presented with sudden-onset left lower abdominal pain for four days. The pain was initially severe and continuous but later became colicky in nature. She reported no fever or alterations in bowel habits. She was on the third day of menstruation with normal menstrual flow and reported sediments in the urine during the first two days of illness, but denied dysuria, urinary frequency, or urgency. On examination, the lower abdomen was markedly tender with voluntary guarding, limiting deep palpation. No palpable mass was noted, and examination of the upper abdominal quadrants and other systems was unremarkable. Initial differential diagnoses included ovarian torsion, acute appendicitis and urinary tract infection.

Laboratory investigations revealed a normal white blood cell count (11.0 × 10⁹/L), platelet count (219 × 10⁹/L), and haemoglobin (14.7 g/dL). Urinalysis showed no evidence of infection, and renal and liver function tests were within normal limits.

Abdominal ultrasonography demonstrated a convoluted tubular anechoic structure in the left hemipelvis, suggestive of hydrosalpinx, with a maximum diameter of 3.0 cm (Figure 1a). Minimal moving echogenic debris and internal septations were noted. The wall of the tubular structure was thin and showed preserved vascularity, but surrounding hyperechoic fat indicated ongoing inflammation. No swirling appearance or pedicle was observed, and minimal free fluid was present in the pelvis.

Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis confirmed these findings, showing a convoluted tubular hypodense structure in the left hemipelvis (Figure 2) adjacent to the uterus. It extended to the midline and measured 6.9 x 7.7 x 5.3 cm (AP x W x CC). The wall of the structure was slightly thickened and demonstrated enhancement, with irregular areas of mural hypoenhancement which may indicate ischaemia. This was associated with surrounding fat stranding and free fluid within the pelvis. Otherwise, no rim-enhancing collection was identified. Both ovaries were normal in location and appearance. There was no evidence of pedicular torsion, dilated ovarian follicles or swirling of ovarian vessels. The uterus showed normal size and appearance. In view of normally located ovaries and its appearance, radiological diagnosis of pyosalpinx was made, and she was admitted for antimicrobial therapy.

However, her pain persisted after three days of admission and repeat ultrasonography showed thickening and increased echogenicity of the tubal wall, now with reduced vascularity (Figure 1b) which raised concern of tubal ischaemia/gangrene. Again, both ovaries were normally located and well-visualised. In view of disproportionate abdominal pain, worsening mural inflammation with reduced vascularity, clinical suspicion of fallopian tube torsion was made. After a multidisciplinary discussion, she underwent diagnostic laparoscopy.

Diagnostic laparoscopy revealed a 540° torsion of the middle portion of the left fallopian tube with a gangrenous loop (Figure 3). The left ovary, as well as the uterus, right ovary, and right fallopian tube, appeared normal. A left salpingectomy was performed, preserving the viable ovary. Histopathology of the excised tube showed haemorrhagic and congested tissue devoid of epithelial lining, with extensive areas of fresh haemorrhage and absence of viable stroma. Postoperatively, she received three doses of intravenous cefotaxime and metronidazole, along with adequate analgesia. Her recovery was uneventful, and she was discharged two days after surgery. Follow-up at two and six weeks confirmed complete clinical recovery.

DISCUSSION

Acute abdominal or pelvic pain in females of reproductive age is commonly associated with surgical and gynaecological emergencies such as acute appendicitis, ovarian torsion, ectopic pregnancy, pelvic inflammatory disease, or ovarian follicle/cyst rupture (Franco P.N. *et al.*, 2023). The diagnosis of isolated fallopian tube torsion (IFTT) is frequently delayed due to its rarity and the difficulty of radiological detection using ultrasound, CT, or even MRI, with definitive diagnosis typically established via laparoscopy or laparotomy. In one case series of 13 patients, all cases were diagnosed surgically (Boukaidi *et al.*, 2011). The largest 20-year retrospective review of 45 IFTT cases also demonstrated very low sensitivity for radiologic diagnosis, with ultrasound, CT, and MRI showing sensitivities of 22%, 14%, and 40%, respectively (Gaied *et al.*, 2012).

Most patients with IFTT are in the menarchal age group, although it can occasionally occur in pre-menarchal patients (Gaied *et al.*, 2012; Bulut, 2024). Paediatric literature reports a mean age at presentation of 13.2 ± 2.1 years. Consistent with this case, the patient was 12 years old and had attained menarche two months prior. Previous reports have suggested that the fallopian tube torsion commonly occurs on the right side in view of the close relationship of left fallopian tube to the sigmoid mesentery (Gross *et al.*, 2005). Similar to other ischaemic events, a vicious cycle of vascular compromise occurs in isolated fallopian tube torsion (IFTT). Initially, mechanical obstruction of the adnexal veins and lymphatics leads to tissue oedema. The increasing oedema further impairs venous and lymphatic drainage, eventually compromising arterial inflow and resulting in ischaemia and necrosis (Bondioni *et al.*, 2002). This pathophysiological progression was evident in our case, in which the sequelae of the ischaemic process

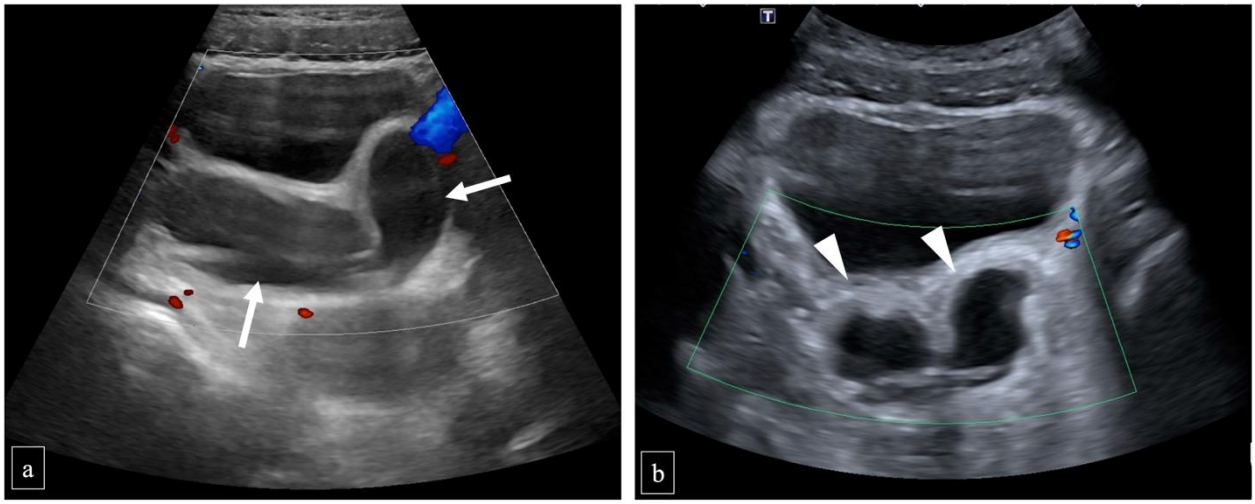


Figure 1: Ultrasound on the day of admission (a) showed thin wall anechoic tubular structures at uterovesical pouch (arrows) in keeping with hydrosalpinx. Repeated ultrasound (b) showed thickening of the fallopian tube wall (arrowheads). Both of these studies failed to demonstrate both ovaries. Noted reduced vascularity in the second ultrasound (b).

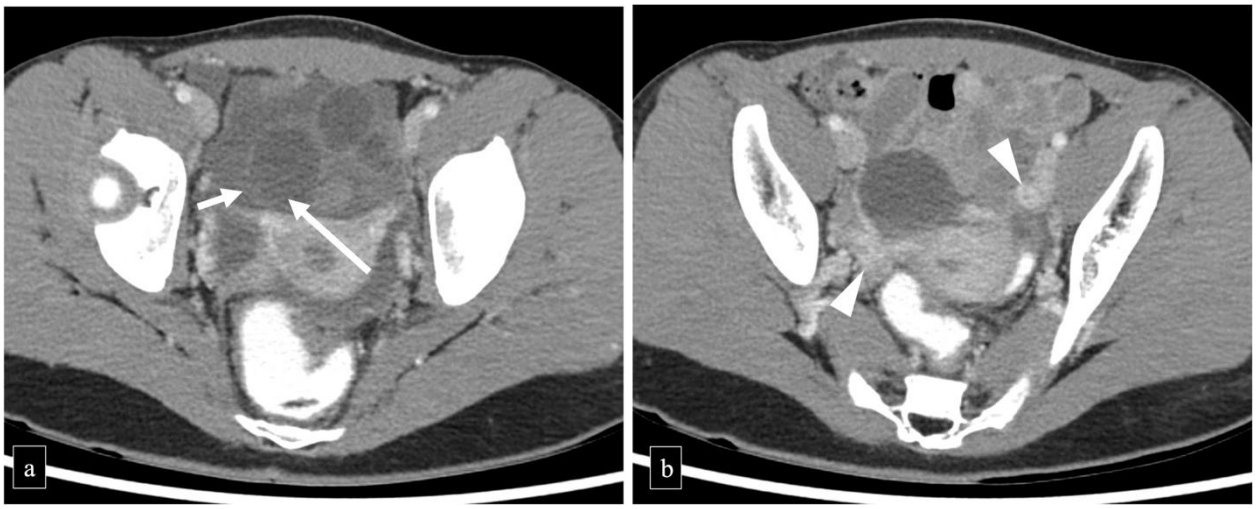


Figure 2: Contrast-enhanced CT of the pelvis in axial view at the level of uterine body (a) and uterine fundus (b) showed convoluted cystic structure at the central pelvis (long arrow) indicating hydrosalpinx with focal area of mural hypoenhancement (short arrow in a). Normal location and appearance of both ovaries (arrowheads in b). Noted minimal free fluid in the pelvis likely reactive.

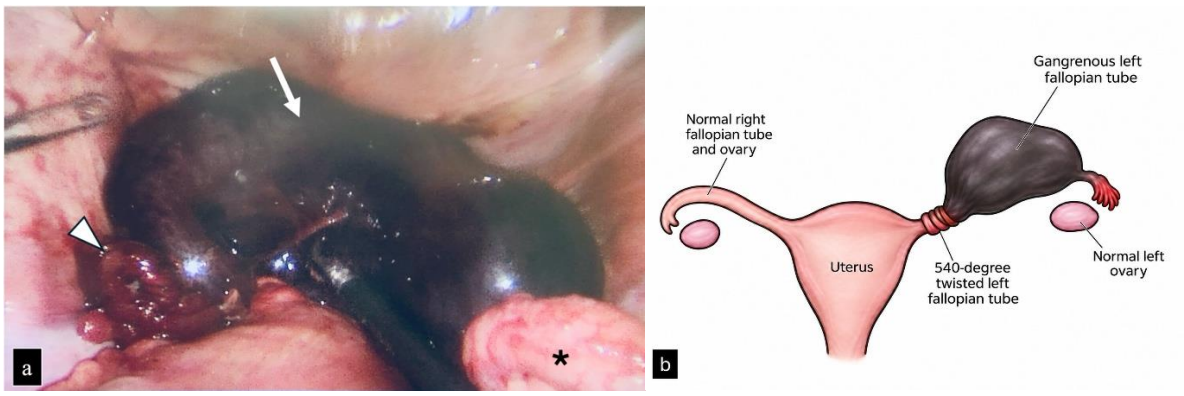


Figure 3: (a) Laparoscopic image showed dilated and torsed of left fallopian tube (arrow) with blackish discolouration in keeping with gangrene. Noted the twisted and gangrenous middle portion of left fallopian tube (arrowhead), and normal left ovary (asterisk). (b) Schematic drawing of intraoperative findings showed 540-degree twisted left fallopian tube and normal ipsilateral ovary.

became more pronounced on repeat ultrasonography performed on the third day of admission.

This patient presented with non-specific symptoms, including acute, localised, non-migratory severe left pelvic pain and tenderness, accompanied by a fever, but without nausea or altered bowel habits. A large case series by Bulut reported these symptoms in 100% of their patients (Bulut, 2024). Other smaller series similarly described localised, non-migratory abdominal pain, with or without nausea and vomiting, and severe abdominal tenderness in most cases (Boukaidi *et al.*, 2011; Balasubramaniam *et al.*, 2020; Pignataro & Schindler, 2023). These studies also highlighted that laboratory investigations are often unhelpful in diagnosis, consistent with this patient, whose laboratory results were normal.

No single risk factor has been identified for IFTT. A large case-based systematic review categorised potential risk factors as intrinsic (tubal) or extrinsic (surrounding structures) (Shriya V. *et al.*, 2020). The most commonly reported risk factor is hydrosalpinx, followed by sterilisation, pelvic inflammatory disease or ovarian cysts. In this case, it was not possible to determine whether the hydrosalpinx had been present before the torsion because the patient had previously been well and no prior pelvic imaging had been performed. Other recognised risk factors appeared less likely based on the blood parameters and laparoscopic findings; normal infective parameters, virgin abdomen-pelvis, and absence of ovarian cyst.

Ultrasonography, typically used as the first-line imaging modality, often shows non-specific findings. Dilated tubular structures suggestive of hydrosalpinx are commonly reported, but specific features indicating torsion are rarely identified (Boukaidi *et al.*, 2011; Balasubramaniam *et al.*, 2020; Bulut, 2024). Some authors have described the presence of twisting of the vascular bundle, producing a “whirlpool sign” (Vijayaraghavan & Senthil, 2009) which was absent in this case. Ramadan M.K.*et al.*, 2020 noted that fallopian tube torsion may appear as a dilated tubular structure with a tapering end, forming an extra-ovarian cystic mass with a normal ipsilateral ovary (Coutureau *et al.*, 2022). In this case, severe pain limited visualisation of both ovaries on the initial two ultrasonographic examinations, highlighting a scenario where CT may provide additional diagnostic information.

Cross-sectional studies have yet to identify a definitive radiologic sign of IFTT, though adnexal masses were present in all cases assessed by CT (Bulut, 2024). A few studies have attempted to define CT or MRI features suggestive of IFTT. Coutureau *et al.* described two patterns: thin-walled hydrosalpinx with a median diameter of 3 cm, and an extra-ovarian cyst adjacent to a soft tissue mass containing twisted tubes and vessels (Coutureau *et al.*, 2022). Over 90% of patients demonstrated a normal ipsilateral ovary (Narayanan *et al.*, 2014; Ramadan *et al.*, 2020) as observed in this case.

To date, no CT or MRI features reliably indicate a gangrenous fallopian tube or hydrosalpinx. In this patient, the fallopian tube wall was thin, and enhancement was markedly reduced compared with adjacent adnexal structures and bowel loops, potentially suggesting hypovascularity or ischaemia and raising concern for gangrene.

Definitive diagnosis was achieved through direct laparoscopic visualisation, with surgical management performed in the same setting. Laparoscopy remains the gold standard for diagnosis and treatment of IFTT, particularly when radiologic findings are inconclusive.

According to the American College of Obstetricians & Gynecologists (ACOG), ‘A surgeon should not remove a torsed ovary unless oophorectomy is unavoidable, such as when a severely necrotic ovary falls apart’ (ACOG, 2019). This is because the uniqueness of adolescent population where the ovarian preservation is utmost important in ensuring their fertility. Our case in-line with this recommendation where the left ovary was preserved despite presence of tubal gangrene and subjected for salpingectomy.

In line with fertility-preserving principles advocated by ACOG, detorsion with preservation should be considered when the affected fallopian tube remains potentially viable - no visible gangrenous necrosis or fails to show evidence of revascularisation following detorsion (Bertozzi *et al.*, 2017). However, unlike ovarian torsion, standardised criteria for determining tubal salvageability in IFTT have not been established. Persistent gangrenous appearance and lack of reperfusion after detorsion favour irreversible tubal injury and the need for salpingectomy. However, histopathological confirmation of haemorrhagic infarction and necrosis remains the gold standard that supports the intraoperative assessment (Nagahama *et al.*, 2024).

Unilateral salpingectomy is not expected to preclude future spontaneous pregnancy when the contralateral fallopian tube and ovaries are normal. Nevertheless, removal of one fallopian tube reduces the available tubal pathway for natural conception and may potentially affect reproductive efficiency. In paediatric IFTT, the long-term fertility consequences of salpingectomy remain poorly defined because published series are small and reproductive follow-up is limited. Preservation of a viable tube should therefore be considered whenever feasible, while ovarian preservation remains the main objective (Casey *et al.*, 2013; Bertozzi *et al.*, 2017).

CONCLUSION

Although IFTT is an exceedingly rare condition, maintaining a high index of suspicion at the time of presentation can facilitate prompt diagnosis and potentially allow salvage of the affected tube. Current literature, together with the finding of this case, suggests a diagnosis of IFTT particularly in young

patients presenting with severe, localised, non-migratory abdominal pain and normal laboratory results. Given the limited number of reported cases and the scarcity of radiologic descriptions in the literature, this case provides additional insight that may help reduce delays in definitive diagnosis and surgical intervention, thereby preserving future fertility.

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REFERENCES

American College of Obstetricians and Gynecologists' Committee on Adolescent Health Care. (2019). Adnexal torsion in adolescents. Committee Opinion No. 783. *Obstetrics & Gynecology*, 134(2): e56–e63. https://doi.org/10.1097/AOG.0000000000003373

Amirkhanloo, F., Esmaelzadeh, S., Adnani, M. & Shafizadeh, F. (2022). Isolated fallopian tube torsion as a cause of acute abdominal pain in children: A case report. *Journal of Obstetrics, Gynecology and Cancer Research*, 7(6): 578–582. https://doi.org/10.30699/jogcr.7.6.578

Balasubramaniam, D., et al. (2020). Isolated fallopian tube torsion: A rare twist with a diagnostic challenge that may compromise fertility. *Journal of Human Reproductive Sciences*, 13(2): 162–167. https://doi.org/10.4103/jhrs.JHRS_143_19

Bertozzi, M., Magrini, E., Riccioni, S., Giovenali, P. & Appignani, A. (2017). Isolated fallopian tube torsion with hydrosalpinx: Review of a debated management in a pediatric population. *Journal of Pediatric Surgery*, 52(10): 1553–1560. https://doi.org/10.1016/j.jpedsurg.2017.07.005

Bondioni, M.P., McHugh, K. & Grazioli, L. (2002). Isolated fallopian tube torsion in an adolescent: CT features. *Pediatric Radiology*, 32(8): 612–613. https://doi.org/10.1007/s00247-002-0721-8

Boukaidi, S.A., Delotte, J., Steyaert, H., et al. (2011). Thirteen cases of isolated tubal torsions associated with hydrosalpinx in children and adolescents: Proposal for conservative management, retrospective review and literature survey. *Journal of Pediatric Surgery*, 46(7): 1425–1431. https://doi.org/10.1016/j.jpedsurg.2011.01.033

Bulut, G. (2024). Isolated tubal torsion in pediatric ages: Single surgeon's experience. *Turkish Journal of Pediatric Surgery*, 38(3): 111–115. https://doi.org/10.62114/JTAPS.2024.58

Casey, R.K., Damle, L.F. & Gomez-Lobo, V. (2013). Isolated fallopian tube torsion in pediatric and adolescent females: a retrospective review of 15 cases at a single institution. *Journal of Pediatric and Adolescent Gynecology*, 26(3): 189–192. https://doi.org/10.1016/j.jpag.2013.02.010

Coutureau, J., Mandoul, C., Curros-Doyon, F., Millet, I. & Taourel, P. (2022). Recognizing the features of isolated fallopian tube torsion on CT and MRI and interobserver agreement: A cross-sectional study. *European Journal of Radiology*, 157: 110607. https://doi.org/10.1016/j.ejrad.2022.110607

Franco, P.N., García-Baizán, A., Aymerich, M., et al. (2023). Gynaecological causes of acute pelvic pain: Common and not-so-common imaging findings. *Life*, 13(10): 2025. https://doi.org/10.3390/life13102025

Gaied, F., Emil, S., Lo, A., Baird, R. & Laberge, J.M. (2012). Laparoscopic treatment of isolated salpingeal torsion in children: Case series and a 20-year review of the literature. *Journal of Laparoendoscopic & Advanced Surgical Techniques*, 22: 941–947. https://doi.org/10.1089/lap.2011.0530

Gross, M., Blumstein, S.L. & Chow, L.C. (2005). Isolated fallopian tube torsion: A rare twist on a common theme. *American Journal of Roentgenology*, 185(6): 1590–1592. https://doi.org/10.2214/AJR.04.1646

Nagahama, M., Tomoyose, E., Yoshikawa, Y., Tokashiki, M. & Hokama, A. (2024). Isolated fallopian tube torsion in a 14-year-old girl: A case report and review of the literature. *Cureus*, 16(12): e75853. https://doi.org/10.7759/cureus.75853

Narayanan, S., Bandarkar, A. & Bulas, D.I. (2014). Fallopian tube torsion in the pediatric age group: Radiologic evaluation. *Journal of Ultrasound in Medicine*, 33: 1697–1704. https://doi.org/10.7863/ultra.33.9.1697

Pignataro, J.N. & Schindler, L. (2023). Isolated fallopian tube torsion: Diagnosis and management of a gynecologic emergency. *Cureus*, 15(9): e46260. https://doi.org/10.7759/cureus.46260

Ramadan, M.K., Demachkie, K., Mohsen, A., Sinno, L. & Kaza'al, J. (2020). Isolated tubal torsion: A rare cause of acute pelvic/abdominal pain among adolescent females. *Gynecology and Minimally Invasive Therapy*, 9(4): 241–244. https://doi.org/10.4103/GMIT.GMIT_91_19

Varghese, S., Seldon, Y., Raperport, C., Rinne, N., Patel, K. & Zaid, R.Z. (2024). Isolated fallopian tube torsion: A systematic review of case reports. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 296: 140–147. https://doi.org/10.1016/j.ejogrb.2024.02.050

Vijayaraghavan, S.B. & Senthil, S. (2009). Isolated torsion of the fallopian tube: The sonographic whirlpool sign. *Journal of Ultrasound in Medicine*, 28(5): 657–662. https://doi.org/10.7863/jum.2009.28.5.657