

Isolated Torsion of the Fallopian Tube

The Sonographic Whirlpool Sign

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Objective. The purpose of this series is to describe the sonographic features of isolated torsion of the fallopian tube. **Methods.** Sonography was performed in 4 women with acute lower abdominal pain. **Results.** The uterus and ovaries were normal in the 4 women. The ipsilateral fallopian tube was distended with fluid. A round mass was seen close to the tube. A sonographic whirlpool sign was seen on rocking movement of the probe over the mass. Ipsilateral torsion of the fallopian tube was confirmed at surgery in all of them. **Conclusion.** The sonographic whirlpool sign is the specific sign of tubal torsion. **Key words:** fallopian tube; sonography; torsion; whirlpool sign.

Isolated torsion of the fallopian tube is a rare cause of lower abdominal pain. The lack of specific imaging characteristics makes the preoperative diagnosis of this condition very difficult. Here we describe the sonographic features of this condition in 4 patients.

Case Descriptions

Case 1

A 29-year-old woman was referred for sonography with acute pain in the right infraumbilical region lasting for 3 days. It was associated with dysuria. She had undergone puerperal sterilization during her last caesarean delivery 3 years previously. Her menstrual history was unremarkable. Endovaginal sonography revealed the normal uterus and both of the ovaries. There was a small tubular and folded cystic mass on the left side, one end broad and the other tapering, suggestive of a hydrosalpinx. There was a large hydrosalpinx on the right side measuring 63 × 42 mm. It was tender and thick walled and contained internal echoes (Figure 1). On a color Doppler study, there was no flow seen in its walls. There was a suggestion of a mass resembling a target between the hydrosalpinx and right ovary (Figure 2). Rocking movement of the probe over this brought on the sonographic whirlpool sign (Video 1). Laparoscopy confirmed a gangrenous hydrosalpinx on the right side due to torsion, with 3 rotations (Figure 3). The hydrosalpinx was excised. There was a small hydrosalpinx on left side, which was also removed.

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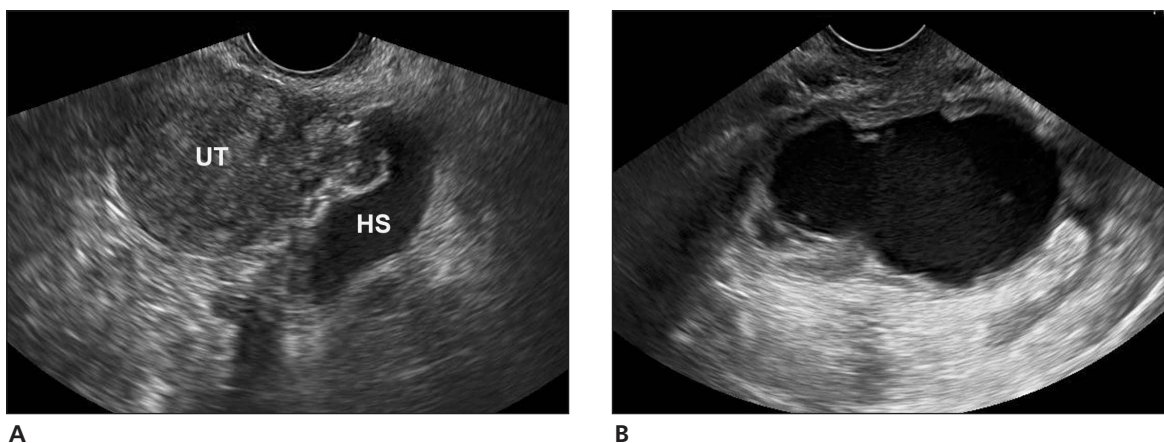


Figure 1. Endovaginal sonograms showing a uterus (A; UT), a small left hydrosalpinx (A; HS), and a large thick-walled right hydrosalpinx with internal echoes (B).

Case 2

A 52-year-old woman had acute severe left lower quadrant pain for 15 hours. She had vomited twice and had a temporary decrease of pain after micturition and defecation. She had not undergone laparotomy before. On endovaginal sonography, the uterus was enlarged, with 3 fibroids of 2 to 4 cm. The ovaries were normal. The left fallopian tube was distended with fluid and was tender (Figure 4A). On a color Doppler study, there was no flow seen in the walls of the fallopian tube (Figure 4B). There was a round mass of concentric rings cephalic to the fallopian tube. The movement of the transducer brought on the sonographic whirlpool sign in the mass. It was seen both on gray scale and color Doppler studies (Figure 5 and Videos 2 and 3). Laparoscopy confirmed torsion, with 2 rotations of the left fallopian tube. Hysterectomy with bilateral salpingo-oophorectomy was done. Histopathologic examination revealed adenomyosis of uterus with fibroids. The left fallopian tube did not reveal any specific disease.

Case 3

A 60-year-old postmenopausal woman had acute pain in the right iliac fossa lasting for 4 days. She had vomited once at the onset of pain. On sonography, the uterus was normal. Both ovaries were also normal. There was a tender tense pyriform cystic mass in right side of pelvis. There were incomplete folds in the narrow portion, suggestive of a hydrosalpinx (Figure 6). Close to the narrow portion, rocking movement

of the probe revealed the sonographic whirlpool sign, indicating torsion of the hydrosalpinx (Figure 7). On a color Doppler study, there was no flow seen in the walls of the hydrosalpinx or in the twisted pedicle. Laparotomy revealed a gangrenous hydrosalpinx of right fallopian tube due to torsion, with 3 rotations of the neck of the hydrosalpinx (Figure 8). The hydrosalpinx was removed.

Case 4

A 46-year-old woman had acute left flank pain with vomiting for 2 days. She was referred for sonography to rule out ureteric calculus. Sonography revealed a normal urinary system. Endovaginal sonography showed a subserous fibroid of 28 mm in the fundus of the uterus. Both ovaries were normal. There was a tender thick-walled cystic mass of 57 × 30 mm by the side of

Figure 2. Sonogram of the right adnexa showing a normal right ovary (RO) and a round targetlike whirlpool mass (arrow) posteromedial to the right ovary.



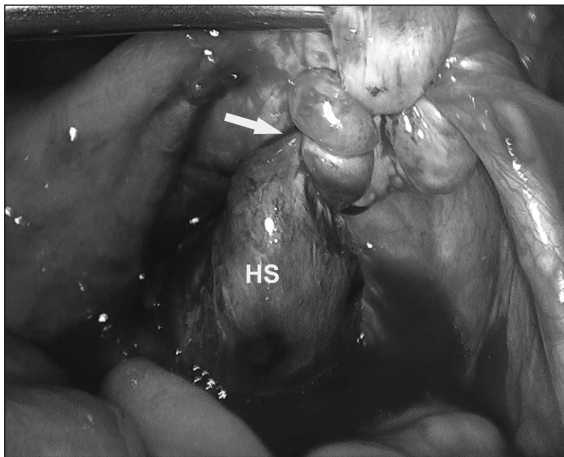


Figure 3. Laparoscopic image showing a gangrenous right hydrosalpinx (HS) and the site of torsion (arrow).

the left ovary. There were incomplete septa, indicating a hydrosalpinx (Figure 9). On a color Doppler study, there was no flow seen in the walls. The sonographic whirlpool sign was seen close to the mass, suggestive of torsion of the left hydrosalpinx (Figure 10 and Video 4). Laparotomy confirmed torsion of the left hydrosalpinx. It was hemorrhagic but not gangrenous. Hysterectomy with left salpingo-oophorectomy was done.

Discussion

Isolated torsion of the fallopian tube is a rare gynecologic cause of acute lower abdominal pain. The exact cause of the condition is unknown. Some studies have postulated theo-

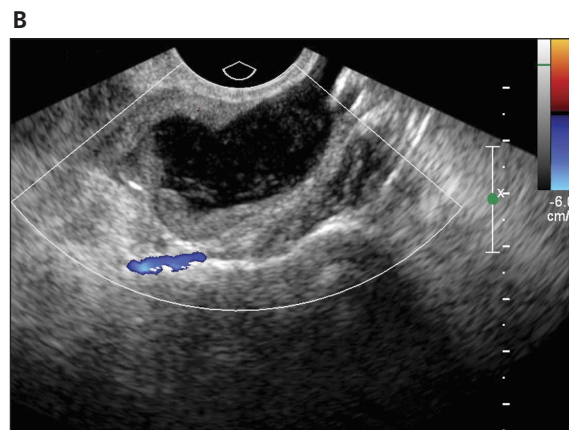
retical explanations. Youssef et al¹ noted factors that could possibly influence the occurrence of fallopian tube torsion and divided them into two types: internal and external. Regad² surveyed 201 cases of fallopian tube torsion and found a normal fallopian tube in only 24%. The incidence of fallopian tube torsion is unknown.

Fallopian tube torsion is rare before menarche or during menopause.³⁻⁵ The most common presenting symptom is pain, which begins in the lower abdomen or pelvis on the affected side but may radiate to the flank or thigh.⁶⁻¹⁰ The onset of pain is sudden and cramplike and may be intermittent.^{6,8} Other associated symptoms include nausea, vomiting, bowel and bladder conditions, and scant uterine bleeding.⁶⁻¹⁰

Preoperative diagnosis of a twisted fallopian tube has not been possible because of the physical findings associated with other common diseases and the nonspecificity of imaging findings. The differential diagnosis of fallopian tube torsion includes acute appendicitis, ectopic pregnancy, pelvic inflammatory disease, a twisted ovarian cyst, and degenerative leiomyoma.¹¹⁻¹³

Imaging findings in torsion of the fallopian tube described so far are nonspecific, and clinical correlation is mandatory. In the setting of acute pelvic pain, the sonographic findings of a dilated fallopian tube with a normal-appearing ipsilateral ovary should point to the possibility of isolated tubal torsion.¹³⁻¹⁵ Sonographic signs of a dilated fallopian tube are a hyperechoic wall, a folded configuration and foci of echogenicity protruding into the lumen, and a tapering end

Figure 4. A, Sonogram showing a tender thick-walled fluid-distended left fallopian tube. **B,** Color Doppler sonogram showing that there is no flow in the walls of the tube.



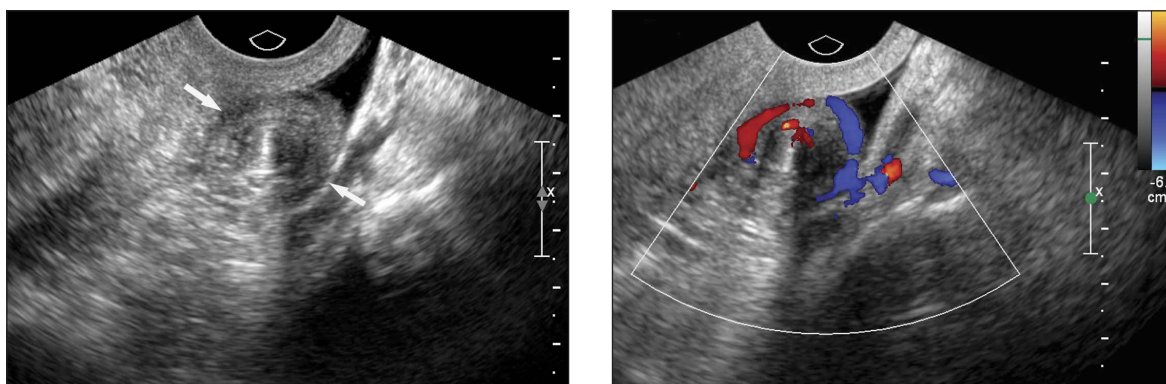


Figure 5. **A**, Gray scale sonogram showing a round mass of concentric rings (arrows) cephalic to the fallopian tube. **B**, Color Doppler sonogram showing the circular vessels in a whirlpool mass.

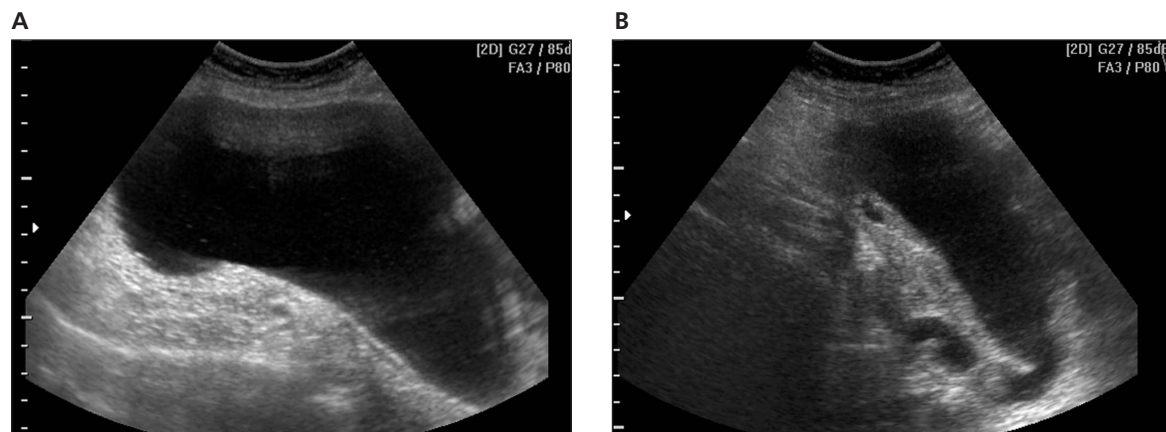
toward the cornua of the uterus.¹⁶ To date, there have been no specific sonographic signs described to diagnose tubal torsion. Baumgartel et al¹⁴ described the finding of high-impedance or absence of flow in a tubular structure as an indicative sign of tubal torsion, especially with a history of tubal ligation. This is a very nonspecific finding because detecting Doppler flow in the fallopian tube is a rare occurrence. In all 4 cases described here, there was no flow seen in the walls of the fallopian tube on color Doppler studies.

The first author has described the sonographic whirlpool sign as a specific sign of ovarian torsion.¹⁷ In a similar clinical situation of acute pelvic pain, if sonography reveals normal ovaries and a dilated fallopian tube is seen, a possibility of tubal torsion is to be considered. In such a situation, a search is done to look for a whirlpool mass in close proximity to the fallopian tube.

This mass is usually not as big or obvious compared with that seen in ovarian torsion; hence, a rocking movement of the endovaginal probe is made over this area. In this series, this maneuver brought on the sonographic whirlpool sign of torsion of the fallopian tube. The sign was present in all 4 patients described here. Surgery confirmed torsion of fallopian tube in all of them. There was a hydrosalpinx in 3 of them, 2 of which were gangrenous. In 1 patient, the fallopian tube did not show any specific abnormalities.

In conclusion, isolated fallopian tube torsion, although uncommon, should be included in the differential diagnosis of acute lower abdominal pain in women. If sonography reveals normal ovaries and a dilated fallopian tube, one should search for the whirlpool sign on either side of the fallopian tube. The sonographic whirlpool sign is the specific sign of fallopian tube torsion.

Figure 6. **A**, Sonogram showing a large tender tense pyriform hydrosalpinx in the right adnexa. **B**, Incomplete septa in its narrow position.



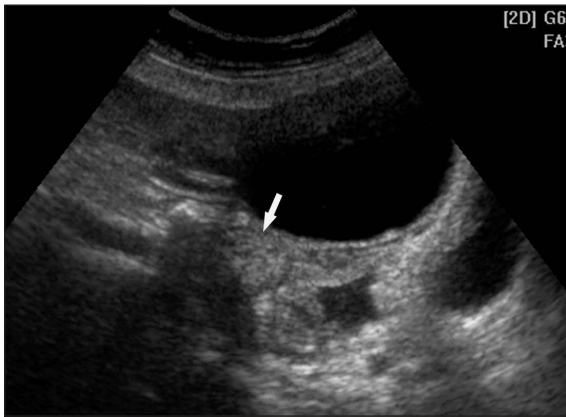


Figure 7. Sonogram showing a round whirlpool mass (arrow) close to the narrow position of the right hydrosalpinx.

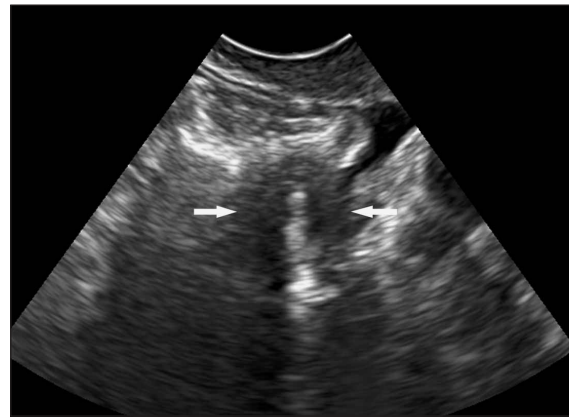


Figure 10. Sonogram showing a round targetlike whirlpool mass (arrows) close to the hydrosalpinx.



Figure 8. Gangrenous hydrosalpinx (HS) and the torsion of the neck (arrow).

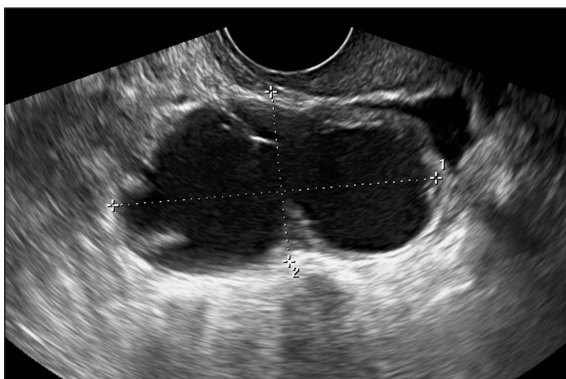


Figure 9. Sonogram showing a tender thick-walled left hydrosalpinx with internal echoes.

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