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A Case of Ovarian Torsion with Dermoid Cyst

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ABSTRACT

Adnexal torsion is an uncommon but serious cause of lower abdominal pain in women and is often difficult to distinguish from other acute abdominal condition; however the possibility of ovarian torsion should be considered when an ovarian mass is discovered in an appropriate clinical setting. If the adnexal torsion is complete and goes undiagnosed and untreated haemorrhagic infarction may occur in the involved ovary and may lead to peritonitis and death. Although ultrasonography is typically the initial emergent examination, computed tomography [CT] and magnetic resonance [MR] imaging may also be useful diagnostic tools. Common CT and MR imaging features of adnexal torsion include fallopian tube thickening, smooth wall thickening of the twisted adnexal cystic mass, ascites, and uterine deviation to the twisted side. Additional imaging findings that can suggest haemorrhagic infarction include eccentric smooth wall thickening exceeding 10 mm in a cystic ovarian mass converging on the thickened fallopian tube and lack of contrast enhancement of the internal solid component or thickened wall of the twisted ovarian mass. In this article we report a case of young female with history of lower abdominal swelling for one month with sudden onset of severe lower abdominal pain and vomiting was found to have right ovarian torsion with a large cyst with signs of haemorrhagic infarction on MR imaging and the patient was treated by open laparotomy and right sided salpingo-oophorectomy with cystectomy which was later confirmed as mature cystic teratoma or dermoid cyst on excisional biopsy.

Keywords: Hemorrhagic infarction, Magnetic resonance imaging, Salpingo-oophorectomy, Mature cystic teratoma.

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INTRODUCTION

Ovarian torsion is defined as partial or complete rotation of the ovarian vascular pedicle and causes obstruction to venous outflow and subsequently arterial inflow. Ovarian torsion is the fifth most common gynecologic surgical emergency [1].

Ovarian torsion is bimodal, occurring in women in their first three decades of life and in postmenopausal women. Ovarian torsion is a well- recognized complication of ovarian lesions such as cystic ovarian masses, paraovarian cysts, and dermoids, especially those greater than 6 cm in size [2].

Although gray-scale ultrasonography [US] and color Doppler US have been reported to be useful in detecting adnexal torsion, computed tomography [CT] and magnetic resonance [MR] imaging may also be useful in making the preoperative diagnosis of adnexal torsion, especially in subacute cases. Early diagnosis can help prevent irreversible damage and may thus allow conservative, ovary sparing treatment in young women [3].

In this article, we discuss and illustrate the common and uncommon MR imaging features of adnexal torsion. We also present findings that can help determine the presence of hemorrhagic infarction in patients with adnexal torsion.

CASE REPORT

A 17 years old woman, presented to our institution with a history of sudden onset of severe lower abdominal pain and vomiting. The pain was sharp and constant. Similar episodes of pain were experienced in the previous month and diagnosed as a case of right ovarian cyst in another hospital. The previous episodes of pain were shorter in duration and resolved spontaneously. The patient also complaint about lower abdominal swelling since one month. The patient was otherwise well and there were no gastrointestinal or genitourinary symptoms. She had no history of allergy or any other significant illness. She was not on any medication. There was no significant family history or psychosocial history. Her menarche commenced at the age of 12 years with subsequent regular cycles.

On physical examination, the patient was alert, oriented to time, place and person. The patient was in mild distress however her vital signs were within normal limits. On per abdominal examination, there was lower abdominal swelling predominantly on right side with abdominal tenderness and muscle guarding on palpation. On auscultation, intestinal sounds were normal. External genital examination was normal.

The patient's full blood count was within normal range. Urine analysis was done and pregnancy test was negative.

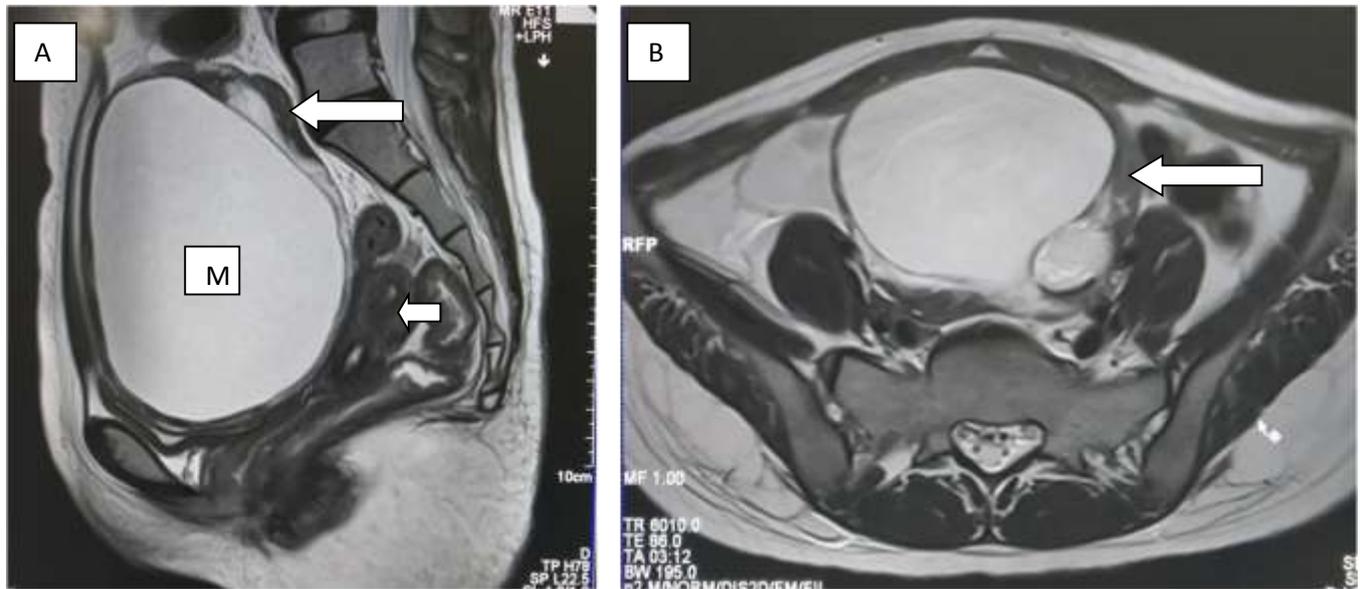


Figure 1. Torsion of a mature cystic teratoma of the right ovary with hemorrhagic infarction in a 17-year-old female with history of sudden onset lower abdominal pain. [A] Sagittal T2 -weighted MR image shows a large, unilocular cystic mass with an amorphous tubular structure [arrows] connecting the tumor [M] and the uterus [small arrow]. [B] Axial T2 weighted MR image shows an eccentric smooth wall thickening [maximum wall thickness, 15 mm] is noted along the left lateral margin of the mass [arrow]. These findings represents a twisted vascular pedicle.

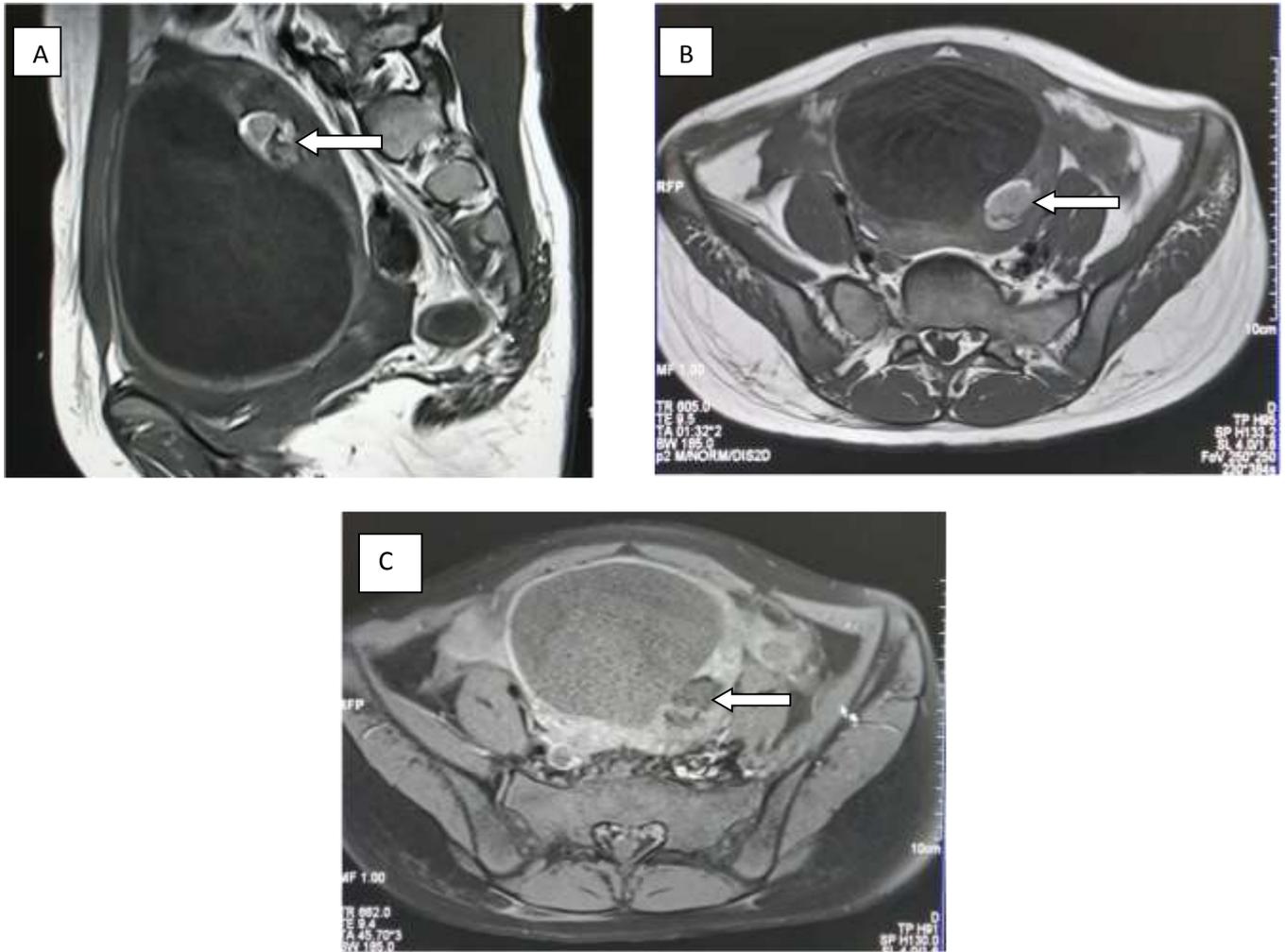


Figure 2: [A, B]- Sagittal and axial T1 -weighted MR images shows a large right ovarian cystic lesion with eccentric T1 hyper-intense mural component [arrows][C]- Axial T1 weighted fat suppressed MR image of the same patient showing loss of signal intensity of the mural component, suggestive of presence of fat [arrow]. These findings are competent with a large right ovarian dermoid cyst.

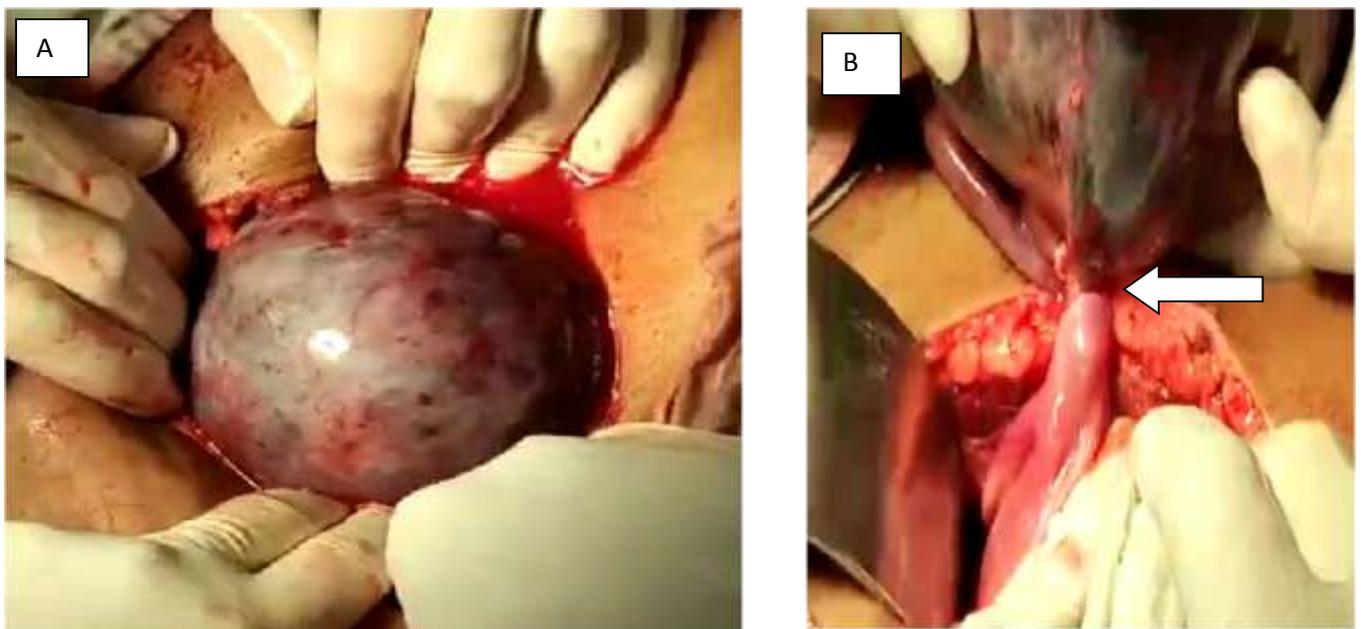


Figure 3. Image A and B are intra-operative image of the same patient showing a large bluish brown, ovoid solid cystic ovarian mass with a twisted, thickened pedicle [arrow], the torsion of the pedicle, at the time of surgery was found to be around 720°. The ovarian mass proved to be a mature cystic teratoma with hemorrhagic infarction on histopathological examination.

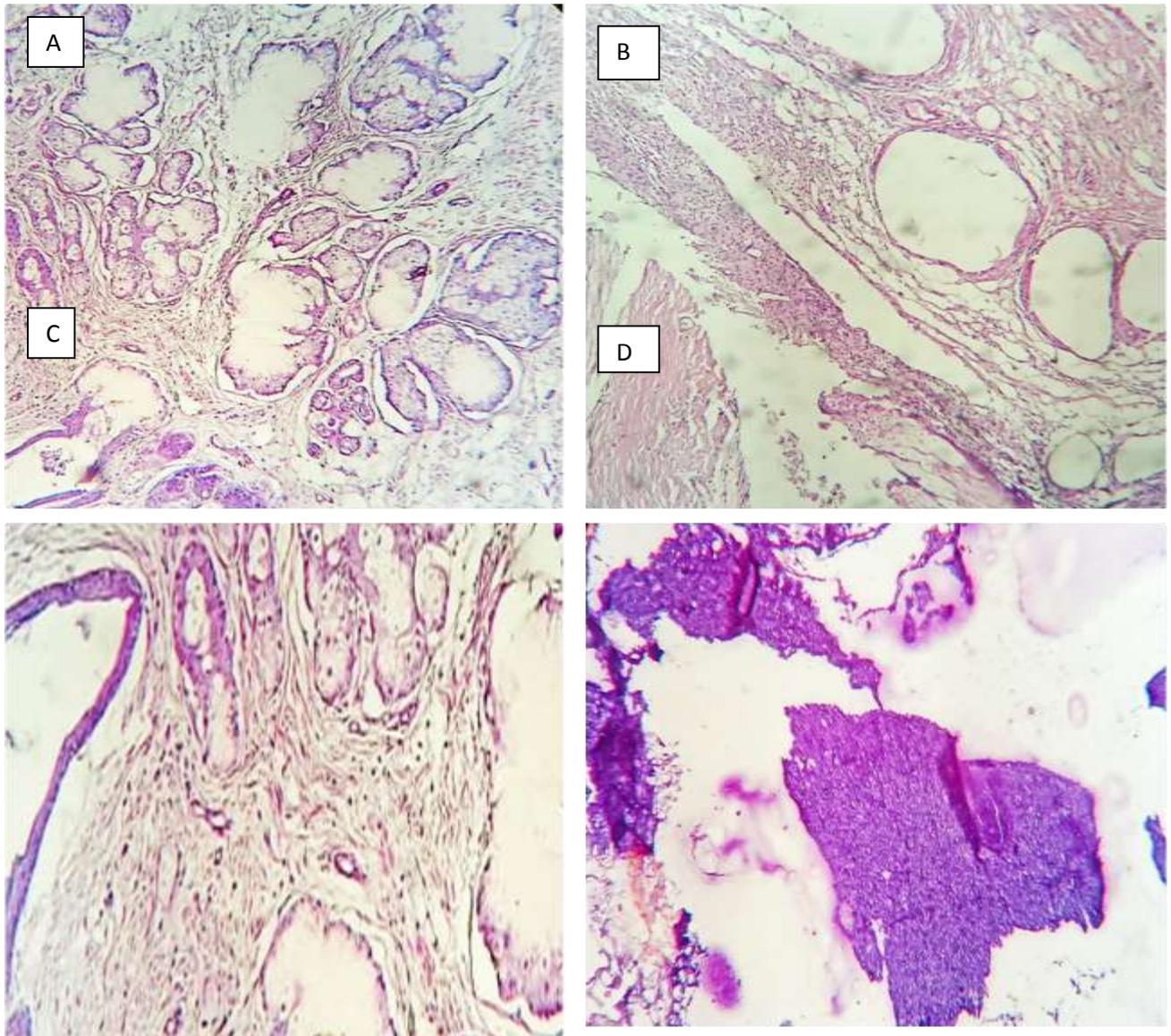


Figure 4: [A] Photomicrograph showing presence of sweat gland and sebaceous glands. [B] Photomicrograph showing dilated glands. [C] Photomicrograph showing hair follicle and adnexal structures. [D] Photomicrograph showing mesenchymal tissue. These shows presence of tissues derived from different germ cell layers within the ovoid cystic lesion, confirming the diagnosis of mature cystic teratoma/dermoid cyst.

DISCUSSION

Adnexal torsion is a well-known but infrequently encountered clinical entity, and patients often present with abdominal pain that may mimic acute abdomen. Torsion of the adnexal structures may involve the tube or ovary but more often involves both. The usual predisposing factor is

an ipsilateral adnexal mass that is almost always benign. Of the various ovarian neoplasms, benign cystic teratoma is considered to be the most common cause of adnexal torsion, occurring in 3.5%–16.1% of cases [4, 5, 6]. Torsion infrequently occurs in the absence of an apparent adnexal mass. This is usually seen in children, in whom the adnexa are especially mobile, allowing torsion at the mesosalpinx [7, 8].

Adnexal torsion is generally unilateral, with a slight [3:2] right-sided predilection; this may be the result of the colon occupying pelvic space on the left or of hypermobility of the caecum and distal ileum on the right [9].

Torsion of the ovarian pedicle produces circulatory stasis that is initially venous but becomes arterial as the torsion and resultant edema progress. If the torsion is complete and obstructs the arterial blood supply, gangrenous and hemorrhagic necrosis results. When complete torsion is suspected, immediate surgery is necessary to remove the damaged tissue [10]. If left untreated, hemorrhagic infarction of the involved ovary may be followed by infection, leading to peritonitis and, in some cases, death. Local peritonitis may cause intestinal obstruction.

Early diagnosis and treatment may make it possible to conserve normal ovarian structures by untwisting the pedicle and resecting the cysts or tumors. However, due to nonspecific clinical and laboratory findings, surgery is delayed in the majority of cases. The most common treatment for adnexal torsion has been adnexectomy without untwisting because of the fear of thromboembolism from a thrombosed vein of the twisted ovary, the possibility of retorsion, and the inability to determine the viability of the ovary. However, several studies have reported that untwisting the vascular pedicle can not only conserve ovarian function but also preserve fertility without thromboembolism after detorsion [11]. Therefore, differentiation of hemorrhagic from nonhemorrhagic infarction following adnexal torsion is important for treatment planning.

US is usually the first examination performed in an emergency setting. However, US findings of adnexal torsion [including a cystic, solid, or complex mass with or without pelvic fluid, thickening of the wall, and cystic hemorrhage] are nonspecific. Rosado et al showed the limited specificity of Doppler US by demonstrating normal adnexal arterial waveforms at Doppler US in three cases of proved adnexal torsion [12].

There are several possible explanations for these findings. One is that persistent adnexal arterial flow is related to the dual ovarian blood supply [the ovarian artery from the aorta and the ovarian arterial branches from the uterine artery]. Another is that venous thrombosis due to torsion leads to symptoms and ovarian necrosis before arterial thrombosis occurs. US is operator dependent and experience is still limited; thus, its role in the early diagnosis of adnexal torsion is not yet fully established. CT and MR imaging are still commonly used to evaluate lower abdominal pain and suspected pelvic masses.

MR imaging must include fat-suppressed T1-weighted sequences to help detect hemorrhage and contrast-enhanced fat-suppressed T1-weighted sequences to help detect the absence of vascular supply, a finding that suggests hemorrhagic infarction.

The common CT and MR findings in adnexal torsion included tube thickening, smooth wall thickening of the twisted ovarian cystic mass, ascites, and uterine deviation to the twisted side. Less common findings included hemorrhage in the thickened tube, hemorrhage within the adnexal mass, and hemoperitoneum.

Tube thickening or a twisted vascular pedicle is thought to be the most specific imaging finding for adnexal torsion. Tube thickening is related to congestion and edema with or without hemorrhagic infarction of the tube. It also indicates a twisted edematous pedicle, which connects the lesion with the uterus and enveloped engorged blood vessels. The tube can be considered thickened when its diameter exceeds 10 mm. They may manifest as an amorphous, solid masslike structure, have a target like appearance, or manifest as a beaklike protrusion extending from the uterus and partially covering the adnexal mass. Sagittal MR imaging in particular may be helpful in detecting tube thickening.

Smooth wall thickening of the twisted cystic ovarian mass was a common imaging finding in adnexal torsion. Furthermore, eccentric smooth wall thickening of more than 10 mm was noted only in torsion with hemorrhagic infarction, not in torsion without hemorrhagic infarction. Although pathologic correlation was not established in each case, eccentric wall thickening of a cystic mass is presumed to be due to the edematous wall congestion in the ovarian cyst or to the thickened tube draped over the ovarian mass. Wall thickening of an adnexal cystic mass may be seen in a malignant tumor, but eccentric smooth wall thickening converging on the thickened tube can be the determining factor in making the diagnosis of a twisted adnexal mass with hemorrhagic infarction.

A small amount of ascites and uterine deviation to the twisted side were commonly seen on CT and MR images of adnexal torsion. However, although these findings may be helpful, they are not specific for adnexal torsion.

Imaging findings such as hemorrhagic tube, hemorrhage within the twisted ovarian mass, and hemoperitoneum were noted only in torsion with hemorrhagic infarction.

Other MR imaging findings that indicate this pathologic condition include lack of enhancement of the solid component, a thickened cyst wall, or a mural nodule of the twisted ovarian mass. These findings directly indicate interruption of blood flow and can lead to the diagnosis of adnexal torsion [13, 14] .

CONCLUSION

Detection of tube thickening and of smooth wall thickening of an adnexal cystic mass at MR

imaging is useful in the diagnosis of a twisted ovarian mass. Sagittal MR imaging may be more helpful in detecting a thickened tube, which may be visualized as a tubular protrusion on the twisted side. Additional imaging findings that can suggest hemorrhagic infarction following adnexal torsion include eccentric smooth wall thickening exceeding 10 mm in a cystic ovarian mass converging on the thickened tube, lack of contrast enhancement of the internal solid component or the thickened wall of a twisted ovarian mass, hemorrhage within the tube or twisted ovarian mass, and hemoperitoneum.

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