RESEARCH PAPER

Ovarian Dermoid Cyst With Torsion And Gangrenous Changes: Mri And Ct Correlation With Operative Confirmation

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Abstract

Ovarian torsion is a gynecological emergency that requires prompt diagnosis to prevent irreversible ischemic damage to the ovary. Dermoid cysts (mature cystic teratomas) are among the most common benign ovarian neoplasms predisposing to torsion due to their heterogeneous content and relatively high weight. We report a case of a 26-year-old female who presented with acute lower abdominal pain and vomiting. Imaging was performed using both computed tomography (ct) and magnetic resonance imaging (mri). Mri revealed a large left ovarian lesion measuring 7.1 × 8.9 cm, hyperintense on t1-weighted and t2-weighted images with signal suppression on fat-saturated t1 sequences, consistent with a dermoid cyst. Additional findings included punctate and linear hypointensities on t2-weighted images corresponding to hyperintensity on fat-saturated t1 images, with a rim of blooming on gradient-recalled echo (gre) sequences, indicating intralesional hemorrhage from torsion. A twisted pedicle was visualized, and post-contrast study showed a non-enhancing ovary with only rim-enhancing vessels, suggesting gangrenous changes. The patient underwent surgery, which confirmed an ovarian dermoid with torsion and a gangrenous left ovary; the fallopian tube was preserved. This case highlights the critical role of mri in diagnosing ovarian torsion complicating a dermoid cyst and in distinguishing viable from non-viable ovarian tissue.

Keywords: Ovarian Torsion, Dermoid Cyst, Mature Cystic Teratoma, Mri, Gangrenous Ovary.

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Introduction

Ovarian torsion refers to the partial or complete rotation of the ovary and its vascular pedicle, leading to venous and lymphatic obstruction followed by arterial compromise and eventual hemorrhagic infarction.[1] It accounts for approximately 2–3% of all gynecologic emergencies and is most common in women of reproductive age.[2] Ovarian torsion is often associated with underlying ovarian lesions, particularly benign neoplasms that increase the size and weight of the ovary.[3] Among these, mature cystic teratomas (dermoid cysts) are the most common tumor type predisposing to torsion, as they contain sebaceous material, hair, and other tissues that create a heterogeneous and heavy mass.[4]

The clinical presentation of ovarian torsion includes sudden onset of unilateral lower abdominal pain, nausea, vomiting, and occasionally low-grade fever.[5] However, symptoms can be nonspecific, leading to diagnostic delays. Prompt and accurate imaging is therefore essential, as delayed diagnosis may result in ovarian necrosis and loss of fertility.[6] Ultrasound with color Doppler is often the first-line imaging modality, but it has limitations in the setting of large or complex masses. Magnetic resonance imaging (MRI) offers superior soft-tissue characterization, multiplanar capability, and the ability to assess tissue viability using contrast enhancement.[7] Specifically, MRI can identify the dermoid components, detect hemorrhagic changes indicative of torsion, and evaluate the twisted pedicle—a pathognomonic sign.[8] We present a case of a 26-year-

old female with a left ovarian dermoid cyst complicated by torsion and gangrenous changes, confirmed on both imaging and surgery, emphasizing the utility of MRI in this urgent clinical scenario.

Case Presentation

A 26-year-old female presented to the emergency department with a chief complaint of acute onset pain in the lower abdomen, associated with vomiting. There was no history of fever or urinary symptoms. Her menstrual history was unremarkable. A previous ultrasound examination had been performed elsewhere (reports available), which raised suspicion of an adnexal mass, but no prior imaging films were available for direct comparison. On physical examination, there was tenderness in the left iliac fossa with mild guarding. No rebound tenderness was elicited. Vital signs were stable.

Contrast-enhanced computed tomography (CT) of the abdomen and pelvis was initially performed, followed by dedicated pelvic magnetic resonance imaging (MRI) for further characterization. On CT, a large left adnexal lesion was noted with faint intralesional hemorrhages, suggestive of a dermoid cyst with possible complication (Figure 4). MRI was then performed to evaluate the internal composition and vascular status of the ovary. The uterus measured 3.2 × 3.9 × 3.9 cm with an endometrial thickness of 1.8 mm and a normal junctional zone of 4.1 mm. The cervix and vagina appeared normal. The right ovary measured 2.6 × 1.4 cm and contained a small follicular cyst, which was unremarkable.

The left ovary was markedly enlarged by a lesion measuring 7.1 × 8.9 cm. On T2-weighted and T1-weighted images, the lesion appeared hyperintense, and on fat-saturated T1-weighted images, it showed hypointensity, consistent with a dermoid cyst containing macroscopic fat (Figures 2 and 3). Within the lesion, punctate and linear regions of hypointensity were seen on T2-weighted images, which corresponded to hyperintensity on fat-saturated T1 images. Gradient-recalled echo (GRE) sequences demonstrated a rim of blooming artifact, indicating the presence of hemosiderin or deoxyhemoglobin from intralesional hemorrhage (Figure 1). A twisted pedicle was clearly visualized. Post-contrast T1-weighted images showed no enhancement of the left ovarian parenchyma, with only rim-enhancing vessels around the periphery, suggesting gangrenous changes (Figure 5). A small follicular cyst measuring 3.2 × 8 mm was also noted within the left ovary. Free fluid was present in the pouch of Douglas. The urinary bladder was normally distended with no abnormal wall thickening.

Based on the imaging findings, a diagnosis of left ovarian dermoid cyst with torsion and secondary gangrenous changes was made. The patient underwent emergency surgery. Intraoperative findings confirmed a twisted left ovary with a dermoid cyst and frankly gangrenous appearance. The ovary was removed (oophorectomy), but the fallopian tube was found to be normal and was preserved. The operative specimens are shown in Figures 6 and 7. Postoperative recovery was uneventful.

Discussion

This case demonstrates the classic imaging features of an ovarian dermoid cyst complicated by torsion and progression to gangrenous necrosis. Ovarian torsion occurs when the adnexa rotates around the infundibulopelvic and utero-ovarian ligaments, compromising blood flow.[1] The presence of an underlying mass, such as a dermoid cyst, increases the risk of torsion because the added weight and asymmetry predispose the ovary to rotation.[3] In this case, the large size of the dermoid (7.1 × 8.9 cm) was the likely predisposing factor.

MRI is particularly valuable in this setting because it can characterize the internal contents of an ovarian lesion with high specificity. The hyperintensity on T1-weighted and T2-weighted images with suppression on fat-saturated sequences is diagnostic of a dermoid cyst, as it confirms the presence of macroscopic fat.[9] Other typical components of dermoid cysts, such as hair, sebaceous material, and calcifications, may also be identified, though calcifications are better seen on CT. The presence of punctate and linear hypointensities on T2-weighted images that bloom on GRE sequences indicates hemorrhage. In the context of torsion, hemorrhage occurs due to venous outflow obstruction followed by arterial stasis, leading to extravasation of blood products into the cyst wall and stroma.[8]

The most critical finding in this case was the absence of ovarian parenchymal enhancement on post-contrast images, with only rim-enhancing vessels. This pattern is highly specific for irreversible ischemia and gangrenous change.[7] In early torsion, the ovary may still enhance because arterial inflow can be maintained despite venous compromise. However, once complete arterial occlusion occurs, the ovary becomes non-viable. The twisted pedicle sign—direct visualization of the

vascular pedicle in a spiral configuration—is a pathognomonic sign of torsion and was clearly seen in this patient.[8]

The clinical implication of detecting a non-enhancing ovary is that the organ is no longer salvageable, and oophorectomy becomes necessary. In this case, the patient underwent removal of the gangrenous left ovary, but the fallopian tube was normal and was left behind, preserving some reproductive capacity. Had the patient presented earlier or had imaging shown preserved enhancement, detorsion with ovarian preservation might have been possible.[6] This underscores the importance of rapid diagnosis and the utility of contrast-enhanced MRI in triaging patients for surgical intervention.

The differential diagnosis of a complex adnexal mass with hemorrhage includes hemorrhagic cyst, endometrioma, and ectopic pregnancy.[9] However, the presence of macroscopic fat on fat-saturated sequences definitively establishes the diagnosis of a dermoid cyst. The lack of contrast enhancement distinguishes torsion-related necrosis from an actively bleeding corpus luteum cyst, which may show a clot but preserves ovarian parenchymal enhancement.[7] Free fluid in the pouch of Douglas is a nonspecific finding but is commonly seen in torsion as a reactive exudate.[10]

Limitations of this case report include the absence of preoperative color Doppler ultrasound correlation and the lack of histopathological images of the dermoid components. However, the imaging findings are highly characteristic, and the surgical confirmation is definitive. This case adds to the literature by illustrating the complete imaging spectrum of dermoid cyst with torsion—from fat-containing lesion to hemorrhagic changes to gangrenous non-enhancement—and by correlating MRI findings directly with operative specimens.

Conclusion

Ovarian torsion complicating a dermoid cyst is a surgical emergency that can lead to irreversible ovarian necrosis if not promptly diagnosed. MRI with contrast provides a comprehensive evaluation by confirming the fat content of the dermoid, detecting hemorrhagic changes from torsion, visualizing the twisted pedicle, and most importantly, assessing ovarian viability through enhancement patterns. A non-enhancing ovary with only rim-enhancing vessels indicates gangrenous change and the need for oophorectomy. Radiologists and clinicians should be aware of these imaging signs to facilitate timely surgical intervention and optimize reproductive outcomes.

References

1. Sasaki KJ, Miller CE. Adnexal torsion: review of the literature. J Minim Invasive Gynecol. 2014;21(2):196-202.
2. Huang C, Hong MK, Ding DC. A review of ovarian torsion. Ci Ji Yi Xue Za Zhi. 2017;29(3):143-147.
3. Oelsner G, Shashar D. Adnexal torsion. Clin Obstet Gynecol. 2006;49(3):459-463.
4. Comerci JT, Licciardi F, Bergh PA, Gregori C, Breen JL. Mature cystic teratoma: a clinicopathologic evaluation of 517 cases and review of the literature. Obstet Gynecol. 1994;84(1):22-28.
5. Houry D, Abbott JT. Ovarian torsion: a fifteen-year review. Ann Emerg Med. 2001;38(2):156-159.
6. Huchon C, Fauconnier A. Adnexal torsion: a literature review. Eur J Obstet Gynecol Reprod Biol. 2010;150(1):8-12.
7. Rha SE, Byun JY, Jung SE, et al. CT and MR imaging features of adnexal torsion. Radiographics. 2002;22(2):283-294.
8. Ghossain MA, Buy JN, Bazot M, et al. CT and MR imaging of ovarian torsion. J Comput Assist Tomogr. 1994;18(3):406-411.
9. Outwater EK, Siegelman ES, Hunt JL. Ovarian teratomas: tumor types and imaging characteristics. Radiographics. 2001;21(2):475-490.
10. Kim YH, Cho KS, Ha HK, et al. CT features of torsion of benign cystic teratoma of the ovary. J Comput Assist Tomogr. 1999;23(6):923-928.

Figure Legends

Figure 1: Gradient-recalled echo (GRE) MRI shows rim and central foci of blooming artifact (arrowheads) within the left ovarian lesion, indicating intralesional hemorrhage secondary to torsion.

Figure 2: Fat-saturated T1-weighted MRI demonstrates the dermoid cyst with linear hemorrhagic streaks (arrows) within the lesion, consistent with torsion-related bleeding.

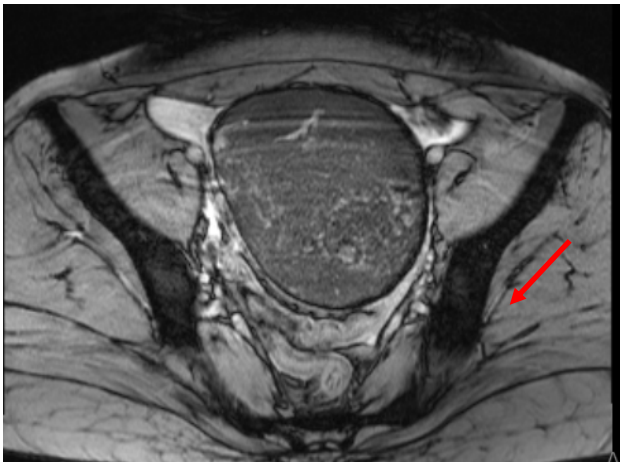
Figure 3: Non-fat-saturated T1-weighted MRI shows a hyperintense lesion involving the left ovary (asterisk),

characteristic of a dermoid cyst containing macroscopic fat.

Figure 4: Contrast-enhanced CT scan of the pelvis shows the dermoid cyst (arrow) with faint intralesional hemorrhages, correlating with the MRI findings.

Figure 5: Post-contrast T1-weighted MRI shows a non-enhancing left ovary with only rim-enhancing vessels (curved arrows), suggesting gangrenous changes. The twisted pedicle is also visualized.

Figures 6 & 7: Intraoperative and postoperative specimen photographs show the gangrenous left ovary with the dermoid cyst (Figure 6) and the preserved normal fallopian tube (Figure 7, white arrow).



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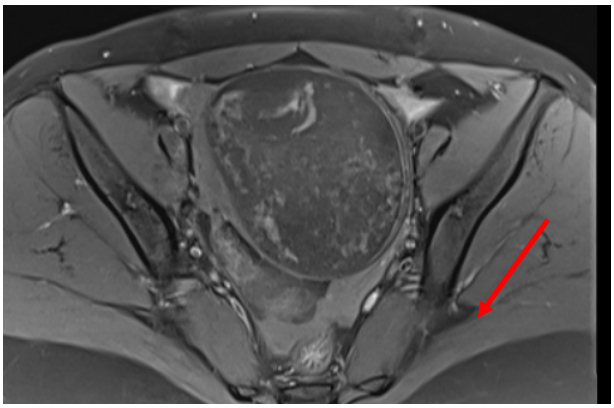

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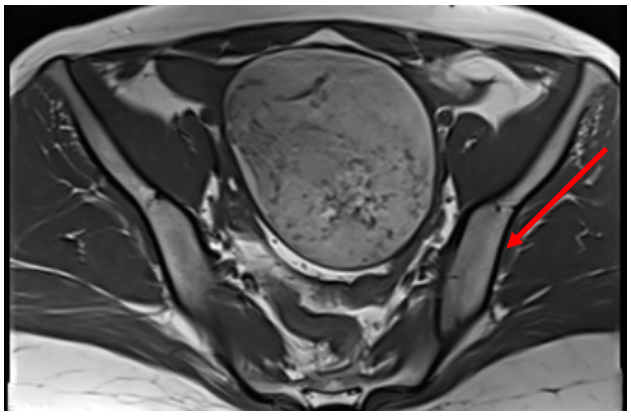

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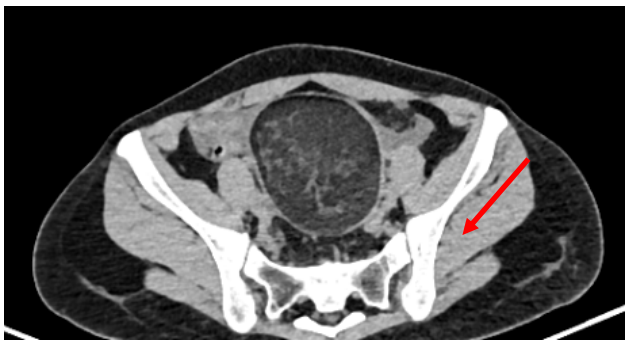

Figure 4:

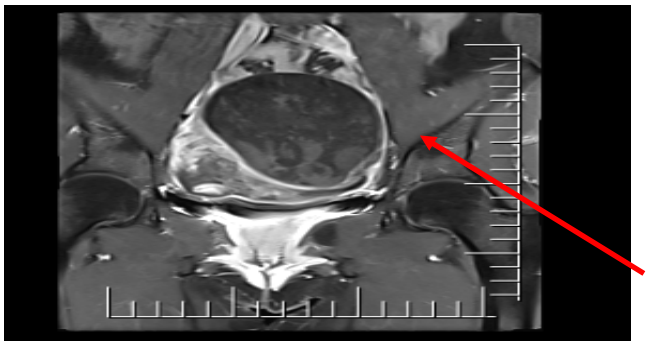

Figure 5:

OPERATIVE SPECIMENS.

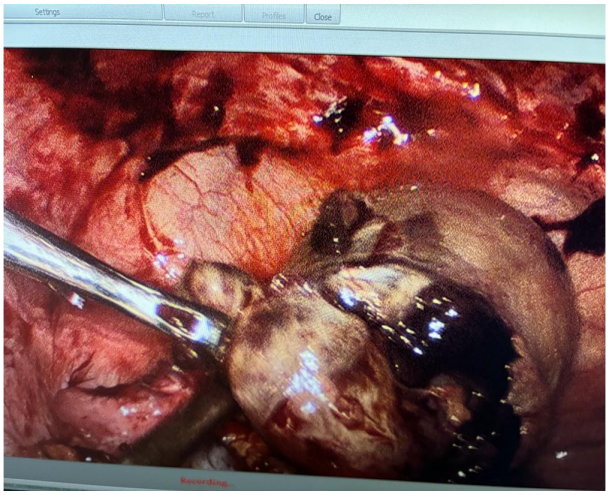

Figure 6 and 7