

## Ovarian torsion

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**Section:** Genital (female) imaging

**Area of Interest:** Pelvis

**Procedure:** Diagnostic procedure

**Procedure:** Imaging sequences

**Procedure:** Contrast agent-intravenous

**Imaging Technique:** Ultrasound

**Imaging Technique:** MR

**Special Focus:** Acute Neoplasia Case Type: Clinical Cases

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**Patient:** 20 years, female

### Clinical History:

A 20-year-old woman presented to our department with a vague pelvic pain. There were no inflammation indices like leukocytosis or elevated levels of C-reactive protein. Her past medical and gynaecological history was unremarkable. Abdominal ultrasound, transvaginal ultrasound and pelvic MRI were consequently performed, not by emergency procedure.

### Imaging Findings:

The abdominal ultrasound showed a right ovarian mass, inhomogeneous for the presence of solid and fluid component. There was also free pelvic effusion [Fig. 1]. It was confirmed by transvaginal ultrasound. The MRI, performed with axial, coronal, sagittal T1, T2 and T2 fat-suppression-weighted sequences and T1-weighted sequences after contrast-medium injection, confirmed the ultrasound findings, describing an inhomogeneous ovarian mass consisting of fat (hyperintense on T1-T2) and a cystic component (hypointense on T1, hyperintense on T2) with partial haemorrhagic content (hyperintense on T1, hypointense on T2) and small peripheral calcifications (hypointense on T1-T2), without significant contrast enhancement after contrast medium injection (Fig. 2a-b, 4a-c). Moreover, a torsion of vascular pedicle was noted (Fig. 3a-c). A dermoid cyst with ovarian torsion was suspected. The abdominal ultrasound one day later showed increased intra-abdominal effusion. Consequently, a laparoscopy procedure was performed with right ovarian resection; it confirmed dermoid cyst with ovarian torsion.

### Discussion:

Ovarian torsion refers to a rotation of the ovary, generally unilateral, and a part of the fallopian tube on the supplying vascular-pedicle. It is the fifth most common gynaecological emergency, with a prevalence of 2.7%. It can be intermittent or sustained and results in venous, arterial and lymphatic stasis. It requires urgent surgical intervention to prevent ovarian necrosis [1]. Ovarian torsion occurs mainly in young women and in post-menopausal women. The two main causes are the hypermobility of the ovary (history of abdominal surgery) and the adnexal masses: most lesions are dermoid cysts or para-ovarian cysts (especially masses larger than 5-10 cm). It has been proposed that malignant lesions are unlikely to be associated with adnexal torsion because they are more likely to cause fibrosis with consequent adhesive effect.

Ultrasound could be the first diagnostic step showing enlarged hypo or hyperechoic ovary with peripherally displaced follicles with hyperechoic central stroma [2]. Doppler shows in most patients little or no intra-ovarian

venous flow or absent arterial flow and sometimes absent or reversed diastolic flow. The normal vascularity does not exclude intermittent torsion. In most patients, there is free pelvic fluid. Very important is the whirlpool sign of the twisted vascular pedicle. If there is cystic degeneration, a long-standing ovarian infarction should be suspected. CT shows ovarian torsion as a cystic/complex adnexal lesion with enlarged ovary, distended pedicle and possible underlying ovarian lesion. If HU > 50 on non-contrast CT is seen, it suggests haemorrhagic necrosis. In most patients, surrounding fat-stranding, oedema, and free fluid can be identified. In urgent clinical settings, CT is frequently used as the first-line imaging study for abdominal pain [3]. Other features of torsion that have been reported on CT or MRI include deviation of the uterus to the side of the twist and fallopian tube thickening. MRI is not the imaging modality of choice if torsion is suspected in an emergency setting [4, 5]. An MRI study can be helpful in selected cases when the symptoms of torsion are subacute, like in our case, or when the diagnosis is not reached with ultrasound or CT. If there is haemorrhagic infarction we have a thin rim of high signal in T1 without contrast enhancement [6]. Endometriomas and haemorrhagic corpus luteal cysts are less likely to have high T1 rim and do not usually involve the entire ovary. In T2-weighted sequences, we can have low signal due to interstitial haemorrhage.

If ovarian torsions are diagnosed and treated early, the prognosis is favourable with a low mortality rate.

**Differential Diagnosis List:** Dermoid cyst with ovarian torsion, Tubo-ovarian abscesses, Endometriosis, Appendicitis, Ruptured ovarian cysts

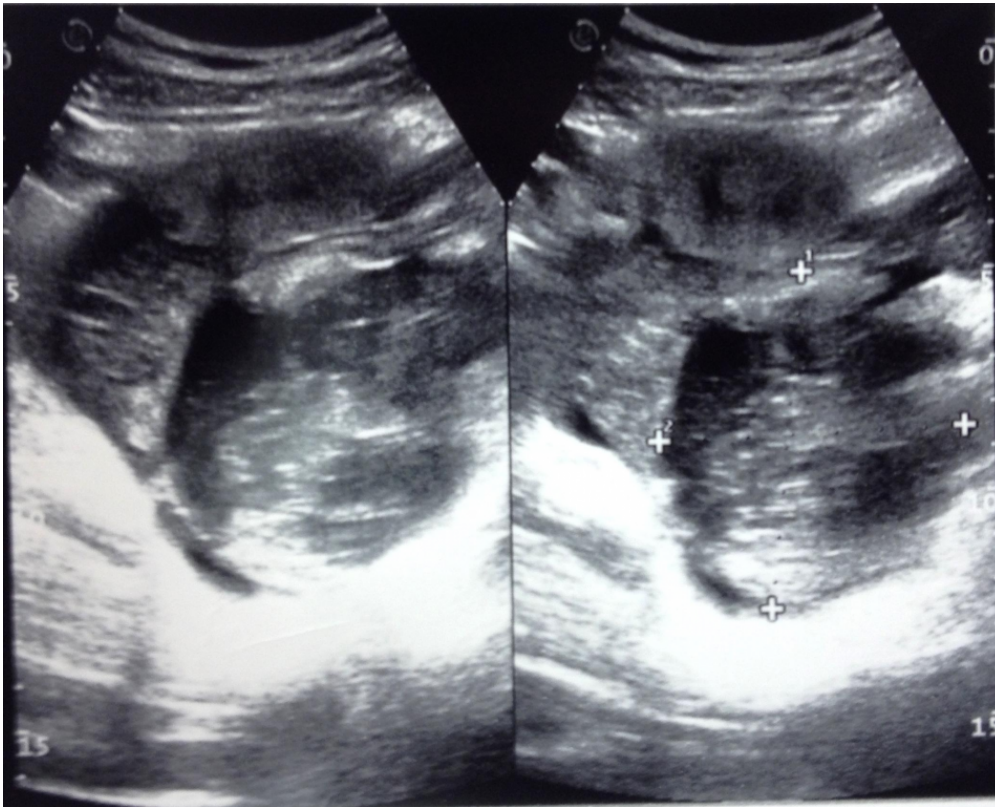
**Final Diagnosis:** Dermoid cyst with ovarian torsion

#### References:

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**Figure 1**

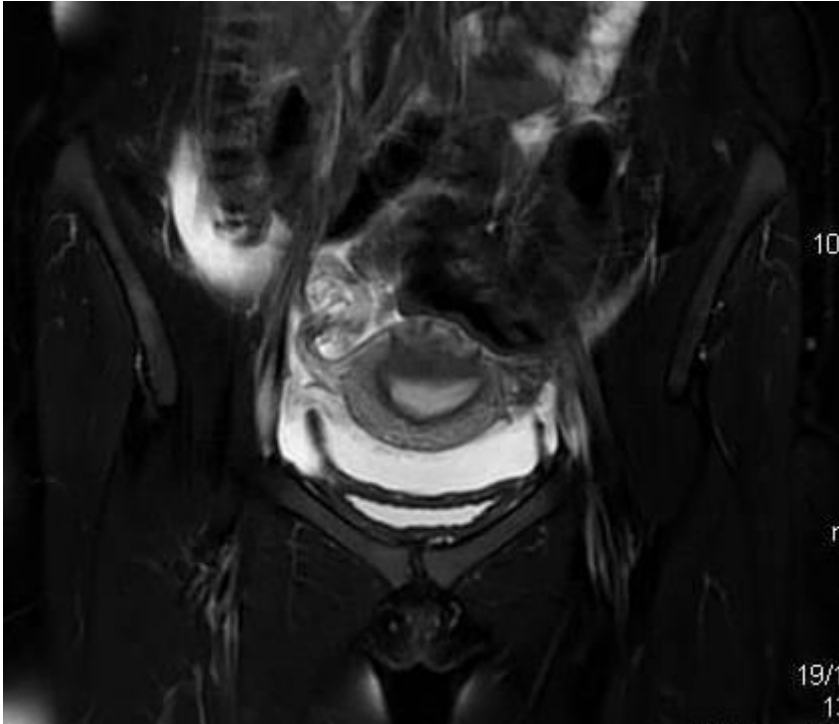
a



**Description:** Inhomogeneous pelvic mass with coexistence of fluid and solid component, with fluid effusion around it. **Origin:** F.Perinei Hospital, Departement of Radiology, Altamura (Ba), Italy.

**Figure 2**

a



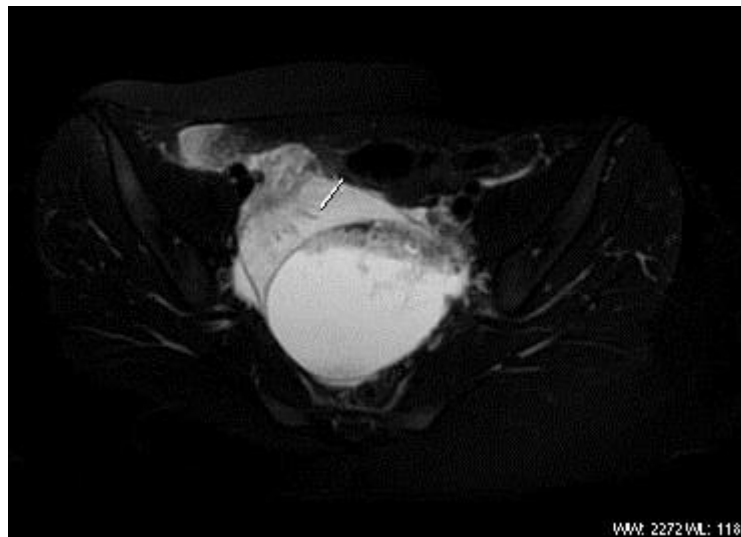
**Description:** Thickening and mild expansion of right fallopian tube with enlargement and congestion of its edge, probable point of torsion. **Origin:** F.Perinei Hospital, Department of Radiology, Altamura (BA), Italy

**b**



**Description:** Probable pivot of torsion (arrow) upstream of the mass. **Origin:** F.Perinei Hospital, Department of Radiology, Altamura (BA), Italy

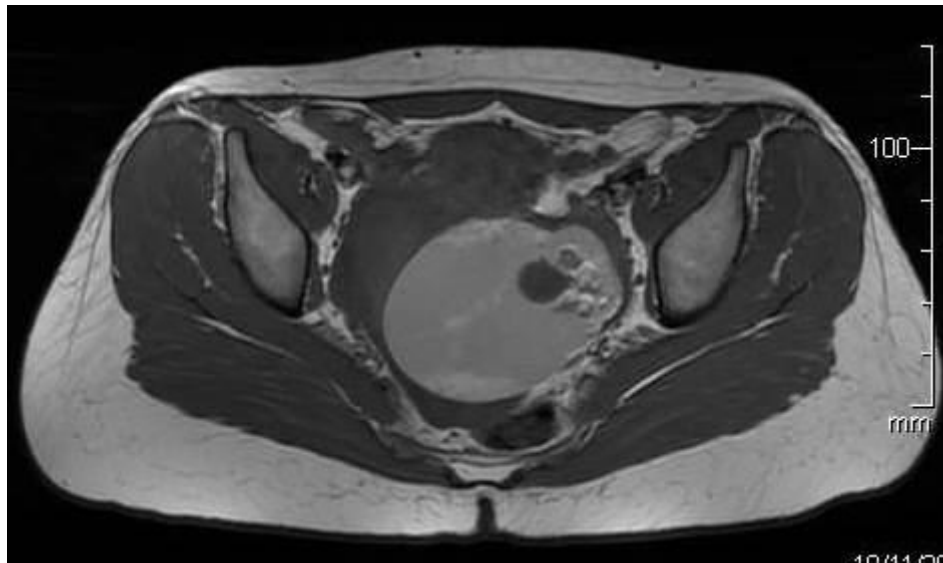
**c**



**Description:** Linear structures (arrow) converging to right ovary attributable to congested vascular pedicle. Free pelvic effusion can be seen. **Origin:** F.Perinei Hospital, Department of Radiology, Altamura (BA), Italy.

**Figure 3**

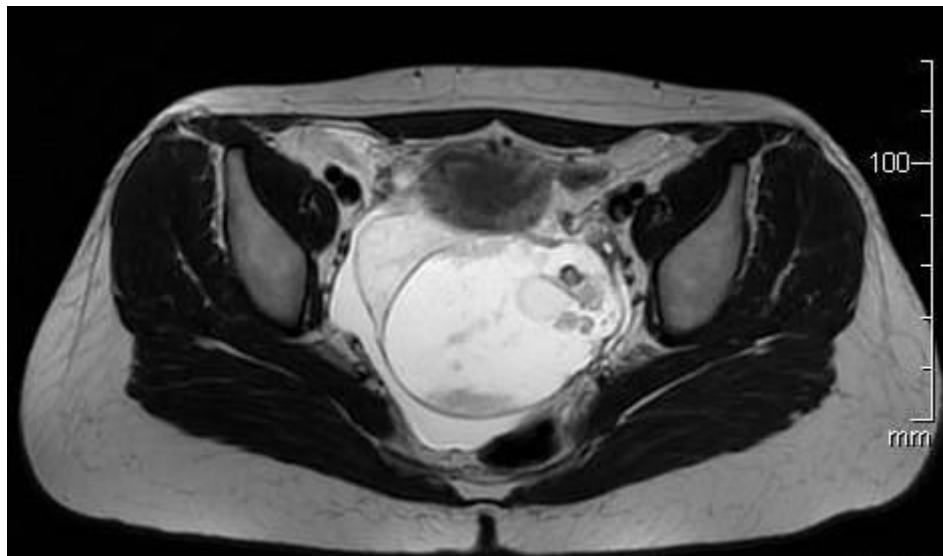
**a**



**Description: T1:**

Inhomogeneous pelvic mass formed by cyst-like component in the right side (hypointense on T1 and hyperintense on T2), fat component (hyperintense in T1-T2). **Origin:** F.Perinei Hospital, Department of Radiology, Altamura (BA), Italy

**b**



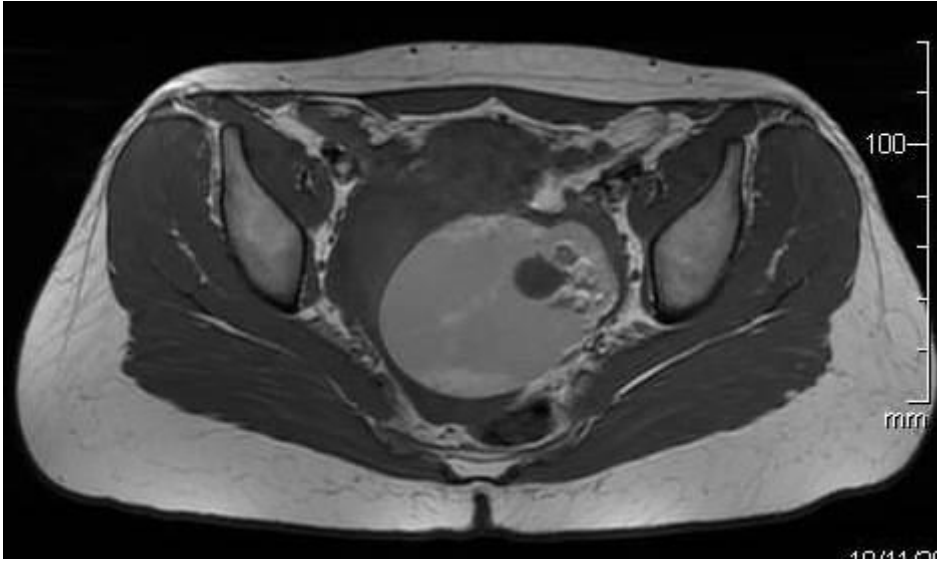
**Description: T2 weighted sequence:**

free pelvic effusion around the lesion.

Small calcifications on left side of the lesion (hypointense on T1 and T2-weighted sequences) and circumscribed areas of haemorrhage (hyperintense on T1, hypointense on T2). **Origin:** F.Perinei Hospital, Department of Radiology, Altamura (BA), Italy

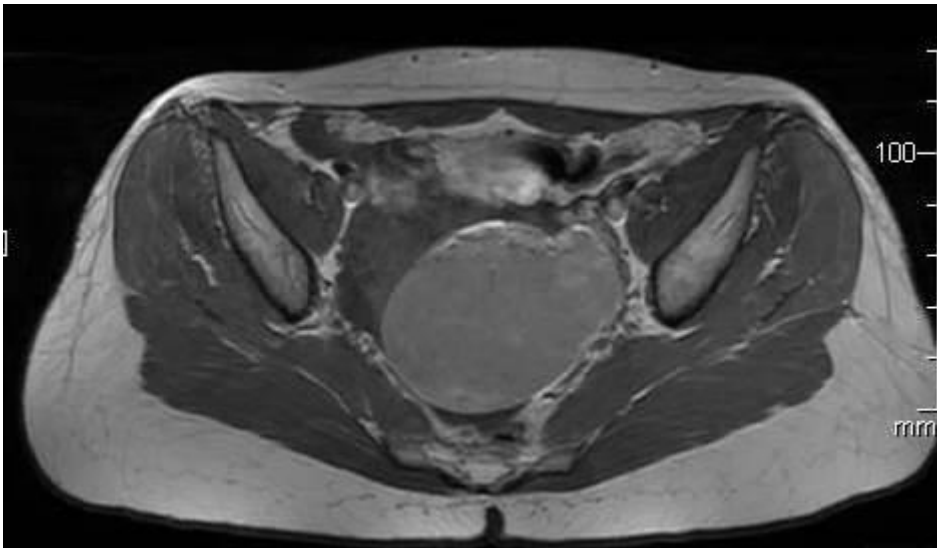
**Figure 4**

**a**



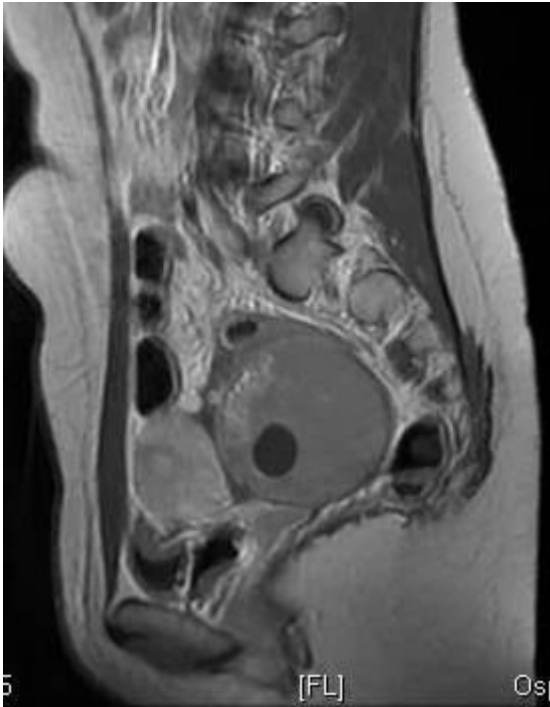
**Description:** T1-weighted sequence before contrast agent injection. **Origin:** F.Perinei Hospital, Department of Radiologu, Altamura (BA), Italy

**b**



**Description:** There is no marked contrast enhancement of the mass. **Origin:** F.Perinei Hospital, Department of Radiologu, Altamura (BA), Italy

**c**



**Description:** Sagittal contrast enhancement T1-weighted sequence **Origin:** F.Perinei Hospital, Department of Radiologu, Altamura (BA), Italy