

Indian Fertility Society

SONO-NAVIGATOR SERIES

ROLE OF ULTRASOUND IN DIAGNOSING ENDOMETRIOMA

Endometriosis, a common and clinically important cause of infertility, is classically defined as the presence of functional endometrial glands and stroma outside the uterine cavity. This may present microscopic implants to large cysts called as endometriotic cysts / endometriomas or chocolate cysts.

Endometriomas are most common in ovaries and are the result of repeated cyclic hemorrhage within a deep implant. Cyst walls may become thick and fibrotic with dense adhesions.

Diagnosis

The **gold standard** diagnostic technique is laparoscopy. Although ultrasound is poor at detecting peritoneal implants (~11%), it is better at detecting endometriomas.¹ Ultrasound examination is an easy and noninvasive method in the differential diagnosis, planning surgical intervention as well as preoperative and postoperative medical therapy. This includes morphologic assessment with two-dimensional ultrasound and other various ultrasound modalities such as three-dimensional sonography, color Doppler, and power ultrasound imaging.²

Typical Ultrasound Features

- 1. **Classical appearance is of a unilocular cyst with diffuse homogeneous ground-glass echoes** and acoustic enhancement, as a result of the hemorrhagic debris. This appearance occurs in **50%** of cases.³ (Fig. 1)
- 2. **Small echogenic foci** adhering to the wall in about **1/3rd** of cases. These have been postulated to be cholesterol deposits, small blood clots or debris. It's important to differentiate these foci from true wall nodules as they make the diagnosis of endometrioma very likely. (Fig. 2)
- 3. On doppler ultrasound, **color score between 1 and 3** (i.e. no vascularization to moderate vascularization) with no flow inside the papillary projection. (Fig. 3)
- 4. **Bilateral endometriomas in 28% cases.**⁴ Large ones may appear as kissing ovaries. (Fig. 4)
- 5. Findings of **acute haemorrhage such a layering blood products or retractile thrombus are uncommon(<10%)**, despite repeated haemorrhage.

Atypical Ultrasound Appearances (Fig. 5, 6)

- 1. Absence of ground glass appearance
- 2. Bi- or multi-locular (~85% will have <5 locules)
- 3. Retracted blood clots
- 4. Papillary projections, vascularized – Calcified lesions
- 5. Cystic-solid lesion (~15%) or purely solid lesion (1%)
- 6. Anechoic cysts (rare; 2%)

Typical Ultrasound Appearances of common ovarian cysts (common differential diagnosis, Fig. 7-10)

Type of cyst	Typical USG appearance
Follicular cyst	Simple, anechoic, smooth walled
Corpus Luteal cyst	Ring of fire (Fig. 7)
Hemorrhagic cyst	fibrin strands (fishnet/reticular) or low level echoes, good through transmission, variable wall thickness, some circumferential vascularity. Retracting clot, fluid level debris may also be seen. (Fig. 8)
Mature cystic teratoma	Hyperechoic rokitansky nodule , fat fluid level (supernatant layer is hyperechoic, representing fat)*, focal calcifications.** (Fig. 9)
Mucinous cytadenoma	A cystic mass with multiple, smooth, thin septa and no nodularity. Contains different echogenic materials, ranging from anechoic to diffuse low echogenic with floating echogenic foci that suggest a variety of mucin components. (Fig. 10)

* In an endometrioma with fat - fluid levels, **the supernatant fluid layer should be hypoechoic**, with a hyperechoic dependent layer representing blood.

**Endometriomas also may have central calcification although punctuate calcifications in the walls of endometriomas are more common. So, presence of focal calcification does not exclude endometrioma.

Most common misdiagnoses of endometriomas by sonography -hemorrhagic cysts and dermoids.

The Society of Radiologists in Ultrasound 2010 Consensus Conference Statement recommended **Short-interval follow-up (6 to 12 weeks)** in reproductive-aged women to ensure that acute hemorrhagic cysts are not mistaken for endometriomas.⁵

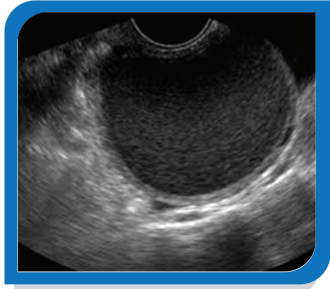


Fig. 1: Typical endometrioma showing ground glass appearance

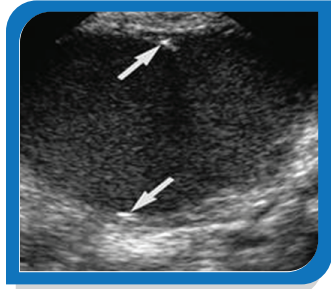


Fig. 2: Typical endometrioma showing wall nodularity

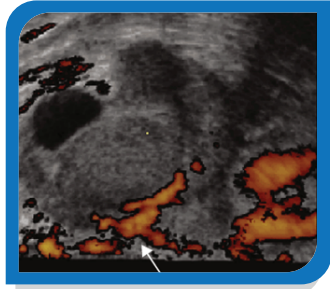


Fig. 3: Vascularity pattern of an endometrioma. Pericystic flow at the level of the ovarian hilus (arrowhead).



Fig. 4: Bilateral endometriomas with Kissing Ovaries.

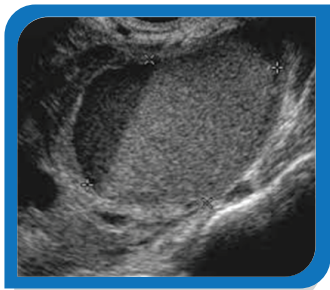


Fig. 5: Atypical endometrioma with fluid level and variable echogenicity.



Fig. 6: Multiloculated endometrioma

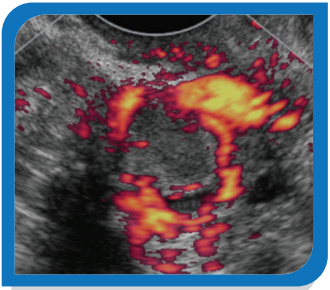


Fig. 7: Corpus luteal cyst showing ring of fire pattern.



Fig. 8: Haemorrhagic Ovarian cyst

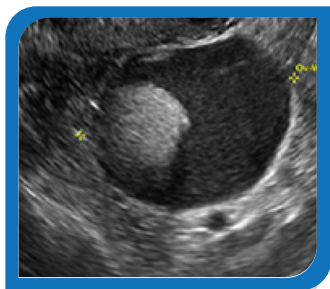


Fig. 9: Mature cystic teratoma



Fig. 10: Mucinous cystadenoma showing a thin walled multilocular cystic mass with a regular septum.

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2. Abuhamad A. (2014). Ultrasound in obstetrics abd gynecology:A practical approach.

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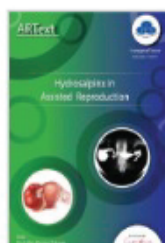
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