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ASA Endometriosis Ultrasound: Technical Educational Reference

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JUNE 2026

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Purpose

This document provides practical, sonographer-focused guidance to support implementation of the ASA Endometriosis Guideline (2026). It describes scan technique, dynamic manoeuvres, documentation, and recognised limitations of ultrasound for specific disease subtypes. It is intended to be read alongside the guideline, not as a replacement. It aims to:

- Support structured ultrasound examinations
- Promote consistency in technique and reporting
- Support safe practice and effective communication

Intended audience

This document is intended primarily for Accredited Medical Sonographers (AMS) and sonography students performing pelvic ultrasound examinations in individuals with suspected or confirmed endometriosis.

It may also be used by:

- Sonologists and radiologists overseeing ultrasound services.
- Gynaecologists and other referrers seeking to understand the scope and limitations of ultrasound findings.
- Educators and training providers supporting endometriosis ultrasound education.

Systematic assessment

This technical reference supports the ASA 2026 Endometriosis Guideline by detailing scan techniques and documentation. The approach can be applied at different practice levels (see Table 1). Core elements should be achievable within routine services, while comprehensive compartment mapping, bowel characterisation, and urinary tract assessment beyond screening generally require advanced training and adequate appointment time. Where findings are indeterminate, complex, or outside scope, escalation to a specialist endometriosis imaging service is recommended.

The document provides practical, anatomy-based technical guidance for performing a structured ultrasound examination in individuals with suspected or known endometriosis. Organised by pelvic compartment, it outlines a systematic approach to image acquisition, dynamic assessment, and documentation, aligned with the ASA Endometriosis Guideline (see Appendix 1: Example worksheet). The guidance is applicable to both Level 1 and Level 2 assessment.

This guidance supports consistency and clarity in sonographic practice, while recognising variation in practitioner experience, patient tolerance, and clinical context. Techniques should be applied judiciously, within scope of practice, and interpreted alongside clinical history and other imaging findings.

Before applying the technical principles outlined below, the practitioner should consider whether the examination can proceed safely and appropriately, and recognise the limitations that may affect completeness and interpretation.

Table 1: Scope of endometriosis ultrasound assessment by practice level

Regions examined at Level 1 and Level 2		
Region or assessment component	**Level 1 – General assessment**	**Level 2 – Advanced specialist assessment**
Uterus, structural assessment, mobility	✓	✓
Adenomyosis features (MUSA terminology)	✓	✓
Adnexa	✓	✓
Ovaries, position and morphology	✓	✓
Ovarian endometriomas using IOTA criteria	✓	✓

General screening of the posterior compartment (POD, USLs, bowel) to identify clearly visible abnormalities or suspicious features suggestive of DE	✓	✓
POD sliding sign, basic assessment (positive, negative, or indeterminate)	✓	✓
POD sliding sign, nuanced interpretation	x	✓
Posterior compartment mapping (USLs, torus uterinus, vaginal wall) using structured frameworks (e.g. IDEA, #Enzian)	x	✓
Bowel mapping, including wall layer involvement and nodule extent	x	✓
Anterior compartment assessment (bladder, ureters, uterovesical sliding sign)	x	✓
Pelvic sidewalls	x	✓
Superficial peritoneal disease (where technically feasible and clinically relevant)	x	✓

Contraindications and limitations

Ultrasound assessment for endometriosis should only proceed with appropriate patient or guardian consent. The examination must not proceed if consent is not obtained and must be modified or ceased immediately if consent is withdrawn at any stage.

Transvaginal ultrasound may also need to be modified or avoided where it is declined or not tolerated because of pain, distress, anatomy, or patient preference. In these circumstances, alternative approaches such as transabdominal, transperineal, or transrectal ultrasound may be used where clinically appropriate, however, it should be recognised that these approaches have reduced sensitivity for the detection of endometriosis compared with transvaginal assessment.

Ultrasound has recognised limitations in the assessment of endometriosis, and a normal examination does not exclude disease. Sensitivity varies according to disease type, anatomical site, operator experience, equipment quality, and patient tolerance. Superficial and extra-pelvic disease may not be detected on routine pelvic ultrasound.

Any modification, limitation, or cessation of the examination should be clearly documented in the report, including the reason, the stage at which the examination was limited, and the impact on completeness and interpretation. Patient comfort, dignity, and safety must always take precedence over protocol completeness.

Core principles applicable to all compartments

Unless otherwise specified, the following principles apply to all anatomical compartments assessed. Assessment should be performed using a transvaginal approach unless contraindicated.

- Imaging should be performed in sagittal and transverse planes.
- Transducer pressure and dynamic imaging should be used to evaluate mobility, adhesions, and site-specific tenderness.
- Pain elicited during assessment should be documented, including anatomical location.
- All lesions should be measured in three planes.
- Findings should be interpreted in conjunction with clinical history and other imaging, not in isolation.
- Where findings are indeterminate, complex, or outside scope, escalation to a specialist endometriosis imaging service or complementary imaging such as MRI, is recommended.

Middle compartment

Uterus

Purpose and relevance

Systematic assessment of the uterus is important in individuals with suspected or confirmed endometriosis, as uterine morphology, position, and mobility may reflect associated adhesions or deep disease. Adenomyosis is highly prevalent in this population and may contribute significantly to pelvic pain, abnormal uterine bleeding, and infertility.[2] In addition, careful uterine assessment allows exclusion of other gynaecological conditions, such as fibroids, that may cause overlapping symptoms and influence management. Uterine assessment also provides key contextual information for interpreting findings in adjacent compartments.

Anatomy and normal appearance

The uterus should be assessed for size, shape, contour, orientation, myometrial echotexture, and mobility. Normal myometrium appears homogeneous, with a clearly defined endometrial–myometrial junctional zone.[3]

Altered uterine position, such as an anteverted and retroflexed (question-mark) configuration, may act as an indirect sonographic sign suggesting restricted mobility due to posterior adhesions or DE involving the posterior compartment (Figure 1).[2,4,5] This finding is not diagnostic but provides supportive contextual information.

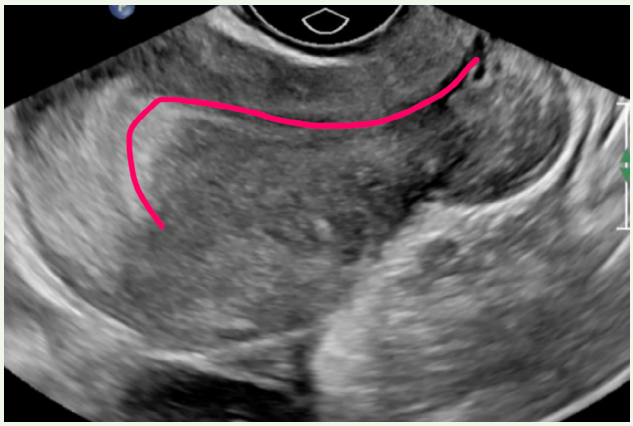


Figure 1: Anteverted retroflexed uterus showing the "question mark" sign.

Sonographic technique

- Assess uterine orientation, contour, size, and mobility.
- Chroma or tint filters may be used to enhance contrast and improve visibility of subtle lesions.
- Three-dimensional (3D) or four-dimensional (4D) ultrasound may aid in evaluating the junctional zone and lesion morphology, supporting differentiation from fibroids.

Sonographic features of adenomyosis

Adenomyosis assessment (MUSA criteria)

Adenomyosis is characterised by ectopic endometrial tissue within the myometrium and is highly prevalent in individuals with endometriosis, particularly those with deep disease.[2]

According to the MUSA criteria, adenomyosis demonstrates both direct and indirect sonographic features. A diagnosis of adenomyosis requires the presence of at least one direct feature; indirect features alone are insufficient to confirm the diagnosis.

Direct MUSA sonographic features include: (See Table 2)

- Myometrial cysts (Figure 2).
- Hyperechoic islands (Figure 2).
- Echogenic sub-endometrial lines or buds (Figures 3 and 4).[4,6–8]

Indirect MUSA features include: (see Table 2)

- Globular uterine shape.
- Asymmetric myometrial thickening (often posterior) (Figure 5).[4,6] Where asymmetry is the only feature present, reassess later in the examination, as transient myometrial contractions can mimic asymmetry.[1]
- Fan-shaped shadowing (Figure 6).
- Translesional vascularity (Figure 7).
- Irregular or interrupted junctional zone (Figure 8 and Video 1).[4,6,7]

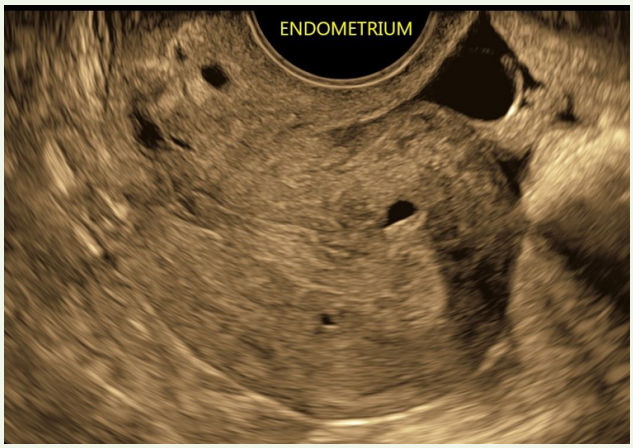


Figure 2: Hyperechoic islands and myometrial cysts are direct MUSA features of adenomyosis

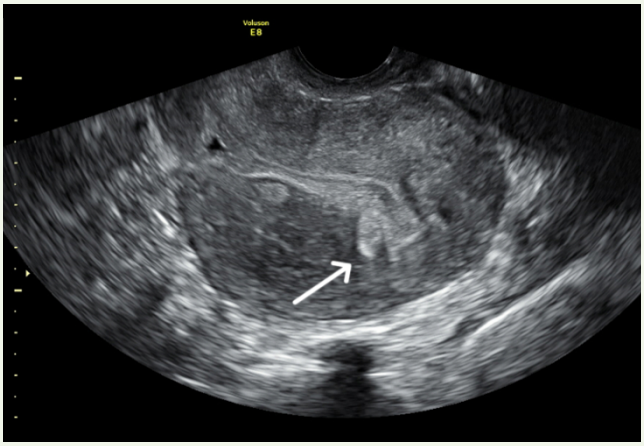


Figure 3: Echogenic sub-endometrial lines or buds projecting into the adjacent myometrium, a MUSA direct criterion.

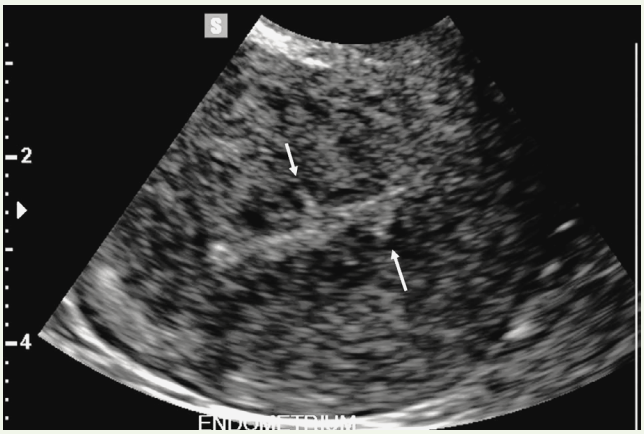


Figure 4: Longitudinal endometrium demonstrating echogenic sub-endometrial lines, a MUSA direct criterion.

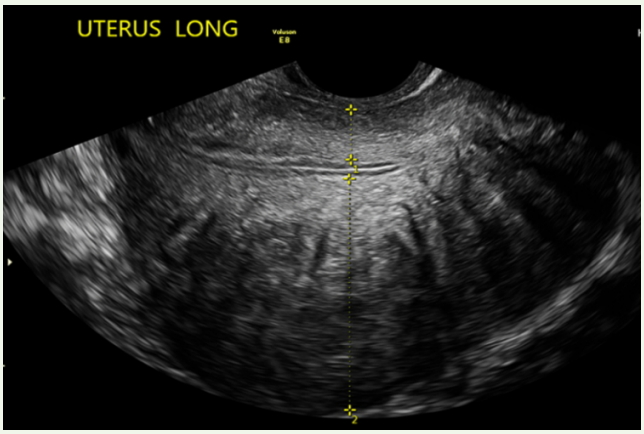


Figure 5: Posterior to anterior uterine wall thickness ratio >1, suggesting asymmetry associated with adenomyosis, a MUSA indirect criterion.

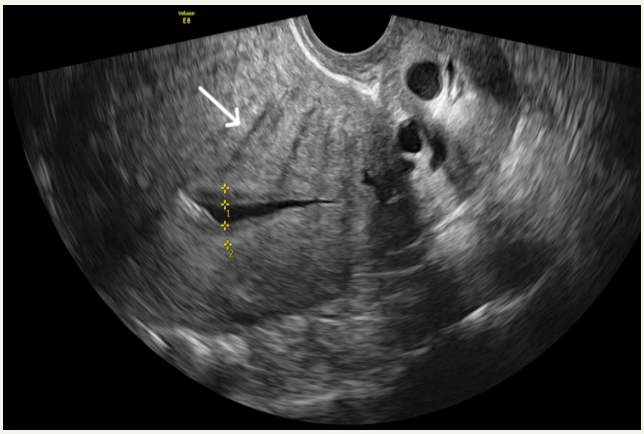


Figure 6: Fan-shaped acoustic shadowing of the myometrium, an indirect MUSA criterion.

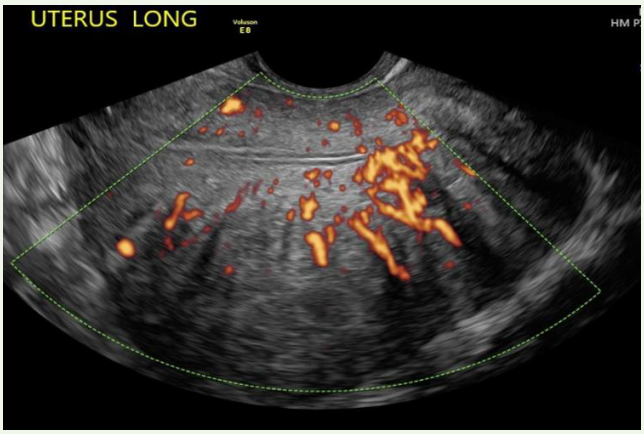


Figure 7: Translesional vascularity traversing areas of abnormal myometrium on power Doppler represents an indirect MUSA criterion and assists in differentiating adenomyosis from fibroids, which typically demonstrate peripheral or circumferential vascularity rather than vessels crossing through the lesion.

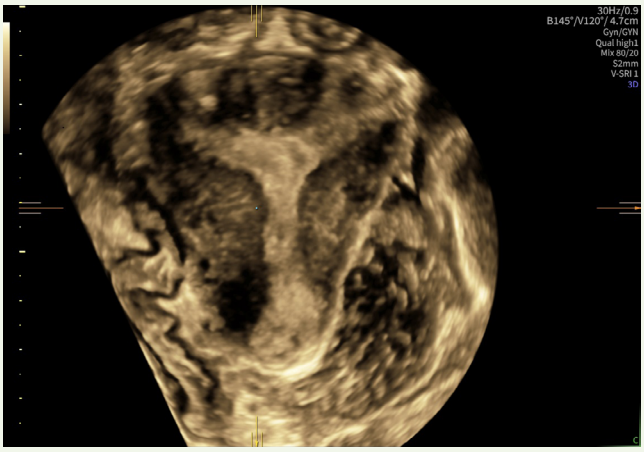
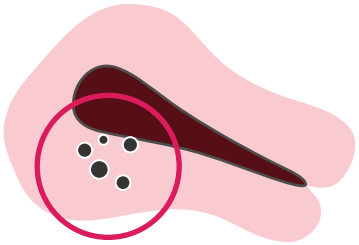
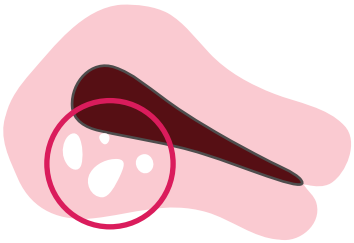
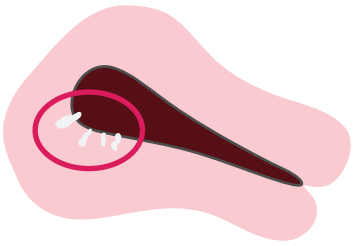
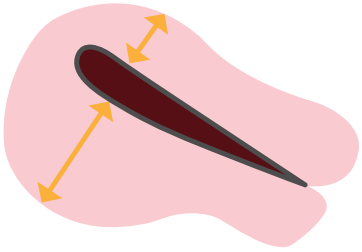
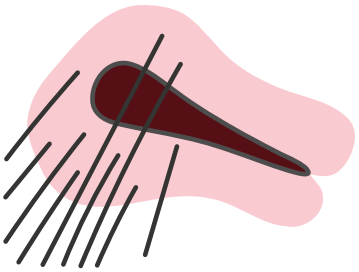
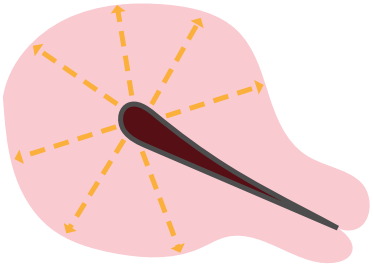
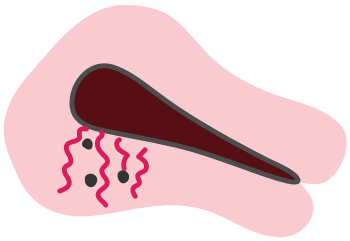
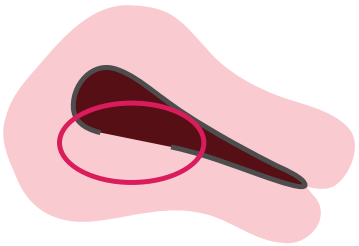


Figure 8: Irregular outline of the endometrial cavity with loss of clear myometrial junctional zone in the fundal region, an indirect MUSA criterion.

Table 2: MUSA direct and indirect sonographic features of adenomyosis.

Direct signs	 Cysts	 Hyperechoic islands	 Echogenic subendometrial lines and buds
Indirect signs	 Asymmetrical thickening	 Fan shaped shadowing	 Globular uterus
	 Translesion vascularity	 Interrupted junctional zone	

Clinical considerations

Adenomyoma, the focal form of adenomyosis, appears as an ill-defined, asymmetric myometrial lesion with trans-lesional vascularity and no mass effect on surrounding myometrial vessels.[4] In contrast, leiomyomas (fibroids) typically demonstrate:

- Well-defined margins,
- Edge-reflective shadowing, and
- Circumferential deviation of myometrial vessels.

Recognition of these features assists in distinguishing adenomyosis from fibroids and reduces misclassification.[4]

Ovaries

Purpose and relevance

Assessment of the ovaries is an important component of structured endometriosis ultrasound. Ovarian position, morphology, and mobility can reflect disease severity, the presence of adhesions, and involvement of adjacent compartments.[2,9] Ovarian endometriomas are common in individuals with endometriosis and are strongly associated with deep disease, chronic pelvic pain, and infertility.[10]

Anatomy and normal appearance

The ovaries are typically located lateral to the uterus along the pelvic sidewalls.[4] A normal ovary has a smooth contour, homogeneous stromal echotexture, and contains follicles appropriate for the individual's age and hormonal status. Normal ovaries demonstrate mobility relative to the uterus, bowel, pelvic sidewalls, and USLs.

Sonographic technique

- Identify and measure each ovary in at least three orthogonal planes.
- Assess ovarian position, morphology, and relationship to adjacent pelvic structures.
- Assess ovarian mobility relative to the uterus, bowel, pelvic sidewalls, and USLs where visualisation permits.
- Ovarian immobility may be observed in endometriosis, but has poor sensitivity and low positive predictive value.[7,11,12] Immobility may also result from patient-related factors, previous surgery, pelvic inflammatory disease (PID), or other causes of adhesions, and should be interpreted cautiously and only in conjunction with other sonographic findings.

Sonographic features of endometriosis

In endometriosis, one or both ovaries can be displaced depending on where disease is present. This represents an indirect finding suggestive of adhesions and should be interpreted in conjunction with other sonographic features of endometriosis. Locations include:

- Posteriorly, often adjacent to the cervix or low in the posterior compartment,
- Fundally against the uterine serosa,
- Anteriorly,
- Laterally, or
- Against bowel.[4]
- The presence of "kissing ovaries," where both ovaries are fixed together in the midline (usually in the POD), is strongly associated with advanced disease, particularly DE involving the bowel, fallopian tubes, and USLs (Figures 9 and 10).[2,9]

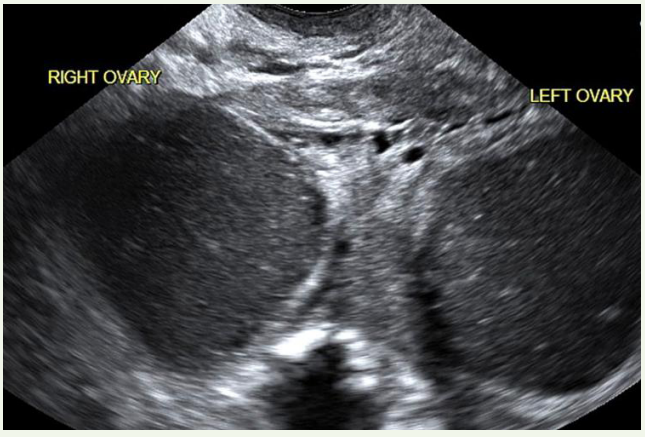


Figure 9: "Kissing ovaries" fixed in the midline; a feature strongly associated with advanced endometriosis.

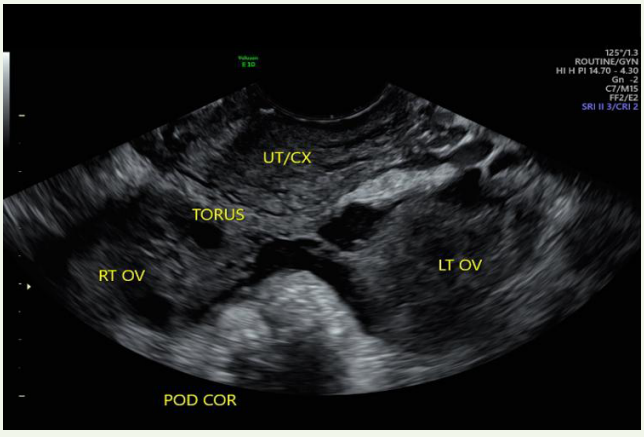


Figure 10: Ovaries fixed together in the posterior compartment.

Ovarian endometriomas

Ovarian endometriomas are benign cystic lesions resulting from repeated cyclical haemorrhage within ectopic endometrial tissue.[9,10,13] They are markers of advanced disease, frequently coexist with DE, and are associated with chronic pain and infertility.[10] Although cyst rupture can occur, ovarian torsion is uncommon, as endometriomas are frequently adherent and therefore lack sufficient mobility.[14]

Typical sonographic features on TVUS include (as per IOTA Consensus):[15,16]

- Unilocular or multilocular cysts (Figure 11).
- Low-level homogeneous internal echoes ("groundglass" appearance) (Figures 12 and 13).
- Absence of internal vascularity (Figures 11 and 13).
- Bilaterality in up to 50% of cases.[4,9,17,18]

However, up to 50% of endometriomas have atypical ultrasound features including:

- Hyperechoic, ball-like wall foci suggestive of blood clots (Figure 11),
- Fluid-fluid levels, and
- Calcified foci. [16,19,20]

Their appearance can differ between premenopausal and postmenopausal patients.[16]

Endometriomas are found in up to 78% of patients with DE, with a predominance on the left ovary and more commonly in individuals under 35 years of age.[13,21–23] When an endometrioma is identified, a systematic assessment for pelvic adhesions, organ mobility (including evaluation of the sliding sign), and associated DE, particularly involving the USLs, should be performed.[5,24]

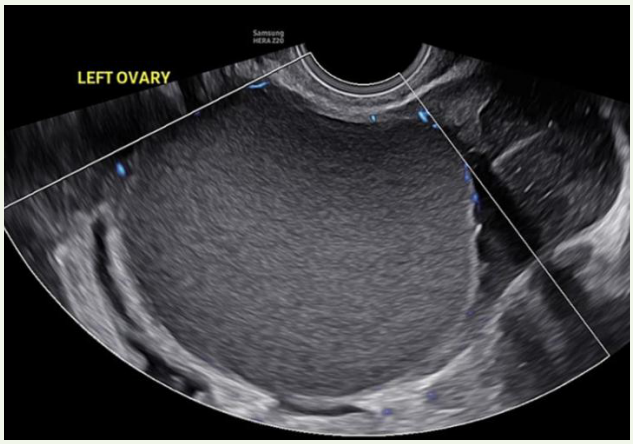


Figure 11: Endometriomas are most often unilocular ovarian cysts.

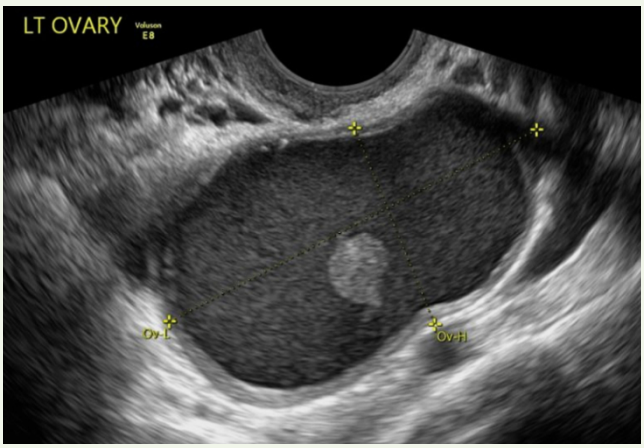


Figure 12: Diffuse low-level internal echoes giving a "ground-glass" appearance with an echogenic solid component, a classic sonographic feature of an endometrioma.

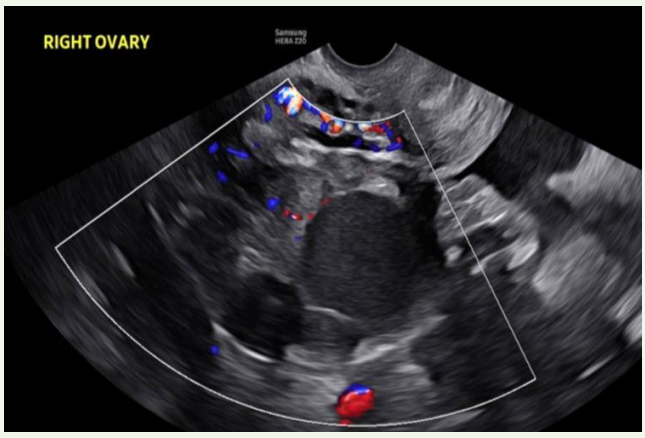


Figure 13: Low-level homogenous internal echoes within a cystic ovarian lesion, absence of internal vascularity, classic features of an endometrioma.

Clinical considerations

- If solid or vascularised components are present, further assessment with colour Doppler and risk stratification (e.g., IOTA or O-RADS) is recommended.[7] Although rare, malignant transformation can occur but this is predominantly a complication seen in older patients and should not prompt over-diagnosis in younger individuals.[4,7,25]
- During pregnancy, endometriomas may undergo decidualisation, mimicking malignancy on imaging.[26] Accurate interpretation is essential to avoid unnecessary intervention, and cases with suspected decidualised endometriomas should be referred for specialist assessment to ensure malignancy is not overlooked.[9]
- Bilateral endometriomas are associated with more extensive disease and a higher likelihood of POD obliteration.[13] Complete POD obliteration is significantly more prevalent in patients with ovarian endometriosis, occurring in up to 21.7% of cases, compared to only 5.8% in those without ovarian involvement.[23]

Fallopian tubes

Purpose and relevance

Assessment of the fallopian tubes is an important adjunct to structured endometriosis ultrasound. Hydrosalpinx and haematosalpinx may reflect tubal obstruction due to endometriosis or adhesions and can be associated with infertility, pelvic pain, and more extensive pelvic disease.[4]

Anatomy and normal appearance

When normal, they appear as a solid, iso/hypoechoic structure which can be traced from the uterine cornua. When abnormal, they may appear as tubular, elongated structures distinct from the ovary, with characteristic folds or septations depending on the underlying pathology.[4]

Sonographic technique

- Assess the adnexal regions in multiple planes.
- Identify any tubular cystic structures separate from the ovary.
- Trace the structure longitudinally and transversely to confirm a tubal origin and exclude paraovarian cysts or dilated bowel loops.
- Assess the relationship to the ovary, uterus, and surrounding pelvic structures.

Sonographic appearance of endometriosis

Hydrosalpinx

Hydrosalpinx refers to a fluid-filled fallopian tube, typically resulting from distal tubal occlusion due to endometriosis or adhesions.[2,9] On ultrasound it appears as a tubular, anechoic or hypoechoic cystic structure separate from the ovary (Figures 14 and 15).[4]

Characteristic sonographic features include:

- Incomplete septations (“cogwheel” sign as seen in Figure 16).[4]
- Focal narrowing (“waist” sign).[4]
- Endosalpingeal folds.[4]
- “Chain of cysts” appearance.[4]

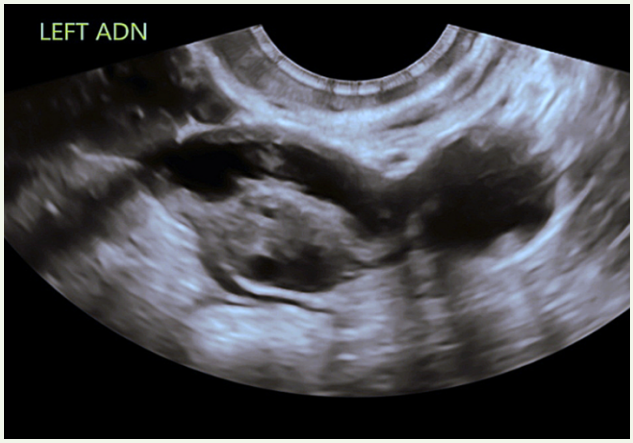


Figure 14: Dilated, fluid-filled fallopian tube with incomplete septations (cogwheel sign), consistent with hydrosalpinx.

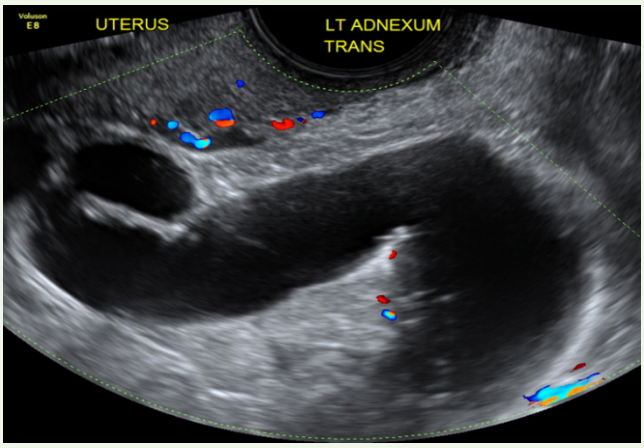


Figure 15: Fluid filled fallopian tube, consistent with hydrosalpinx.

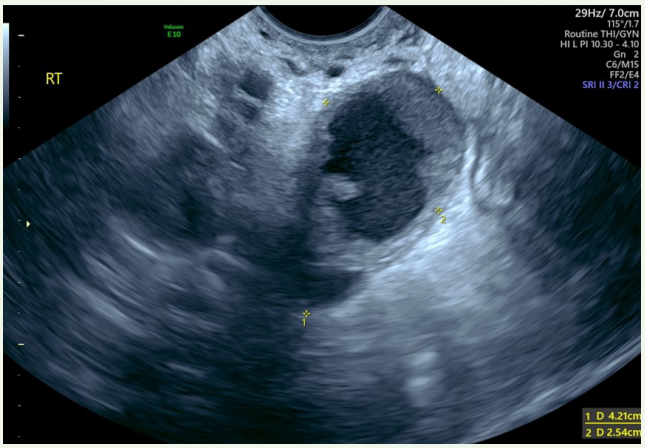


Figure 16: Dilated fallopian tube with incomplete septations, the cogwheel sign.

Haematosalpinx

Haematosalpinx is a blood-filled fallopian tube, typically appearing as a dilated tubular structure with low-level internal echoes (Figure 17 and 18).[4] While it may indicate tubal endometriosis, it is relatively uncommon and non-specific. It may also mimic pyosalpinx, which is usually associated with infection.[4]

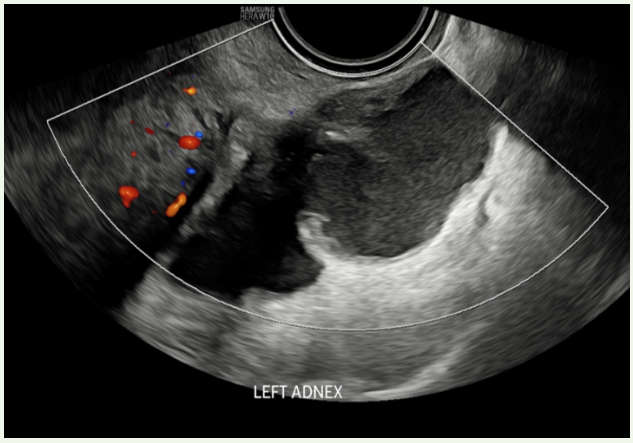


Figure 17: Dilated fallopian tube containing groundglass low-level echoes, typical of haematosalpinx.

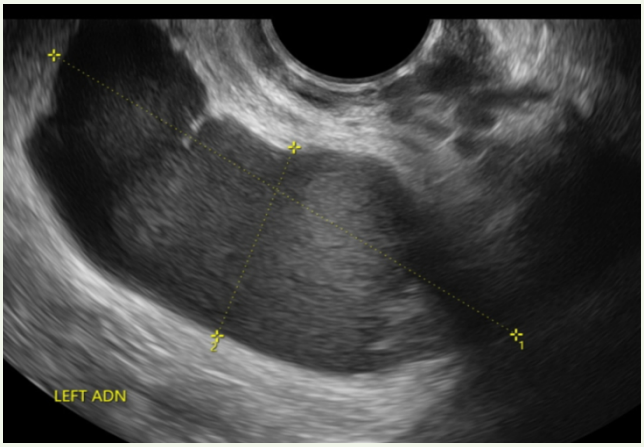


Figure 18: TVUS image demonstrating typical appearance of haematosalpinx, can be associated with endometriosis-related tubal obstruction.

Clinical considerations

Hydrosalpinx and haematosalpinx are not diagnostic of endometriosis in isolation. Interpretation should be made in the context of other sonographic features and clinical symptoms. Further evaluation for endometriosis is warranted when these findings are accompanied by other sonographic features, clinical symptoms, and patient history.[4]

Posterior compartment

Purpose and relevance

The posterior compartment is the most common site of DE, with reported involvement in up to 93% of affected individuals.[2,4] Disease in this region is strongly associated with pelvic pain, bowel symptoms, dyspareunia, and complex surgical management.[27] Accurate sonographic assessment and mapping of the posterior compartment is important for diagnosis, referral, triage, risk stratification, and multidisciplinary surgical planning.

Key anatomical structures within the posterior compartment include the POD, USLs, torus uterinus, posterior vaginal wall, and the bowel (especially the anterior rectum, rectosigmoid junction, and sigmoid colon) (Figure 19).[2,4,9]

Current understanding suggests that endometriosis originating in the rectovaginal septum (RVS) does not occur as a separate entity.[28] What was previously labelled as RVS disease typically represents severe posterior compartment involvement where normal tissue planes are lost.[28] When RVS DE occurs, it typically results from lesions arising in adjacent areas, including the POD, that infiltrate inferiorly into the space, which is rare.

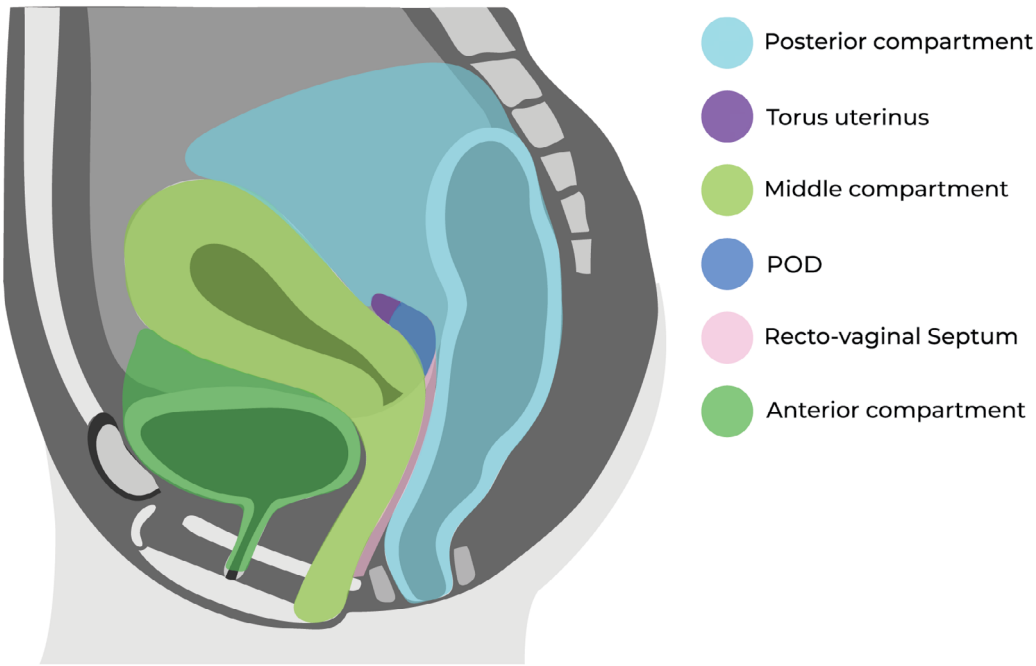


Figure 19: Anatomical compartments of the pelvis, including the anterior, middle, and posterior compartments.

Anatomy and normal appearance

POD

The POD, also known as the rectouterine pouch or posterior cul-de-sac, is the most dependent peritoneal space in the pelvic cavity and is located between the posterior cervix and uterus anteriorly, and the anterior rectum posteriorly.

USLs

The USLs are commonly involved in DE, with up to 73% of affected individuals showing nodules.[21,24] These paired ligamentous structures extend from the torus uterinus posteriorly and laterally toward the sacral spine.[29,30] When the transducer is positioned in the posterior vaginal fornix they will lie in the near field, just beneath the vaginal wall.[4]

- Homogeneous, hyperechoic, band-like structures angling posterior and laterally from the cervix (Figures 20, 21, and Video 2).[2,4,5]
- Best visualised when free fluid is present in the POD.[2,4,5]

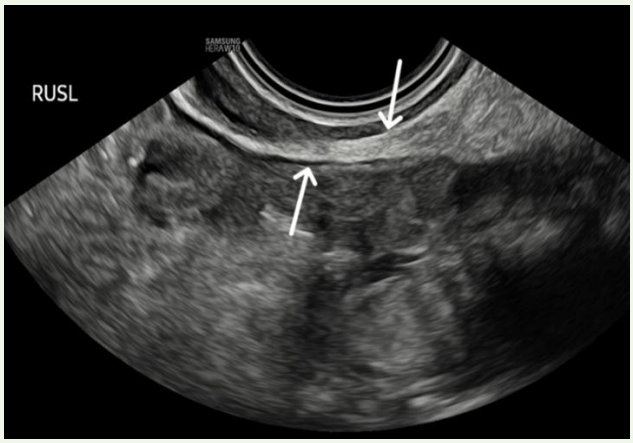


Figure 20: Normal right USL seen as a hyperechoic band-like structure.

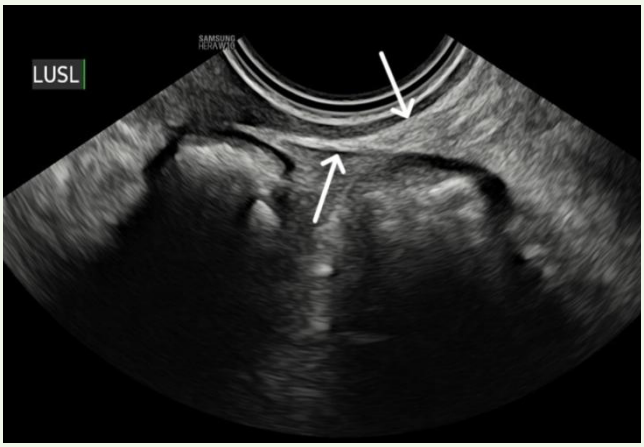


Figure 21: Normal sonographic appearance of the left USL.

Torus uterinus

The torus uterinus, also known as the cervicouterine junction (Figure 19), is a midline fibromuscular ridge on the posterior cervix that represents the convergence of the USLs (Figure 22 and Video 3).[31] Lesions at the torus uterinus are a common site of posterior compartment disease, reported in up to 55% of affected individuals, and may extend laterally along the USLs.[4,21,26]

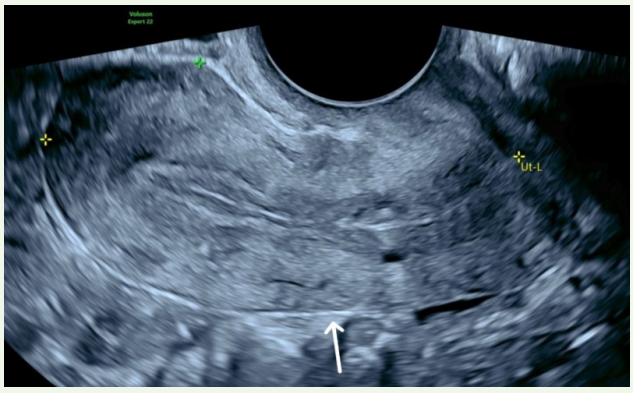


Figure 22: Torus uterinus noted on the posterior aspect of the cervix.

Bowel

DE frequently involves the bowel, with up to 93% of disease affecting the anterior rectum and rectosigmoid colon.[4,9,32] Lesions typically infiltrate the serosa and muscularis propria, but rarely extend to the mucosa, making them difficult to detect with colonoscopy.[4]

On TVUS, the torus uterinus provides a reliable anatomical landmark for distinguishing between the lower and upper anterior rectum:

- Lower anterior rectum: The rectal segment lying caudal (below) to the level of the cervix, typically adjacent to the posterior vaginal fornix.[33,34]
- Upper anterior rectum: The rectal segment lying cranial (above) to the cervix extending towards the rectosigmoid junction.[34]

Understanding the layered structure of the bowel wall is important for identifying abnormalities:

- Anterior rectal serosa: thin, hyperechoic line.[5]
- Muscularis propria: hypoechoic, with outer longitudinal and inner circular layers separated by a faint, hyperechoic line (<3mm).[5]
- Submucosa: hyperechoic.[5]
- Mucosa: hypoechoic (Figures 23 and 24).[5]

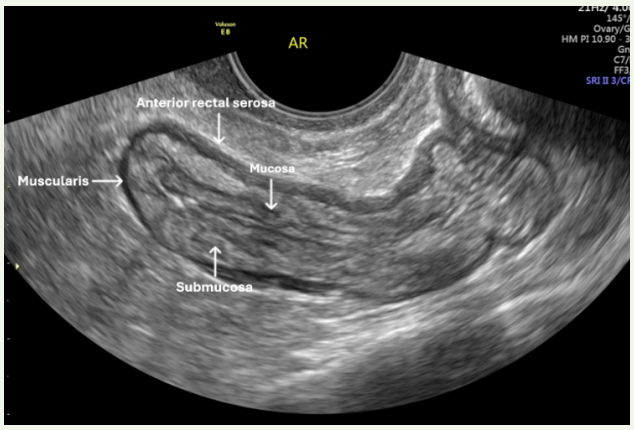


Figure 23: Anatomy of the bowel wall on ultrasound.

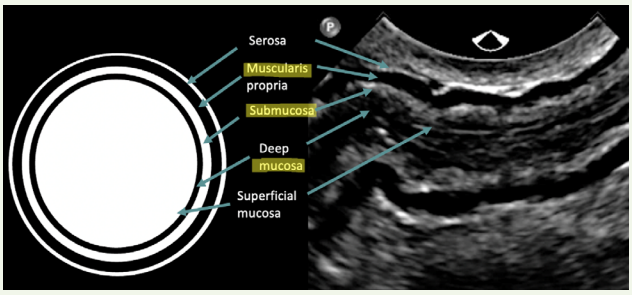


Figure 24: Layers of the bowel wall noted with the transducer in the posterior vaginal fornix.

Vaginal wall

- The vaginal wall should appear as a uniformly hypoechoic layer (Figure 25).
- No focal thickening, nodularity, or distortion is present.
- Tissue planes between the posterior vaginal wall, rectum, and surrounding structures are preserved.

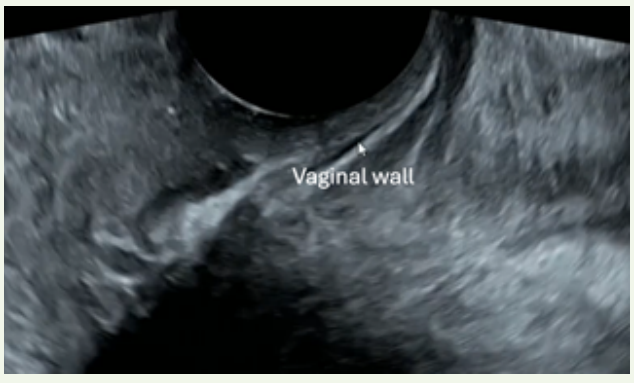


Figure 25: Normal thin appearance of the vaginal wall.

Sonographic technique

- Position the transducer in the posterior vaginal fornix to evaluate the POD, USLs, torus uterinus, vaginal wall, and adjacent bowel.[2,4]
- 4D imaging from a transperineal approach may be useful where TVUS is not feasible, particularly for documenting posterior compartment distortion and the relationship of the rectum, rectosigmoid, and posterior vagina. However, a negative or limited transperineal assessment should not be used to exclude bowel disease.

POD

- Identify the posterior cervix/uterus anteriorly and the anterior rectum posteriorly.
- Assess the POD for nodules of endometriosis.
- Perform the sliding sign and document any site-specific tenderness.[2]

USLs

- While in the posterior vaginal fornix, maintain a sagittal orientation to first identify the posterior cervix and torus uterinus.[4,8]
- Sweep the transducer laterally to identify each USL as it extends posterolaterally from the torus uterinus junction.[2,5]
- Once the USL is identified, rotate the transducer medially by approximately 45 degrees to align with the long axis (Figure 26, Video 4).[8]
  - Right USL: Rotate the transducer clockwise (medially on the patient) to approximately 2 o'clock.
  - Left USL: Rotate the transducer anticlockwise (medially on the patient) to approximately 10 o'clock.
- Assess for direct features of disease, including hypoechoic lesions and indirect features, such as distortion of surrounding tissue planes and increased echogenicity.[2,5,9]
- Non-visualisation or apparent discontinuity may reflect normal anatomical variation rather than pathology and should be interpreted alongside lesion morphology, tissue distortion, and dynamic findings.

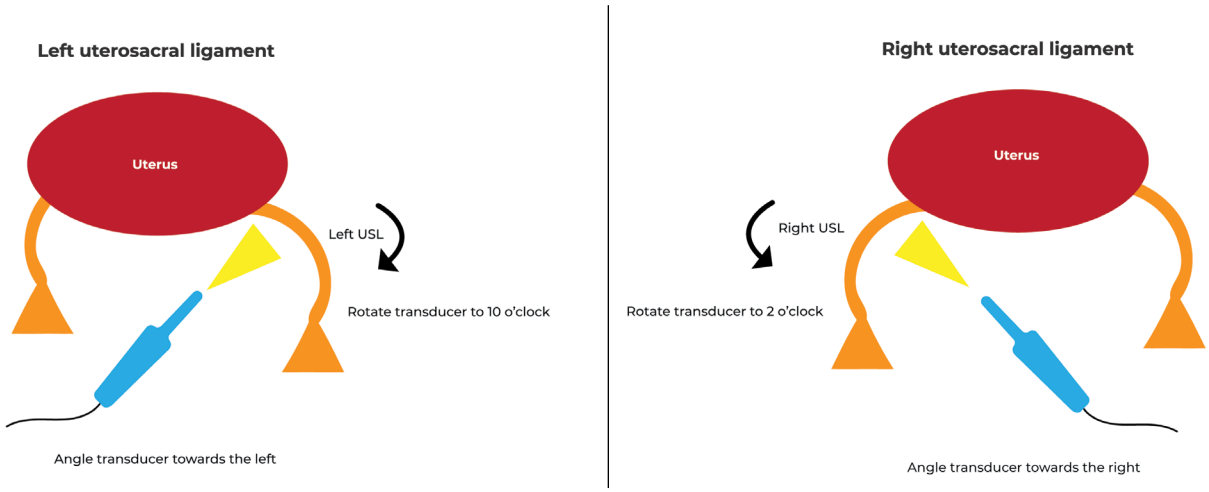


Figure 26: TVUS assessment of the USL is achieved by positioning the transducer in the posterior vaginal fornix, sweeping laterally and rotating to approximately 2 o'clock for the right USL and 10 o'clock for the left USL.

Torus uterinus

- The torus uterinus is posterior to the cervix at the level of the external os.
- Adjust transducer angle and depth to optimise visualisation, particularly in retroverted or retroflexed uterus.[9]
- Care should be taken to avoid inadvertent imaging of the adjacent cardinal ligament.
- Assess for hypoechoic lesions and contour irregularity.

Bowel

- Assess the anterior rectum, rectosigmoid junction, and sigmoid colon.
- Angle the transducer towards the sacrum and apply dynamic imaging to evaluate bowel mobility and detect adhesions.[2]
- Where within scope and local protocol, measure the distance from the most caudal lesion to the anal verge to assist with surgical planning, and document the method used.[2,5,9]

Vaginal wall

- Use high frequency settings, focal zone placement in the near field, and appropriate gain to visualise the vaginal wall.
- Apply gentle probe pressure to assess mobility.

Sonographic features of endometriosis

POD

DE within the POD can cause significant scarring, pain, and potentially bowel or nerve issues.[35–37] DE lesions and adhesions can tether structures and partially or completely obliterate the POD and influence surgical planning and risk stratification.[2] Assessment of the POD is especially important when a negative sliding sign is observed.

Common sonographic features include:

- Loss of normal sliding between posterior uterus/cervix and anterior rectum.
- Fibrotic thickening or hypoechoic nodules.
- Tethering of ovaries or bowel into the posterior compartment.[2]
- Partial or complete POD obliteration (level of obliteration can be fundus, mid uterus, POD).

USL

- Hypoechoic lesions (Figure 27, Video 5).[38]
- Irregular, star-shaped lesions (Figures 28 and 29).[38]
- Hyperechoic foci.[31]
- Loss of normal tissue planes (Figure 30).
- Reduced mobility with negative sliding sign.
- Site-specific tenderness.[39,40]

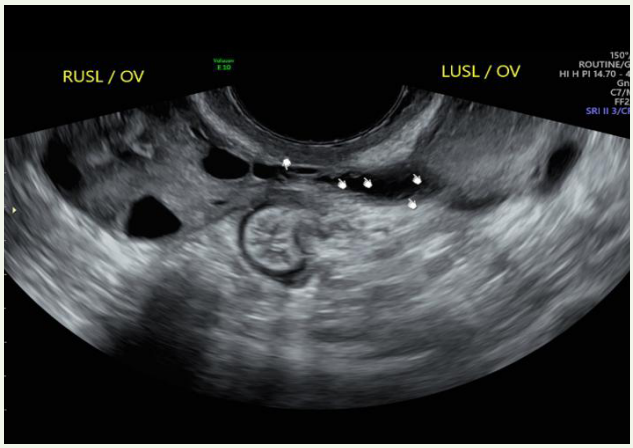


Figure 27: USL demonstrating nodularity.

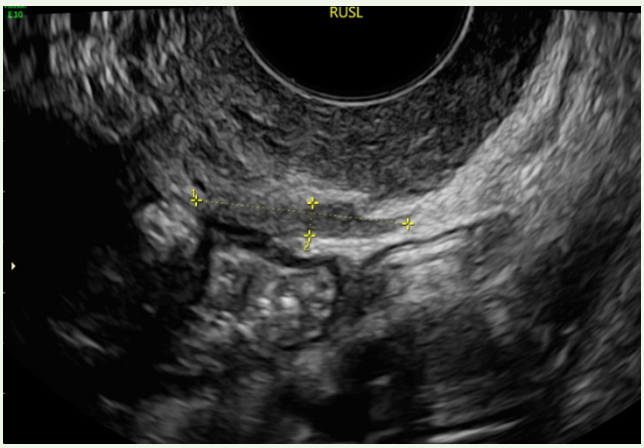


Figure 28. Endometriosis lesion within the right USL, consistent with DE.

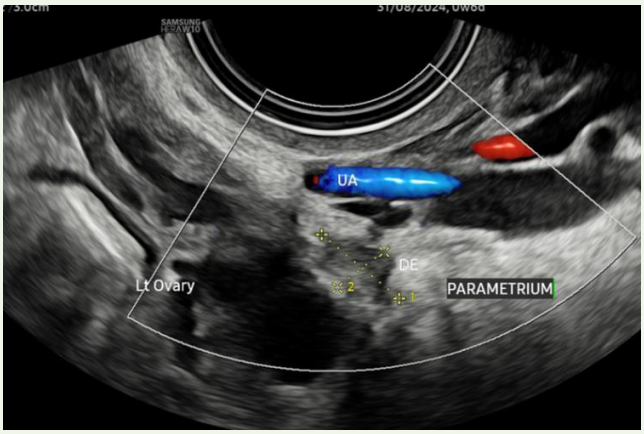


Figure 29: Hypoechoic lesion within the left parametrium.

Figure 30: Hypoechoic lesion involving the right USL and adjacent right parametrium.

Torus uterinus

- Hypoechoic lesions with variable morphology (smooth, well-defined, irregular, or spiculated) (Figure 31, Video 6).[4]
- Echogenic foci.[31]
- Cystic components.

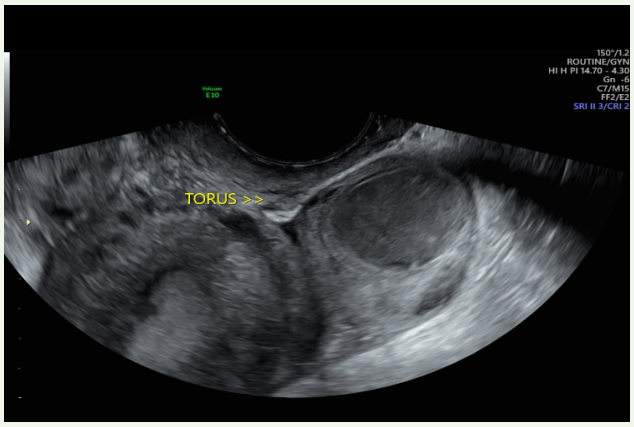


Figure 31: Hypoechoic lesion involving the torus uterinus, consistent with endometriosis.

Bowel

- Focal thickening of the muscularis propria (Figure 32).
- Hypoechoic lesions (elliptical, C shaped, or omega (Ω or mushroom) shaped) (Figure 33 and 34).[2,4,5,9]
- Solid lesions with comet tail or tapering extensions.[2,4,5,9]
- Parallel hyperechoic lines (Moose antler sign), indicative of submucosal involvement (Figure 35).[2,4,5,9]
- Lesions are generally avascular on Doppler, helping differentiate from malignancy.

Figure 32: Focal thickening of the bowel wall.

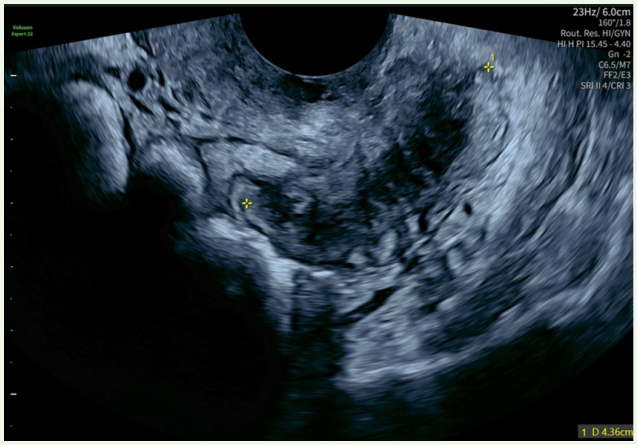


Figure 33: Large hypoechoic bowel lesion.

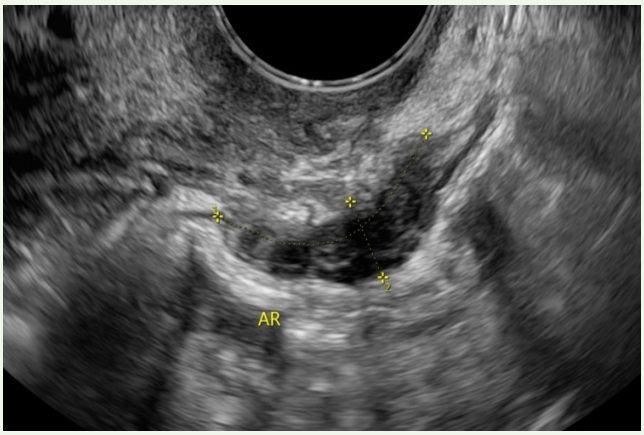


Figure 34: Hypoechoic, mushroom shaped, bowel wall lesion, consistent with DE.

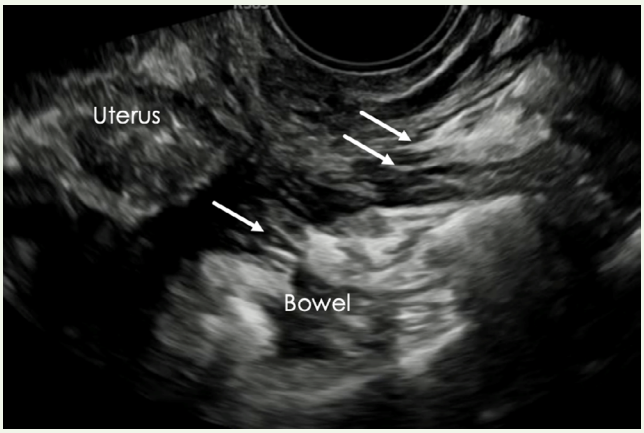


Figure 35: A large bowel nodule adherent to the posterior uterus. The nodule infiltrates the submucosal layer of the bowel, showing prominent spikes towards the lumen (the moose antler sign).

Vaginal wall

- Focal hypoechoic nodularity of the vaginal wall (Figure 36 and 37).[5]
- Loss of the normal smooth contour of the vaginal wall.
- Extension of hypoechoic lesions from adjacent structures (e.g. torus uterinus, USLs, anterior rectum) into the vaginal wall.
- Distortion or obliteration of adjacent tissue planes, particularly between the posterior vaginal wall and rectum.

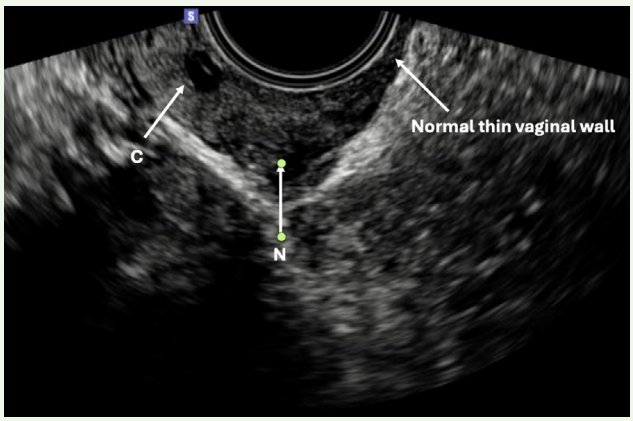


Figure 36: Focal nodule in the vaginal wall.

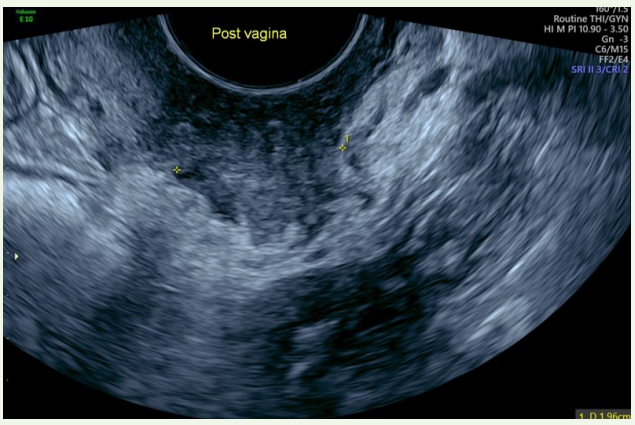


Figure 37: Posterior vaginal wall nodule.

Dynamic assessment posterior compartment

POD sliding sign

The sliding sign is a dynamic manoeuvre performed during TVUS to assess POD obliteration.[2,4,5] It evaluates whether pelvic organs move freely relative to one another.

Note: POD obliteration is not specific to endometriosis. Consider prior surgery, pelvic inflammatory disease, and other causes of adhesions. Correlate with history and other sonographic findings.[41]

Before performing this manoeuvre, explain the procedure to the patient and monitor for any discomfort.[4] Document any site-specific tenderness and the level of restricted movement (e.g. POD, mid-uterus, and fundus).

For an anteverted uterus:

- Place the transducer in the anterior vaginal fornix.[4]
- Apply transducer pressure at approximately the level of the internal os and observe whether the anterior rectum and sigmoid glide freely relative to the posterior cervix and posterior vaginal wall. A cine loop should demonstrate independent movement if the sign is positive.[2,5,17]
- If sliding is not seen to the fundus, apply pressure with your non-scanning hand to the lower abdomen to move the fundus.

For a retroverted uterus:

- Place the transducer in the posterior vaginal fornix by applying gentle pressure to the tissue plane between the uterine fundus and the rectum.[4]
- Quickly release transducer pressure to assess for adhesions within the peritoneal cavity.[4,32]

Interpretation

- **Positive sliding sign:** Independent movement of the uterus/cervix and bowel structures indicates a non-obliterated POD (Video 7 and Video 8).[2,32]
- **Negative sliding sign:** Uterus/cervix and bowel move together indicating an obliterated POD, suggesting adhesions and likely DE (Video 9, Figure 38).[2,32]
- **Restricted sliding sign:** Movement at only one level of the uterus or on one side, indicating partial obliteration of the POD. If negative or restricted sliding is observed, the area should be reassessed from the posterior vaginal fornix to help localise adhesions and reduce the risk of a false-positive interpretation.

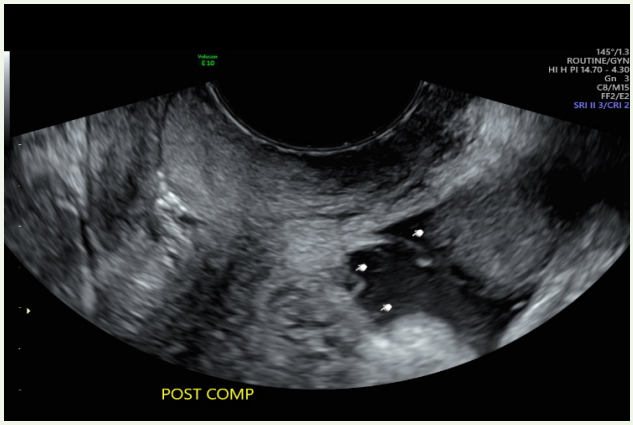


Figure 38: Adhesions noted adjacent to the ovary.

Clinical considerations

- Bowel DE is often associated with involvement of the retroperitoneum, torus uterinus, or USLs; these areas should be carefully evaluated when bowel lesions are present.[4]
- Caution is required at the rectosigmoid junction, where normal anatomical curvature can mimic bowel wall thickening and lead to over-calling of endometriosis. Use transducer compression to clarify whether apparent thickening represents true pathology or normal anatomical configuration.
- Posterior compartment endometriosis is frequently associated with extensive disease and may necessitate multidisciplinary management involving gynaecology, colorectal surgery, and pain specialists.[42]

Anterior compartment

Purpose and relevance

The anterior compartment includes the urinary bladder, distal ureters, vesicovaginal septum, uterovesical pouch, and round ligaments (see Figure 19).[4,9] The anterior compartment should be systematically assessed as part of structured endometriosis ultrasound to identify bladder and ureteric involvement and to exclude clinically significant urinary tract obstruction. Bladder endometriosis may present with urinary symptoms, including suprapubic pain, dysuria, and haematuria.[7,43]

Anatomy and normal appearance

Bladder

- The urinary bladder lies anterior to the uterus and cervix, separated by the uterovesical space.
- The normal bladder wall is thin, smooth, and uniformly echogenic.
- The bladder base and dome are the regions most commonly affected by DE.
- In normal anatomy, the posterior bladder wall moves freely over the anterior uterine serosa during dynamic assessment.
- No focal wall thickening, nodularity, or distortion should be present.

Ureters

- The distal ureters course bilaterally along the pelvic sidewalls toward the ureterovesical junctions (UVJs).
- On ultrasound, ureters appear as thin, hypoechoic tubular structures (Figure 39, Video 10).[2,6]
- Normal ureters demonstrate rhythmic contraction and relaxation (vermiculation), indicating patency.[2,6]
- Ureteric calibre is uniform, with no focal narrowing or dilatation.

Figure 39: Ureter appearing as a hypoechoic tubular structure.

Sonographic technique

Bladder

- Both TVUS and TAUS may assist in assessment (Figure 40).[44]
- For TVUS assessment position the transducer in the anterior vaginal fornix.[44]
- Optimal bladder assessment during TVUS is achieved with a partially filled bladder, improving visualisation of the bladder wall while avoiding excessive distension.[6,9]
- Adhesions involving the anterior myometrium may be a normal finding following caesarean section and should not be assumed to be associated with endometriosis in the absence of other supportive features.

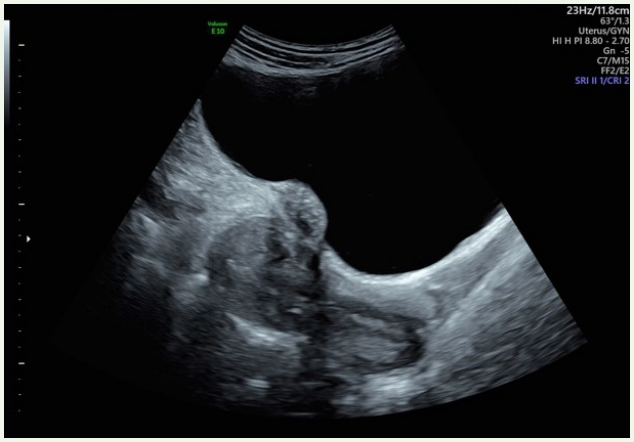


Figure 40: TAUS assessment of the bladder demonstrating a posterior wall lesion.

Ureters

- Position the transducer in the anterior vaginal fornix in a sagittal plane on the cervix.[43]
- Move the transducer towards the pelvic sidewall. Observe the tubular hypoechoic ureters extending towards the base of the bladder.[43]
- Examine for signs of extrinsic compression, dilatation, or obstruction; persistent ureteric dilatation of greater than 6 mm is considered significant.[2,5,45]
- Identification of the UVJ and assessment of ureteric jets using colour Doppler is recommended when clinically appropriate and when hydronephrosis is suspected.[2,44]
- If DE is present, measure the distance between the lesion and the UVJ to assess the risk of obstruction.[2,5]
- Consider TAUS assessment of the kidneys if ureteric involvement is suspected, particularly in the presence of flank pain.[46]

Sonographic features of endometriosis

Bladder

- Focal or diffuse bladder wall thickening, hypoechoic or isoechoic lesions, or plaque-like lesions, most commonly at the base or dome (Figures 41 and 42).[4,9,17]
- Lesion shape and margin vary from spherical to elongate and smooth to irregular.
- Bladder DE characteristically arises from the serosal surface and invades inward through the muscle layer (detrusor muscle) to the bladder wall, whereas primary bladder malignancy typically originates from the urothelial lining and extends outwards.[9,44,47,48] Lesions frequently do not protrude into the lumen, making them difficult to detect on cystoscopy.[4,49]

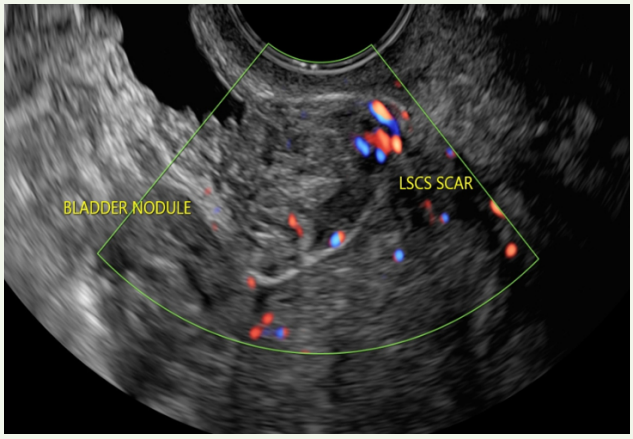


Figure 41: Bladder wall lesion, involving the detrusor muscle, extending into the uterovesical space consistent with endometriosis.

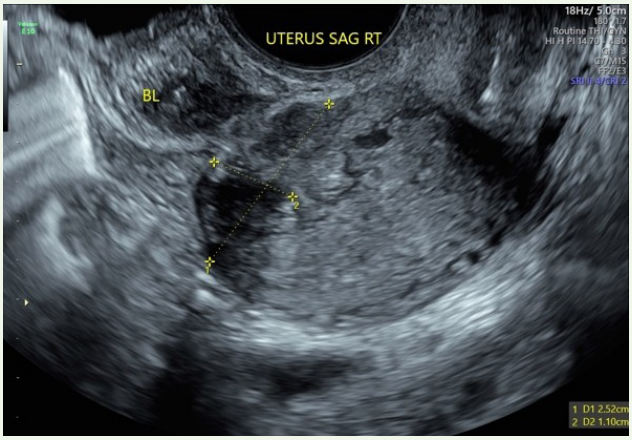


Figure 42: Anterior compartment bladder nodule with focal adenomyosis noted.

Ureters

- Hypoechoic, irregular soft-tissue lesions adjacent to or encasing the ureter (Video 11).[44]
- Focal or segmental ureteric narrowing with loss of normal tubular contour. [44]
- Loss of ureteric wall definition. [44]
- Ureteric dilatation (diameter 6 mm or more).[48]

Clinical considerations

Bladder wall abnormalities should be assessed carefully to distinguish endometriosis from alternative pathology, including post-surgical scarring or primary bladder malignancy. Lesion origin, morphology, and relationship to adjacent structures should guide interpretation and reporting.

Although endometriosis involving the urinary tract is uncommon, affecting only 1-2% of all endometriosis cases,[17,24] delayed recognition, particularly of ureteric involvement, can result in silent renal obstruction and irreversible renal impairment.[2,5,9,50] Hydronephrosis should prompt referral to a urologist, and definitive treatment usually requires surgical excision with a multidisciplinary team including gynaecology and urology.[9]

Dynamic assessment anterior compartment

Uterovesical space sliding sign

- Use the sliding sign to assess the mobility between the bladder and uterus.
- Assess for signs of tethering, adhesions, or lesions.

Sonographic technique

- Place the transducer in the anterior fornix.
- Apply gentle pressure with the transducer.[2]
- Observe whether the posterior bladder wall slides freely over the anterior uterine wall.[2,5]

Interpretation

- Positive sliding sign: Independent movement indicates a non-obliterated uterovesical space (Video 12).
- Negative sliding sign: Restricted movement indicates obliteration due to DE or prior surgical adhesions (e.g. caesarean sections) (Video 13).[2,5]

Superficial endometriosis (SE)

Purpose and relevance

Superficial endometriosis (SE), also referred to as peritoneal endometriosis,[51,52] refers to lesions confined to the surface of the peritoneum.[53] Although SE is common and may contribute significantly to pelvic pain and infertility, it is challenging to detect sonographically.[52] Recognition of the limitations of ultrasound in detecting SE is essential to avoid false reassurance and to support appropriate clinical interpretation.[53,54] When DE is already identified, the IDEA Addendum[53] notes that detecting SE adds little clinical value.

Anatomy and normal appearance

The peritoneum lines the pelvic cavity and covers pelvic organs, including the uterine serosa, ovaries, pelvic sidewalls, and POD. In normal anatomy, the peritoneal surfaces are smooth, thin, and not directly visualised on ultrasound unless outlined by free fluid. No focal thickening, nodularity, or distortion of adjacent tissue planes should be present.

Sonographic technique

- Use high-resolution imaging, optimised gain, and focal zone placement to detect subtle abnormalities.
- Presence of physiological free fluid may improve visualisation of superficial lesions.[52]

Sonographic features of endometriosis

Superficial endometriosis lesions are often subtle and variably visualised (Video 14, Video 15, and Video 16).

- Hypoechoic areas with or without cystic spaces (Figure 43).[53]
- Hyperechoic foci (Figures 44 and 45).[52,53]
- Single or multiple lesions, sometimes forming clusters (linear or honeycomb appearance).[52,53]
- Peritoneal pockets or peritoneal cysts.[52,53]
- Loculated fluid appearance.

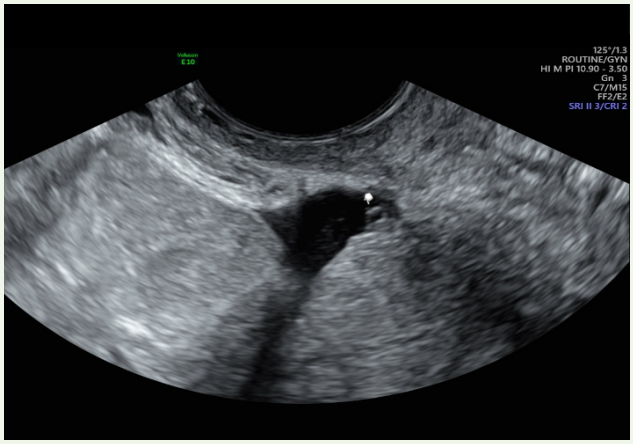


Figure 43: Anterior uterine serosal superficial endometriosis lesion.

Figure 44: Hyperechoic foci typical of SE.

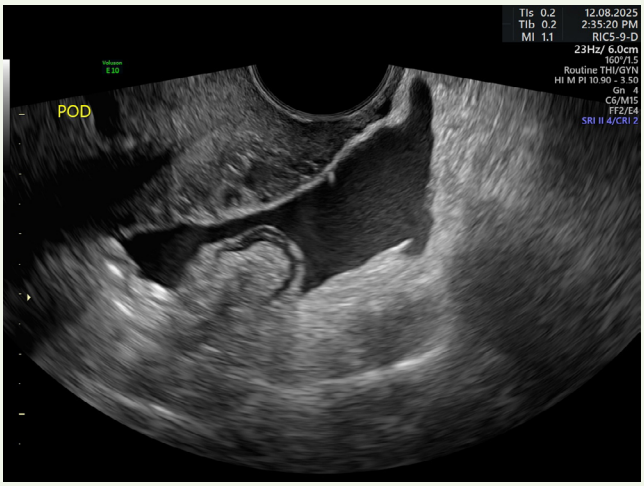


Figure 45: Free fluid in the POD demonstrating SE nodule.

Clinical considerations

Superficial endometriosis may not be visible on ultrasound even when optimal technique and a high level of awareness are employed, reflecting the recognised diagnostic limitations of ultrasound for this form of disease.[7] Diagnostic difficulty is further compounded in the absence of physiological free fluid in the POD. Where superficial disease is suspected, its possible presence should prompt careful evaluation of adjacent compartments, particularly in symptomatic individuals. Although less likely to cause anatomical distortion than DE, SE can still contribute significantly to pain and infertility.[53]

Extra-pelvic endometriosis

Purpose

Extra-pelvic endometriosis refers to endometriosis-like tissue occurring outside the pelvic cavity, including the abdominal wall, diaphragm, thoracic cavity, and appendix.[17,21,36,55] Although uncommon, extra-pelvic disease may cause significant morbidity and is frequently under-recognised. Symptoms may be cyclical or non-cyclical and often correlate with the anatomical site involved.[56,57] Identification of extra-pelvic disease on ultrasound is challenging and frequently incidental; however, awareness of characteristic patterns can support appropriate referral and multidisciplinary management.

Sonographic technique

Although pelvic ultrasound is not designed to comprehensively evaluate extra-pelvic disease, certain techniques may assist when symptoms or clinical suspicion warrant targeted assessment:

- Abdominal wall:
  - Use high frequency linear transducers to assess the umbilicus and caesarean section scars.
  - Evaluate for focal hypoechoic nodules, heterogeneous masses, or lesions demonstrating cyclical tenderness.
- Appendix:
  - Use graded compression in the right iliac fossa.
  - Identify tubular, blind ending structure; assess for mural thickening or hypoechoic nodules.
- Diaphragm (limited TAUS):
  - Scan subcostal regions with deep inspiration.
  - Assess for focal nodularity or hypoechoic plaques along the hemidiaphragm.
- Thoracic cavity:
  - Ultrasound has limited utility; lesions are typically detected via CT or MRI.[58]
  - TAUS may detect pleural effusions or diaphragmatic irregularities in rare cases.

Sonographic features of endometriosis

Extra-pelvic lesions vary widely in appearance depending on location and depth of infiltration. Common features include:

- Abdominal wall endometriosis:
  - Focal hypoechoic or heterogeneous mass within rectus sheath or subcutaneous tissue (Figure 46).[58]
  - Ill-defined margins or spiculated extensions.
  - Increased vascularity on Doppler in some cases.
  - Marked site-specific tenderness during transducer pressure.
- Scar endometriosis (e.g., caesarean section scar):
  - Nodular or mass-like lesion at or near surgical scar.[58]
  - May mimic hernia, granuloma, or neoplasm.
- Appendiceal endometriosis:
  - Focal mural thickening.
  - Hypoechoic nodules.
  - Possible luminal narrowing.
- Diaphragmatic endometriosis:
  - Hypoechoic plaques or nodules along the hemidiaphragm.
  - May be associated with cyclical shoulder pain or catamenial symptoms.[58]
- Thoracic endometriosis:
  - Rarely visible on ultrasound.
  - May present indirectly as pleural effusion or diaphragmatic irregularity.[58]

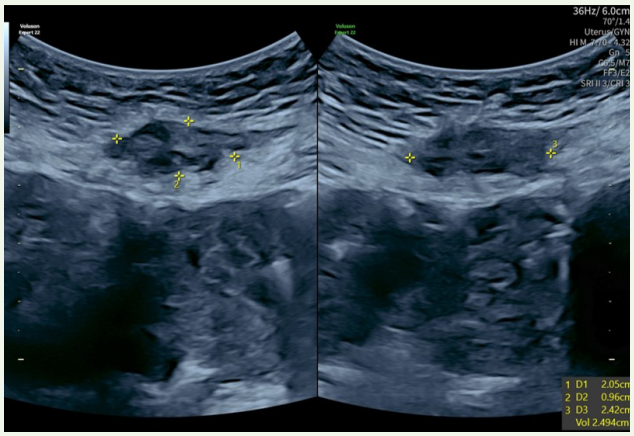


Figure 46: Focal hypoechoic nodule within the rectus sheath.

Clinical considerations

Extra-pelvic endometriosis is uncommon, and symptoms may include cyclical abdominal wall pain, shoulder tip pain, catamenial pneumothorax, gastrointestinal symptoms, or right upper quadrant pain.[56–58] Ultrasound has limited sensitivity for extra-pelvic disease; findings should be interpreted cautiously and in conjunction with clinical history.

Conclusion

This document provides practical guidance to support consistent and safe implementation of endometriosis-focused ultrasound in accordance with the ASA Endometriosis Guideline. It should be used alongside clinical assessment and multidisciplinary care, with appropriate recognition of the limitations of ultrasound and the need for escalation where findings are complex or uncertain.

Acknowledgment of image and media contributions

The authors gratefully acknowledge the individuals and organisations who have generously contributed ultrasound images, video clips, and other media used throughout this technical guidance. Their willingness to share clinical material has been invaluable in supporting the development of a comprehensive and practical resource for endometriosis assessment. We recognise the time, expertise, and commitment involved in acquiring and curating high-quality imaging, and we sincerely thank all contributors for their support of this initiative. We would like to formally acknowledge Gillian Profaca, Janessa Baddeley, Jing Fang, Mercedes Espada Vaquero and QUFW.

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Appendix 1: Example worksheet

Patient & Examination Details

Date: _____ **Examiner:** _____ **Approach:** ☐ TV ☐ TA

Consent (TV): ☐ Verbal ☐ Written ☐ Declined **Pain limiting exam:** ☐ No ☐ Yes

LMP: _____ **Periods:** ☐ Regular ☐ Irregular ☐ Post-menopause

Laparoscopy ☐ No ☐ Yes Date of last surgery: _____

Key symptoms: ☐ Dysmenorrhoea ☐ Dyspareunia ☐ Dyschezia ☐ Urinary ☐ Infertility

MIDDLE COMPARTMENT

Uterus

Position: ☐ AV ☐ RV ☐ Axial ☐ AV-retroflexed (question-mark)

Mobility: ☐ Normal ☐ Reduced

Adenomyosis: ☐ No ☐ Yes → ☐ Focal ☐ Diffuse

MUSA features seen: _____

Endometrium

☐ Regular ☐ Thickened ☐ Distorted _____mm

☐ Proliferative ☐ Secretory ☐ Minimal ☐ Non-specific

Vascularity: ☐ No ☐ Yes **IUCD position correct** ☐ Yes ☐ No ☐ N/A

Ovaries / Adnexa

Right ovary: ☐ Normal ☐ Abnormal (specify) **Mobility:** ☐ Free ☐ Restricted

Right ovary size _____x_____x_____mm (_____cc) **Vascularity:** ☐ Yes ☐ No

Left ovary: ☐ Normal ☐ Abnormal (specify) **Mobility:** ☐ Free ☐ Restricted

Left ovary size _____x_____x_____mm (_____cc) **Vascularity:** ☐ Yes ☐ No

Endometrioma: ☐ No ☐ Right ☐ Left ☐ Bilateral → Size: _____x_____x_____mm

Kissing ovaries: ☐ No ☐ Yes

POSTERIOR COMPARTMENT

Pouch of Douglas (POD)

Sliding sign: ☐ Positive (patent) ☐ Restricted ☐ Negative (obliterated)

If restricted/negative – level: ☐ Upper uterus ☐ Mid uterus ☐ Retrocervical

Uterosacral Ligaments / Torus / Vaginal Wall

Normal bilaterally: ☐ Yes ☐ No

Nodule: Side ☐ R ☐ L ☐ Bilateral Size: _____x_____x_____mm

Tender: ☐ Yes ☐ No

Bowel

Nodule suspected: ☐ No ☐ Yes

If yes: Segment ☐ Upper rectum ☐ Lower rectum ☐ Sigmoid

Size: _____x_____x_____mm Distance from anal verge (mm): _____
Layer involvement: ☐ Muscularis ☐ Submucosa ☐ Mucosa

ANTERIOR COMPARTMENT

Bladder / Vesicouterine Space

Bladder nodule: ☐ No ☐ Yes → Size: _____x_____x_____mm

Site: ☐ Base ☐ Dome ☐ Other

Uterovesical sliding sign: ☐ Positive ☐ Negative

Ureters

Right: ☐ Normal ☐ Dilated (>6 mm) **Left:** ☐ Normal ☐ Dilated (>6 mm)

OVERALL IMPRESSION

☐ No sonographic evidence of endometriosis (within limits of exam)

☐ Ovarian endometriosis

☐ Deep posterior compartment disease

☐ Anterior compartment involvement

☐ Features suggest advanced disease → Specialist referral recommended

Key limitations / comments:

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