

Adenomyosis: What the sonographer needs to know



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Introduction

Adenomyosis is a benign gynaecological condition. It is defined as growth of endometrial tissue within the myometrium due to migration of the endometrial glands and stroma (Chapron et al, 2020). It is a condition with varying symptoms resulting in a challenging clinical diagnosis. Ultrasound is the first line imaging modality for adenomyosis. Technological advances within ultrasound have led to an increase in diagnosis compared with the formerly invasive diagnosis based on histopathology. Whilst transabdominal ultrasound (TVUS) has a limited role to play, many studies have shown transvaginal ultrasound (TVUS) to be comparable to MRI in the hands of an experienced operator (Cunningham et al, 2018). MRI is particularly useful when assessing adenomyosis with co-morbidities such as endometriosis or fibroids (MUSA et al, 2015).

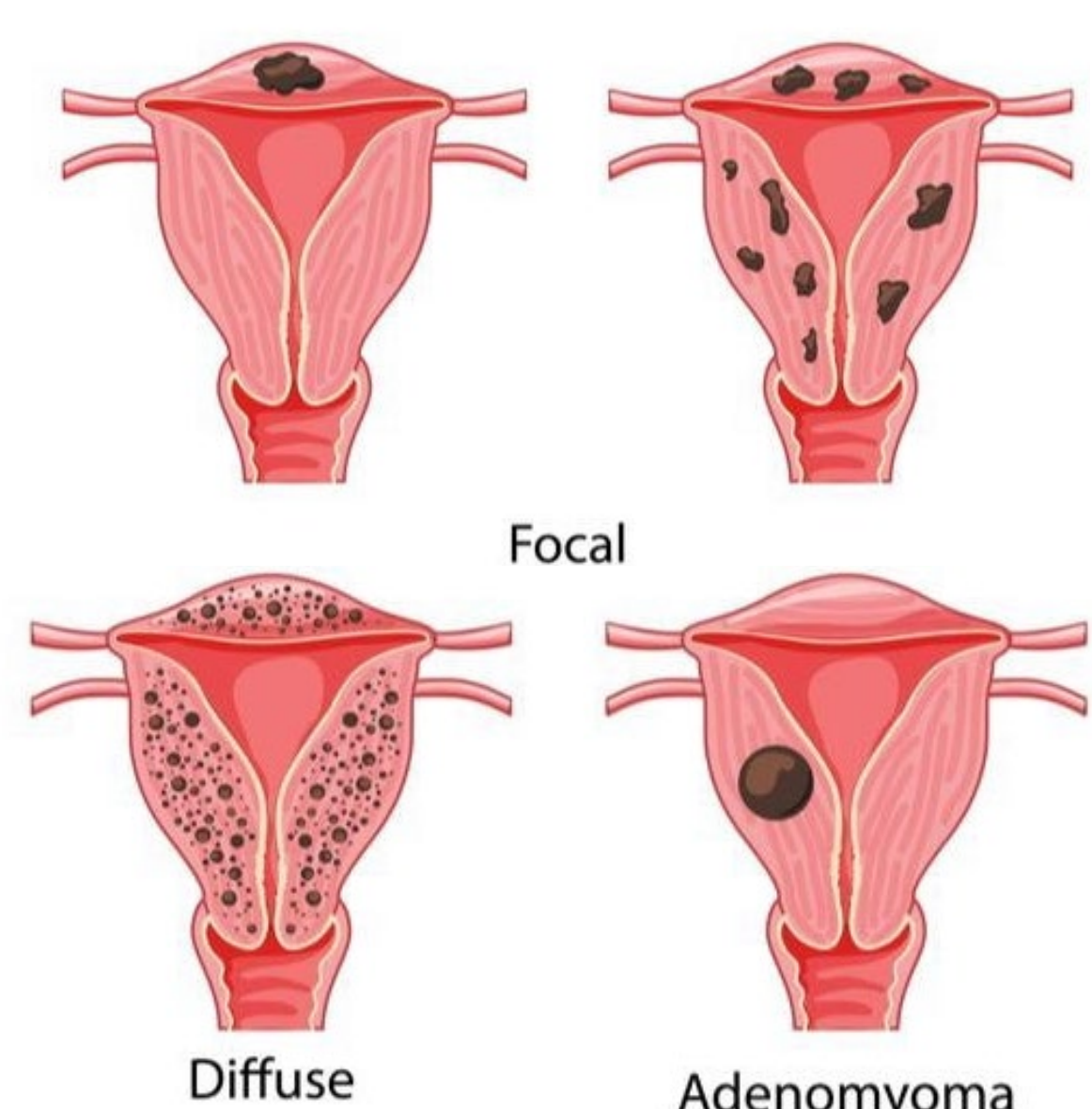


Figure 1. An illustration showing the different stages of adenomyosis. It can present as focal, diffuse or an adenomyoma (Image credit: Vectoressa/Shutterstock).

Clinical Presentation

There is no consensus amongst published literature regarding the pathogenesis of adenomyosis (Chapron et al, 2020). Patients can present with abnormal uterine bleeding or pelvic pain, however in a small proportion it can be completely asymptomatic. Patients most often present with dysmenorrhea or menorrhagia. This is a result of intramyometrial bleeding from the ectopic endometrial glands (Cunningham et al, 2018). The clinical bimanual examination accompanied with a detailed history can raise suspicion of adenomyosis. Most physicians subsequently look to confirm with ultrasound.

Sonographic appearances

TVUS allows for a dynamic scan assessing organ mobility and patient pain. Sonographic appearances suggestive of adenomyosis are the following: globular uterus, myometrial cysts, myometrium thickening (focal or diffuse), "venetian blind shadowing", heterogenous myometrium, echogenic striations and poor endometrial-myometrial junctional zone. The presence of increased vascularity of the myometrium (translesional) can also be seen in patients with adenomyosis. Technical factors can play a role in improving visualization of sonographic signs. Cine clips can help better appreciate US findings of adenomyosis compared with still images. Myometrial cysts are better detected by decreasing the field of view and the use of the zoom function (Cunningham et al, 2018).

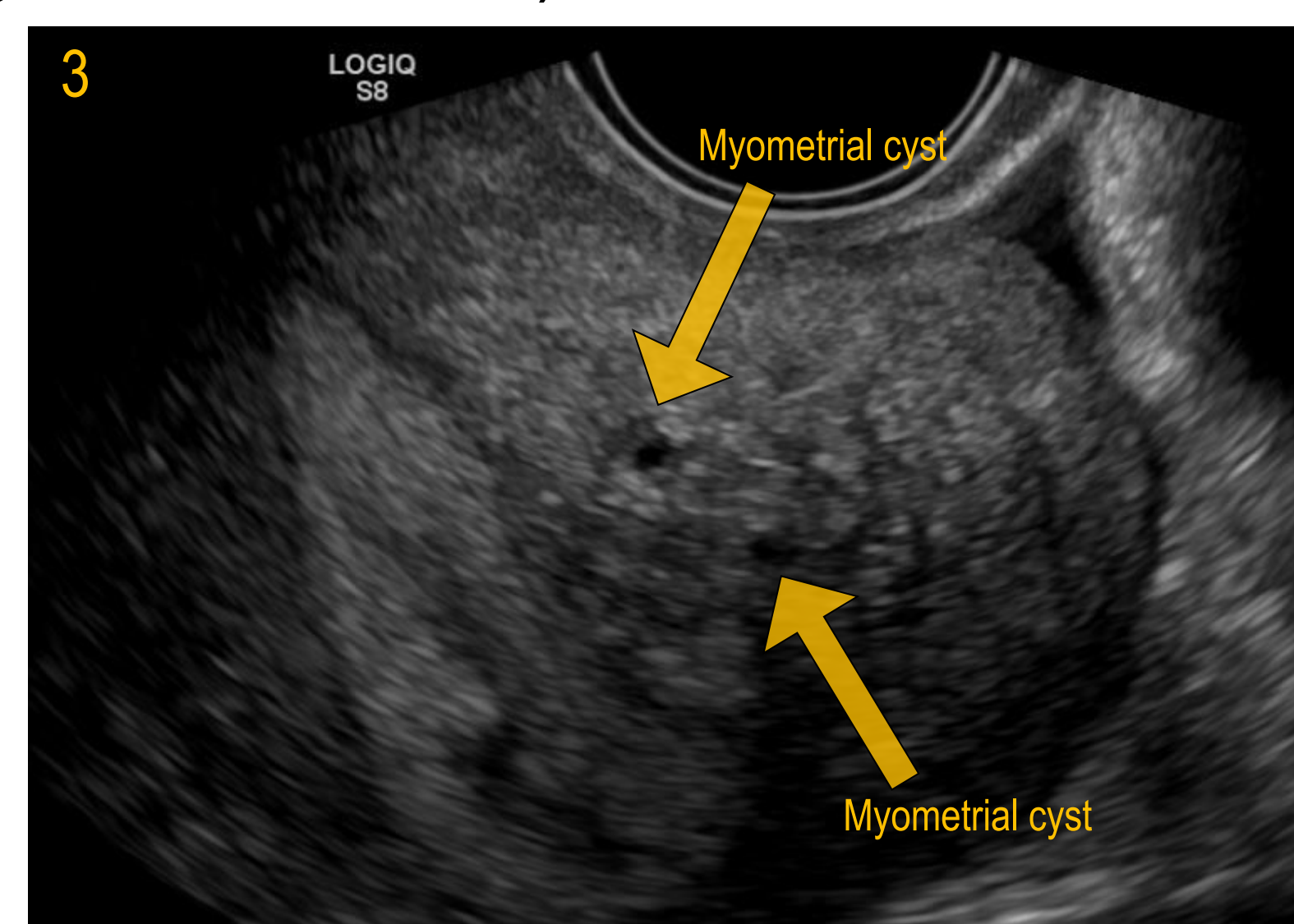
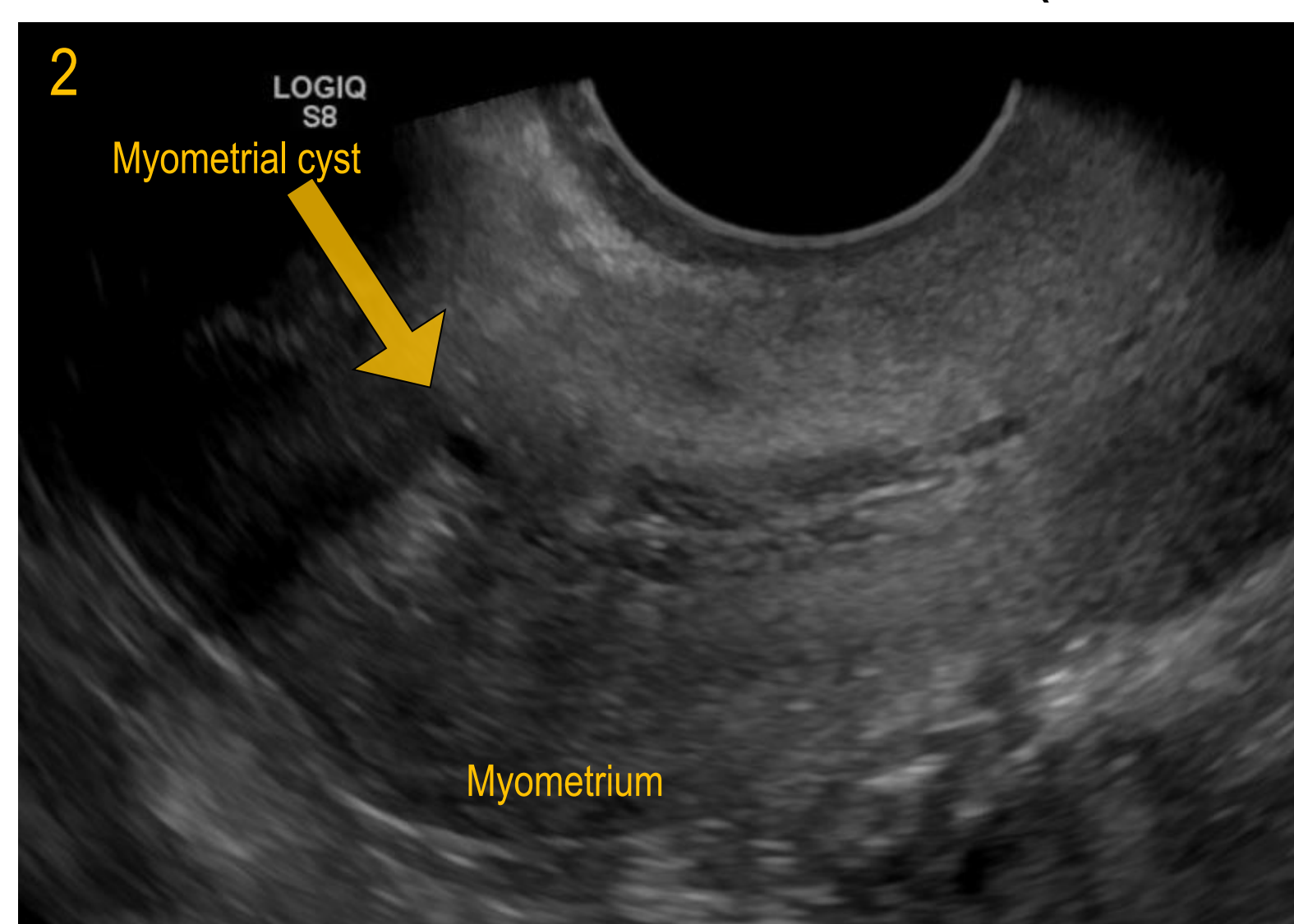


Figure 2 and 3. TVUS images showing myometrial cysts in an anteverted and retroverted uterus. Myometrial cysts are highly characteristic of adenomyosis. They are a result of endometrial glands filling with fluid. They usually measure 1-5mm and are commonly anechoic but can contain internal echoes due to the presence of active endometrial tissue (Cunningham et al, 2018).

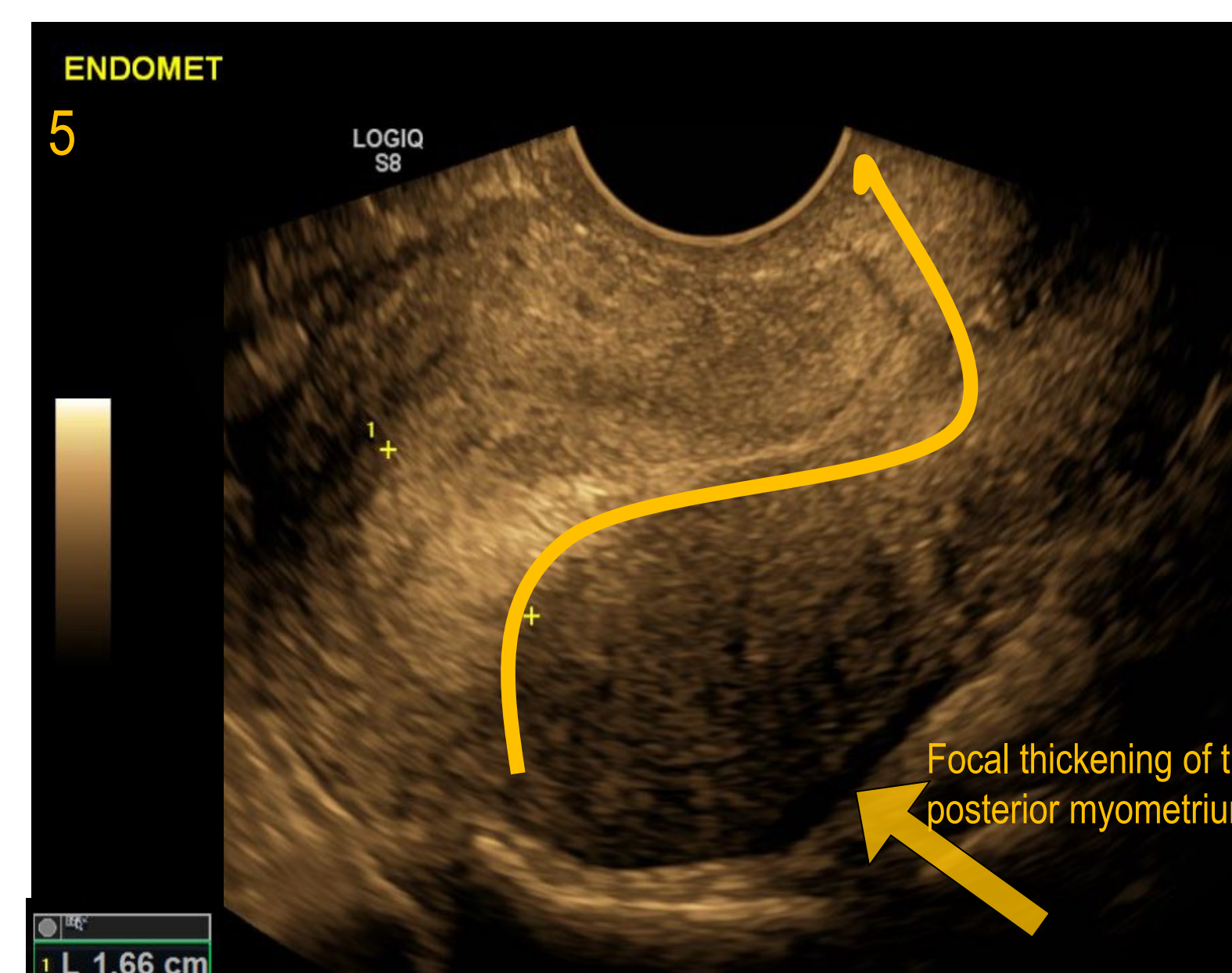
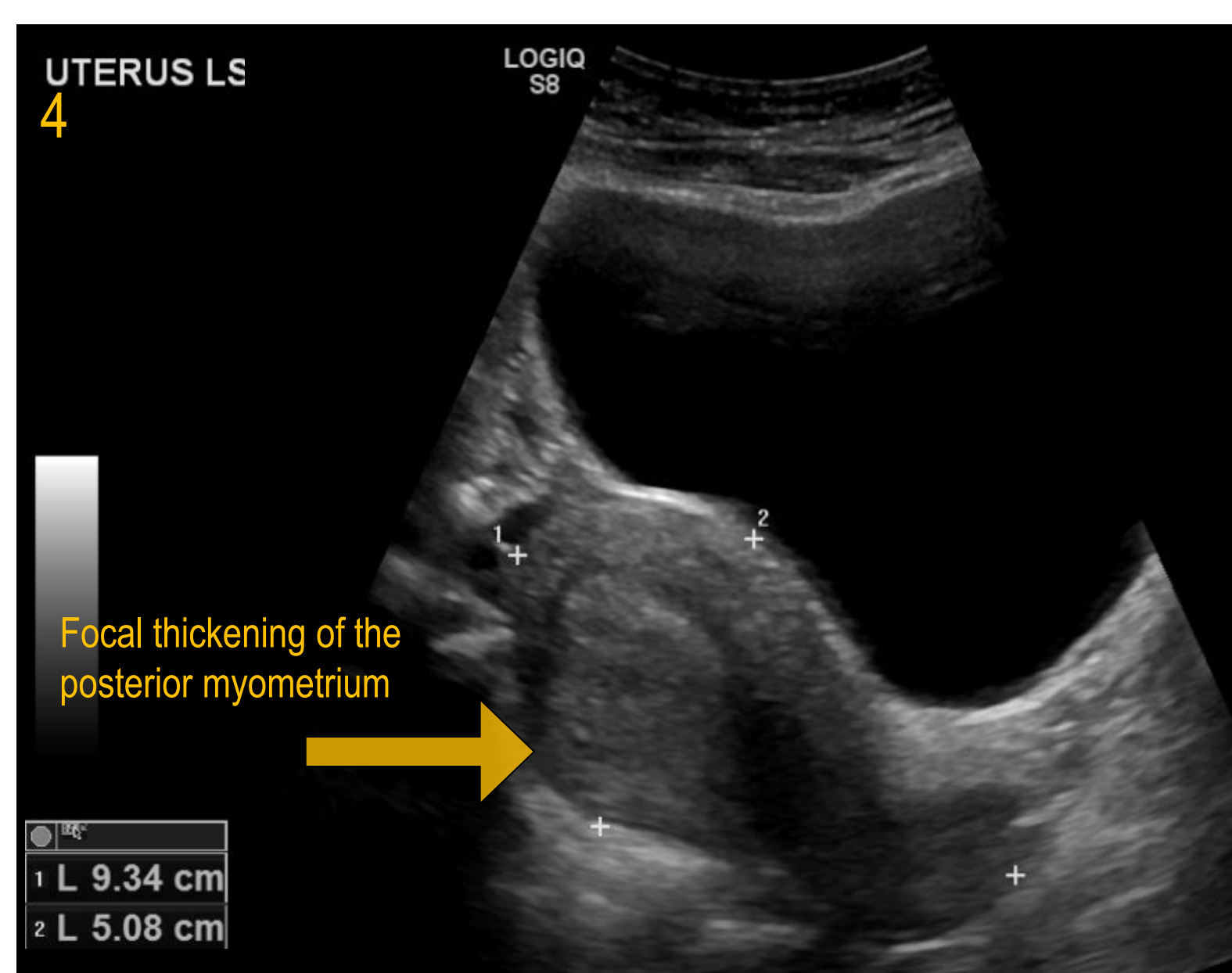


Figure 4 and 5. Transabdominal and TVUS image showing myometrial thickening of the posterior myometrium. Myometrial thickening can be focal or diffuse, which results in a globular uterus. The ectopic endometrial tissue is still hormonally sensitive. This causes a local reaction resulting in myometrial thickening. The shape of the uterus called the "question mark" sign was recently added as a sonographic sign for adenomyosis associated with DIE (Chapron et al, 2020), see Figure 5.

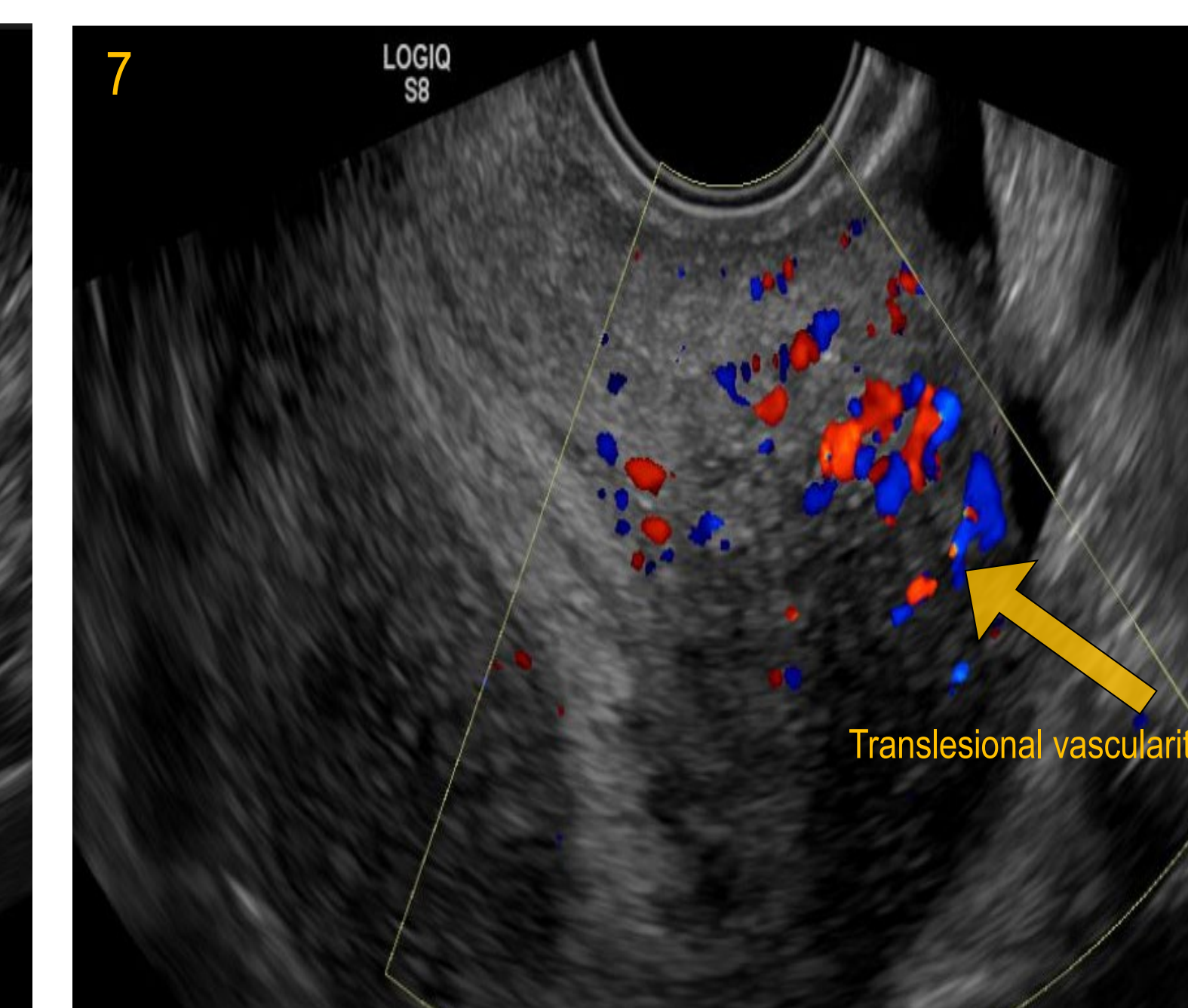
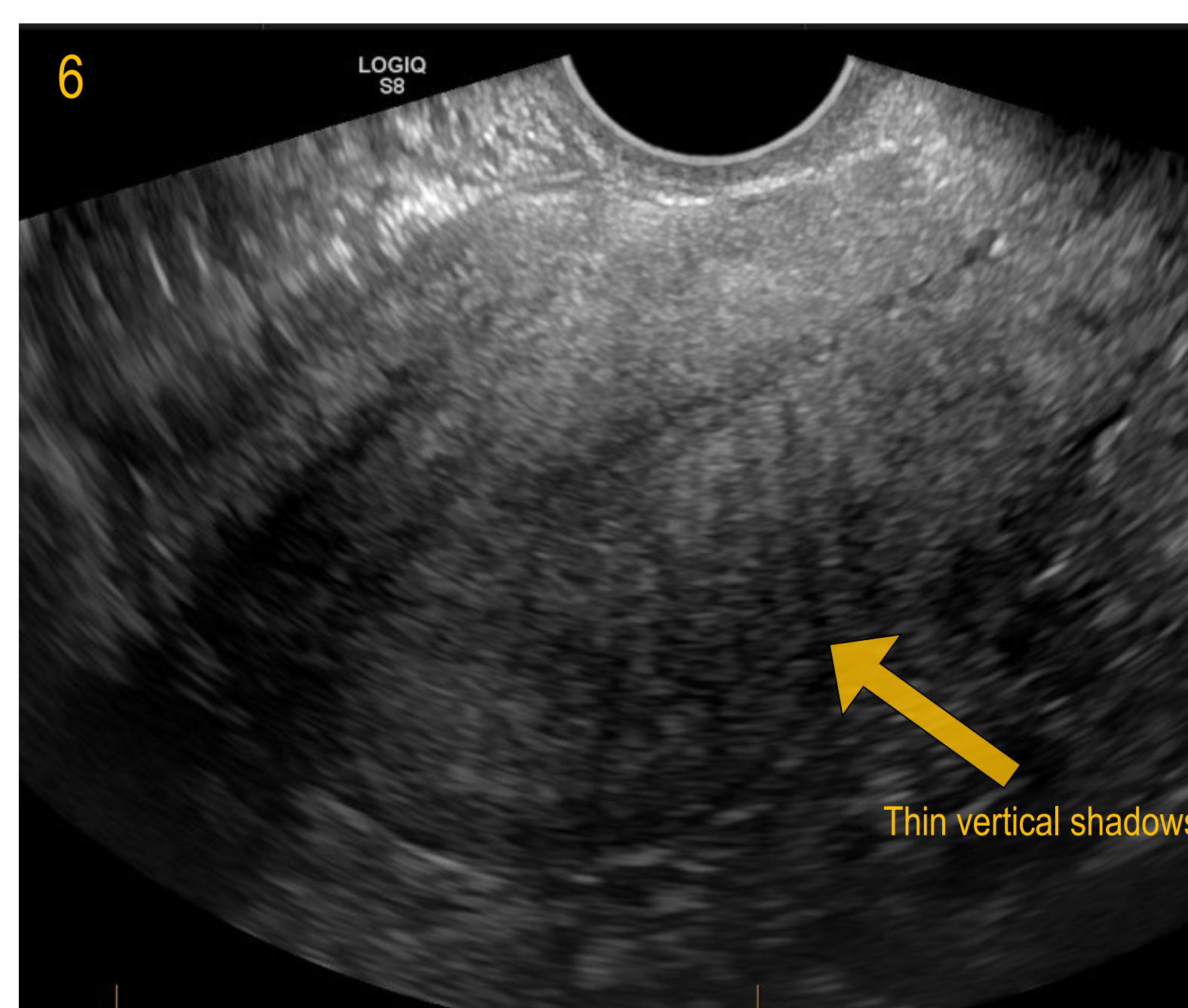


Figure 6. TVUS image of an anteverted uterus showing "venetian blind shadowing". This occurs due to the altered echotexture of the myometrium resulting in multiple thin vertical shadows and myometrial heterogeneity. Figure 7. Doppler image demonstrating increased vascularity of the myometrium. This Doppler pattern is useful for sonographers to differentiate between fibroids (where flow is usually peripheral) or adenomyosis (where flow is translesional).

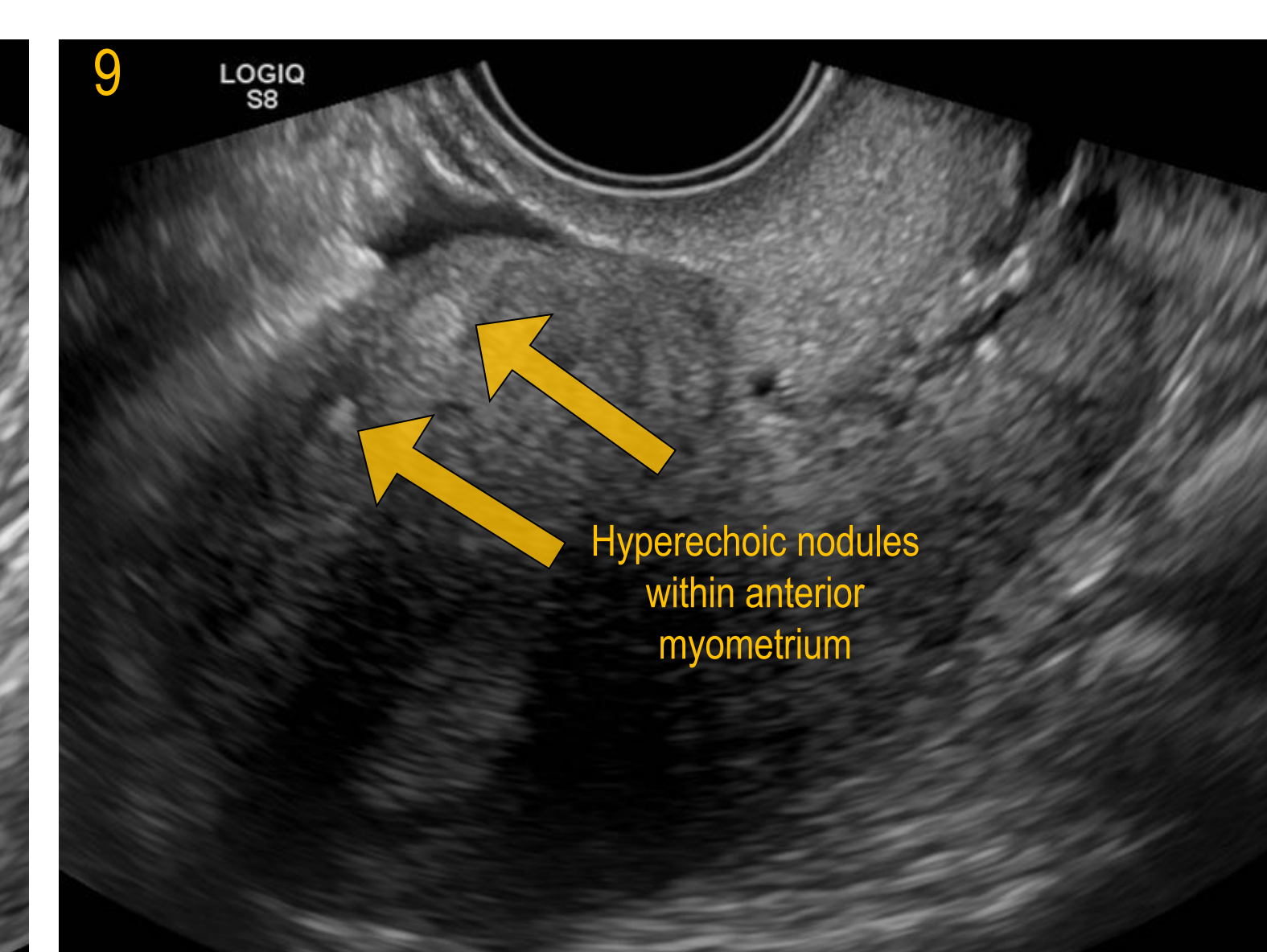
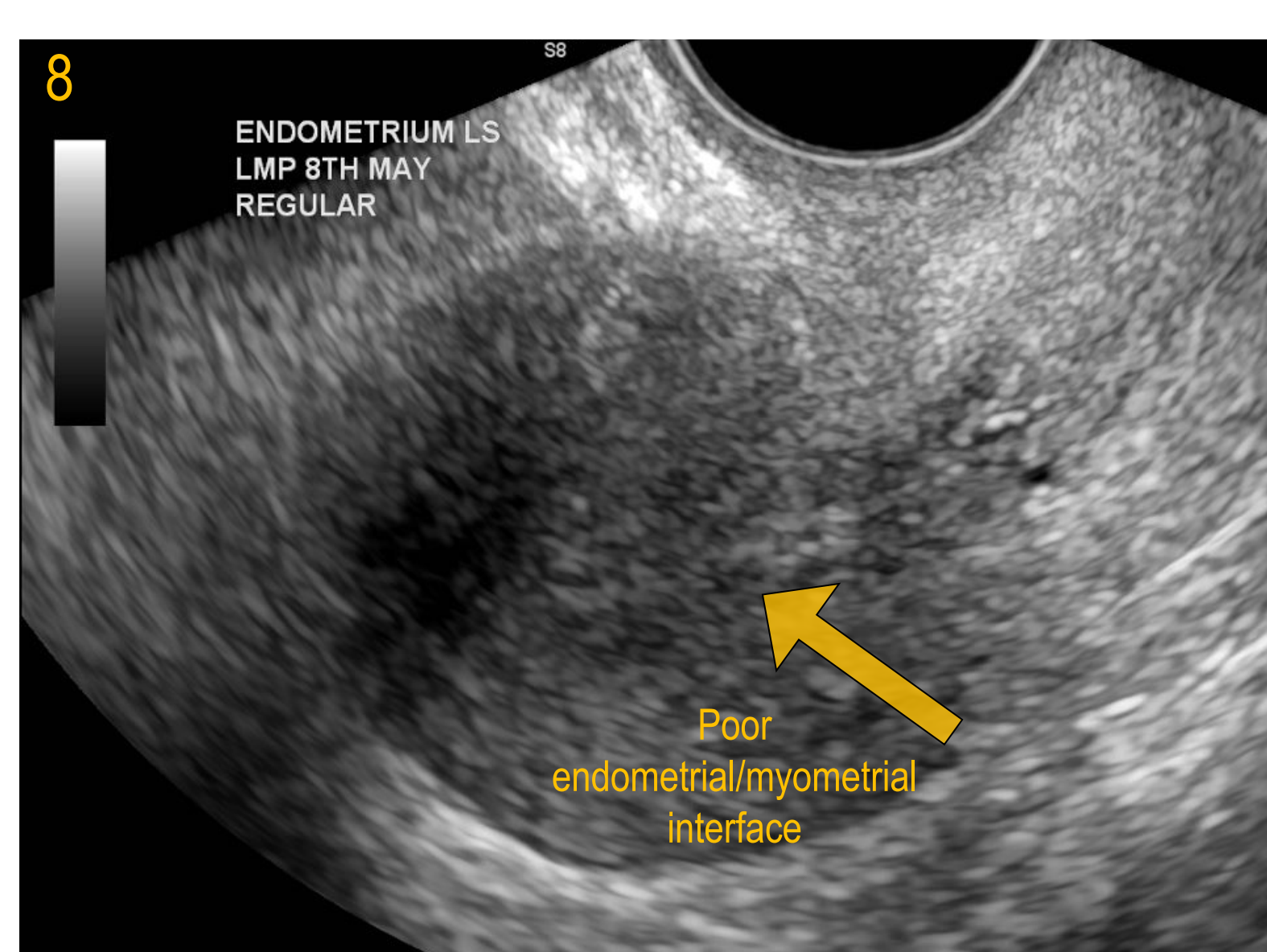


Figure 8 TVUS image of an anteverted uterus showing indistinct margins or an irregular junctional zone and Figure 9 TVUS image of an anteverted uterus showing echogenic nodules or hyperechoic islands due to direct invasion of endometrial tissue into the inner myometrium.

MUSA Criteria

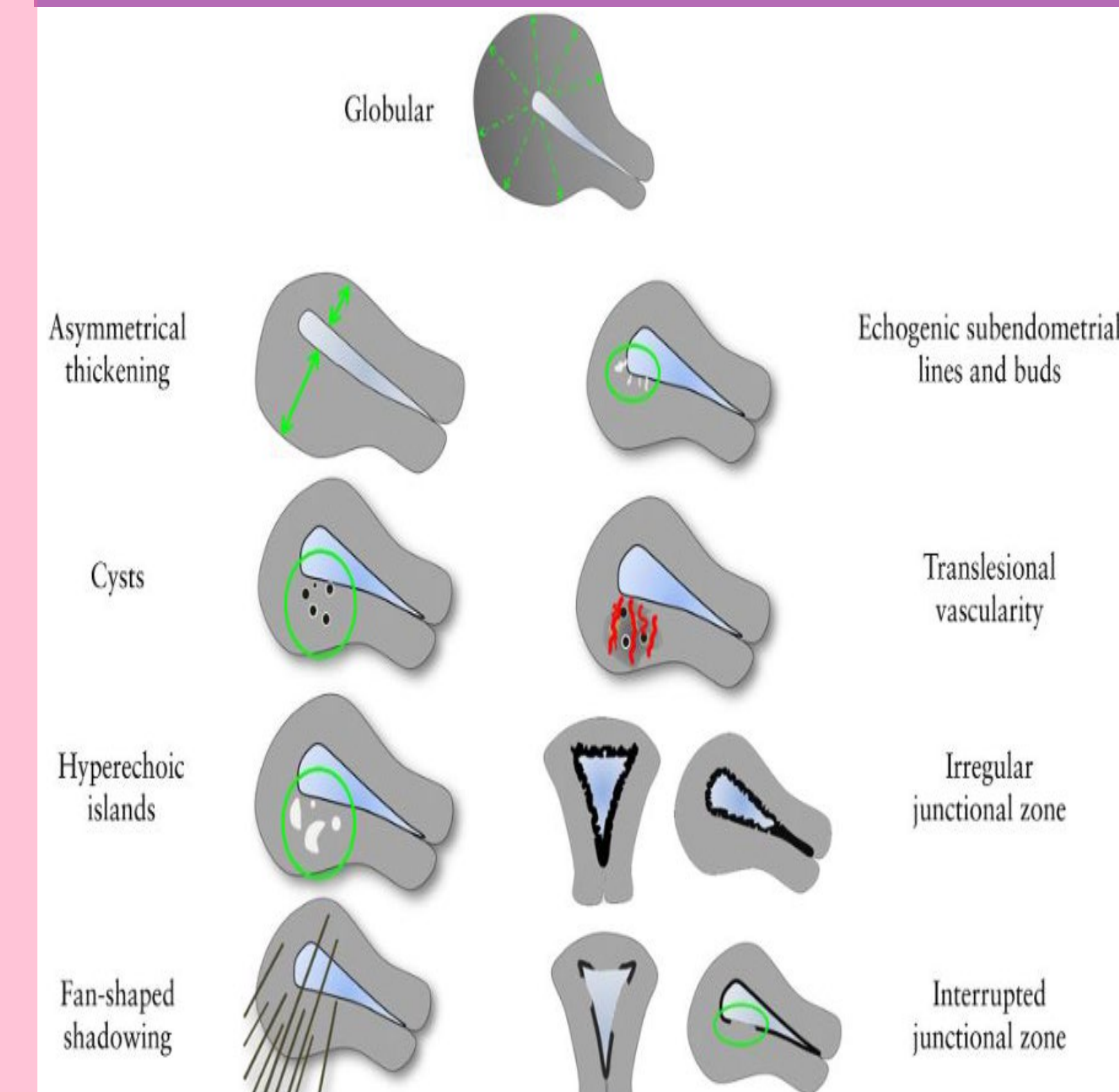


Figure 10. Diagram illustrating the MUSA criteria for diagnosis of adenomyosis. (Adapted from MUSA et al, 2015).

Discussion

MUSA's (Morphological Uterus Sonographic Assessment) goal was to provide standardisation for assessing and reporting adenomyosis using ultrasound. Ultrasound diagnosis relies heavily on real time diagnosis in the hands of an experienced operator. However, using MRI can increase diagnostic confidence especially in co-morbidity cases (Van den Bosch and Van Schoubroeck, 2018). Whilst there is still no consensus regarding the most specific sonographic sign, there is agreement the more sonographic signs evident increases the predictive value (Chapron et al, 2020). There is a need for continued awareness of the condition amongst sonographers and its associated sonographic appearances to avoid misdiagnosis.

Summary

What should the sonographer look for?	How can your machine help?
<ul style="list-style-type: none"> Myometrial cysts Myometrial thickening Venetian blind shadowing Heterogenous myometrium Echogenic striations Poor endometrial-myometrial interface "Question mark" sign 	<ul style="list-style-type: none"> Use Zoom Decrease depth Use cine clips Use Doppler Drop frequency

References

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