

Sonography Should Be the First Imaging Examination Done to Evaluate Patients With Suspected Endometriosis

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 Invited paper

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Abbreviations

MRI, magnetic resonance imaging

Endometriosis is defined as the presence of normal endometrial tissue occurring outside the endometrial cavity. This ectopic endometrial tissue responds to normal cyclic hormonal changes, resulting in localized bleeding, inflammation, and subsequent adhesion formation.

As a result, endometriosis is a well-known cause of chronic pelvic pain in premenopausal women. The most common site and most recognized sonographic appearance of endometriosis is the ovarian cyst known as an endometrioma or chocolate cyst. Sonographically, an endometrioma is an ovarian cyst that has homogeneous low-level echoes with some areas of increased echogenicity (clot) but with no evidence of blood flow inside.¹ Many years ago, the sonographic diagnosis of endometriosis was reserved for patients with obvious endometriomas, thus missing the cause of pelvic pain in a large number of patients. We now know that endometriosis is also commonly found in other dependent areas of the pelvis, including the anterior and posterior cul-de-sac, the uterosacral ligaments, the bladder and bowel wall (rectosigmoid particularly), and the rectovaginal septum.

Endometriosis can occur in the form of superficial and deep implants. The pain associated with these implants may be intense, but these lesions are often small and not easily detected by standard pelvic sonography. Some patients with extensive disease and large endometriomas may have relatively few symptoms, whereas others with small deep endometriotic implants may have severe dysmenorrhea, dyspareunia, and chronic pelvic pain.

Diagnostic laparoscopy remains the reference standard for diagnosing pelvic endometriosis. More recently, however, detailed transvaginal sonography specifically looking for endometriotic lesions in correlation with the sites of pain has been quite effective in detecting the disease.²⁻⁶ In addition, as previously described, patients with endometriosis often have severe pelvic adhesions that further contribute to their pain and can also be detected sonographically. Examples of common sonographic findings consistent with adhesions are tethering of the uterus to the uterosacral ligaments so that the uterus is in a fixed, immobile position and obliteration of the posterior cul-de-sac.

In 2004, Bazot et al⁷ described a group of 83 women with surgically proven deep pelvic endometriosis and found that the sensitivity and specificity for detecting the disease sonographically were

78.5% and 95.2%, respectively. The sensitivity was best for intestinal and bladder disease and slightly less accurate for uterosacral and rectovaginal involvement. Since then, many studies have looked at the use of pain-guided transvaginal sonography to detect implants of deep endometriosis.^{8,9} In a systematic review and meta-analysis looking at the accuracy of transvaginal sonography for the detection of deep bowel endometriosis, Hudelist et al³ found pooled estimates of sensitivity and specificity of 91% and 98%, respectively, with a positive likelihood ratio of 30.36 and a negative likelihood ratio of 0.09.

When comparing sonography and magnetic resonance imaging (MRI) as imaging modalities in 98 patients with surgically confirmed endometriosis, Abrao et al¹⁰ found that transvaginal sonography had sensitivity, specificity, and accuracy of 98%, 100%, and 99%, respectively, compared to MRI's sensitivity, specificity, and accuracy of 83%, 98%, and 90% for rectosigmoid endometriosis. In a study by Saba et al,⁹ the specificity and sensitivity for detecting endometriosis by sonography were 86% and 73%, respectively, whereas for MRI they were 90% and 73%, respectively. Other investigators have shown that transvaginal sonography performs similarly to MRI in the diagnosis of intestinal endometriosis, although MRI may have slightly higher sensitivity for uterosacral disease.¹¹ Pascual et al⁶ found that introital 3-dimensional sonography was highly effective in detecting endometriosis of the rectovaginal septum. Others have advocated using a bowel preparation for better visualization of the bowel wall or extra gel in the vagina to distance the probe from the area of interest, resulting in improved imaging quality.³

Technique

The standard transvaginal sonographic examination based on the American Institute of Ultrasound in Medicine practice guideline¹² includes imaging of the uterus and ovaries. In a patient with chronic pelvic pain, this process is only a small part of the procedure, and the examiner must extend the study beyond the standard protocol. The most important portion of the examination for these patients is evaluation of the cul-de-sac, bowel wall, and rectovaginal septum while gently palpating with the probe to elicit the areas of tenderness. This procedure is called tenderness-guided transvaginal sonography and is very accurate in the identification of rectosigmoid endometriosis.^{8,9}

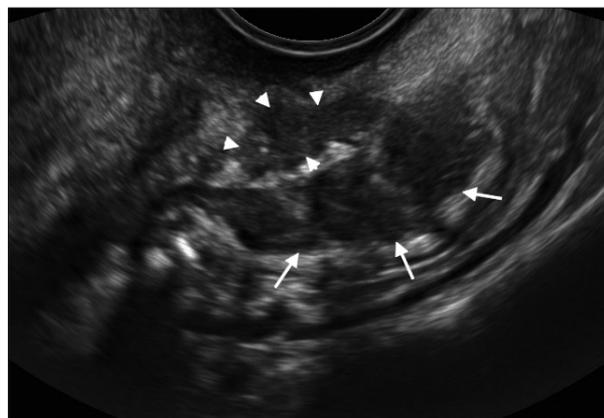
It is best to start on one side, palpating the ovary with the probe and then proceeding posteriorly toward the cul-de-sac by small increments, still palpating and guided by the patient's discomfort. In the process, one can assess the

region of the uterosacral ligament and the bowel wall while compressing it slightly. Then looking at the posterior aspect of the cervix and top of the rectovaginal septum, one can evaluate the wall of the rectum and the back of the cervix. There is often a small amount of free fluid in healthy patients, which is very helpful in outlining the posterior limit of the cervix, normally smooth and closely applied to the surrounding bowel. Small implants of endometriosis may appear as small bumps or irregularities on the posterior aspect of the cervix (Figure 1 and Video 1).

In doing this part of the examination, it is important to move the cervix lightly while observing the organs glide past each other. This technique should be used throughout the pelvis to detect adhesions. Even a small implant of endometriosis on the back of the cervix can cause adhesions to the nearby bowel, thus causing pain and lack of normal motion of the cervix. The technique of testing the mobility of the organs was first introduced to determine whether there were adhesions between the bowel and periumbilical areas before placing a trocar for laparoscopy.¹³

Deep implants of endometriosis are solid in appearance sonographically and have very little if any detectable blood flow on color Doppler imaging. When in the bowel wall, the implant takes the form of a nodular and fusiform swelling of one side of the bowel wall. In other areas, the implant may be a small rounded solid structure adherent to the back of the cervix or pelvic ligaments. It is often helpful to observe the peristalsis in the surrounding bowel, as the implant will stand out because of its immobility.

Figure 1. Longitudinal view of a multilobular endometriosis implant along one wall of the rectosigmoid (arrows). This area is adherent to the top of the rectovaginal septum, where there is another implant (arrowheads).



Conclusions

Transvaginal sonography when performed as described above is accurate and effective in detecting endometriosis without the need for MRI. It does not take much time to perform this additional search for deep pelvic endometriosis, is much more cost-effective than MRI, has a high level of patient acceptance, and when the disease is discovered, often explains years of chronic pelvic pain or infertility. Studies have shown that sonography is at least as sensitive and specific as MRI in detecting deep implants of endometriosis and thus is the imaging examination of choice in patients suspected of having endometriosis.

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