Magnetic resonance imaging correlation to intraoperative findings of deeply infiltrative endometriosis

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Objective: To show characteristics of deeply infiltrative endometriosis (DIE) on magnetic resonance imaging (MRI) and how they correlate with intraoperative findings.
Design: Overview of still and dynamic MRI images of four different patients with DIE. We then used videos from their surgeries to highlight the appearance of endometriosis corresponding to these images (educational video).
Setting: University hospital.
Patient(s): Four different patients with DIE were included in this video. These were all women of reproductive age who suffered from debilitating deeply infiltrative endometriosis. These patients had a pelvic MRI performed at our institution and subsequently underwent surgery with one of our minimally invasive gynecologic surgeons.
Intervention(s): The MRI endometriosis protocol includes T1-weighted fat and nonfat saturated as well as T2-weighted sequences. Images are taken along all three planes (axial, sagittal, and coronal) before and after contrast. What distinguishes the standard MRI from the endometriosis-protocol MRI is the thickness of the slices taken. For the evaluation of endometriosis, T1 nonfat saturated images are taken in 6-mm slices with no skip sections in between. Then, T1 fat saturated images and T2-weighted images are taken in 5-mm slices with a 1-mm skip section in between slices. The areas that are suspicious for lesions consistent with DIE are corroborated on videos taken during surgery.
Main Outcome Measure(s): Value of accurate mapping of lesions with the use of preoperative MRI in surgical planning and complete resection of diseased tissue.
Result(s): Results from a previously published prospective study by Bazot et al. reported sensitivity, specificity, positive predictive value, and negative predictive value of 90.3%, 91%, 92.1%, and 89%, respectively. Similarly to our institution, that study used a 1.5-T MRI, and the protocol of our institution closely mimicked the technique used in that study. Another prospective study published by Hottat et al. showed sensitivity, specificity, and positive and negative predictive values of MRI predicting intraoperative disease of 96.3%, 100%, 100%, and 93.3% respectively. Those results were gathered with the use of a 3.0-T MRI. The high accuracy in these studies of prediction of deep pelvic endometriosis in specific locations shows that MRI is effective for preoperative planning, as was the case for the four patients in our video.
Conclusion(s): Preoperative planning for DIE with the use of MRI is integral in surgical planning. Other imaging modalities to diagnose DIE, such as transvaginal ultrasound, endoanal ultrasound, barium enema, cystoscopy, and rectoscopy, have all been used and studied for the evaluation of endometriosis. However, given its accuracy for mapping lesions, MRI could potentially replace multiple types of imaging while offering the best option for preoperative planning. Accurate mapping would result in greater success of resection and allow for multidisciplinary planning if necessary. Furthermore, being able to train the eye to identify lesions on MRI that are consistent with DIE is an asset to the gynecologic surgeon. (Fertil Steril® 2017;107:e11–2. ©2016 by American Society for Reproductive Medicine.)
Key Words: Endometriosis, MRI

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AVAILABLE ON YOUTUBE

https://youtu.be/UnW8wcHmHoU

SUGGESTED READINGS

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