

Recent Endometriosis References:

Alborzi, S., et al. (2018). "Diagnostic accuracy of magnetic resonance imaging, transvaginal, and transrectal ultrasonography in deep infiltrating endometriosis." *Medicine (Baltimore)* 97(8): e9536.

To determine the diagnostic accuracy of pelvic magnetic resonance imaging (MRI), transvaginal sonography (TVS), and transrectal sonography (TRS) in diagnosis of deep infiltrating endometriosis (DIE). This diagnostic accuracy study was conducted during a 2-year period including a total number of 317 patients with signs and symptoms of endometriosis. All the patients were evaluated by pelvic MRI, TVS, and TRS in the same center. The criterion standard was considered to be the laparoscopy and histopathologic examination. Of 317 patients being included in the present study, 252 tested positive for DIE. The sensitivity, specificity, positive predictive value, and negative predictive value of TVS was found to be 83.3%, 46.1%, 85.7%, and 41.6%, respectively. These variables were 80.5%, 18.6%, 79.3%, and 19.7% for TRS and 90.4%, 66.1%, 91.2%, and 64.1% for MRI, respectively. MRI had the highest accuracy (85.4%) when compared to TVS (75.7%) and TRS (67.8%). The sensitivity of TRS, TVS, and MRI in uterosacral ligament DIE was 82.8%, 70.9%, and 63.6%, respectively. On the contrary, specificity had a reverse trend, favoring MRI (93.9%, 92.8%, and 89.8% for TVS and TRS, respectively). The results of the present study demonstrated that TVS and TRS have appropriate diagnostic accuracy in diagnosis of DIE comparable to MRI.

Andres, M. P., et al. (2018). "Transvaginal Ultrasound for the Diagnosis of Adenomyosis: Systematic Review and Meta-Analysis." *J Minim Invasive Gynecol* 25(2): 257-264.

Adenomyosis is characterized by the presence of ectopic foci of endometrial glandular tissue and/or stroma within the myometrium. The diagnosis of adenomyosis is traditionally made through histologic evaluation of the postsurgical specimen. More recently, imaging with transvaginal ultrasound (TVUS) has been used for the preoperative diagnosis of adenomyosis. As yet, there is no consensus regarding the best imaging feature or combination thereof for the nonsurgical diagnosis of adenomyosis. This study systematically evaluated the literature in the last 10 years to determine the accuracy of 2-dimensional (2D) TVUS, different imaging features, enhancing methods such as 3-dimensional (3D) TVUS, elastography and color Doppler in the nonsurgical diagnosis of adenomyosis. A total of 8 studies were included. Pooled sensitivity and specificity for 2D TVUS for the diagnosis of adenomyosis for all combined imaging characteristics was 83.8% and 63.9%, respectively. Pooled sensitivity for 355 total patients with use of imaging feature of heterogeneous myometrium with 2D TVUS was highest (86.0%), and pooled specificity for 283 total patients with use of globular uterus was highest (78.1%). After including the "question mark" sign with other TVUS features, higher sensitivity and specificity, of 92% and 88%, respectively, were noted. For 3D TVUS, pooled sensitivity and specificity for all combined imaging characteristics was 88.9% and 56.0%, respectively. Poor definition of junctional zone showed the highest pooled sensitivity (86%) and the highest pooled specificity (56.0%) for the diagnosis of adenomyosis with 3D TVUS. There was no improvement in overall accuracy in 3D TVUS compared with 2D TVUS. Preliminary results of TVUS with color Doppler showed a high sensitivity and specificity for the differentiation between adenomyosis and myomas (95.6% and 93.4%, respectively). Also, TVUS elastography in 1 study showed an improvement in specificity (82.9%) compared with 2D

TVUS (63.9%), albeit with comparable sensitivity. Larger studies are needed to advance our understanding of the different types of adenomyosis and their clinical impact.

Baggio, S., et al. (2016). "The Role of Computed Tomography Colonography in Detecting Bowel Involvement in Women With Deep Infiltrating Endometriosis: Comparison With Clinical History, Serum Ca125, and Transvaginal Sonography." J Comput Assist Tomogr 40(6): 886-891.

OBJECTIVE: We wanted to assess the diagnostic value of computed tomographic colonography (CTC) in recognizing bowel endometriosis in comparison with serum Ca125, transvaginal sonography (TVS), and presence of intestinal symptoms. METHODS: We included in this study 92 women undergoing surgery for symptomatic DIE. Preoperative evaluation included clinical history, Ca125 serum value, and TVS. CTC was performed in 37/92 patients (40.2%), and the results were compared to the other preoperative tools and to surgical exploration, considered the clinical reference standard. RESULTS: Surgery confirmed bowel endometriosis in 49/92 subjects (53.3%). Presence of intestinal symptoms, serum Ca125 values, and TVS were significantly correlated to intestinal involvement, but CTC had the highest accuracy in detecting bowel endometriosis with a sensitivity of 68%, a specificity of 67%, a PPV of 81%, and a NPV of 50% (P = 0.04). CONCLUSIONS: CTC proved to be an accurate and low invasive imaging technique to detect DIE of the bowel and compared favorably with clinical evaluation, serum Ca125 determination, and TVS.

Bazot, M. and E. Darai (2017). "Diagnosis of deep endometriosis: clinical examination, ultrasonography, magnetic resonance imaging, and other techniques." Fertil Steril 108(6): 886-894.

The aim of the present review was to evaluate the contribution of clinical examination and imaging techniques, mainly transvaginal sonography and magnetic resonance imaging (MRI) to diagnose deep infiltrating (DE) locations using prisma statement recommendations. Clinical examination has a relative low sensitivity and specificity to diagnose DE. Independently of DE locations, for all transvaginal sonography techniques a pooled sensitivity and specificity of 79% and 94% are observed approaching criteria for a triage test. Whatever the protocol and MRI devices, the pooled sensitivity and specificity for pelvic endometriosis diagnosis were 94% and 77%, respectively. For rectosigmoid endometriosis, pooled sensitivity and specificity of MRI were 92% and 96%, respectively fulfilling criteria of replacement test. In conclusion, advances in imaging techniques offer high sensitivity and specificity to diagnose DE with at least triage value and for rectosigmoid endometriosis replacement value imposing a revision of the concept of laparoscopy as the gold standard.

Carneiro, M. M., et al. (2017). "To operate or not to operate on women with deep infiltrating endometriosis (DIE) before in vitro fertilization (IVF)." JBRA Assist Reprod 21(2): 120-125.

Deep infiltrating endometriosis (DIE) can cause infertility and pelvic pain. There is little evidence of a clear connection between DIE and infertility, and the absolute benefits of surgery for DIE have not been established. This paper aimed to review the current literature on the effect of surgery for DIE on fertility, pregnancy, and IVF outcomes. Clinicians should bear in mind that a comprehensive clinical

history is useful to identify patients at risk for endometriosis, although many women remain asymptomatic. Imaging can be useful to plan surgery. The effect of surgery on the fertility of women with DIE remains unanswered due to the heterogeneous nature of the disease and the lack of trials with enough statistical power and adequate follow-up. Surgery is not recommended when the main goal is to treat infertility or to improve IVF results. Decisions should be tailored according to the individual needs of each woman. Patients must be provided information on the potential benefits, harm, and costs of each treatment alternative, while the medical team observes factors such as presence of pelvic pain, patient age, lesion location, and previous treatments. In this scenario, management by a multidisciplinary endometriosis team is a key step to achieving successful outcomes.

Chamie, L. P., et al. (2018). "Atypical Sites of Deeply Infiltrative Endometriosis: Clinical Characteristics and Imaging Findings." *Radiographics* 38(1): 309-328.

Endometriosis is defined as the presence of endometrial tissue that is located outside the uterine cavity and associated with fibrosis and inflammatory reaction. It is a polymorphic and multifocal disease with no known cure or preventive mechanisms. Patients may be asymptomatic or may experience chronic pelvic pain, dysmenorrhea, dyspareunia, or infertility. The pelvic cavity is the most common location for endometriotic implants, which usually affect the retrocervical space, ovaries, vagina, rectosigmoid colon, bladder dome, and round ligaments. Atypical endometriosis is rare and difficult to diagnose. The most common atypical locations are the gastrointestinal tract, urinary tract, lung, umbilicus, inguinal area, breast, and pelvic nerves, as well as abdominal surgical scars. Gastrointestinal lesions are the most common extragenital manifestation, and the diaphragm is the most frequent extrapelvic site. The catamenial nature of the symptoms (occurring between 24 hours before and 72 hours after the onset of menstruation) may help suggest the diagnosis, but imaging by specialists is fundamental to evaluation. Depending on the area affected, radiography, ultrasonography, thin-section computed tomography, or magnetic resonance imaging can be used to assess suspected lesions. Because isolated extragenital endometriosis is rare, concomitant evaluation of the pelvic cavity is mandatory. Surgical excision is the only therapeutic option for definitive treatment, and comprehensive disease mapping is necessary to avoid residual disease. The authors review atypical locations for endometriosis and emphasize the most appropriate imaging protocols for investigation of various clinical manifestations. Online supplemental material is available for this article. ((c))RSNA, 2018.

Chapron, C., et al. (2017). "Relationship between the magnetic resonance imaging appearance of adenomyosis and endometriosis phenotypes." *Hum Reprod* 32(7): 1393-1401.

STUDY QUESTION: What is the relationship between endometriosis phenotypes superficial peritoneal endometriosis (SUP), ovarian endometrioma (OMA), deep infiltrating endometriosis (DIE) and the adenomyosis appearance by magnetic resonance imaging (MRI)? **SUMMARY ANSWER:** Focal adenomyosis located in the outer myometrium (FAOM) was observed more frequently in women with endometriosis, and was significantly associated with the DIE phenotype. **WHAT IS KNOWN ALREADY:** An association between endometriosis and adenomyosis has been reported previously, although data regarding the association between MRI appearance of adenomyosis and the endometriosis phenotype are currently still lacking. **STUDY DESIGN, SIZE, DURATION:** This was an observational, cross-sectional

study using data prospectively collected from non-pregnant patients who were between 18 and 42 years of age, and who underwent surgery for symptomatic benign gynecological conditions between January 2011 and December 2014. For each patient, a standardized questionnaire was completed during a face-to-face interview conducted by the surgeon during the month preceding the surgery. Only women with preoperative standardized uterine MRIs were retained for this study. PARTICIPANTS/MATERIALS, SETTING, METHODS: Surgery was performed on 292 patients with signed consent and available preoperative MRIs. After a thorough surgical examination of the abdomino-pelvic cavity, 237 women with histologically proven endometriosis were allocated to the endometriosis group and 55 symptomatic women without evidence of endometriosis to the endometriosis free group. The existence of diffuse or FAOM was studied in both groups and according to surgical endometriosis phenotypes (SUP, OMA and DIE). MAIN RESULTS AND THE ROLE OF CHANCE: Adenomyosis was observed in 59.9% (n = 175) of the total sample population (n = 292). Based on MRI, the distribution of adenomyosis was as follows: isolated diffuse adenomyosis (53 patients; 18.2%), isolated FAOM (74 patients; 25.3%), associated diffuse and FAOM (48 patients; 16.4%). Diffuse adenomyosis (isolated and associated to FAOM) was observed in one-third of the patients regardless of whether they were endometriotic patients or endometriosis free women taken as controls (34.2% (81 cases) versus 36.4% (20 cases)); P = 0.764. Among endometriotic women, diffuse adenomyosis (isolated and associated to FAOM) failed to reach significant correlation with the endometriosis phenotypes (SUP, 20.0% (8 cases); OMA, 45.2% (14 cases) and DIE, 35.5% (59 cases); P = 0.068). In striking contrast, there was a significant increase in the frequency of FAOM in endometriosis-affected women than in controls (119 cases (50.2%) versus 5.4% (3 cases); P < 0.001). FAOM correlated with the endometriosis phenotypes, significantly with DIE (SUP, 7.5% (3 cases); OMA, 19.3% (6 cases) and DIE, 66.3% (110 cases); P < 0.001). LIMITATIONS, REASONS FOR CAUTION: There was a possible selection bias due to the specificity of the study design, as it only included surgical patients in a referral center that specializes in endometriosis surgery. Therefore, women referred to our center may have suffered from particularly severe forms of endometriosis. This could explain the high number of women with DIE (166/237-70%) in our study group. This referral bias for women with severe lesions may have amplified the difference in association of FAOM with the endometriosis-affected patients compared to women without endometriosis. Furthermore, according to inclusion criteria, women in the endometriosis free group were symptomatic women. This may introduce some bias as symptomatic women may be more prone to have associated adenomyosis that in turn could have been overrepresented in the endometriosis free group. Whether this selection could have introduced a bias in the relationship between endometriosis and adenomyosis remains unknown. WIDER IMPLICATIONS OF THE FINDINGS: This study opens the door to future epidemiological, clinical and mechanistic studies aimed at better characterizing diffuse and focal adenomyosis. Further studies are necessary to adequately determine if diffuse and focal adenomyosis are two separate entities that differ in terms of pathogenesis. STUDY FUNDING/COMPETING INTEREST(S): No funding supported this study. The authors have no conflict of interest to declare.

Darvishzadeh, A., et al. (2016). "Deep pelvic endometriosis: a radiologist's guide to key imaging features with clinical and histopathologic review." *Abdom Radiol (NY)* 41(12): 2380-2400.

While endometriosis typically affects the ovaries, deep infiltrating endometriosis can affect the gastrointestinal tract, urinary tract, and deep pelvis, awareness of which is important for radiologists. Symptoms are nonspecific and can range from chronic abdominal and deep pelvic pain to nausea,

vomiting, diarrhea, constipation, hematuria, and rectal bleeding. Ultrasound and computed tomography may show nonspecific soft-tissue density masses causing bowel obstruction and hydronephrosis. This constellation of presenting symptoms and imaging evidence is easily mistaken for other pathologies including infectious gastroenteritis, diverticulitis, appendicitis, and malignancy, which may lead to unnecessary surgery or mismanagement. With this, deep pelvic endometriosis should be considered in the differential diagnosis in a female patient of reproductive age who presents with such atypical symptoms, and further work up with magnetic resonance imaging is imperative for accurate diagnosis, treatment selection, and preoperative planning.

Foti, P. V., et al. (2018). "Endometriosis: clinical features, MR imaging findings and pathologic correlation." *Insights Imaging* 9(2): 149-172.

OBJECTIVE: We illustrate the magnetic resonance imaging (MRI) features of endometriosis. **BACKGROUND:** Endometriosis is a chronic gynaecological condition affecting women of reproductive age and may cause pelvic pain and infertility. It is characterized by the growth of functional ectopic endometrial glands and stroma outside the uterus and includes three different manifestations: ovarian endometriomas, peritoneal implants, deep pelvic endometriosis. The primary locations are in the pelvis; extrapelvic endometriosis may rarely occur. Diagnosis requires a combination of clinical history, invasive and non-invasive techniques. The definitive diagnosis is based on laparoscopy with histological confirmation. Diagnostic imaging is necessary for treatment planning. MRI is as a second-line technique after ultrasound. The MRI appearance of endometriotic lesions is variable and depends on the quantity and age of haemorrhage, the amount of endometrial cells, stroma, smooth muscle proliferation and fibrosis. The purpose of surgery is to achieve complete resection of all endometriotic lesions in the same operation. **CONCLUSION:** Owing to the possibility to perform a complete assessment of all pelvic compartments at one time, MRI represents the best imaging technique for preoperative staging of endometriosis, in order to choose the more appropriate surgical approach and to plan a multidisciplinary team work. **TEACHING POINTS:** * Endometriosis includes ovarian endometriomas, peritoneal implants and deep pelvic endometriosis. * MRI is a second-line imaging technique after US. * Deep pelvic endometriosis is associated with chronic pelvic pain and infertility. * Endometriosis is characterized by considerable diagnostic delay. * MRI is the best imaging technique for preoperative staging of endometriosis.

Greaves, E., et al. (2017). "Relevant human tissue resources and laboratory models for use in endometriosis research." *Acta Obstet Gynecol Scand* 96(6): 644-658.

Endometriosis is characterized by the growth of endometrium-like tissue outside the uterus, most commonly on the pelvic peritoneum and ovaries. Although it may be asymptomatic in some women, in others it can cause debilitating pain, infertility or other symptoms including fatigue. Current research is directed both at understanding the complex etiology and pathophysiology of the disorder and at the development of new nonsurgical approaches to therapy that lack the unwanted side effects of current medical management. Tools for endometriosis research fall into two broad categories; patient-derived tissues, and fluids (and cells isolated from these sources) or models based on the use of cells or animals. In this review, we discuss the literature that has reported data from the use of these

tools in endometriosis research and we highlight the strengths and weaknesses of each. Although many different models are reported in the literature, hypothesis-driven research will only be facilitated with careful experimental design and selection of the most appropriate human tissue from patients with and without endometriosis and combinations of physiologically relevant in vitro and in vivo laboratory models.

Guerriero, S., et al. (2018). "Deep Infiltrating Endometriosis: Comparison Between 2-Dimensional Ultrasonography (US), 3-Dimensional US, and Magnetic Resonance Imaging." J Ultrasound Med 37(6): 1511-1521.

OBJECTIVES: To evaluate the diagnostic accuracy of 2-dimensional (2D) and 3-dimensional (3D) transvaginal ultrasonography (US) in comparison with magnetic resonance imaging (MRI) for identification of deep infiltrating endometriosis. **METHODS:** In this prospective observational study, 159 premenopausal women who underwent surgery for a clinical suspicion of deep infiltrating endometriosis were prospectively enrolled. All women underwent 2DUS, 3DUS, and MRI. The following 3 locations of deep endometriosis were considered: (1) intestinal; (2) other posterior lesions (retrocervical septum, rectovaginal septum, uterosacral ligaments, and vaginal fornix); and (3) anterior. The sensitivity, specificity, positive predictive value, and negative predictive value of 2D and 3D transvaginal US in comparison with MRI were determined. **RESULTS:** Intestinal deep infiltrating endometriosis was identified by 2DUS in 56 of 66 patients, by 3DUS in 59 of 66, and by MRI in 61 of 66. A receiver operating characteristic curve analysis showed optimal results for 2DUS, 3DUS, and MRI (areas under the curve, 0.86, 0.915, and 0.935, respectively) with a statistically significant difference between 2DUS and MRI ($P = .0103$), even when the 95% confidence interval showed an overlap. Other posterior deep infiltrating endometriosis was identified by 2DUS in 55 of 75 patients, by 3DUS in 65 of 75, and by MRI in 66 of 75. A receiver operating characteristic curve analysis showed very good results for 2DUS, 3DUS, and MRI (areas under the curve, 0.801, 0.838, and 0.857) with no statistically significant differences. In the 12 women with deep infiltrating endometriosis in the anterior location, the nodules were correctly identified by 2DUS in 3 of 12 patients, by 3DUS in 5 of 12, and by MRI in 6 of 12. **CONCLUSIONS:** Our results seem to suggest that there is a statistically significant difference between 2DUS and MRI for the intestinal location of deep infiltrating endometriosis, whereas no differences were found among the techniques for the other locations.

Hoyos, L. R., et al. (2017). "Endometriosis and Imaging." Clin Obstet Gynecol 60(3): 503-516.

Endometriosis is a condition with variable location, size, and lesion composition which poses a diagnostic imaging challenge for the practicing gynecologist. Transvaginal ultrasound and magnetic resonance imaging are the most frequent imaging techniques used for its evaluation, but transvaginal ultrasound should be the first-line approach, as it is often sufficient, followed by modified ultrasound techniques. Magnetic resonance imaging should be considered when a diagnosis has not been achieved by sonographic means or when the renal system needs to be concurrently evaluated. Computed tomography has no role in the routine evaluation of endometriosis except in very few particular scenarios.

Ito, T. E., et al. (2017). "Magnetic resonance imaging correlation to intraoperative findings of deeply infiltrative endometriosis." *Fertil Steril* 107(2): e11-e12.

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.

Kocher, M., et al. (2017). "Cesarean-Section Scar Endometrioma: A Case Report and Review of the Literature." *J Radiol Case Rep* 11(12): 16-26.

Endometriomas can occur after any surgery where there is endometrial manipulation, and there are a number of reports of endometriomas developing in the abdominal wall at the site of the Pfannenstiel incision following Cesarean-section. Although this is ultimately a histopathologically-confirmed diagnosis, preoperative imaging including ultrasound, computed tomography, and magnetic

resonance imaging may be helpful in the diagnosis and assessment. We report a pathology-confirmed case of Cesarean-section endometrioma with a classic, clinical presentation and imaging findings on computed tomography. A comprehensive literature review and discussion of the multi-modality imaging appearance of Cesarean-section endometrioma is also provided.

Kuo, H. H., et al. (2017). "Unexpected epithelial ovarian cancers arising from presumed endometrioma: A 10-year retrospective analysis." *Taiwan J Obstet Gynecol* 56(1): 55-61.

OBJECTIVE: To evaluate the incidence and prognosis of unexpected epithelial ovarian cancers (EOCs) occurring in presumed benign endometrioma. **MATERIALS AND METHODS:** Patients who underwent primary surgery at Chang Gung Memorial Hospital between November 2003 and October 2013 were searched with the Systematized Nomenclature of Medicine code followed by chart review. **RESULTS:** The incidence of unexpected EOCs in presumed ovarian endometrioma was 0.14%, as 11 patients were revealed after reviewing 497 patients of pathology-proven EOCs in the current series. All patients were aged ≥ 40 years; seven (63.6%) had inward mass within ovarian cyst in preoperative images, six had cancer antigen-125 (CA-125) > 200 U/mL, and two with CA-125 > 1500 U/mL. Ten patients underwent laparoscopy initially, including five with ovarian preservation at the beginning. Ten patients subsequently completed concurrent or secondary staging surgery, including four totally with laparoscopy. The histologic subtypes had clear-cell (8/11), endometrioid (1/11), mixed clear-cell and endometrioid (1/11), and low-grade serous adenocarcinoma (1/11). Seven patients had endometriosis-associated ovarian carcinoma (EAOC), while the other four were non-EAOC with no endometriosis component. The only mortality was a patient of non-EAOC in Stage IIIc, whereas the other 10 in Stage I were alive. The overall survival rate was 90.9% (10/11) with follow-up ranging from 23 months to 130 months. **CONCLUSION:** Unexpected EOCs occurring in presumed ovarian endometrioma was rare and, if present, the prognosis was good in Stage I disease with laparoscopic management. Combining parameters of patient's age, CA-125 level, and inward solid mass at imaging could help to raise the precautions.

Nematian, S. E., et al. (2018). "Systemic Inflammation Induced by microRNAs: Endometriosis-Derived Alterations in Circulating microRNA 125b-5p and Let-7b-5p Regulate Macrophage Cytokine Production." *J Clin Endocrinol Metab* 103(1): 64-74.

Context: Endometriosis is characterized by aberrant inflammation. We previously reported increased levels of microRNA (miRNA) 125b-5p and decreased levels of miRNA Let-7b-5p in serum of patients with endometriosis. **Objective:** Determine the regulatory function of miRNAs 125b-5p and Let-7b-5p on production of proinflammatory cytokines in endometriosis. **Design:** Case-control study. **Setting:** University hospital. **Patients:** Women with (20) and without (26) endometriosis; human U937 macrophage cell line. **Intervention:** Sera were collected from surgically diagnosed patients and differentiated U937 cells that were transfected with miRNAs 125b-5p and Let-7b-5p mimics and inhibitor. **Main Outcome Measures:** Enzyme-linked immunosorbent assay for tumor necrosis factor-alpha (TNF-alpha), interleukin (IL)-6, IL-8, and IL-1beta levels and quantitative real-time polymerase chain reaction for expression of miRNAs 125b-5p and Let-7b-5p in sera of patients with and without endometriosis. Transfected macrophages were evaluated for expression of inflammatory cytokines,

intracellular production, and secretion of these cytokines. Results: We noted substantial elevation of TNF-alpha, IL-1beta, and IL-6, marked upregulation of miRNA 125b, and considerable downregulation of Let-7b in sera of patients with endometriosis vs control. There was a positive correlation between miRNA 125b levels and TNF-alpha, IL-1beta, and IL-6 and a negative correlation between miRNA Let-7b levels and TNF-alpha in sera of patients with endometriosis. Transfection experiments showed a noteworthy upregulation of TNF-alpha, IL-1beta, IL-6, and IL-8 in macrophages transfected with miRNA 125b mimic or Let-7b inhibitor. The secreted cytokine protein levels and intracellular imaging studies closely correlate with the messenger RNA changes. Conclusions: Endometriosis-derived miRNAs regulate macrophage cytokine production that contributes to inflammation associated with this condition.

Nyangoh Timoh, K., et al. (2018). "Magnetic Resonance Enterography to Assess Multifocal and Multicentric Bowel Endometriosis." J Minim Invasive Gynecol 25(4): 697-705.

STUDY OBJECTIVE: To prospectively determine the accuracy of magnetic resonance enterography (MRE) compared with conventional magnetic resonance imaging (MRI) for multifocal (i.e., multiple lesions affecting the same digestive segment) and multicentric (i.e., multiple lesions affecting several digestive segments) bowel endometriosis. **DESIGN:** A prospective study (Canadian Task Force classification II-2). **SETTING:** Tenon University Hospital, Paris, France. **PATIENTS:** Patients with MRI-suspected colorectal endometriosis scheduled for colorectal resection from April 2014 to February 2016 were included. **INTERVENTIONS:** Patients underwent both 1.5-Tesla MRI and MRE as well as laparoscopically assisted and open colorectal resections. **MEASUREMENTS AND MAIN RESULTS:** The diagnostic performance of MRI and MRE was evaluated for sensitivity, specificity, positive and negative predictive values, accuracy, and positive and negative likelihood ratios (LRs). The interobserver variability of the experienced and junior radiologists was quantified using weighted statistics. Forty-seven patients were included. Twenty-two (46.8%) patients had unifocal lesions, 14 (30%) had multifocal lesions, and 11 (23.4%) had multicentric lesions. The sensitivity, specificity, positive LR, and negative LR for the diagnosis of multifocal lesions were 0.29 (6/21), 1.00 (23/24), 15.36, and 0.71 for MRI and 0.57 (12/21), 0.89 (23/25), 4.95, and 0.58 for MRE. The sensitivity, specificity, positive LR, and negative LR for the diagnosis of multicentric lesions were 0.18 (1/11), 1.00 (1/1), 15, and 0.80 for MRI and 0.46 (5/11), 0.92 (33/36), 5.45, and 0.60 for MRE. Lower accuracies for MRI compared with MRE to diagnose multicentric ($p = .01$) and multifocal lesions ($p = .004$) were noted. The interobserver agreement for MRE was good for both multifocality ($\kappa = 0.80$) and multicentricity ($\kappa = 0.61$). **CONCLUSION:** MRE has better accuracy for diagnosing multifocal and multicentric bowel endometriosis than conventional MRI.

Porpora, M. G., et al. (2018). "The Role of Magnetic Resonance Imaging-Diffusion Tensor Imaging in Predicting Pain Related to Endometriosis: A Preliminary Study." J Minim Invasive Gynecol 25(4): 661-669.

OBJECTIVES: To evaluate the sacral nerve root features by the means of magnetic resonance imaging-diffusion tensor imaging (MRI-DTI) tractography in women with endometriosis and/or adenomyosis, and to analyze the correlations among DTI abnormalities, pain symptoms, and endometriotic lesions found at surgery. **DESIGN:** A cross-sectional, observational study (Canadian Task

Force classification II-2). SETTING: University hospital. PATIENTS: Women (n = 76) with clinical suspicion of endometriosis. INTERVENTIONS: Before surgery, dysmenorrhea, deep dyspareunia, and noncyclic pelvic pain (NCP) were assessed using a 10-point visual analog scale. MRI enabled a 3-dimensional reconstruction of S1, S2, and S3. Fractional anisotropy was calculated for each root. Laparoscopic treatment of endometriosis was performed in 56 patients. MEASUREMENTS AND MAIN RESULTS: Our findings revealed correlations among sacral root reconstruction by MRI-DTI, pain symptoms, and laparoscopic findings. DTI of sacral roots revealed a regular and homogeneous appearance in 17 patients (25.8%) and abnormalities in microstructure reconstruction, with fiber irregularities and disorganization and loss of the simple unidirectional course, in 44 patients (66.7%). At laparoscopy, ovarian endometriomas were found in 82.1% of the patients, and deeply infiltrating endometriosis (DIE) were found in 57.1%. Endometriosis was staged according to the revised American Society for Reproductive Medicine classification. Pathological DTI findings were significantly associated with the severity of dysmenorrhea and NCP, pain duration, presence of tubo-ovarian and cul-de-sac adhesions, and DIE. CONCLUSION: The presence of pathological DTI findings of the sacral nerve roots correlates with the type of pain, adhesions, and DIE. At present, DTI can be useful for providing a better understanding of pain; however, DTI could become a useful tool in therapeutic planning for patients with endometriosis.

Richards, E. G. and T. Falcone (2017). "Preoperative Imaging is a Critical Component in the Workup of Deeply Infiltrating Endometriosis." J Minim Invasive Gynecol 24(7): 1053-1054.

Thalluri, A. L., et al. (2017). "MRI findings in deep infiltrating endometriosis: A pictorial essay." J Med Imaging Radiat Oncol 61(6): 767-773.

Endometriosis is an important gynaecological disorder which can impact significantly on an individual's quality of life and has major implications on fertility. Deep infiltrating endometriosis is a severe form of endometriosis which can cause obliteration of anatomic compartments. Laparoscopy remains the gold standard for diagnosis of endometriosis, although is an invasive procedure that has the potential to be hindered by obliterative disease. Ultrasound is often employed as the first-line imaging modality when endometriosis is suspected, however, MRI is more accurate in assessment of complex disease. Pre-operative MRI is highly specific in the diagnosis of endometriosis and characterization of disease extent, and plays a key role in guiding surgical management. MRI findings in deep infiltrating endometriosis are described.

Zannoni, L., et al. (2017). "Comparison of transvaginal sonography and computed tomography-colonography with contrast media and urographic phase for diagnosing deep infiltrating endometriosis of the posterior compartment of the pelvis: a pilot study." Jpn J Radiol 35(9): 546-554.

PURPOSE: To compare the diagnostic accuracy of transvaginal sonography (TVS) and computed tomography-colonography with contrast media and urographic phase (CTCU) in the preoperative detection of deep infiltrating endometriosis (DIE). MATERIALS AND METHODS: Forty-seven patients with clinical suspicion of DIE underwent preoperative TVS and CTCU. Imaging data were compared with histopathologic analysis. Sensitivity, specificity, positive and negative predictive values and test

accuracies of the two modalities were calculated. RESULTS: For diagnosing intestinal DIE, TVS and CTCU had a sensitivity of 98 and 71%, specificity of 33 and 50%, positive predictive value of 91 and 91%, negative predictive value of 67 and 20%, accuracy of 89 and 68%, respectively. For diagnosing ureteral DIE, TVS and CTCU had a sensitivity of 10 and 60%, specificity of 94.8 and 70.2% on the right; sensitivity of 28.5 and 57.1%, specificity of 96.3 and 76.9% on the left, respectively. CONCLUSION: TVS should be regarded as an accurate, radiation-free first-line diagnostic modality for patients with suspicion of posterior endometriosis. CTCU should be regarded as a complementary imaging modality, particularly for sigmoid or ureteral endometriosis.