

The role of MRI in evaluation of recto-sigmoid junction wall endometriosis. A case report

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Abstract

Endometriosis is a condition that occurs due to the presence of endometrial glandular tissue outside the uterine cavity, more frequently at pelvic level affecting ovaries, uterosacral ligament, recto-vaginal septum, sigma or urinary bladder. The diagnosis of endometriosis involves a detailed anamnesis, gynecological examination, imagistic examinations, biochemical investigations, laparoscopy, and histological confirmation. We present herein the case of a 30-year-old patient with severe dysmenorrhea and infertility, diagnosed with profound endometriosis. The patient undergone a magnetic resonance imaging (MRI) pelvic examination with a specific protocol which includes endovaginal and endorectal instillation of gel and involves a scan of the pelvis in three planes (axial, coronal and sagittal) T2-weighted; T2 sequences with inclinations at the level of the uterus, urinary bladder and uterosacral ligaments; T1, T1 Fat Sat sequence unenhanced and post-contrast and T2 sequences post vaginal and rectal instillation of sterile gel. The MRI examination with endovaginal and endorectal instillation of sterile gel has a high specificity and sensitivity in establishing the diagnosis, allowing an accurate evaluation of the various modifications caused by endometriosis and its extent in the wall of pelvic organs. Such an investigation allows an exact preoperative mapping of lesions.

Keywords: endometriosis, deep infiltration, gel instillation, magnetic resonance imaging

Introduction

Endometriosis is a condition that occurs due to the presence of endometrial glandular tissue outside the uterine cavity more frequently at the pelvic level: ovaries, uterosacral ligament, recto-vaginal septum, sigma or urinary bladder⁽¹⁾. Localizations outside the pelvis are rare (e.g. the lung). Endometriosis can also be categorized as a chronic, inflammatory, estrogen-dependent, invasive disease with frequent development of adhesions. It is associated with chronic pelvic pain and infertility⁽¹⁾. Endometriosis affects approximately 10-20% of hormonally active women aged between 20 and 40 years and approximately 40% of infertile patients present this condition⁽¹⁾. Because the cause of the disease is not clear many factors are suspected to be involved in the etiology: hormonal, immune, genetic, environmental factors or anatomical factors⁽¹⁾.

The most incriminated risk factors are: nulliparity, age, race, body weight index, alcohol, and cigarette abuse. Although it is a condition without a certain etiopathogenesis, there are several hypotheses about its etiology (i.e. the theory of retrograde menstruation, metastatic dissemination of endometrial cells, metaplastic transformation, theories associated with a genetic predisposition, exposure to dioxins, immune deficiencies or anatomic abnormalities)⁽¹⁾.

Most patients present symptoms according to the place of implantation of the endometrial ectopic cells. In the

case of pelvic implantation the predominant symptoms are chronic pelvic pain in varying degrees, dysmenorrhea, dyspareunia or infertility. In the case of digestive colonization the digestive symptoms (constipation/diarrhea, rectorrhagia, sickness, vomiting or bloating) prevail. In case of a urinary organ localization the main symptoms are urinary and imply dysuria, hematuria, or polyuria. Scapular pain often occurs in the case of insertion of ectopic endometrial tissue into the diaphragm. Pulmonary endometriosis can also be associated with hemoptysis⁽²⁾.

Endometrial ectopic tissue is found in most cases (90%) at the level of the posterior peritoneum: utero-sacral ligaments (52%), uterine corpus, Douglas pouch, digestive tube (21%), vagina and recto-vaginal septum, urethras. An uncommon localization is at the level of the anterior peritoneum (10%), on the urinary bladder (9%), the urinary bladder pouch, or anterior abdominal wall⁽³⁾.

Endometriosis can be classified into 3 types:

- superficial peritoneal endometriosis, consisting of superficial implantations and adhesions at the peritoneal level;

- ovarian endometriosis, represented by endometriomas or endometriotic cysts;

- profound peritoneal endometriosis, which covers the aspect of peritoneal infiltration for more than 5 mm, with the involvement of utero-sacral ligaments or the muscles of the pelvic organs (bladder, rectum, sigma).

The diagnosis of endometriosis involves a detailed anamnesis, a gynecological examination, imagistic examination [ultrasound, magnetic resonance imaging (MRI), computer tomography (CT) with specific protocols], biochemical work +/- laparoscopy and histological confirmation.

Case report

We herein present the case of a 30-year-old patient diagnosed two years ago with profound endometriosis. In the present episode the patient displayed severe dysmenorrhea, pelvic pain and alternation of diarrhea and constipation.

The ultrasound examination showed a retroverted uterus and the presence of bilateral endometrioid ovarian cysts⁽⁴⁾. For a complete review of organ involvement, a MRI examination of the pelvis which includes the endovaginal and endorectal instillation of sterile gel was performed⁽⁵⁾.

This specific MRI pelvic examination for endometriosis, including endovaginal and endorectal gel instillation, is a non-invasive examination, which involves scanning the pelvis in three planes: axial, coronal and sagittal T2 -weighted; T2 sequences with inclinations in the uterus, urinal bladder and utero-sacral ligaments planes; sequences T1, T1 Fat Sat unenhanced and post-contrast and T2 sequences post vaginal and rectal instillation of sterile gel⁽⁶⁾.

The preparation for MRI consists in administration of an evacutory microenema one hour before the examination and the intravenous administration of an antispastic drug at the beginning of the examination⁽⁶⁾.

The MRI examination highlights:

- retroverted uterus with diffuse hypertrophy of the junctional area (adenomyomatosis), with the modification of its signal through the presence of microspots in hypersignal T1 Fat Sat (endometriotic microspots)



Figure 1. (a-c). MRI investigation after endovaginal and endorectal insertion of sterile gel: sections in sagittal plane T2 (a, b), and coronary T2; (c). A uterus in retroversion, with a diffusely thickened junctional area, endometrioid placards which infiltrate the wall of the recto-sigmoid junction, adhesions and endometrioid cysts

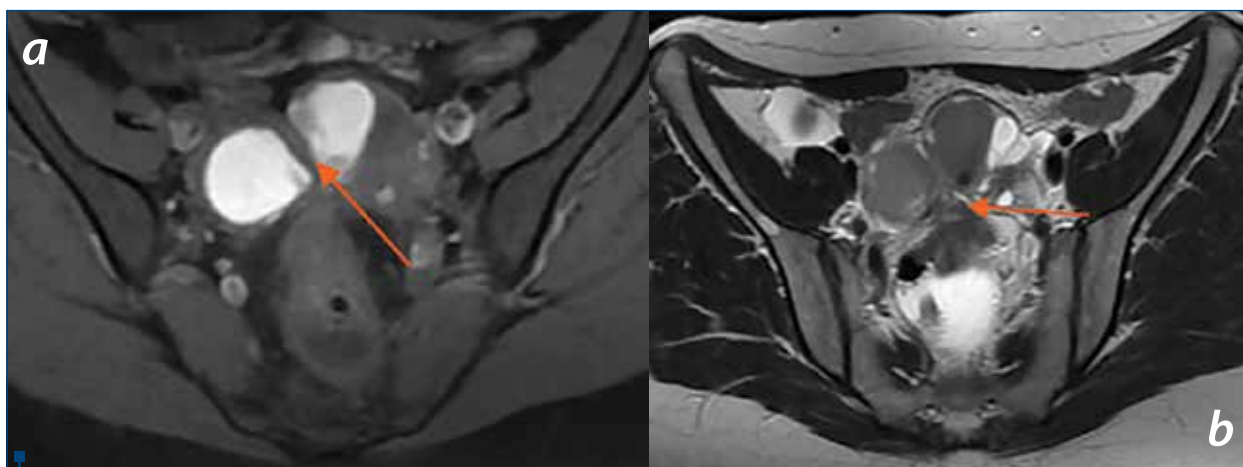


Figure 2. (a, b). Sections in axial plane: T1 Fat Sat sequence before the instillation of gel (a), and axial T2 sequence post endovaginal and endorectal instillation of sterile gel (b). The traction of both adnexes on the medial line - "kissing ovaries" and endometriotic cysts at their level can be visualized; as well as the infiltration and stenosis of the recto-sigmoid junction wall



Figure 3 (a, b, c, d). Hydro-CT of the colon - sections in axial plane (a, b, c), and reconstruction in sagittal plane (d). The infiltration and stenosis (narrow) of the recto-sigmoid junction wall are visualized

- the modification of the pelvic structure through traction of both ovaries on the medial line, “kissing ovaries”, visualizing at their level formations in hyposignal T2, hypersignal T1 and T1 Fat Sat, with a pathognomonic aspects for endometriotic cysts.

- endometrioid placards at the level of the recto-sigmoid junction wall, which appears diffusely infiltrated and circumferentially stenosed⁽⁷⁾ (Figure 1).

- significant adhesions caused by endometrioid infiltration, visualized at the ovarian level, with the traction of ovaries to the medial line. The traction of the recto-sigmoid junction give the aspect of a “club”⁽⁸⁾ (Figure 2).

- a diffuse thickening of utero-sacral ligaments with the visualization of endometrioid nodules placed onto them.

Due to the infiltrating endometriosis of the recto-sigmoid junction wall, it was decided to continue the imagistic investigations with a hydro-CT exploration of the colon⁽⁹⁾.

The hydro-CT examination is a radiant, non-invasive technique which involves the instillation of 1.1-1.5 liters of lukewarm water after the patient has begun a preparation consisting of the cessation of food intake 24 h before the investigation and the consumption of still water only, the administration of an evacuatory micro-enema 1-2 hours before the examination and an unenhanced and post-contrast scan of the abdomen and the pelvis⁽¹⁰⁾. Thus, the recto-sigmoid junction is decompressed and visualized, allowing an exact diagnosis of endometriotic infiltration (Figure 3). Measurements of the thickness of the endometriotic invasion in the recto-sigmoid junction wall were performed, the degree of stenosis and its length as well as the distance from the external anal cavity were appreciated. All of these data were very important for the surgeon in order to establish a therapeutic plan⁽¹¹⁾.

Discussion

The MRI examination of the pelvis with endorectal and endovaginal insertion of sterile gel is a non-invasive, non-radiant technique with high diagnostic accuracy (90%) in the diagnosis of endometriosis. It is more specific and sensitive than ultrasound or the CT scan. It is a high-resolution, multiplane imaging technique, which allows the diagnosis of all forms of endometriosis, with the visualization of: endometriomas, adhesions, superficial/profound peritoneal implantations and extraperitoneal lesions.

Scanning in three planes, axial, sagittal and coronary allows:

- the exact evaluation of the extent of peritoneal endometriosis, with the visualization of nodules or endometriotic placards at the level of the structures covered by peritoneum (i.e. ligaments, the Douglas pouch fundus, the recto-vaginal septum or the uterus)

- the evaluation of the involvement of pelvic organs (i.e. rectum, sigma, bladder) and the changes of the pelvic structure

- a good analysis of endometrioid placard locations that are difficult to examine through laparoscopy and of profound endometriosis, thus laparoscopic surgery for deep endometriosis still represents a challenge for most of the pelvic surgeons^(1,2)

- a accurate establishment of pre-operative mapping of lesions and planning of the surgical intervention.

Conclusions

Endometriosis is a frequent pathology. The MRI examination with endovaginal and endorectal instillation of sterile gel and Hydro-CT of the colon has a high specificity and sensitivity in establishing the diagnosis. ■

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