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Case Report

Deep Pelvic Endometriosis

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- Endometriosis
- Deep pelvic
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- Structured report

Abstract

Endometriosis with extensive deep affectation needs a targeted MR study for an accurate diagnosis and treatment planning. The reported patient had affectation of the three compartments, with solid invasive masses, predominantly fibrous. Since laparoscopy provides limited information on the sub peritoneal extent and presence of endometriotic lesions in areas hidden by adhesions, the non-invasive MR study will allow proper assessment of the whole pelvis and a more accurate global diagnosis of this entity. Compared to transvaginal, endorectal and endoscopic sonography, MR provides the necessary information for proper surgical planning as a map of organ affectation.

Structure reporting of endometriosis is extremely important to systematically check each of the structures that may be affected in the different anatomical compartments. However, successful treatment planning may require, as in this case report, laparotomy with two different surgical teams (gynecology and coloproctology) for appropriate end results.

INTRODUCTION

Endometriosis is defined as the presence of ectopic endometrial glands and stroma outside the uterus. There are three main distinct forms of pelvic endometriosis: superficial (small deposits mainly recognized at laparoscopy), ovaric (endometriomata), and deep pelvic endometriosis (sub peritoneal invasion of endometrial tissue by at least 5mm) [1]. Deep pelvic endometriosis diagnosis is a diagnostic challenge. Treatment planning is based on an accurate interpretation of anatomic changes, being the MR images the most precise for a more accurate assessment.MR images provide high accuracy in the evaluation of deep pelvic endometriosis presence and extension in specific locations, being able to provide information that will guide surgery, either by laparoscopy or laparotomy [1]. MR imaging offers the most accurate map of organ affectation and disease extension (Figure 1), (Table 1), treatment success relating to the radical surgical removal of all foci.

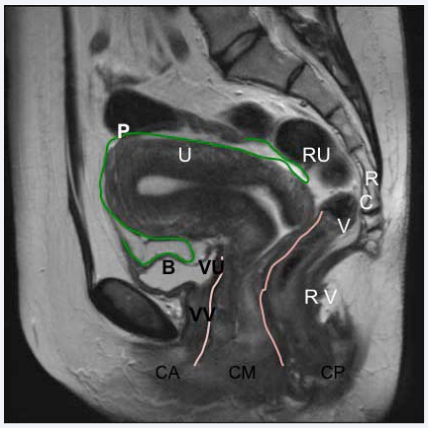

Figure 1a CA: Anterior compartment includes: B: Bladder; VU: Vesico Uterinepouch: VV: Vesico Vaginal septum; CM: Middle Compartment; U: Uterus, CP: Posterior Compartment; R: Rectum; V: Posterior vaginal fornix; RV: Recto vaginal septum; C: Retrocervical area; P: Peritoneum; RU: Recto Uterine pouch. Anatomical locations of deep pelvic endometriosis, compartments, MR T2-weighted.

CASE PRESENTATION

A 37-year-old woman with previous history of ovarian surgery in a different country attended the Emergency Department with abdominal and lumbar pain, and fever. Blood analysis only showed an increase C-reactive protein (CRP). An abdominal ultrasound scan showed advanced (grade 3) right hydronephrosis without revealing the cause (Figure 2a). Computed tomography (CT) (Figure 2b) showed an anatomic distortion of pelvic structures, with a mass located on the right, close to the uterus, with irregular boundaries. The mass affected the right uterus-sacral ligament, occupying the recto-uterine space with extension to rectal wall. There was a minimum amount of free fluid, as well as peritoneal thickening and lymphadenopathies at the right iliac, obturator and interaortocaval space. The mass also originated right ureteral entrapment with retrograde dilation, causing the ureteral hydronephrosis. Endometriosis with ovarian affectation, deep endometriosis and post-operative fibrosis were suspected. A double J was placed to resolve the ureteral hydronephrosis. In the MR study, a right adnexal parauterine mass was identified with hemorrhagic foci, some of them with shading effect (Figure 3a,3b). There were also hemorrhagic foci on the right

uterosacral ligament, hyper intense on T1 weighted images with fat suppression (Figure 3c,3d), located within an irregular complex mass, predominantly solid, with a fibrous component, hypo intense on T2 weighted images, which trapped the ureter.

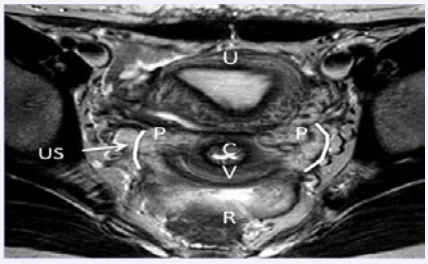

Figure 1b Transverse plane; P: Parametrium (curved lines); US: Uterosacral ligaments (arrow); U: Uterus; C: Cervix; V: Vagina; R: Rectum.

Table 1: Anatomical locations of deep pelvic endometriosis.

COMPARTMENTS	ANTERIOR	MIDDLE	POSTERIOR
	Vesicouterine pouch	Uterus	Rectovaginal pouch
	Vesicovaginal septum	Ovaries	Retro cervical area
	Bladder	Fallopian tubes	Uterosacral ligaments
	Ureters	Uterine Ligaments	Posterior vaginal fornix
			Rectovaginal septum
			Rectum

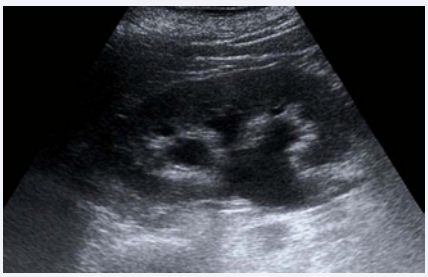

Figure 2a Tran abdominal ultrasound image of the right kidney which demonstrates moderate hydronephrosis.

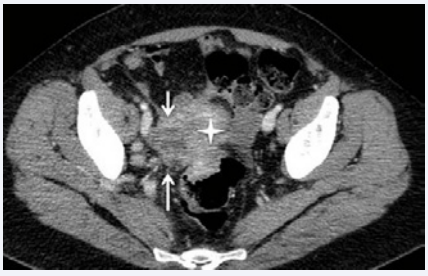

Figure 2b CT after contrast administration, pelvic imaging, parauterine sample mass [arrows] with utero-rectal and parametrial affectation, responsible for the hydronephrosis by ureteral entrapment, Uterus (Star).

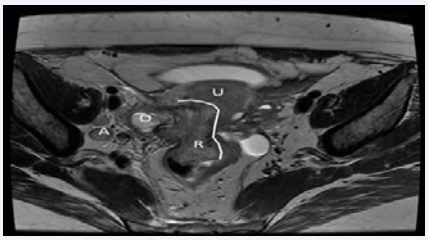

Figure 3a Irregular solid mass (defined by the line), invades uterus [U], rectum [R], it affects mesorectal fascia and includes right ovary [O]. It corresponds to an extensive affectation by deep endometriosis. In this ovarian, a small endometrioma with shading is appreciated [A] Iliac adenopaties.
MR, transverse planes, a&bT2-weighted image; c&d T1-weighted image with fat suppression.

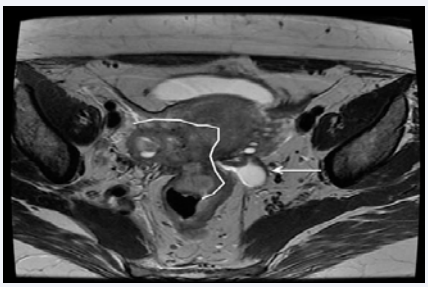

Figure 3b The mass described in (Figure 3a) [line] and left utero sacral affectation is identified with image pseudo cyst [arrow].

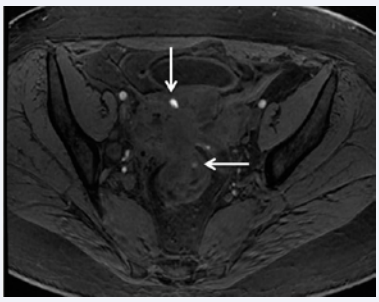

Figure 3c In the anterior margin of the implant and in rectal affectation [arrows].

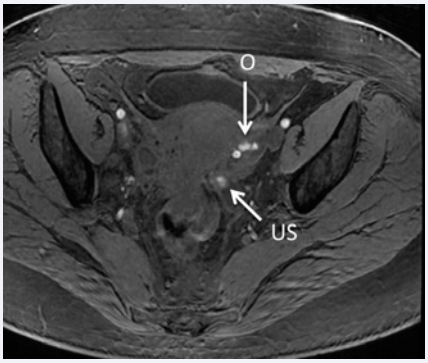

Figure 3d Endometriomas in left ovary [O, arrow] and hemorrhagic focus on left uterosacral ligament [US, arrow].

The right uterosacral affectation extended to the mesorectal fascia. There was also a left uterus sacral affectation and a small fluid collection (pseudo cyst). The anterior compartment of the bladder was affected with a nodule on its anterior wall (Figure 4a).

The extensive affectation in posterior compartment is noticed, with implant invading the serosa and the posterior wall of the uterus, as well as a rectosigmoid, indicative of deep invasive endometriosis (Figure 4b). In the intestinal segment, an anterior parietal fibrous mass affection was appreciated, 4cm in length, displacing the mucosa (mushroom cap sign) and causing stenosis of the light. Caudally to this area, there is occupation of the bottom of the posterior pouch, uterus-rectal. The existence of numerous iliac lymph nodes in chains was significant, predominantly on the right (Figure 4c), as well as retroperitoneal located, inter-aortocaval and left paraaortic and infrarenal. Additionally, an alteration of myometrium diffuse signal by adenomyosis was appreciated, with poor delineation of the endometrial cavity and Nabothian Cyst (Figure 4d). Final imaging report included deep endometriosis affecting structures of the front (right ureter and bladder), medium (uterus, ovaries) and posterior compartments (uterosacral ligaments, bottom of utero -rectal pouch, recto sigmoid intestinal wall and retro cervical area). Barium enema was performed (Figure 5a) to confirm the existence of recto sigmoid stenosis together with colonoscopy (Figure 5b). Biopsies were taken for histological confirmation. The patient underwent surgery, performed both by gynecology and coloproctology specialists, with hysterectomy, a double adnexetomy, rectosigmoidectomy and appendectomy. Surgical findings and pathology analysis confirm the MR findings, with per ovarian and peritubal endometriosis foci showing marked fibrosis and adhesions, adenomyosis and hemorrhagic invasive endometriosis in the posterior wall, serosa and parametrium.

DISCUSSION

Our case represents an example of deep endometriosis and MR assessment of the whole pelvis with simultaneous tissue characterization (fibrous, scarring, glandular, bleeding), providing a map of distribution for proper surgical planning [2]. Since laparoscopy, reference standard for the diagnosis of endometriosis, provides limited information on the sub peritoneal extent and presence of endometriotic lesions in areas hidden by adhesions, RM imaging is very useful in staging endometriosis. MR allows a wider vision of the pelvis and is more accurate for the global diagnosis of deep pelvic endometriosis than transvaginal sonography, endorectal sonography and rectal endoscopic sonography [3]. It is important to make a systematic reading assessing each of the structures that may be affected in the front, middle and posterior anatomical compartments [4]. Deep pelvic endometriosis is a diagnostic challenge because

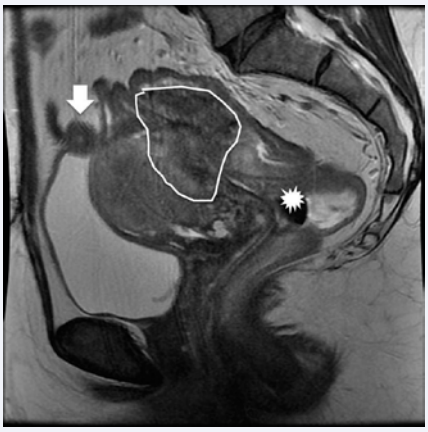

Figure 4a Solid invasive endometriosis; Invasion of serosal surface of the uterus and obliteration of the cul-de-sac e invasion rectal [circle]; Retro cervical obliteration space [star]. MR Imaging T2-weighted, Sagittal planes, Bladder affectation, Well defined, Low signal intensity bladder wall nodule [thick arrow].

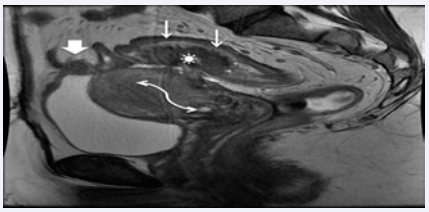

Figure 4b Rectal extra luminal mass, solid invasive endometriosis, Mushroom cap sign, represents the low signal intensity core of fibrotic endometriois and hypertrophic muscular propia [star], capped by high signal intensity mucosa [straight arrows].
It is seen in uterus a loss of definition of the joint area, with impaired myometrial signal caused by adenomyosis. Naboth cyst in cérvix [curved arrows].

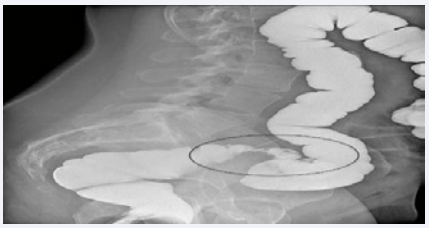

Figure 5a Lateral image from a barium examination which shows circumferential narrowing of the rectosigmoid [circle], with mass effect and spiculations of the anterior margin.

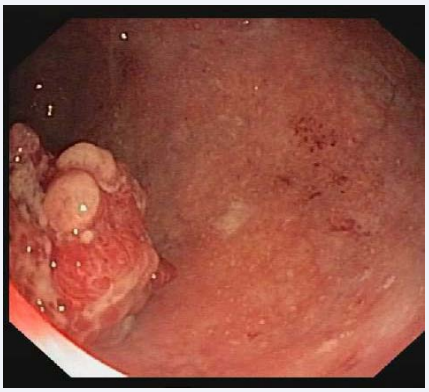

Figure 5b Colonoscopy, vegetating and polilobulated lesion located 14cm away from the anal margin. Erythematous mucosal areas are seen between 18 and 10 cm from the anal margin, with small shallow ulcers covered by fibrin.

the solid masses can be easily overlooked [5].This form of endometriosis is composed of fibro muscular hyperplasia surrounding scant endometrial glands. The lesion often has poorly defined margins and T2 signal hypo intensity as a result of fibrosis. The presence of sub centimeter foci with T2 hyper intensity representing ectopic endometrial glands within these infiltrating fibrotic masses may help establish the diagnosis. On T1-weighted imaging, the fibrotic masses demonstrate intermediate signal intensity, and the endometrial glands may have high or low signal intensity depending on the presence or absence of hemorrhage. Blood presence (hiper intensity T1 fat suppressed) also helps diagnosis, although unfortunately high T1 signal intensity is not very frequent to be found, perhaps because surrounding fibrosis and smooth muscle hypertrophy minimize cyclical bleeding within the ectopical endometrial glands. The inflammatory response results in distorsion of normal pelvic anatomy and adhesion formation, as it happens in our particular case. Endometriosis is affecting as many as 10% premenopausal women. Of its three forms of presentation: superficial (peritoneal), ovarian (endometriomata) and deep endometriosis, it is the latter that most often causes pain (pelvic pain, dysmenorrhea, dyspareunia, dyschezia and urinary symptoms) and is associated with infertility. It is estimated that 20% of infertile women have endometriosis and that up to 50% of women with endometriosis are infertile [6]. As for the affected structures, the uterosacral ligaments are the most common location on MR appears as T2 hypo intense thickening or nodular. Our case has marked affectation of the right one. The rectosigmoid colon is the intestinal segment most commonly involved. A highly specific MR feature in this affectation is the "mushroom cup" sign (showed in imaging). On T2-weighted imaging, low signal intensity is seen at the base of the mushroom, attributed to hypertrophy and fibrosis of the muscularispropia. The high signal intensity cap represents the mucosa and sub mucosa, which are displaced into the bowel lumen [5]. The recto uterine pouch is another commonly involved site of deep pelvic endometriosis; it invades the posterior myometrium and can mimic adenomyosis. It is important to remember in order to differentiate the adenomyosis is an "inside-out" process (invading the junctional zone). By contrast, deep invasive endometriosis of the posterior uterus is an "outside-in" process that invades the serosa and myometrium while sparing the uterine junctional zone [5]. Associating endometriosis and adenomyosis is frequent, as in women younger than 36 years there is a 90% prevalence of adenomyosis [7].This pathology, under diagnosed with other diagnostic techniques, has features that allow being accurately diagnosed by magnetic resonance. It is characterized by the presence of ectopic endometrial glands within the myometrium, with surrounding smooth-muscle hyperplasia [8]. MR demonstrates the condition as diffuse or focal thickening of the junctional zone, a T2W low signal intensity layer at the deep myometrium. The main MR finding is the thickening, larger than 12mm, of the joint sub endometrial low signal band, seen in up to 85% of cases. Following the various locations of affectation by deep pelvic endometriosis, when it involves the urinary tract, the bladder is frequently affected, especially the posterior wall (generally with direct extension and obliteration of the vesicouterine pouch). Urinary tract disease may manifest as hydronephrosis caused by ureteral obstruction, intrinsic and extrinsic ureteral affectation may occur. Extrinsic affectation is common (80% of cases) and caused by progressive enclosure of the ureters by endometriotic tissue, as in the case we are presenting. Intrinsic ureteral endometriosis is defined by infiltration of the muscular is of the ureteral wall [9]. The incidence of intrinsic ureteral affectation is underestimated [10]. Remember that the possibility of ureteral affectation must be considered in the presence of large paracervical lesions (2cm or more). It's also important to remember that laparoscopy, which allows visualization of only superficial endometriosis, has a limited value in deep pelvic endometriosis and the main limitation of transvaginal ultrasound is the restricted field. In addition, severe pelvic adhesions and other distortions of the pelvic anatomy may limit transvaginal ultrasound evaluation of pelvic region. For this reason, the study of deep endometriosis should be complemented by MR pelvic imaging, whose protocol of study includes T1 weighting with fat suppression and T2 high resolution, multi planar, to provide a comprehensive evaluation of disease extension. The sensitivity, specificity and accuracy of MR imaging in the diagnosis of endometriosis in specific sites are variable, but for this three parameters at any location, it oscillates between 76 and 99% (2.3). In conclusion, MR imaging demonstrates high accuracy in prediction of deep pelvic endometriosis in specific locations, and accurate preoperative assessment of disease extension is required for planning complete surgical excision [11,12].

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