Endometriosis at the boundary: extrapelvic locations

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Purpose

The spread of the endometriosis localizations out of the uterus are highly distributed and are to be absolutely detected before any invasive treatment [1].

This pathology in many cases is crippling for affected women; in fact symptoms that endometriosis causes, like dysmenorrhoea, dyspareunia, pelvic pain, pain during defecation and infertility are important [2, 3, 4, 5]; but they aren't useful for endometriosis lesions' localization.

So it's very important that endometriosis may be diagnosed as soon as possible and with certainty, because there is the necessity of highest therapeutic efficacy. In this regard it's fundamental the detection of all sites involved by this pathology, superficial, deep, pelvic and extrapelvic sites [6, 7, 8].

In diagnosis and evaluation of different locations and extent of endometriosis MR imaging is a precious means, in particular way for deep endometriosis but also for the detection of extrapelvic endometriosis [9, 10].

In fact there are many atypical sites of endometriosis' foci, less frequent than classical sites analyzed in many studies in literature (pelvic endometriosis) [11, 12, 13, 14], often unrecognized by both the clinician and the radiologist. MR imaging with a specific protocol is the prevalent method to discover all localizations, allowing an accurate detection of every possible site involved by endometriosis [15, 16].

In this study we analyzed these atypical localization that we define like "endometriosis at the boundary".

We have chosen this term because it best describes the detachment from the most frequent endometriosis localizations, that usually are most studied by both the radiologist and the gynaecologist.

Extrapelvic endometriosis is described in all this different district of the human body:

- bladder
- gastrointestinal tract
- perineum
- pleura and lungs
- liver
- next to inguinal hernia
- umbilical scar
- laparothomic or laparoscopic scars
- renal pelvis and ureter
- inguinal and pelvic lymphonodes
Tab I: Presentation's endometriosis symptoms with relation to the implantation's site, summarized in this table.

<table>
<thead>
<tr>
<th>Site</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Reproductive Apparatus</td>
<td>Dysmenorrhoea; Pelvic and Abdominal Pain; Dyspareunia; Infertility; Menstrual Irregularity; Acute Pelvic Pain (ex: broken endometrioma)</td>
</tr>
<tr>
<td>Gastrointestinal Tract</td>
<td>Tenesmus, Cyclic Rectal Bleeding and Diarrhea; Colic Obstruction</td>
</tr>
<tr>
<td>Urinary Apparatus</td>
<td>Cyclic Hematuria and Pain; Ureteral Obstruction</td>
</tr>
<tr>
<td>Surgical Scars and Umbilical Scar</td>
<td>Cyclic Pain and Bleeding</td>
</tr>
<tr>
<td>Lungs</td>
<td>Cyclic Hemoptysis</td>
</tr>
</tbody>
</table>

The majority of our patients had a non-specific symptomatology, that didn't help in the localization of endometriosis' lesions.

In our group of 79 consecutive cases we have analyzed the frequency of the symptomatology with which endometriosis appeared, we have seen that patients most of all complained of pelvic pain and dysmenorrhoea. This two symptoms didn't help in the localization of extrapelvic endometriosis foci.

Tab II: The frequency of the symptoms complained by the group of 79 female patients.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysmenorrhoea</td>
<td>60</td>
</tr>
<tr>
<td>Pelvic Pain</td>
<td>40</td>
</tr>
<tr>
<td>Condition</td>
<td>Count</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Infertility</td>
<td>30</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>30</td>
</tr>
<tr>
<td>Menstrual Irregularity</td>
<td>10</td>
</tr>
<tr>
<td>Cyclic Hematuria/Dysuria</td>
<td>2</td>
</tr>
<tr>
<td>Rectal Bleeding (cyclic)</td>
<td>1</td>
</tr>
<tr>
<td>Pain During Defecation</td>
<td>1</td>
</tr>
</tbody>
</table>

Of particular interest are the endometriosic localizations at abdominal wall. They appear like a mass of respectable size near a surgical scar, like a caesarean scar, or after hysterectomy, appendicectomy, a scar in the laparoscopic trocar passage way, in the puncture sites of amniocentesis and in the episiotomy scars [17, 18].

Subcutaneous endometriosis of the abdominal wall near surgical scars, endometriosis localizations in the renal pelvis and ureter and the ones in the small bowel are really rare [19].

The aim of our study was to evaluate the role of MR imaging in the endometriosis' diagnosis of extrapelvic locations and particularly the ones in the abdominal wall, in the renal pelvis and ureters and in the small bowel, analysing the presence or absence of symptomatology for each localization as a guide for their discover.

**Methods and Materials**

We have studied a consecutive group of 79 women (February 2007- May 2010), interval of age between 25 years and 49 years (mean age 37 years).

**Preparation for MR**

Every patient has done abdominal RM with ultrasound gel in rectum (100ml) and vaginal cavity (25-30 ml) and with ev contrast medium.

The morning of the exam each patient has done a microenema to obtain a complete emptying of the rectal ampulla.

The exam could be conducted in each period of the menstrual cycle except during the menstrual flux's period.
MR technique

The MR exams have been conducted in the Radiology of the General Hospital of the University of Padua with a MR Siemens of 1,5 T.

We obtained sequences Turbo Spin Eco T1W and T2W in the axial and sagittal planes and sequences Turbo Spin Eco T2W in the coronal plane.

Then, after administration of paramagnetic contrast medium ev (Gadolinium 0,5M, dose of 0,2 ml/kg) we obtained sequences Spin Echo T1W, T2W and with fat suppression in the axial, coronal and sagittal planes.

The slices were of 4 mm with a matrix of 384 X 230.

Results

We have studied a group of 79 female patients, with an interval of age between 25 and 49 years.

Everyone has done MR exam that confirmed clinical hypothesis of endometriosis.

We found 10 different sites involved by endometriosis and we analysed the frequency in each site.

The most frequent location was ovary, 47 women presented it, rectovaginal septum was the second one (34 patients), then bowel (29 patients presented this localization, but of this group 27 women had endometriosis’ lesions in the rectosigmoid colon and only 2 of them presented the involvement by endometriosis foci of the small bowel), then uterus (28 patients), then vaginal fornix (18 patients), the bladder was involved in 8 women, in 3 patients there were localizations at the vescicouterine pouch, at the abdominal wall in 3 patients, then in the Fallopian tubes (1 patient) and in the renal pelvis and ureter (1 woman). (Fig. 1)

The abdominal wall was involved only in 3 patients of this group.

1) This localizations is in only one patient in the thickness of the abdominal wall, in the external inguinal hole, the woman didn't complain associated symptomatology, but at palpation it was appreciable a mass in this region (Fig. 2).
2) One patient presented a subcutaneous endometriosis lesion in the trocar passage tract, in fact previously she underwent laparoscopy to remove endometriosis' foci. She didn’t complain associated symptoms (Fig. 3).

3) Another one had endometriosis' localization in the cesarean scar, this patient is the only one of the three who presented involvement of the abdominal wall who complain symptoms. She presented pelvic cyclic pain and spotting during the menstrual cycle (Fig. 4).

The renal pelvis and ureter is another rare endometriosis extrapelvic localization, we found it in only one patient of the group of 79 women analyzed.

At MR we saw dilatation of the caliceal-pyelic level and of the left ureter, with a reduction of the ureter’s diameter before of the bladder’s access (hydronephrosis and hydroureter) (Fig. 5).

The involvement of this site in this patient wasn’t associated with the presence of symptomatology, because she didn't reach acute ureteral obstruction, that causes very intense cholic, intermittent pain often associated with nausea and vomit.

Bowel localizations were present in 29 patients, but only 2 of them had involvement of the small bowel, both complained of pelvic pain, but only one of the two patients presented pain during defecation (Fig. 6).

Tabella II: Correlation between sites involved by endometriosis and symptomatology.

<table>
<thead>
<tr>
<th>Extrapelvic Sites</th>
<th>Symptoms related to the sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal Wall (3 PAZ)</td>
<td>External Hole</td>
</tr>
<tr>
<td></td>
<td>Inguinal Hole</td>
</tr>
<tr>
<td></td>
<td>Trocar Passage-Way</td>
</tr>
<tr>
<td></td>
<td>Cesarean Scar</td>
</tr>
<tr>
<td></td>
<td>No Symptom</td>
</tr>
<tr>
<td></td>
<td>· Cyclic Pelvic Pain</td>
</tr>
</tbody>
</table>

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All the 6 patients analyzed had also other multiple locations.

The attention that is not focused by the symptomatology obliges to a careful exam, not analyzing only the most common sites involved by endometriosis, like the superficial and deep pelvic ones, but focusing in every possible sites.

In fact endometriosis' lesions in the bowel or in ureters must be rapidly treated, because sometimes they are silent until obstruction.

So RM play a fundamental role, it's the only one imaging method, because the symptomatology sometimes doesn't help in diagnosis.

Images for this section:

**Fig. 1:** Sites involved by endometriosis and its frequency in each site.
**Fig. 2:** Extended endometriosis' localization at right inguinal hole (arrow) without bulging of the outer skin profile, even if a mass was found at palpation, no pain was present.

**Fig. 3:** A very small endometriosis' localization with high signal is present in the subcutaneous abdominal wall (arrow), visible in the right T1W image with fat suppression. It is in the site of a previous transmural passage-way of the laparoscopic trocar. This localization was confirmed by histology.
**Fig. 4:** In the site of a previous cesarean section there is the subsequent development of an endometriosis' localization (arrows). It appears with high signal, due to the hemorrhagic component, surrounded by thick fibrotic tissue.

**Fig. 5:** Involvement of the left ureter, with a reduction of his diameter before of the bladder's access (arrows), causing hydrenephrosis and hydroureter.
Fig. 6: The wall of the small bowel is involved by a large mass, that presents disomogeneous and high signal (arrow). This mass is protruding into the intestinal lumen.
Conclusion

The endometriosis localizations at abdominal wall, in the renal pelvis and ureters, and in the small bowel, at the contrary of what we can think are not always associated with characteristic symptoms, in the majority of cases the women who presented this localizations are without symptoms.

In our study we also obtain the confirmation of the link between surgical scars and endometriosis, but not only, we also found out that endometriosis' lesions could be detected also in the inguinal region, at the inguinal external hole.

MR imaging is a valid approach in the diagnosis and detection of endometriosis' lesions in each district of the human body, not limiting to the detection of most common sites involved by this pathology, but analyzing every possible sites involved.

Summarizing, to obtain a complete localization of all endometriosis' lesions the MR study must be carefully analyzed not only in the possible abdominal locations but even in extraabdominal sites, and chiefly in : abdominal wall, retroperitoneal compartment, and along previous surgical traces. In other words the pelvic study need to be enlarged to the total abdominal and external sites. The learning message is for alternative diagnostic methods, like entire intestine and US studies. The only alternative radiologic method could be the MSCT which otherwise is to leave out for the incomplete marking of the small endometriotic locations that could be easily detected by the high signal of MR study.

References


Personal Information