Best Practice & Research Clinical Obstetrics and Gynaecology 28 (2014) 655–681

Contents lists available at ScienceDirect

Best Practice & Research Clinical Obstetrics and Gynaecology

journal homepage: www.elsevier.com/locate/bpobgyn

3

Imaging for the evaluation of endometriosis and adenomyosis

Caterina Exacoustos [a,*], Lucia Manganaro [b], Errico Zupi [c]

[a] Department of Biomedicine and Prevention Obstetrics and Gynecological Clinic, University of Rome 'Tor Vergata', Italy
[b] Department of Radiological, Oncological and Pathological Sciences, University of Rome 'Sapienza' Italy
[c] Department of Molecular and Developmental Medicine, University of Siena, Italy

Keywords:
endometrioma
deep infiltrating endometriosis
pouch of Douglas obliteration
pelvic adhesions
adenomyosis
junctional zone

Endometriosis affects between 5 and 45% of women in reproductive age, is associated with significant morbidity, and constitutes a major public health concern. The correct diagnosis is fundamental in defining the best treatment strategy for endometriosis. Therefore, non-invasive methods are required to obtain accurate diagnoses of the location and extent of endometriotic lesions. Transvaginal sonography and magnetic resonance imaging are used most frequently to identify and characterise lesions in endometriosis. Subjective impression by an experienced sonologist for identifying endometriomas by ultrasound showed a high accuracy. Adhesions can be evaluated by real-time dynamic transvaginal sonography, using the sliding sign technique, to determine whether the uterus and ovaries glide freely over the posterior and anterior organs and tissues. Diagnosis is difficult when ovarian endometriomas are absent and endometriosis causes adhesions and deep infiltrating nodules in the pelvic organs. Magnetic resonance imaging seems to be useful in diagnosing all locations of endometriosis, and its diagnostic accuracy is similar to those obtained using ultrasound. Transvaginal ultrasound has been proposed as first line-line imaging technique because it is well accepted and widely available. The main limitation of ultrasound concerns lesions located above the rectosigmoid junction owing to the limited field-of-view of the transvaginal approach and low accuracy in detecting upper bowel

* Corresponding author. Universitá degli Studi di Roma 'Tor Vergata', Department of Biomedicine and Prevention, Obstetrics and Gynecological Clinic, Ospedale Generale S. Giovanni Calibita , Fatebenefratelli, Isola Tiberina 1, 00186 Roma, Italy. Tel.: +39 06 6837416, +39 335 8303967.
E-mail address: caterinaexacoustos@tiscali.it.

http://dx.doi.org/10.1016/j.bpobgyn.2014.04.010

lesions by transabdominal ultrasound. A detailed non-invasive diagnosis of the extension in the pelvis of endometriosis can facilitate the choice of a safe and adequate surgical or medical treatment.

Introduction

Endometriosis is estimated to affect between 5% and 45% of women of reproductive age, is associated with significant morbidity, and constitutes a major public health concern [1,2]. Symptoms of women with pelvic endometriosis are chronic pelvic pain, dysmenorrhoea, dyspareunia, dyschezia, urinary symptoms, and infertility. [3]

Three different forms of endometriosis exist: ovarian endometriosis (endometrioma), peritoneal endometriosis and adhesions, and deep endometriosis. Pelvic endometriosis, especially in severe stages, is strongly associated with adenomyosis, which plays an important role in causing dysmenorrhoea, menorrhagia, and infertility in women with endometriosis.

Ovarian lesions are the most frequent localisation of endometriotic tissue, causing typical ovarian cysts. Deep infiltrating endometriosis (DIE) is defined as an endometriotic lesion infiltrating the peritoneum and penetrating into the retroperitoneal space or the wall of the pelvic organs to a depth of at least 5 mm [4], and affects between 4 and 37% of women with endometriosis. These different forms of presentation are likely to have different imaging patterns, which may cause specific imaging diagnostic problems. Several systems scores have been used to stage the extension of endometriosis in relation to different locations inside the pelvis. The most common system used to evaluate the disease is the revised classification system of the American Society of Reproductive Medicine (rASRM), which followed the American Fertility Society (AFS) score [5]. As with other systems, this classification does not consider adenomyosis as part of the disease, which remains after surgical treatment of extrauterine lesions, with persistence of symptoms related to pelvic endometriosis.

The interval between the onset of first symptoms and clinical diagnosis of endometriosis is about 7–10 years [6]. The main diagnostic problems for endometriosis are the detection of the disease, especially in the absence of an endometriotic cyst or in the case of minimal lesions, and also the evaluation of the extent of the disease. The patient's history and symptoms, a pelvic examination, along with the experience of the sonographer or radiologist, could improve diagnostic accuracy in the diagnosis of pelvic endometriosis.

The correct diagnosis is fundamental to defining the best treatment strategy for endometriosis; therefore, non-invasive methods are required to obtain accurate diagnoses of the location and extent of endometriotic lesions. Two imaging modalities are used most frequently to identify and characterise lesions in endometriosis: transvaginal sonography and magnetic resonance imaging.

Transvaginal ultrasonography has been proposed as the first line-line imaging technique because it allows extensive exploration of the pelvis; it is well accepted and widely available.

Magnetic resonance imaging (MRI) is used as a second-line of investigation in the study of the female pelvis. The role of MRI in the evaluation of endometriosis, especially DIE, has been widely demonstrated. MRI is carried out in selected women according to the outcome of transvaginal ultrasound imaging and the severity of symptoms. Many investigators have studied the role of MRI in the evaluation of deep implants located in the anterior compartment, recto-vaginal septum, posterior vaginal fornix, and bowel wall, especially for the lesions located above the rectosigmoid junction.

Other diagnostic procedures, such as rectal sonography, barium enema, or computed tomography urography play complementary roles in the identification of endometriosis, depending on the site affected, and could be useful in the choice of surgical approach. Transabdominal ultrasound is not accurate in detecting endometriosis, mainly because of bowel gas and adhesions that may reduce the ability to evaluate the pelvic organs. In particular, DIE mostly has retroperitoneal or bowel lesions, which are difficult to see with transabdominal ultrasound probes [7].

A detailed non-invasive examination of the pelvis to assess the extension of the endometriosic lesions can facilitate the choice of a safe and adequate surgical or medical strategy [4].