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## Chronic pelvic pain: An imaging approach



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### KEYWORDS

Chronic pelvic pain;  
Endometriosis;  
Deep infiltrating  
endometriosis;  
Pelvic congestion  
syndrome

**Abstract** Chronic pelvic pain is defined as disabling pain of at least six months duration. Chronic pelvic pain has often multiple causative factors. Careful analysis of clinical history and detailed clinical examination must be carried out to guide further imaging investigations. Endometriosis is a common cause of chronic pelvic pain, although there is no correlation between the severity of lesions and pain intensity. Pelvic ultrasonography should be the first line imaging examination to search for causative conditions that include endometriosis, adenomyosis, pelvic varices and chronic infection. Magnetic resonance imaging (MRI) is useful for making the positive diagnosis and assessing the spread of endometriosis. MRI is more accurate than ultrasonography for the diagnosis of tubo-ovarian abscess when an adnexal mass is identified. Duplex and color Doppler ultrasonography as well as MR angiography are the best imaging technique for the diagnosis of pelvic congestion syndrome. In patients with pudendal neuralgia, cross-sectional imaging help exclude nerve compression.

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Chronic pelvic pain (CPP) has several definitions in the literature, but the most acknowledged one is a pain of a duration of six months or more located to the pelvis, which is non-cyclical, not relieved by standard pain medication and severe enough to generate functional disability [1,2]. CPP represents a diagnostic and therapeutic challenge. The intensity of the pain must be assessed by means of specific evaluation tools, in particular visual analogue scales and digital versions [3].

CPP has multiple possible causes. A careful analysis of patient history covering symptoms of the gastrointestinal, gynecological, and urinary systems as well as muscle, bone and joint symptoms must guide the clinical examination and further diagnostic investigations.

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Psychogenic pain must be a diagnosis of exclusion. Since etiologies are variable and can be combined, it is sometimes challenging to manage this symptom that is hard to tolerate for patients, often frustrating for clinicians, and above all very costly for society.

CPP is a frequent reason for attending a gynecologist by between 10 and 40% of patients [4] and it is thought to be behind around 40% of laparoscopies and 15% of hysterectomies [5]. According to Neis et al., a third of cases of CPP are due to endometriosis and a third to adhesions [6]. Pelvic ultrasonography is the first imaging examination that should be performed. Any of the pelvic structures can give rise to CPP.

This article covers endometriosis, adenomyosis, chronic pelvic infections, adhesions, pelvic congestion syndrome, and pudendal neuralgia, which are the major causes of CPP and highlights the role of imaging in the diagnostic approach.

## Pelvic endometriosis

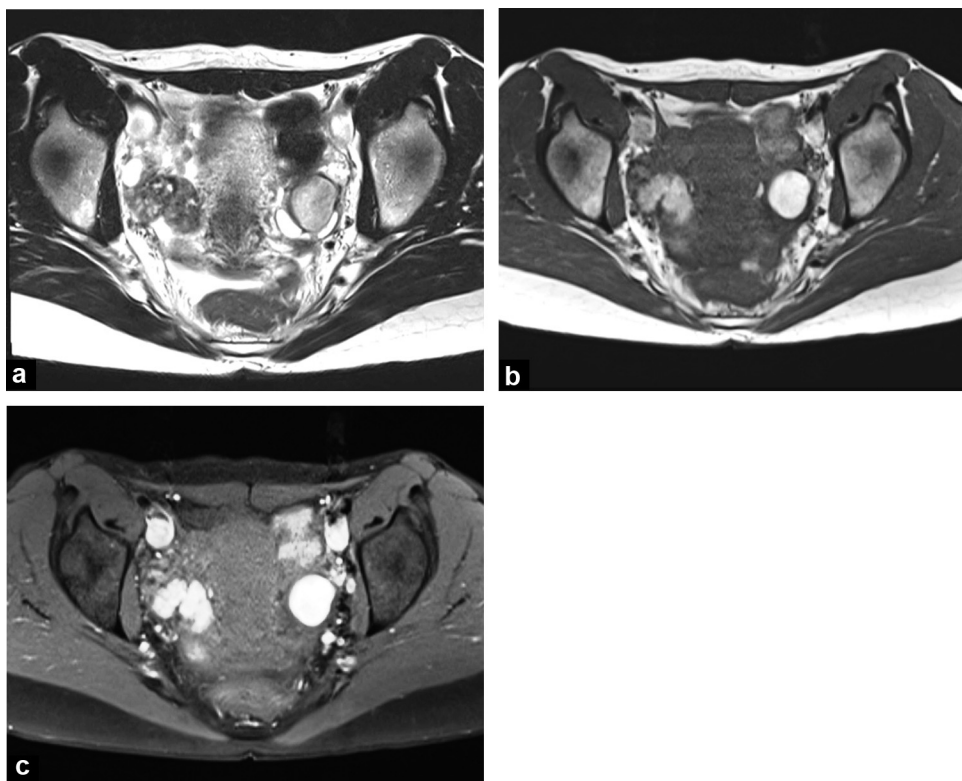
Endometriosis is defined by the presence of functional endometrial tissue (glands or stroma) outside the uterus. Three types of localization have been described including ovarian endometriosis (cystic), superficial peritoneal endometriosis, and deep proliferative endometriosis.

Pelvic endometriosis lesions are found during laparoscopy in one-third of women with CPP [7]. However, 25% of women with histologically demonstrated endometriosis are asymptomatic. The pains associated with endometriosis are CPP, dysmenorrhea, dyspareunia, dysuria, and dyschezia. It is

now recognized that a number of mechanisms are at the root of these pains, with the intervention of inflammatory mediators (production of pro-inflammatory and pro-angiogenic cytokines), and involvement of the central and peripheral nervous systems, and the proprioception system [8]. The secretion of nerve growth factor and vascular endothelial growth factor is also thought to play a role in generating the pain of endometriosis. Repeated microbleeds within deep endometriosis lesions, and the development of autonomic innervation within these lesions, can sometimes explain the discordance between substantial pain and lesions that are macroscopically relatively small. There is no association between the macroscopic severity of lesions and symptoms of pain [9].

## Ovarian endometriosis

An ovarian endometrial cyst or endometrioma is a hemorrhagic collection. When isolated it is often accompanied by only mild pain. In its typical form on ultrasonography it is homogenous and isoechoic (homogenous fine stippling) sometimes with pseudoseptations or clots. Differential diagnoses of other types of cyst may sometimes be put forward (functional hemorrhagic cyst, dermoid cyst etc.). The presentation can be multiple or bilateral, as is seen in between 30 and 50% of cases [10]. On MRI, endometrioma usually has high signal intensity on T1-weighted images, higher than or equal to that of the subcutaneous fat, and the signal persists on fat-suppressed sequences, by contrast to dermoid cysts (Fig. 1). On T2-weighted images there is an intermediate signal (shading sign), sometimes with a fluid-fluid level [11].



**Figure 1.** Endometrioma of the left ovary on MRI. Intermediate signal intensity on T2-weighted MR image (shading) (a), high signal intensity on T1-weighted images without (b) and with fat saturation (c).

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