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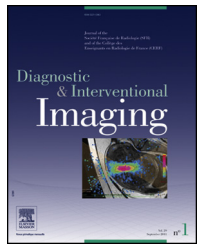

PICTORIAL REVIEW /*Oncology*

MR imaging of pelvic extraperitoneal masses: A diagnostic approach

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Abstract Pelvic extraperitoneal pelvic masses are relatively uncommon conditions and generally raise diagnostic imaging challenges. Magnetic resonance (MR) imaging plays a central role in the diagnosis of these masses due to its unique tissue-specific multiplanar capabilities that allow optimal pelvic mass localization and internal characterization. This article reviews the MR imaging presentation of extraperitoneal pelvic masses, gives clues that allow identifying their extraperitoneal and/or specific origin as well as suggests different steps for narrowing the differential diagnosis. These steps include systematic analysis of the clinical context, tumor location, relationships with major pelvic structures and close study of the internal components of the lesions.

Masses of the pelvic extraperitoneal space are rare but include a broad spectrum of benign and malignant conditions arising from different pelvic components, with various clinical presentations. Reaching a definite diagnosis is often challenging for radiologists but may be possible through a systematic analysis of the clinical context, tumor location, relationships

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with major pelvic structures and internal components. Some histological components such as cystic, myxoid stroma, collagen fibers, calcification, and fat have suggestive or even pathognomonic features on magnetic resonance (MR) imaging. In addition, the patterns of enhancement after intravenous administration (IV) of a gadolinium chelate can reflect the vascularity of masses and may be also useful for the diagnosis, especially for differentiating benign from malignant soft-tissue masses.

The goals of this article were to review the different MR imaging presentation of extraperitoneal pelvic masses, give clues allowing identification of their extraperitoneal and/or specific origin as well as suggest different steps for narrowing the differential diagnosis.

Clinical background

Knowledge of the clinical context and analysis of all possible existing distant or local abnormalities are crucial when facing an extraperitoneal pelvic abnormality (Figs. 1 and 2). Pelvic extraperitoneal masses may indeed be part of a more diffuse disease process, including tumoral, infectious or inflammatory conditions. In this regard, retroperitoneal pelvic abscess that may complicate Crohn disease or diverticulitis of the sigmoid colon is easily diagnosed on the basis of clinical signs of infection and specific imaging features. Similarly, the diagnosis of a subperitoneal rectal nodule of endometriosis is generally not a challenge as it is generally associated with suggestive clinical presentation in a woman of reproductive age, retractile involvement of torus uterinum that is hypointense and of uterosacral ligaments.

Mass localization

The pelvis is divided into the extraperitoneal/subperitoneal space and the intraperitoneal space, which are separated from each other by the anterior peritoneal reflection line. The anterior peritoneal reflection line is thus important to identify and is easily recognized on T2-weighted MR images in a midsagittal plane as a thin hypointense line of 1-mm or less in thickness (Fig. 3). Gollub and al. have reported that this line can be identified in 74.4% of patients on MR imaging of the pelvis [1]. The tip of the seminal vesicles in men and the uterocervical angle in women were constant landmarks to determine the location of the most inferior point of the peritoneal membrane [1]. The reasons for difficulty in identifying the anterior peritoneal reflection line included

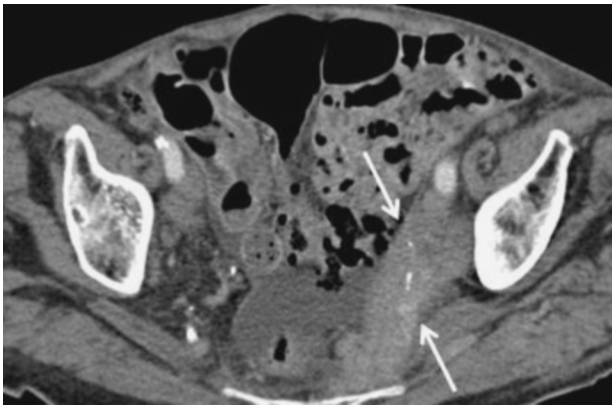

Figure 1. Ninety-year-old woman followed up for lymphocytic lymphoma. Axial contrast-enhanced CT image shows dense, mildly enhancing infiltration of the left side of lateral presacral space (arrows) involving the left iliac internal pedicle. This infiltration is easily related to lymphomatous extraperitoneal pelvic involvement, in the medical context of this patient.

Figure 2. Axial contrast-enhanced CT image in a 42-year-old man with acute pancreatitis shows extraperitoneal large necrotic collections (arrows) that are related to the acute condition.

Figure 3. Anterior peritoneal reflection line identified on sagittal T2-weighted MR image (TR = 3060 ms, TE = 96 ms) in a 40-year-old woman from the level of the posterior vaginal recess, with an insertion on the anterior aspect of the upper part of the mid-rectum. In women, the anterior peritoneal reflection line (dotted arrow) is located approximately 1 cm below and behind the insertion of the posterior vaginal fornix (arrowhead) and courses along the mesorectal fat (arrows).