

76. Ovarian Pathology

Functional follicular ovarian cysts are common, benign entities, typically appearing as unilocular, thin-walled lesions with fluid-like SI (Fig. 76.1, axial T2WI). Nonfunctional cystic lesions are differential considerations, but since cystic neoplasia may appear similar, a newly-diagnosed follicular cyst measuring over 30 mm should be reassessed by ultrasound in 6 weeks. Follicular cyst walls enhance less avidly than those of corpus luteum cysts. The wall of the latter is also typically thicker, as illustrated in the coronal T2WI of Fig. 76.2A (white arrow), with the (B) CE T1WI demonstrating avid wall enhancement. Hemorrhagic corpus luteum cysts are common and are illustrated in Fig. 76.2C,D as high and low SI on axial (C, white arrow) T1 and (D) T2WI, respectively. Multiple bilateral cysts are seen in polycystic ovarian syndrome (PCOS) and ovarian hyperstimulation syndrome. In polycystic ovarian syndrome, such cysts are by definition under 10 mm, peripheral, and subcapsular adjacent to prominent low SI central stroma. In ovarian hyperstimulation syndrome the cysts can be larger and non-peripheral. With the latter, ascites and pleural effusions are possible, as well as the risk of the torsion increases.

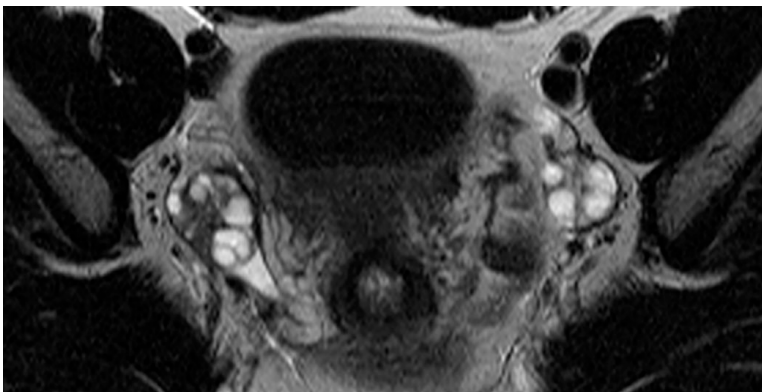


Fig. 76.1

Teratomas may possess a cystic component. A dermoid (i.e. mature cystic teratoma) often contains prominent ectoderm which secretes fatty sebaceous material. A solid non-enhancing protuberance (i.e. the Rokitansky or dermoid plug) containing fat, hair, bone, or teeth is often present. (A) Coronal and (B) axial T1WI in Fig. 76.3 illustrate a heterogeneously appearing cystic mass with prominent high SI components. Such hyperintensity is seen in hemorrhagic cysts and endometriomas, but SI loss on (C) spectrally fat suppressed T2WI confirms the presence of a dermoid. Fat suppression with STIR is nonspecific (i.e. all protons with short T1 are suppressed) and cannot make the above distinction. Microscopic fat content may be undetectable with spectral saturation and

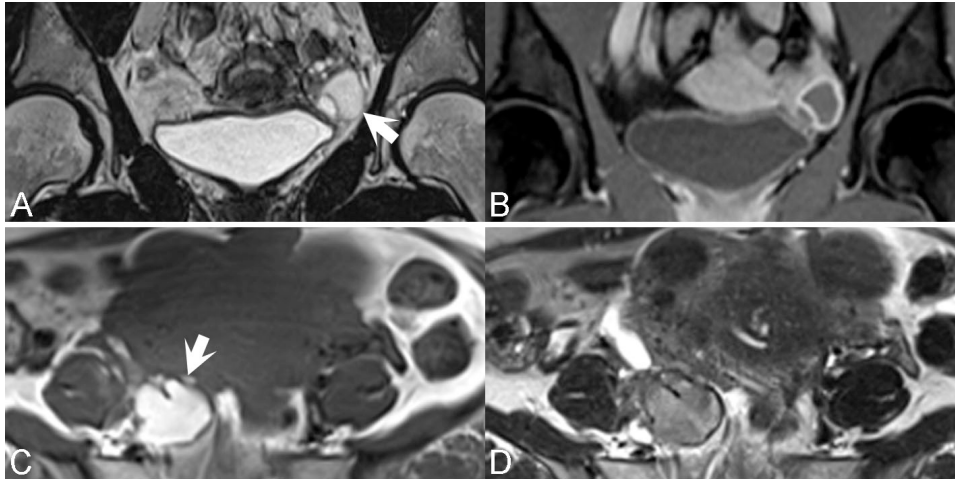


Fig. 76.2

be better identified by SI dropout on out of phase GRE T1WI. Enhancing, solid components favor a malignant, immature teratoma. Dermoid cysts predispose to ovarian torsion, initially manifest as edema-like stromal SI but varying in appearance with time due to necrosis and hemorrhage. Non-enhancement on CE T1WI is specific for ovarian infarction, but not sensitive for torsion given the dual ovarian blood supply. Other findings include ipsilateral uterine deviation, ascites, and engorged ovarian vasculature. Endometriomas, hyperintense on T1WI, are present bilaterally in the axial T1WI of Fig. 76.4A. The more specific appearance is that of the (B) left sided lesion in the T2WI, illustrating the 'shading sign', seen as either complete loss of signal intensity or as in this case dependent layering. Endometrial fibrotic plaque—low SI on T2WI (sometimes containing inner lesional T2 and T1 fat saturated hyperintense microcysts)—in characteristic locations (i.e. in the cul-de-sac, uterosacral ligaments or bowel) also suggests endometriosis. The low SI of fibroma-spectrum neoplasms (fibroma, thecoma and fibrothecoma) is specific for benignity. Such lesions may be associated with ascites and pleural effusions in Meigs syndrome. Delayed enhancement is common. Edema in large lesions increases SI on T2WI, while fat content is greater with lesions with a greater thecoma component.

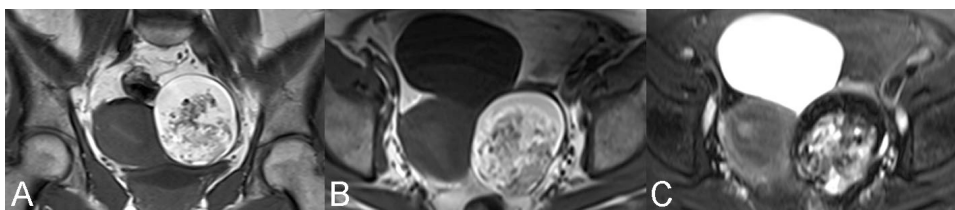


Fig. 76.3

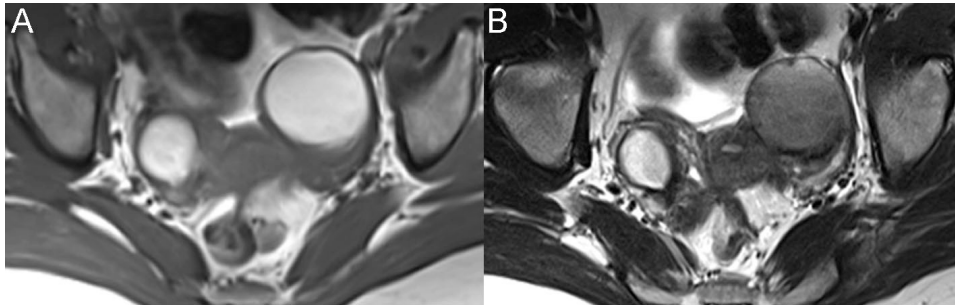


Fig. 76.4

Figure 76.5 presents (A) axial and (B) sagittal T2WI from a 41 year old woman with severe endometriosis (AFS IV). In (A), T2 shading (black *) is noted in the endometrioma on the left, with T2 hypointense deep infiltrative endometriosis in upper rectovaginal septum / caul-de-sac (arrow). In (B), stenosing rectosigmoidal intrainestinal deep infiltrating endometriosis (arrow) is seen, together with a thickened adenomyotic uterine posterior wall (white *).

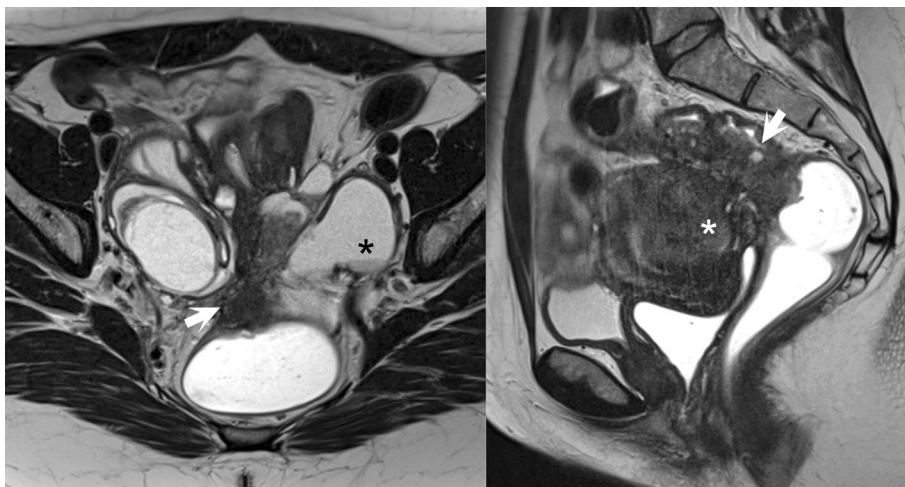


Fig. 76.5

Mucinous and serous cystadenomas are frequently confused for metastatic lesions on MR. Mucinous cystadenomas are larger, more likely to be benign, commonly multiloculated, and demonstrate a high and low SI appearance on T1 and T2WI, respectively, due to mucinous content. A fluid-like SI is more typical of serous lesions, as illustrated in Fig. 76.6. Portions of this lesion's wall and septa are, however, thickened (> 3 mm) on (A) axial and (B) sagittal T2WI—findings concerning for a malignant ovarian neoplasm. (C) Sagittal T1WI illustrate a hyperintense focus of hemorrhage within this cystic malignancy. Further suggestive characteristics include an enhancing solid component—as opposed to nonenhancing debris or clot—or papillary projections. Contrast enhanced time intensity

curves and diffusion restriction can be helpful to further differentiate between benign and malignant ovarian lesions. Necrosis, appearing as a non-enhancing focus on CE T1WI, is concerning as are ascites and peritoneal metastases. Ovarian cancer is staged based upon whether disease is contained to the ovaries (Stage 1) or the pelvis (Stage 2) or whether there are retro- or extra-pelvic intraperitoneal (Stage 3) or distant (Stage 4) metastases. Ovarian carcinoma commonly metastasizes by peritoneal implantation—lesions readily-identified on CE T1WI if greater than 1 cm in size. Direct lymphatic spread to the retroperitoneal space and renal hilum is also common. Metastatic lesions enhance and are heterogeneous on T2WI, whereas bilateral lesions and those of lower SI on T2WI are more suggestive of metastatic gastrointestinal cancer (i.e. Krukenberg tumor). Whole body diffusion weighted MRI (WB-DW/MRI) has been recently shown to be superior in staging accuracy, which is crucial for deciding the optimal treatment strategy.

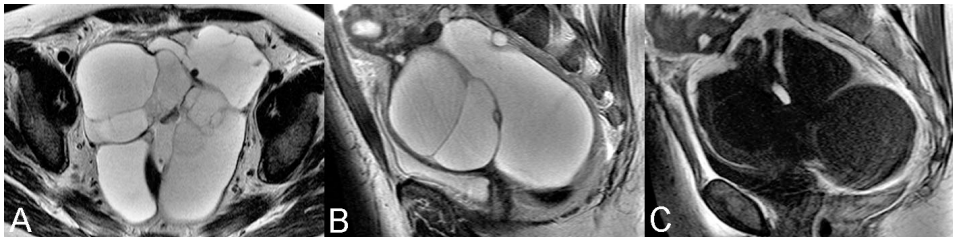


Fig. 76.6