

## MRI of the adnexa : Lesion characterization

Patricia Noël, md, FRCPC.

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Adnexal lesions are common both in pre- and post-menopausal women. There is in the US a 5 to 10% lifetime risk for a woman to undergo surgery for this indication (1). Most of these lesions are benign. Although transvaginal US remains the primary imaging modality for both detection and characterization, MRI with IV contrast administration has been determined the second most useful modality for characterization and management decision, providing the highest post-test probability of ovarian cancer when compared with CT, Doppler US and MRI without IV contrast (2). Contrast-enhanced MRI has shown a sensitivity of 100% and a specificity of 94%, in the diagnosis of malignancy, when prospectively evaluating an indeterminate adnexal mass found on US (3).

MRI is also useful to definitely diagnose several common benign adnexal lesions. This has the potential to avoid an unnecessary surgery. It can also state if the lesion is indeterminate or clearly malignant, allowing to properly refer the patient to surgery, in a specialized center if necessary.

The cystic lesions that can be clearly categorized as benign are extra-ovarian lesions such as peritoneal pseudocysts, spinal meningeal cysts, hydrosalpinges, and several simple looking para-ovarian and paratubal cysts. In these cases, the identification of a normal ovary distinct from the lesion allows the confirmation of the extra-ovarian nature of the lesion. Also, because of the capabilities of MRI in terms of tissue characterization, several solid-appearing adnexal lesions can be specifically categorized as benign, namely mature cystic teratoma, exophytic uterine and broad ligament fibroids, as well as ovarian fibrous tumors such as fibromas and fibrothecomas. MRI also allows a specific diagnosis of endometrial cyst to be made. When a lesion has no specific characteristics on MRI, a precise evaluation of its morphology and content with MRI may assess the risk of malignancy and allow proper referral of the patient to surgery. The primary criteria that suggest malignancy are a large solid component, wall or septal thickness greater than 3 mm, solid nodularity and necrosis. Ancillary findings clearly identifying a malignant lesion are involvement of other pelvic organs and sidewall, peritoneal, mesenteric or omental disease, ascites and adenopathy. Using these criteria, sensitivities from 91-92% and specificities from 91-100% for malignancy can be reached (4, 5).

A typical MRI protocol for adnexal mass evaluation includes high resolution T2W sequences in axial, sagittal and sometimes coronal plane to well delineate the relationship between the lesion and the adnexa, ovary and uterus. In terms of tissue characterization, T1W without and with fat suppression is mandatory. Chemical shift imaging has an added value. Whenever it is possible, gadolinium should be administered to evaluate the enhancement of the lesion and its wall. Diffusion weighted imaging has been interesting in several studies (6).

Several other lesions do have particular imaging characteristics, and MRI can sometimes propose a diagnosis, in correlation with the patient age, past medical and surgical history, tumor marker levels, and risk factors, although in these cases the diagnosis will not be as specific.

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