

MR manifestations of ovarian adenofibromas and cystadenofibromas: Conventional MR imaging and high-b value diffusion-weighted MR imaging with pathologic correlatopn

K. Matsuzaki¹, M. Takeuchi¹, and M. Harada¹

¹Department of Radiology, University of Tokushima, Tokushima, Tokushima, Japan

[Introduction] Ovarian adenofibromas and cystadenofibromas belong to the surface epithelial-stromal tumors, and are histologically characterized by prominent fibrous tissue components with epithelial elements, which are similar to those present in ovarian cystadenomas. These tumors may mimic malignancy by imaging criteria because they may appear as multilocular cystic masses with solid components, or dominantly solid masses. Adenofibromas and cystadenofibromas may occur in women of the reproductive era and accurate preoperative diagnosis may contribute to avoid excess surgical procedure. In this study we evaluated MR findings including diffusion-weighted imaging of these tumors with pathologic correlation.

[Materials and Methods] 10 surgically proven adenofibromas and cystadenofibromas including 8 benign lesions (4 serous cystadenofibromas and 4 mucinous cystadenofibromas), and 2 borderline lesions (one serous adenofibroma and one endometorioid adenofibroma) were retrospectively evaluated. The ages of the patients ranged from 27 to 77 years (mean age: 54 years). MR images were obtained by using 1.0T, 1.5T, or 3.0 Tesla superconducting units. Spin-echo T1-weighted images and spin-echo or fast spin-echo T2-weighted images were obtained in all subjects. Contrast-enhanced T1-weighted images with/without fat saturation were obtained in 8 patients. Diffusion-weighted images (DWI) with high b-value ($b=800 \text{ sec/mm}^2$) were obtained in 7 patients.

[Results] The tumor size ranged from 3 to 11 cm (mean; 5.9 cm) at their maximum diameter. In 8 benign cystadenofibromas, 2 serous cystadenofibromas appeared as unilocular cystic masses with hemorrhagic contents and tiny mural nodules, which showed low intensity on T2-weighted images and on DWI (T2 blackout), and showed weak contrast-enhancement (Fig. 1). Other 2 serous cystadenofibromas appeared as masses containing aggregated small cysts with thickened wall, which showed very low intensity on T2-weighted images and on DWI, and weak contrast-enhancement (Fig. 2). 4 mucinous cystadenofibromas appeared as multilocular cystic masses with solid components, which showed so called “black sponge-like appearance” on T2-weighted images: very low intense solid components containing hyperintense tiny cysts (Fig. 3) (Takeuchi et al. J Comput Assist Tomogr 27, 2003). Some loculated cystic components of mucinous cystadenofibromas showed various signal intensities on T1- and T2-weighted images as “stained-glass” appearance. On DWI, viscous or hemorrhagic contents of some small loculi showed high intensity mimicking malignant solid components (Fig 4). 2 borderline adenofibromas appeared as rather large, solid, or mixed (solid and cystic) masses. The solid portions showed very low to intermediate signal intensity on T2-weighted images, low to high intensity on DWI, and contrast-enhancement on post-contrast T1-weighted images (Fig. 5). The existence of very low intense area on T2-weighted images may suggest fibrous components, however, it was difficult to differentiate from other malignant tumors, especially from Krukenberg's tumors, which may contain fibrous elements by reactive stromal proliferation.

[Conclusion] Benign adenofibromas and cystadenofibromas may mimic malignant tumor due to the presence of solid components, and T2-weighted images and DWI may be able to reveal the solid portion as low intense fibrous tissue suggesting these tumors. Mucinous cystadenofibromas may tend to be multilocular cystic masses with solid portion showing “black sponge-like appearance”, whereas serous cystadenofibromas may tend to be unilocular cystic masses with small fibrous mural nodules or masses containing aggregated small cysts with thickened fibrous wall. Fibrous components of these tumors showed low intensity on DWI due to T2 blackout, and suggestive for their benignity.

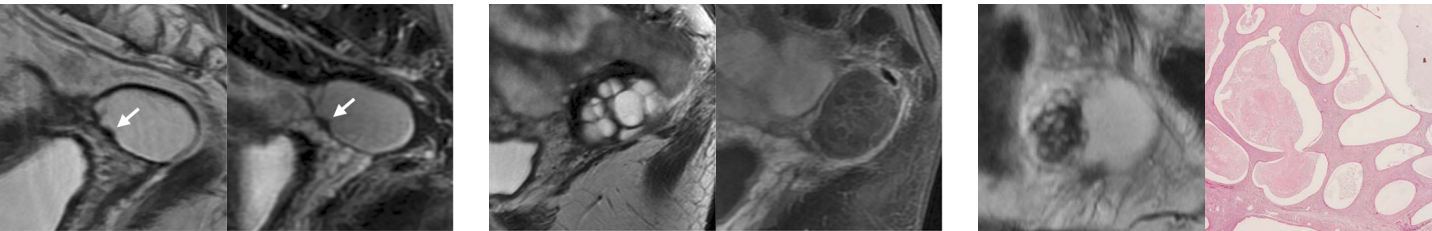


Fig.1: Serous CAF: Small hypointense mural nodule (arrow) is observed on T2WI (a) and on CE-fat-saturated-T1WI (b).

Fig.2: Serous CAF: Aggregated small cysts surrounded by hypointense thick wall on T2WI (a). Dense fibrous wall shows weak CE (b).

Fig.3: Mucinous CAF: Multilocular cystic mass containing “black sponge-like” solid portion on T2WI (a). Sponge-like fibrous tissue (b).

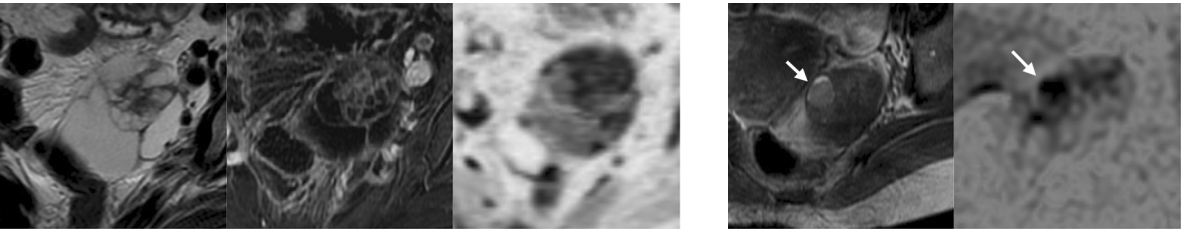


Fig.4: Mucinous CAF: Multilocular cystic mass containing “black sponge-like” solid portion on T2WI (a). Solid portion shows intense CE (b). Viscous or hemorrhagic contents in small loculi show high intensity on DWI. (c)

Fig.5: Endometrioid AF, borderline malignancy: Hypointense solid mass containing hyperintense portion (arrow) on T2WI (a) and on DWI (b) reflecting histologically more advanced area in the fibrous mass.