Ancient Schwannoma of the Female Pelvis Simulating Ovarian Neoplasm: MR Imaging Characteristics and Points of Differential Diagnosis

K. Matsuzaki¹, H. Uehara², S. Yoshida¹ and H. Nishitani¹
¹Dept. of Radiology, ²Second Dept. of Pathology, University of Tokushima, Tokushima, Japan

[Introduction and Purpose]

Schwannoma, also referred to as neurilemoma and neurinoma, is a benign nerve sheath tumor which usually occur in the soft tissues of the head and neck and extremities. When the tumors are located in deep structures such as the mediastinum and the retroperitoneum, those tend to be larger masses with degenerative changes as ancient (degenerated) schwannoma. Because schwannomas are usually asymptomatic neurologically, deeply situated tumors are hardly diagnosed in early stage and often become considerably larger with long duration. Ancient schwannomas are encapsulated masses and manifest secondary degenerative changes including cyst formation, calcification and hemorrhage on cut sections.

The majority of female pelvic masses arise from reproductive tract, but gastrointestinal, mesenteric, urinary and primary extraperitoneal origin tumors also occur and may mimic gynecologic diseases. Especially masses with cystic nature may closely resemble ovarian neoplasm. Primary extraperitoneal neoplasms are rare and comprise various histologic origins. In the tumors, ancient schwannomas may tend to be mistaken for ovarian disease clinically, because the patients are usually asymptomatic and ultrasonography reveals as cystic masses. Diagnosis before surgical treatment is important for postoperative neurological difficulties often develop. The purpose of this study is to establish the MRI diagnosis of this rare neoplasm.

[Materials and Methods]

Five pathologically proven ancient schwannomas in the female pelvis were evaluated (age range, 47-66 years old; mean, 54 years). All patients were neurologically asymptomatic and the tumors were found incidentally on pelvic ultrasonography or CT scans. MR images were obtained with 0.5-1.0 Tesla superconducting systems. The spin echo technique was used with imaging parameters of 450-650/15-25 (TR/TE) for T1-WI and of 1800-4500/80-90 for T2-WI. T1-WI were obtained before and after administration of Gd-DTPA. Sagittal and axial images were obtained on all sequences. CT were also performed in four patients.

[Results]

All tumors were demonstrated as well defined round or oval masses on MRI. The maximum diameter was 42-110 mm (mean, 78mm). Three larger tumors (mean, 95 mm) were almost cystic masses with marginal or mural solid components and two smaller tumors (mean, 54 mm) were solid mass with multiple cystic areas, which located in random or eccentric pattern in the tumors. Four located at the presacral region and one at lateral pelvic region adjacent to the iliac bone. All tumors were diagnosed as extraperitoneal masses based on the characteristic centripetal displacement of the rectum in two, the iliac vessels in three and the iliopsoas muscle in one. In three tumors, definite continuity to the nerve (in one) or contact to the neural foramen (in two) suggested their nerve origin. The contents of cystic component were water like intensity in two, serous fluid like intensity in one and hemorrhagic intensity in two. Fluid-debris level was formed in one large hemorrhagic cyst and unenhanced necrotic tissue or clot were detected in three indicating their secondary degeneration. Calcifications were detected in three of four tumors undergone CT scan. Capsules were identified in four as low intensity rim on T2-WI. Solid component showed intermediate to high intensity on T2-WI and was enhanced by Gd-DTPA on T1-WI in all cases.

[Conclusions]

Centripetal displacement of the rectum, the iliac vessels or the iliopsoas muscle were characteristic findings for its extraperitoneal origin and helpful to rule out ovarian disease. The characteristic location (presacral) was suggestive and detecting the continuity to the nerve or the neural foramen was diagnostic. Formation of capsule, partial or total cystic degeneration and hemorrhagic change on MRI and calcification on CT were its main pathologic features and suggestive of ancient schwannoma.

[References]

1. Kim, S.H. et al., AJR, 159, 1023-1026, 1992

Fig. 1 (Left): The large cystic mass with marginal solid component (arrows). Fluid-debris level was formed in the hemorrhagic cyst. The rectum (R) was displaced anteriorly.

Fig. 2 (Right): The large cystic mass with mural solid calcified component. The rectum (R) was displaced anteriorly.

Fig. 3 (Left): The solid mass with multiple cystic areas. The continuity to the nerve (in one) or contact to the neural foramen (in two) suggested their nerve origin.

Fig. 4 (Right): Necrotic tissue (N) was detected in the large cystic mass.