Clinical Categorical Course, Body MRI, Female pelvic MR update  
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Recent developments in MR techniques have magnified the roles and potential of MR imaging in the female pelvis. This course overviews the latest topics of techniques and clinical applications in the MR female pelvis. Contents included are 3T MR images, cine MR imaging, diffusion-weighted images (DWI), dynamic contrast enhanced MR imaging, feasibility of blood oxygenation level-dependent (BOLD) MR imaging in vivo, and diffusion tensor imaging (DTI) ex vivo etc.

MRI of the female pelvis at 3T has a potential to provide excellent image for uterine cervix and vagina on high-resolution T2WI. Cine MR images obtained with use of ultra-fast MR imaging technique has enabled us to evaluate uterine inherent contractility directly and non invasively. Cine MR is a useful tool for evaluating uterine contractility, one of which is called uterine peristalsis, in a variety of conditions and gynecologic disorders related to important uterine functions such as fertility and menstrual problems, and also for evaluating pelvic floor weakness. DWI can provide excellent tissue contrast based on molecular diffusion and demonstrate abnormal signals in pathologic foci. However, the diagnosis of the lesions should not be based on DWI alone, and overlaying DWI onto conventional MR images is mandatory. DWI also enables the quantitative evaluation of apparent diffusion coefficient, which may have potential roles not only in distinguishing malignant from benign tissues, but also in monitoring the therapeutic outcome. Dynamic contrast enhanced MR imaging has the potentials to improve tumor detection and local staging, and it can also provide quantitative information about perfusion of the tumor, which may be useful not only for monitoring therapeutic effects, but also for predicting the therapeutic outcome. Use of BOLD image in the female pelvis successfully has shown physiological changes of the uterus during menstrual cycle phases. DTI has enables us clearly evaluate three-dimensional fiber architecture of the uterus consisting of submucosal circular, interdigitating intermediate, and outer longitudinal fibers ex vivo.

Comprehension of these latest MR techniques in the female pelvic region is beneficial not only for determining clinical application, but also for developing further investigation with MR imaging.