Plate-like structures in the endometrial canal: Characterization with dynamic contrast-enhanced 3D MR imaging

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INTRODUCTION: Plate-like structures (PLS) are frequently identified in the endometrial canal at dynamic contrast-enhanced 3D MR imaging although T2-weighted images can not demonstrate them clearly.   The purpose of this study was to clarify the characteristics of intracavitary plate-like structures.

METHODS: From November 2005 to April 2006, 466 female patients underwent pelvic MR imaging for suspected pelvic diseases. Of these patients, 107 of these patients were excluded because of a history of hysterectomy (n = 22), intracavitary mass larger than 2mm or thickened endometrium more than 5mm (n = 85). In 359 patients, 43 patients were identified PLS less than 2mm thickness within the endometrial canal at dynamic contrast-enhanced study in the study. These 43 patients ranged in age from 13 to 66 years (mean, 36.6 years). Final diagnoses were leiomyoma (n = 17), adenomyosis (n = 6), ovarian tumor or cysts (n = 16), intrapelvic tumor (n = 1), invasive mole (n = 1), retroflexion of the uterus (n = 1), and Nabothian cyst (n = 1). In 3 patients, a surgical procedure was performed, and, in the remaining 40 patients, final diagnoses were made clinically on the basis of findings at transvaginal sonography, findings during the clinical course, or results of laboratory tests, or of all three. MR imaging was performed on 1.5-T systems (GE Medical Systems, Milwaukee, Wis) with an eight-channel phased-array coil or a torso phased-array multicoil. Sagittal, transverse and oblique coronal T2-weighted fast spin-echo (FSE) MR imaging was performed with the following imaging parameters: repetition time msec/effective echo time msec of 2,000-8,000/80-90, section thickness of 4-7 mm, matrix of 256 x 256, field of view of 35 cm.   Dynamic contrast-enhanced 3D MR imaging was performed with breath holding to cover the uterus. Imaging parameters were as follows: repetition time msec/echo time msec of 3.0-4.9/0.8-2.2, section thickness of 3 or 4 mm, matrix of 256 x 192 or 256 x 160, field of view of 35 cm.   These images were obtained during an intravenous bolus injection of 0.1 mmol/kg of Gd chelate which was administered with a power injector (Spectris; Medrad) at 3.0 mL/sec and followed by a 15-mL saline flush. The imaging delay between initiation of Gd chelete infusion and initiation of 3D imaging was determined by using an automated bolus detection pulse sequence (MR Smartprep; GE Medical Systems).   Imaging time for one phase was 20 seconds, and three phases were acquired.   The dynamic contrast-enhanced 3D MR source images, multiplanar reconstructed MR images were analyzed.   The PLS were described in terms of location, shape, and size.   We investigated the relationship between PLS and the menstrual cycle.

RESULTS: PLS were recognized in 43 of 359 cases, and described a plane parallel to the uterine axis.   PLS' mean length was 19.6±8.0mm.   PLS' Enhancement pattern on dynamic contrast-enhanced study was high-intensity relative to the surrounding endometrium in the early phase, and iso-intensity relative to the surrounding endometrium in the late phase.   Three of 43 cases were performed hysterectomy, as a result all three specimens revealed normal endometrial canals. One of 43 cased was followed by MRI, and then PLS disappeared.   In the proliferative phase of the menstrual cycle, PLS were seen in 21 of 43 cases, in the secretory phase were seen in 14 cases, and menstrual phase were seen in three cases.   In the irregular menstrual cycle, PLS were seen in one case, in the postmenopausal phase were seen in two cases, and two cases with hormonal therapy were seen.

SUMMARY AND CONCLUSION: Twelve percent of female patients suspected pelvic diseases were identified plate-like structures in the endometrial canal at dynamic contrast MR imaging.   We have to consider that the plate-like structures in the endometrial canal are not always pathological states.
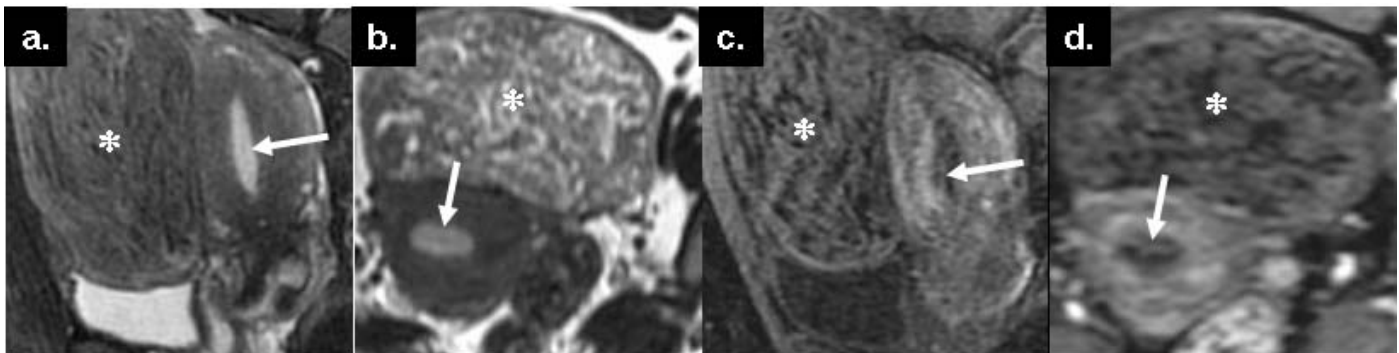

Fig 1. Subserous leiomyoma in a 44-year-old woman.   (a.) Sagittal T2-weighted fast SE (8,181/83) MR image shows a pelvic mass (*) adjacent to the uterus and subtle low signal intensity in the endometrial canal (arrow).   (b.) Transverse T2-weighted fast SE (2,000/83) shows the juxtauterine mass (*) and subtle low signal intensity in the endometrial canal (arrow).   (c.) Sagittal SPGR (4.9/2.2) dynamic contrast MR image demonstrate a plate-like enhancement in the endometrial canal.   (d.) Transverse SPGR dynamic contrast MR image with multiplanar reconstruction techniques   demonstrate the plate-like enhancement in the endometrial canal.   This patient underwent hysterectomy 21days later, and it was proved that the juxtauterine mass was subserous lipoleiomyoma , however, the endometrial canal was normal structure.