

Decidualized adenomyosis: MR imaging findings including diffusion-weighted imaging

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[Target audience] The target audience of this article includes gynecologic radiologists, general radiologists with an interest in gynecologic MR imaging, residents, fellows, and other health professionals interested in the science and practice of gynecologic MR imaging.

[Purpose] Adenomyosis is a common non-neoplastic gynecologic disease characterized by the presence of ectopic endometrium within the myometrium of the uterus, and typically affects premenopausal women over 30 years of age. Decidual change of endometrium during pregnancy is induced by progesterone. With the hypertrophy of the endometrial stromal cells, the normal uterine endometrium may thicken and transform to the decidua. However adenomyotic endometrium looks like the basalis endometrium which seldom responds to hormonal stimuli, decidualization may also occur in ectopic endometrial tissue in adenomyosis during pregnancy or under hormonal therapy. Decidualized adenomyosis may show heterogeneous signal increase on T2WI ¹⁾, and may mimic malignant tumors such as uterine sarcomas. A correct diagnosis is essential to avoid excess surgical procedure. Takeuchi et al. reported the usefulness of DWI with the ADC measurement in diagnosing decidualized endometriomas: the ADC value of edematous, vascularized decidualized endometrial tissue was significantly higher than that of ovarian cancers²⁾. We hypothesized that decidualized adenomyosis may also show higher ADC value than that of malignant uterine tumors.

[Methods] MR imaging findings of 5 decidualized adenomyosis (4 were during pregnancy, and 1 was under hormonal therapy) were retrospectively evaluated. All patients were studied on 1.5T superconducting MR units. Fast spin-echo T2WI, spin-echo T1WI, fat saturated spin-echo T1WI, and DWI were obtained in all five patients. Four patients during pregnancy were studied on a system with a 1.5-T superconducting unit (Signa Excite /Excite HD, General Electric, Milwaukee, WI) with 8ch body-array torso coils. DWI with high b-value (b=800 sec/mm²) was obtained, and the mean ADC values (x 10⁻³ mm²/sec) of the decidualized adenomyosis were measured in a circular ROI from ADC maps on the workstation (AW 4.2). The mean ADC values of 14 pathologically proven malignant uterine myometrial tumors (5 leiomyosarcomas, 3 endometrial stromal sarcomas, 2 undifferentiated uterine sarcomas, 2 rhabdomyosarcomas and 2 malignant lymphomas) were also measured for comparison. The Mann-Whitney U test was used to compare ADC values among decidualized adenomyosis and malignant tumors. A value of P < 0.05 was considered statistically significant.

[Results & Discussion] All five decidualized adenomyosis were demonstrated as heterogeneous signal intensity on T2WI containing prominent bright foci reflecting decidual reaction of endometrium within adenomyosis, and mimicked malignant tumors such as endometrial stromal sarcomas. On DWI the decidualized endometrial foci showed high signal intensity. The mean ADC value in decidualized adenomyosis was 1.62 +/- 0.05, which was significantly higher than that in malignant tumors (0.85 +/- 0.15) (p=0.003). Decidualized adenomyosis is rare, and Shitano et al. reported the MR imaging findings of 3 cases: bright foci on T2WI were prominent in all cases during pregnancy and no high signal spot on T1WI were observed in all cases. To our knowledge, there have been no previous reports of decidualized adenomyosis concerning DWI. In our study all lesions showed high signal intensity on DWI, and relatively high ADC may suggest that T2 shine-through effect caused the signal increase of decidualized adenomyosis.

[Conclusion] Decidualized adenomyosis which shows heterogeneous signal intensity containing bright foci on T2WI may mimic uterine sarcomas. High intensity on DWI is for both decidualized adenomyosis and sarcomas, and ADC measurement may be helpful in distinguishing decidualized adenomyosis from malignant uterine tumors.

[References] 1) Shitano F, et al. Decidualized adenomyosis during pregnancy and post delivery: three cases of magnetic resonance imaging findings. Abdom Imaging. 38:851-7, 2013. 2) Takeuchi M, et al. Magnetic resonance manifestations of decidualized endometriomas during pregnancy. J Comput Assist Tomogr. 32:353-5, 2008

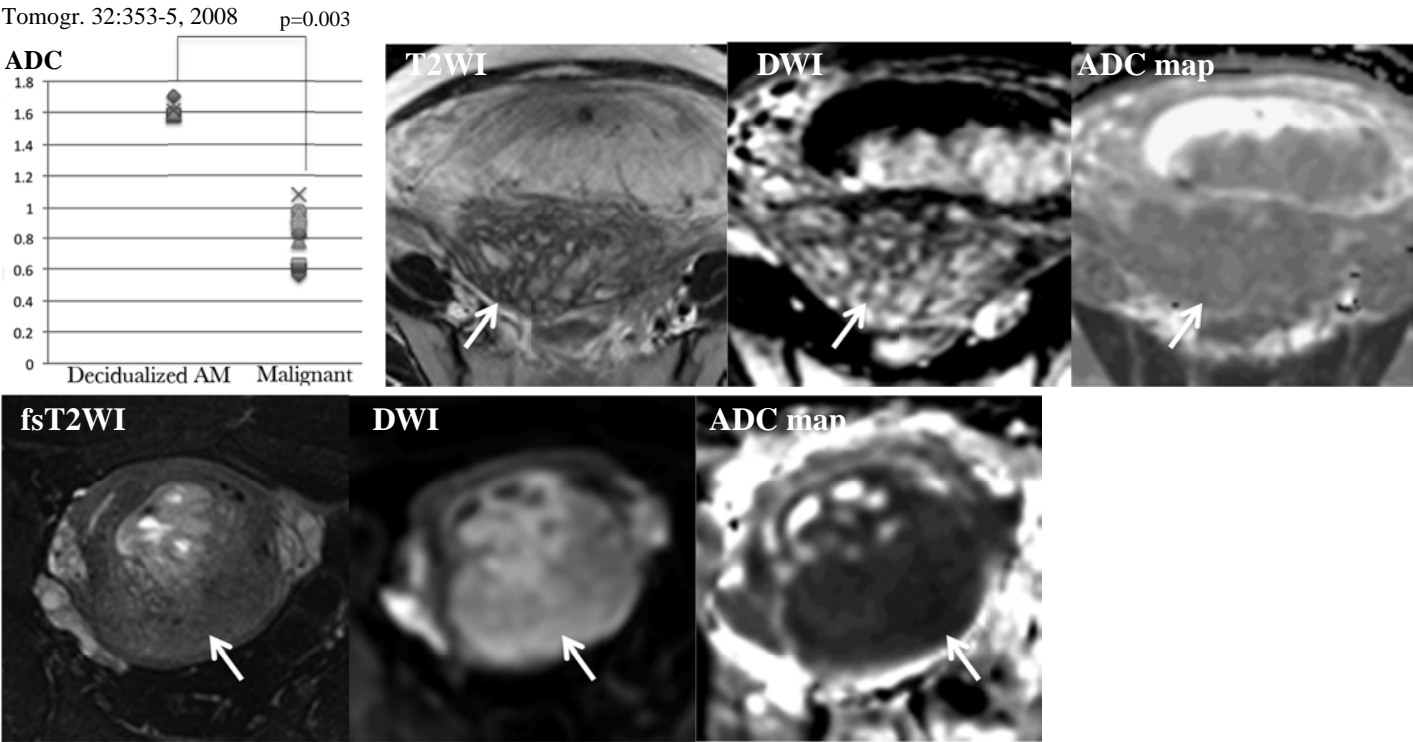


Fig 1: The ADC values of decidualized adenomyosis (AM) and malignant uterine tumors.

Fig. 2: 32-year-old pregnant woman with decidualized adenomyosis. Bright foci on T2WI exhibit high intensity on DWI with high ADC (1.61).

Fig. 3: 37-year-old woman with endometrial stromal sarcoma. Myometrial invasion mimics adenomyosis on T2WI and shows high signal intensity on DWI with low ADC (0.98).