

Magnetic Resonance Imaging-Guided Volumetric High-Intensity Focused Ultrasound Surgery for Pedunculated Subserosal Uterine Leiomyoma

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A 42-year-old woman suffered from dominant pelvic tension with transformed symptom severity score (tSSS) of 66 and was indicated magnetic resonance imaging (MRI) for evaluating the uterine leiomyoma features before MRI-guided volumetric high-intensity focused ultrasound (HIFU). MRI results showed that there was a pedunculated subserosal uterine leiomyoma positioned on the anterior wall of the retroverted uterus, and volume of tumor is about 98 ml. Based on T2-signal intensity classification, the uterine leiomyoma was regarded as type I because signal intensity of uterine leiomyoma is less than that of myometrium and equal to that of abdominis rectus muscle [Figure 1a].^[1] Based on T1-quantitative perfusion analysis, the tumor is classified as type A because time signal intensity curve of tumor is lower than that of myometrium. In addition, the K^{trans} , K^{ep} , V^e , V^p , and area under the curve of tumor are lower than those of myometrium [Figure 1b].^[2] The serum anti-Müllerian hormone (AMH) before ablation was 2.01 ng/mL. During the treatment time, we avoid sonicating the beam to the tumor tissue nearby the stalk. MRI-guided HIFU produced a nearly complete ablation of tumor with a nonperfused volume ratio of 90%, and 10% remaining alive tissue is adjacent to the stalk [Figure 1c]. At 6-month follow-up, the leiomyoma volume was plunged significantly to 65 ml with the corresponding uterine leiomyoma volume reduction ratio of 33% [Figure 1d], and tSSS was lessened significantly to 12 with corresponding symptom improvement ratio of 81%. Moreover, the serum AMH was fully preserved.^[3] MRI findings at 6-month follow-up manifested that the tumor

is still attached to the uterus without any sign of expulsion or torsion.

Pedunculated subserosal uterine leiomyoma, a special type of subserosal uterine leiomyoma, is formerly regarded as a relative contraindication to some treatments like uterine arterial embolization (UAE) due to the high risk of torsion or expulsion after treatment which will result in severe adverse events such as infection and even shock. Surgery is essential to carry out in serious dilemma. Nonetheless, recent findings recommended that the efficacy and safety of UAE for pedunculated subserosal uterine leiomyoma are proved.^[4] In 2004, MRI-guided HIFU achieved the approval from the United States Food and Drug Administration for the treatment of uterine leiomyomas. MRI-guided HIFU is currently evidenced as a minimally invasive ablation method for uterine leiomyomas with effectively safety profile.^[1-3] In this study, MRI-guided HIFU was exploited profitably for pedunculated subserosal uterine leiomyoma without any complications and adverse effects on ovarian reserve. Our findings are in line with previous studies which manifested that MRI-guided HIFU should be taken into consideration as an alternative treatment in company with laparoscopy surgery and UAE.^[5,6]

Ethical approval

Pham Ngoc Thach University of Medicine Institutional Review Board has approved this project, IRB No. 6_CDHA obtained on 22th May in 2015.

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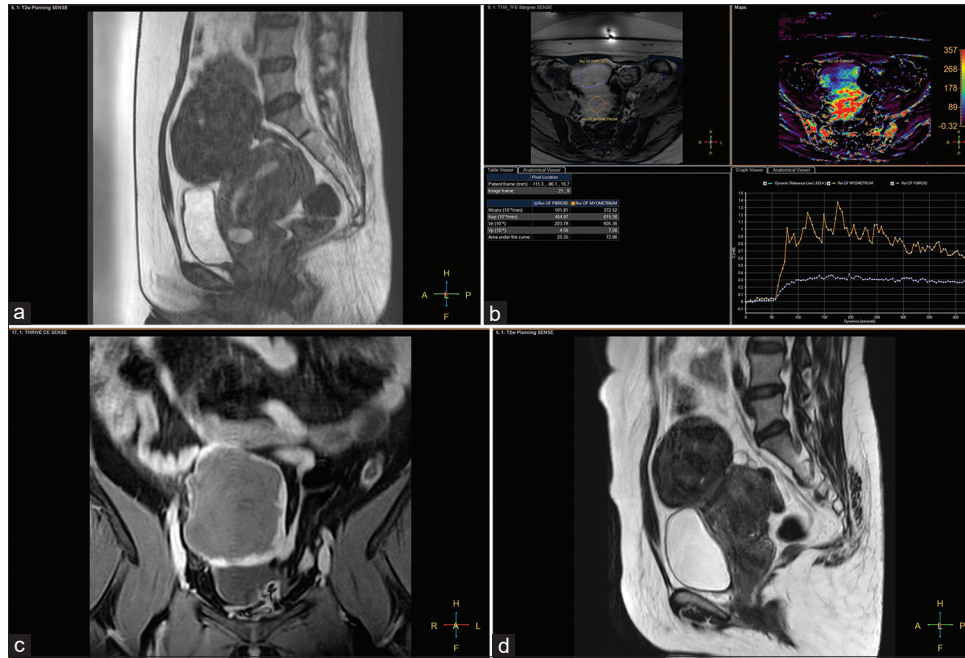


Figure 1: (a) Sagittal T2-weighted image at screening phase shows a type I pedunculated subserosal uterine leiomyoma located on the anterior wall of retroverted uterus. (b) Axial T1-quantitative perfusion-weighted image at screening phase shows the time signal intensity curve of uterine leiomyoma lower than that of myometrium. (c) Coronal contrast enhancement T1-weighted image after treatment shows near-complete ablation of tumor. (d) Sagittal T2-weighted image at 6-month follow-up shows significant shrinkage of uterine leiomyoma without any sign of stalk detach

Declaration of patient consent

The author certify that he have obtained all appropriate patient consent form. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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