

High-intensity Focused Ultrasound Facilitates Surgical Removal of Large Submucosal Fibroids

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Received: 06 Mar 2022

Accepted: 15 Mar 2022

Published: 21 Mar 2022

J Short Name: JCFMI

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Citation:

Ng VWY and Cheung VYT, High-intensity Focused Ultrasound Facilitates Surgical Removal of Large Submucosal Fibroids. J Clin Med Img. 2022; V6(5): 1-2.

Keywords:

Focused ultrasound; Submucosal fibroid; Ultrasound-guided

1. Clinical Image

A 51-year-old woman, gravida 2 para 1 abortus 1, was referred for the management of fibroids. She presented with heavy menstrual bleeding and anemia down to a hemoglobin level of 7.4 g/dL. Physical examination showed a 16-week sized uterus. Endometrial aspirate showed secretory endometrium. She had tried tranexamic acid for menstrual flow control and yet her menorrhagia and anemia persisted. Ultrasound showed a dominant anterior wall fibroid. She strongly preferred non-surgical management with uterine preservation. Treatment alternatives were discussed and she opted to consider high-intensity focused ultrasound (HIFU) ablation. Magnetic resonance imaging (MRI) showed a predominantly intramural fibroid with less than 20% submucosal extension (International Federation of Gynecology and Obstetrics, FIGO classification type 2) [1] measuring 7.0x12.7x13.0 cm (Figure 1).

Ultrasound-guided HIFU was performed under monitored anesthesia care with a treatment time of 140 minutes and a sonication time of 2,025 seconds. An average power of 391 watts (range 350-398 watts) was used and a total energy of 791,986 joules was delivered to the fibroid with good greyscale changes [2]. She was readmitted 23 days after HIFU ablation with fever and vaginal bleeding. Pelvic examination showed a 2 cm necrotic fibroid protruding from the cervix. She responded to antibiotics therapy and was discharged. During her follow-up visits, she reported reduced menstrual flow with modified Uterine Fibroid Symptoms Quality of Life Questionnaire (UFS-QOL) scores decreased from 32 before treatment to 16 at 3 months and 13 at 6 months. Her haemoglobin level had improved to 9.9 g/dL. Repeat MRI revealed the fibroid, not only had significantly reduced in size (5.4x8.8x6.1 cm, reduced 74.9% by volume), but had mostly protruded into the uterine cavity and partly through the cervix (FIGO type 1), which was then amenable to vaginal excision (Figure 2).



Figure 1: Pre-treatment magnetic resonance image shows a large FIGO type 2 fibroid measuring 7.0x12.7x13.0 cm

Submucosal fibroid is a common cause of dysmenorrhoea, abnormal uterine bleeding and infertility in women of reproductive ages. Theoretically most submucosal fibroids can be surgically removed either by hysteroscopic resection or vaginal excision. However, technically FIGO type 2 fibroids ($\geq 50\%$ intramural extension) are much more difficult to remove than type 1 fibroids ($< 50\%$ intramural

ral extension), especially for larger ones. Previous reports have demonstrated that HIFU ablation can facilitate subsequent removal of submucosal fibroids with reduced operation time and blood loss [3,4]. As illustrated in this case, this 2-staged procedure (HIFU followed by surgical removal) is particularly useful for the management of a large submucosal fibroid not suitable for upfront resection, by rendering the fibroid smaller and more protruding into the uterine cavity using HIFU ablation prior to hysteroscopic or vaginal removal.



Figure 2: Magnetic resonance image 6-month after HIFU shows a FIGO type 1 fibroid measuring 5.4x8.8x6.1 cm; 74.9% reduction in size.

2. Conflict of Interest

The authors declare no conflict of interest.

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