



## Case Report

# Combined treatment for big submucosal myoma with High Intensity Focused Ultrasound and hysteroscopic resection



Wen-Liang Liao <sup>a, b</sup>, Tsung-Ho Ying <sup>a, b</sup>, Huang-Ping Shen <sup>a, b, c</sup>, Pei-Ju Wu <sup>a, b, c, \*</sup>

<sup>a</sup> Department of Obstetrics and Gynecology, Chung Shan Medical University, Hospital, 1. No. 110, Sec. 1, Jianguo N. Rd., South Dist., Taichung City 402, Taiwan, ROC

<sup>b</sup> School of Medicine, Chung Shan Medical University, 1. No. 110, Sec. 1, Jianguo N. Rd., South Dist., Taichung City 402, Taiwan, ROC

<sup>c</sup> Institute of Medicine, Chung Shan Medical University, Taiwan, ROC

## ARTICLE INFO

## Article history:

Accepted 22 April 2019

## Keywords:

High Intensity Focused Ultrasound (HIFU)  
Hysteroscopic myomectomy  
Submucosal myoma

## ABSTRACT

**Objective:** Big submucosal myoma often causes heavy menstrual bleeding and are complicated in hysteroscopic surgery. High Intensity Focused Ultrasound (HIFU), is a method for myoma ablation therapy, which may benefit on size reduction, and assist following hysteroscopic myomectomy.

**Case report:** Two cases, case one, 44-year-old female with 3.8 cm submucosal myoma, STEPW (Size, Topography, Extension, Penetration and Wall) score 6 and case 2. 48-year-old female, with 6.0 cm submucosal myoma, STEPW score 8, both received HIFU treatment before hysteroscopic myomectomy was done. The myomas reduced after 5 months with improvement of anemia. The following hysteroscopic myomectomy shows less operative time and fewer blood loss.

**Conclusion:** HIFU reduce size of submucosal myoma and may improve anemia after months. Less operating time and blood loss were demonstrated in the following hysteroscopic myomectomy. For well selected patients, combined treatment with HIFU and hysteroscopic resection may decrease complication rate.

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## Introduction

Uterine myomas (also known as fibroids or leiomyomas) are the most common benign solid pelvic tumors found in women, which occur in 20–25% of women of reproductive age [1]. Most of the patient having uterine myomas are asymptomatic. However, those with submucosal type lesions often have heavy menstrual bleeding, which lead to severe anemia. Submucosal myoma can also cause dysmenorrhea, recurrent pregnancy loss, premature birth, and infertility [2]. Hysteroscopic resection is the treatment of choice for patients with symptomatic lesions. However, hysteroscopic myomectomy has higher complication rate, including uterine perforation, excessive bleeding and fluid overload, and must be performed by experienced surgeons [3,4].

STEPW (Size, Topography, Extension, Penetration and Wall) classification introduced by Lasmar et al. was applied for evaluating

of myoma complexity prior to hysteroscopic surgery, using 5 parameters including size, topography, extension, penetration, and wall [5]. This classification provides a higher correlation with complexity and degree of surgical difficulty in hysteroscopic myomectomy, also rates of complications and completeness of resection [6] For those patients with higher scores in STEPW classification, hysteroscopic myomectomy may not be indicated or required preoperational hormone therapy, such as gonadotropic release hormone agonist, to shrink tumor size.

High Intensity Focused Ultrasound (HIFU) was introduced since decades ago. Previous studies have shown that HIFU has few adverse events and improves clinical symptoms in women with uterine myoma, such as menorrhagia and bulk-related symptoms [7]. In treating submucosal type myoma with HIFU, vaginal expulsion of necrotic tissue is common [8], which increase the risk of endometritis. Also, these lesions may take months to completely remission and possible required repeated procedures for residual lesions [8]. Thus, we aim to perform HIFU treatment for big submucosal myoma to shrink the tumor size, in advance of hysteroscopic myomectomy, which may reducing the complexity and improving the safety of hysteroscopic surgery.

\* Corresponding author. Institute of Medicine, Chung Shan Medical University, Department of Obstetrics and Gynecology, Chung Shan Medical University, Hospital, 1. No. 110, Sec. 1, Jianguo N. Rd., South Dist., Taichung City 402, Taiwan, ROC. Fax: +886 4 24738493.

E-mail address: [mushroom307@gmail.com](mailto:mushroom307@gmail.com) (P.-J. Wu).

## Case presentation

Two cases were introduced in this report. Both patients have received procedure and image studies in Chung Shan Medical University, Taichung, Taiwan. High Intensity Focused Ultrasound treatment was performed using JC Focused Ultrasound Tumor Therapeutic System (Chongqing Haifu Medical Technology Co., Ltd., Chongqing, Sichuan).

First case, a 44-year-old female, G5P3SA2, had prolonged vaginal spotting over months and caused (causing) anemia (Hb: 9.5 g/dl). Magnetic Resonance Imaging (MRI) revealed a uterine submucosal myoma with size of 3.8 cm, which is traditionally regarded as a FIGO type 2 submucosal myoma (Fig. 1 A). Base on STEPW classification introduced by Lasmar et al., the lesion is STEPW score 6, which implies complex hysteroscopic surgery is required [5]. HIFU treatment was performed smoothly in April, 2015, and MRI image after two weeks of treatment revealed the myoma was completely ablated with 100% non-perfusion area (Fig. 1 B).

In the following 5 months, size of fibroid reduced from 3.8 cm to 1 cm. The patient subjectively described on improvement of menstrual amount. Also, her anemic condition improved (Hemoglobin from 9.5 to 10.9 g/dl). Concerning relapsing of fibroid, hysteroscopic myomectomy was applied for complete resection. The total operation time was 10 min, with minimal blood loss and no intraoperative complication. The patient has good recovery and is uneventful till now.

Second case is a 48-year-old female, G3P2AA1, without systematic disease nor operation history. Heavy menstrual bleeding with prolonged vaginal spotting for years with mild anemia (Hb:11.1 g/dL) and physiological intolerance. MRI revealed a FIGO type 2 submucosal myoma about 6 cm (Fig. 2A). Based on Lasmar classification, the lesion is STEPW score 8, that hysteroscopic myomectomy was not indicated [5]. HIFU treatment was performed smoothly in January, 2015. MRI image after two weeks of treatment revealed the myoma was ablated in the majority with 60% non-perfusion area in the central area (Fig. 2B).

In the following 5 months, she had improvement of menstrual amount, with hemoglobin improved to 13.8 g/dl. The myoma size decreased to 5 cm with blood flow at periphery of lesion under Doppler ultrasound. In order to completely resect the fibroid, hysteroscopic operation was carried out thereafter. The lesion was

completed resected smoothly after HIFU treatment. The total operation time was 80 min, with estimated blood loss as 10 ml and no intraoperative complication. The patient has good recovery and is uneventful to date.

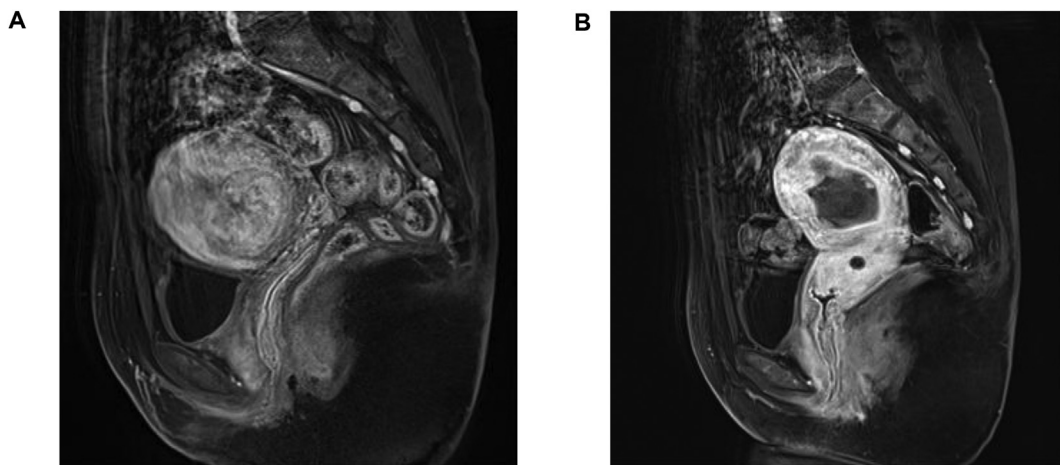
## Discussion

Big submucosal myoma is a difficult issue in clinical management, which usually cause heavy menstrual bleeding that leads to severe anemia and further increases the operation risk. Traditionally, hysterectomy might be applied for patients with submucosal myoma but is not suitable for those with fertility concern. Abdominal myomectomy may affect subsequent conception and increase post-operative pelvic adhesion and rate of cesarean section [9]. However, hysteroscopic myomectomy for big submucosal myoma may require multiple surgeries and has high complication rate, including uterine perforation, excessive bleeding and fluid overload [3].

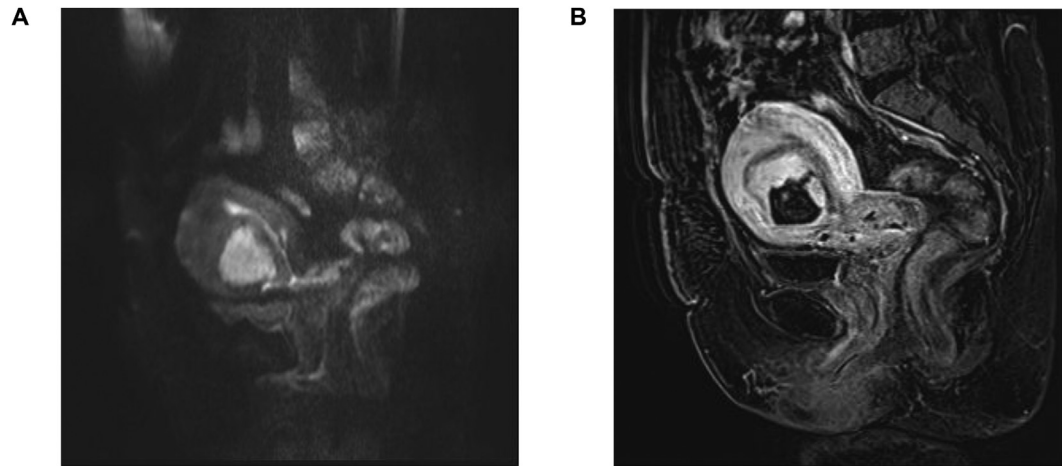
Several previous studies have shown promising result of reducing symptoms related to myoma or as mass reduction since HIFU therapy was introduced in 2004, [7,8]. Previous studies demonstrated safety and efficacy of HIFU in treating submucosal myoma, but having some concerns about vaginal expulsion of ablated tissue, longer time to complete remission of myoma, even repeated procedures for regrowth or untreated part of myoma [8].

Thus, we are seeking a better solution for these complicated myomas, such as our two cases (see Table 1), to reduce the operation complication and preserve the uterine integrity. In our cases, HIFU treatment demonstrated reduction of size and blood flow of lesion, also improvement of patient's anemic status. These improvements have many advantages in following hysteroscopic myomectomy, including faster operation time, more easy application of hysteroscopic myomectomy, fewer blood loss, less chance of intra-operative complication and most importantly one-step resection of lesion.

In conclusion, management of big submucosal myoma is always complicated, which requires multiple modalities to avoid intra-operative complication. Our report demonstrate that for well selected patients, combined treatment with HIFU and hysteroscopic resection may decrease complication rate, preserve the uterine integrity and also fulfill minimal invasiveness in management.



**Fig. 1.** Magnetic resonance images of a submucosal myoma before and after High Intensity Focused Ultrasound treatment. A. Pre-treatment myoma was 3.8 cm, grading as FIGO type 2, STEPW score 6. B. Two weeks after treatment, the myoma was completely resolved with 100% non-perfusion area. Abbreviation: STEPW, 5 parameters System to classify submucosal myomas including Size, Topography, Extension, Penetration and Wall.



**Fig. 2.** Magnetic resonance images of a myoma before and after High Intensity Focused Ultrasound treatment (HIFU). A. Pre-treatment myoma was homogeneous and 6 cm in diameter with STEPW score 8. B. After HIFU treatment, Although the contour of myoma was only shrunken to 5 cm in diameter, the majority of central area showed no perfusion and resolution one-month time after HIFU treatment. Abbreviation: STEPW, 5 parameters System to classify submucous myomas including Size, Topography, Extension, Penetration and Wall.

**Table 1**  
STEPW points for individual cases.

Parameters	Size (cm)			Topography			Extension			Penetration (%)			Lateral wall		Total
	<2	2–5	>5	Inf.	Mid.	Up	<1/3	1/3–2/3	>2/3	0	<50	>50	A/P	lateral	
Score	0	1	2	0	1	2	0	1	2	0	1	2	0	1	
case 1		✓			✓			✓				✓		✓	6
case 2			✓		✓				✓			✓		✓	8

### Conflict of interest

The authors have no conflicts of interest.

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