

**Original article:**

## **Effective use of high intensity focused ultrasound for symptomatic relief in a patient with adenomyosis**

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### **ABSTRACT-**

Adenomyosis is a benign uterine condition which causes significant impact on the lifestyle of symptomatic patients. There are limited treatment options for young females who want to preserve their fertility. We report a case of a young female with history of secondary infertility, severe menorrhagia and dysmenorrhoea who had significant symptomatic improvement after treatment with high intensity focussed ultrasound.

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### **INTRODUCTION-**

Adenomyosis is characterized by the ectopic presence of endometrial glands within the uterine myometrium. The symptoms range from asymptomatic to chronic pelvic pain, menorrhagia and dysmenorrhoea. Few patients also present with history of infertility. The prevalence of adenomyosis varies from 12-18.2% in women undergoing hysterectomy<sup>1</sup>. The treatment of choice for adenomyosis is hysterectomy<sup>2</sup>. There is no definitive medical management in young patients who want to preserve their fertility. This report is aimed at introducing high intensity focused ultrasound as a non- invasive treatment modality for patients with adenomyosis.

### **CASE PRESENTATION-**

A 29 years old female presented with history of heavy menstrual bleeding and severe cramping menstruation since 12 years. She had regular cycles with bleeding lasting for seven to eight days. She had to use atleast nine to ten pads per day. Her first child was nine years old after which she was unable to conceive. The patient had taken medical treatment like NSAIDS and OC Pills with which the symptoms did not abate. She had no major medical history. She had no history of smoking or alcohol consumption. Clinical examination revealed a bulky uterus. Her haemoglobin was 10g/dL and hematocrit was 36%. She was referred for an ultrasound examination which revealed heterogenous myometrial echotexture with an ill-defined junctional zone. MRI examination revealed ill-defined ovoid thickening of the junctional zone in the anterior as well as the posterior myometrium with tinysubendometrial T2 hyperintense cysts.

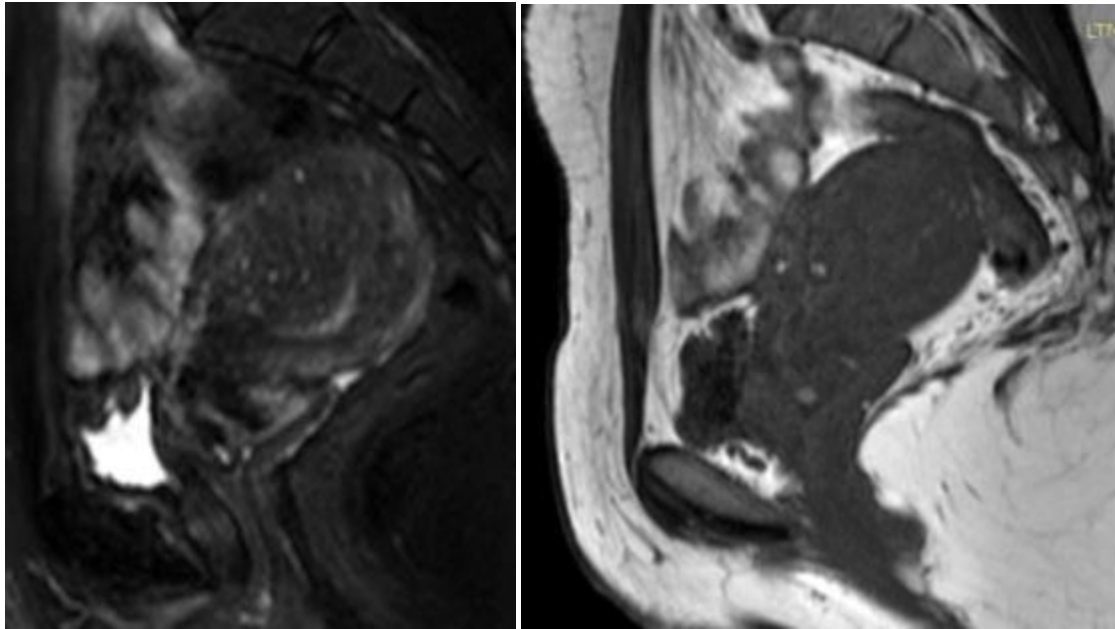


FIGURE 1.FIGURE 2.

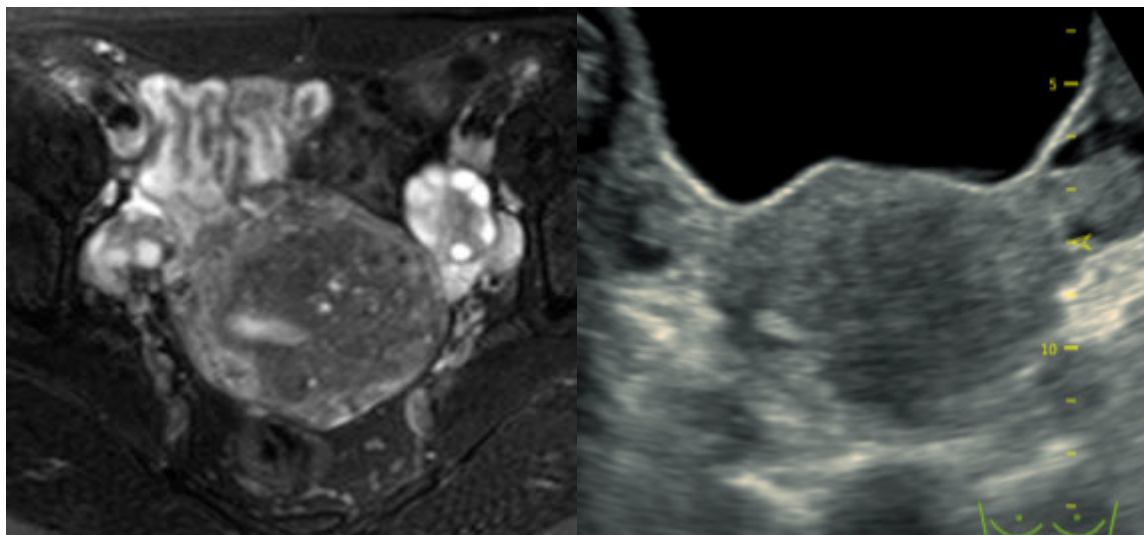


FIGURE 3.FIGURE 4.

FIGURE 1 and 3 showing ill-defined T2 hypointense thickening of the junctional zone involving the anterior and posterior myometrium with intrinsic T2hyperintense cysts.

FIGURE 2 showing focal T1 hyperintensities showing foci of haemorrhages.

FIGURE 4 showing hypoechoic thickening of the junctional zone with heterogenous appearance.

The patient underwent high intensity focused ultrasound treatment in two sittings two days apart. The patient did not experience any complications during or after the procedure except for mild low back pain. The patient had four menstrual cycles after the treatment. Her recent cycles last for only three days and she uses only two to three pads per day. The patient also conceived a pregnancy after the procedure.

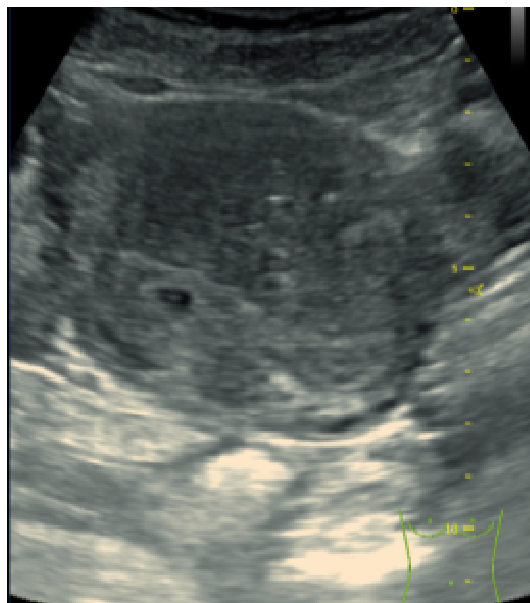


FIGURE 5 showing gravid uterus with intrauterine gestational sac.

#### DISCUSSION-

Adenomyosis is a common benign uterine condition which if symptomatic can cause difficulties in daily activities and significantly hamper the quality of life. It is characterized by the abnormal presence of endometrial glands and stroma in the myometrium. There is varying degree of adjacent myometrial hyperplasia due to reactive smooth muscle cell proliferation resulting in bulky appearance of the uterus and T2 hypointensity on MRI images. The ectopic endometrial glands appear as small cysts on T2 weighted images. There is haemorrhage within the ectopic endometrial glands which appear as T1 weighted hyperintensities. It is postulated that the stromal hyperplasia prevents the myometrial contraction during menstruation resulting in excessive bleeding.

Hysterectomy is considered the gold standard for the treatment of adenomyosis. However in patients who want to preserve their fertility and want symptomatic relief, conservative line of treatment is indicated.

Medical treatments such as GNRH agonists, oral contraceptives, progestins, danazol, selective estrogen and progesterone modulators are used for the treatment of adenomyosis. These act by suppression of endometrial cell proliferation by causing hypoestrogenic, hyperprogestogenic and hyperandrogenic environment<sup>3</sup>. However medical treatments only provide symptomatic relief and are not cytoreductive. Also their prolonged administration has many side effects<sup>3</sup>.

Minimally invasive surgical alternatives are endometrial ablation and uterine artery embolization. Patients without or with only minimal endometrial penetration of <2.5 mm (superficial adenomyosis) have good results from the ablation. Patients with deep endometrial penetration of >2.5 mm (deep adenomyosis) usually have persistent problems and should be offered hysterectomy over repeat ablation<sup>4</sup>. Women who become pregnant after uterine artery embolization are at risk for malpresentation, preterm birth, cesarean delivery and postpartum

haemorrhage<sup>6</sup>. Hence it is usually avoided in patients who want to preserve fertility.

High intensity focused ultrasound is a new non-invasive modality which can be used to ablate adenomyotic foci. Ultrasound waves are focused precisely upon the target causing rapid focal increase in tissue temperature. This results in tissue heating, necrosis, apoptosis and cell lysis. Coagulation necrosis can be demonstrated on histopathology 1-7 days after the procedure and granulation tissue begins to replace the necrotic tissue after 7-14 days. The effective focusing of the high intensity ultrasound waves prevents damage to the intervening or adjacent structures. The advantages of HIFU are that it is non-invasive, painless, can be done on OPD basis, has no dose limit and has great repeatability. Several case studies have demonstrated that HIFU presents low rate of minor and or major complications and, at the same time, a long symptom-relief period<sup>5</sup>. However it is a time consuming procedure and has delayed results. It has few complications like skin burn, back

pain and periprocedural pelvic cramps. Ultrasound waves cannot traverse air and if HIFU passes through bowel there is a rare risk of perforation.

#### CONCLUSION-

Adenomyosis causes significant distress to symptomatic women and can cause physical, emotional and psychological challenges. It poses a dilemma to the clinicians treating young patients who want to preserve their fertility; as the medical line of management is not curative and hysterectomy is the only definitive management. This case demonstrates the role of HIFU as a non-invasive modality which can be effectively used in the treatment of both focal and diffuse adenomyosis. It also shows that HIFU treatment will not effect the fertility of the patient. HIFU is thus a promising tool for the treatment of adenomyosis with relatively few side effects as compared to other treatment modalities. However detailed studies need to be undertaken to confirm its efficacy and to evaluate the long term utility.

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