

# Actual Use of Rigid Hysteroscope Intrauterine BIGATTI Shaver (IBS<sup>®</sup>) with a Morcellator System

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## Abstract

Hysteroscopic resection of endometrial lesions has recently gained popularities. We here report the usefulness and safety of hysteroscopic surgery using Intrauterine BIGATTI Shaver (IBS<sup>®</sup>). We performed this surgery for 6 patients: 4 endometrial polyps and 2 intrauterine myoma. The average operation time was  $25.7 \pm 13.2$  minutes. Only a small amount of bleeding was noted in all cases. There were no surgical complications. Two out of four patients who desired childbearing became pregnant. Hysteroscopic surgery using IBS<sup>®</sup> can safely and reliably remove intrauterine protruding lesions under aspiration without using a heat source. Less endometrial damage may help preserve fertility.

## Keywords

Hysteroscopic Surgery, Morcellator, Uterine Submucosal Fibroids, Endometrial Polyps

## 1. Introduction

Intrauterine lesions such as endometrial polyps and submucosal myomas are associated with menstrual symptoms such as menorrhagia, metrorrhagia, and dysmenorrhea, and can be a factor in infertility and recurrent miscarriage [1] [2] [3] [4]. At present, the mainstream method of lesion resection is hysteroscopic surgery, combining hysteroscopic resectoscope and a high-frequency current generator (electric scalpel); however, this surgical procedure needs mastery, and complications due to electric scalpels and perfusate occasionally occur. It is important to

remove the lesion safely and reliably without causing complications. In particular, if the patient expresses desire for childbearing, it is ideal that surgery does not cause new factors for infertility such as endometrial damage.

In recent years, a device for removing endometrial polyps and uterine submucosal myoma by attaching a tissue removal device to a hysteroscope has become clinically available. Compared to hysteroscopic surgery with a hysteroscopic resectoscope, this procedure is easier and does not require an electric scalpel, which we expect to result in less complication.

In this study, we investigated the usefulness and safety of hysteroscopic surgery using the Intrauterine BIGATTI Shaver (IBS<sup>®</sup>).

## 2. Materials and Methods

This study was approved by the International University of Health and Welfare Hospital Ethics Review Board (approval number: 21-B-5). We investigated the effectiveness and usefulness of the procedure by conducting a retrospective analysis of the clinical results of six cases that underwent hysteroscopic surgery using Intrauterine BIGATTI Shaver (IBS<sup>®</sup>; KARL STORZ SE & Co. KG) (**Figure 1**) at our hospital from January 2020 to December 2020.

At our facility, outpatient hysteroscopy is performed for cases in which intrauterine lesions are suspected by transvaginal ultrasound tomography or sonohysteroscopy. In all these cases, prior to operation, cervical and endometrial cytodiagnosis, and histodiagnosis were performed to rule out malignant tumor lesions. When endometrial polyps, submucosal myoma, and other endometrial lesions were observed, TCR was planned in the operating room under general anesthesia.

On the day before the operation, the cervical dilator (Lamicelle; Japan Medtronic Co., Ltd., Tokyo) was used for cervical dilation, and on the day of the operation, the operation started at the lithotomy position under general anesthesia.

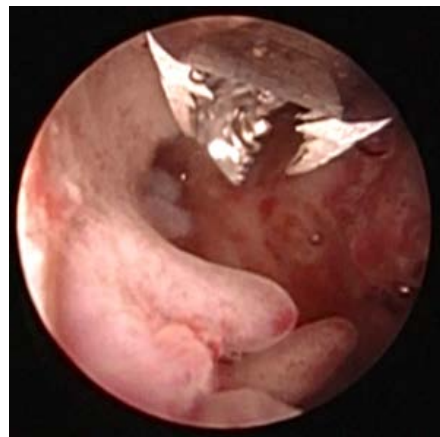


**Figure 1.** Intrauterine BIGATTI Shaver (IBS<sup>®</sup>). Source: the Karlstorz website (<https://www.karlstorz.com/gb/en/highlights-gyn.htm#mod-9255>). This system sets the rotation speed of the shaver blade and removes uterine lesions.

After disinfecting the vagina, the cervix was held and pulled under the speculum with Martin's cervical grasping forceps. While perfusing with saline, the hysteroscope was carefully inserted to the uterus while checking from the cervical canal and the internal ostium. After observing the uterus and confirming the lesion site, the blade was inserted into the uterus until it was pressed against the lesion to perform excision (**Figure 2**). The surgery was concluded when hemostasis was confirmed.

### 3. Results

Patient characteristics are summarized in **Table 1**. The mean age was  $35.2 \pm 7.2$  (28 - 46) years old. Four cases had endometrial polyps, while two had uterine submucosal myoma. The mean operation time was  $25.7 \pm 13.2$  (14 - 50) minutes, and the amount of saline used as perfusate was  $4983.3 \pm 3753.6$  (1100 - 10,000) ml. Only a small amount of bleeding was noted in all cases (**Table 1**). All patients had uneventful postoperative courses and were discharged three hours after surgery. There were no surgical complications such as uterine perforation or



**Figure 2.** Endometrial polyp resection using Intrauterine BIGATTI Shaver (IBS®). After confirming the polyp in the uterine cavity, the shaver blade was inserted into the uterine cavity, and the blade was pressed against the lesion for excision. Hysteroscopic surgery with a morcellator can safely and reliably remove a protruding lesion in the uterine cavity under aspiration without using a heat source.

**Table 1.** Patient demographics and operative characteristics.

Case	Age	Gravida	Para	Surgical indication	Operative time (minutes)	Infertility treatment
1	30	1	0	Endometrial polyp	19	+
2	32	2	0	Endometrial polyp	16	+
3	42	0	0	Endometrial polyp	29	+
4	28	0	0	Endometrial polyp	14	+
5	46	0	0	Submucous myomas	26	-
6	33	0	0	Submucous myomas	50	-

endometrial adhesions. Based on the histopathological test, no malignant findings were noted in all cases. Two out of four cases who expressed desire for childbearing became pregnant through rhythm method and artificial insemination.

#### 4. Discussion

Protruding lesions in the uterine cavity such as endometrial polyps and submucosal myomas can cause not only menstrual symptoms such as metrorrhagia, menorrhagia, and dysmenorrhea, but also infertility and recurrent miscarriage [1] [2] [3] [4]. Although hysteroscopic surgery using a hysteroscopescope is widely used for these lesions, it requires proficiency in the surgical technique, and complications due to electric scalpels and perfusate are occasionally observed. In particular, maintaining a good endometrial environment is considered to be one of the most important factors for improving the pregnancy rate in cases desiring childbearing; as such, it is ideal that hysteroscopic surgery does not cause new factors for infertility associated with endometrial damage.

In recent years, it has become possible and more common to remove endometrial polyps and uterine submucosal fibroids by attaching a tissue removal device to a hysteroscope. The Intrauterine BIGATTI Shaver used this time is composed of a system that removes tissue with a shaver that does not use a high-frequency current generator and uses physiological saline as a perfusate to secure the uterine cavity and eject the excised tissue. This procedure is almost the same as hysteroscopic surgery using hysteroscopescope in terms of preoperative treatment and intraoperative procedure. Compared to loop operation in hysteroscopescope, the excision operation with a shaver is easier and the procedure is easier to learn [5]. Furthermore, since only the lesion tissue can be accurately excised by the aspiration system, there is little damage to the endometrium and the normal myometrium. Since the lesion is excised with a rotating shaver blade, no heat source is required, and there are no complications such as uterine perforation caused by the power source, making it possible to excise minute parts such as near the ostium of the fallopian tube without worry. Furthermore, since the action site of the shaver blade is not on the tip but on the lateral wall, the shaver is always in the field of view, allowing the surgical operation to be performed without worry and uterine perforation is unlikely to occur.

Meanwhile, in terms of the perfusion system, the perfusate is a physiological saline solution, which is less likely to cause hyponatremia and water intoxication complications associated with hysteroscopic surgery. Furthermore, since the aspiration system can immediately remove blood clots and air bubbles that obstruct the visual field, the visual field can be easily secured without creating dead space. Moreover, since the excised tissue is discharged together with the outflowing perfusate, it is not necessary to repeatedly insert the hysteroscope into the uterine cavity, which lowers the possibility of bleeding of the cervical canal.

The indications for this surgical procedure are mainly endometrial polyps,

submucosal myomas, bipartite uterus, and Asherman's syndrome. Among them, cases with fragile endometrial polyps, especially those with multiple polyps, are considered to be most suitable for this procedure [6]. However, rapid excision is difficult with a shaver. Excision takes time in cases with a diameter of at least 20 mm and a protrusion rate of 30% to 40% or less, hard tissue or large tissue. Therefore, in such cases, surgery using a conventional hysteroscopescope is the safest choice.

In hysteroscopic surgery, complications are unlikely to occur, the safety of the surgery is maintained, and the procedure is simple and easy to learn. In particular, this system, which enables targeted removal of lesions, reduces the risk of endometrial damage and is considered to be beneficial for cases who wish to bear children. Intrauterine BIGATTI Shaver equipped with an optical system with an outer diameter of 6 mm does not require excessive cervical dilation. As such, in addition to the abovementioned reduction of endometrial damage, it is less invasive than the conventional hysteroscopic surgery using a hysteroscopescope. Moving forward, this procedure may also be carried out as an outpatient treatment in view of the simplification of the anesthesia method (non-anesthesia or localized anesthesia, etc.). On the other hand, this surgical device has a different style from the conventional hysteroscopic surgery through hysteroscopescope using an electric scalpel, etc. As such, there is a need to improve the excision ability of the device for cases involving submucosal myoma with a low protrusion and a large diameter, and cases with high tissue hardness.

## 5. Conclusion

Hysteroscopic surgery with a morcellator can safely and reliably remove a protruding lesion in the uterine cavity under aspiration without using a heat source. The results also suggested that surgery without damaging the endometrium is also useful from the viewpoint of fertility preservation. We believe that this surgical method, which has less invasion of the uterine cavity, can be performed as an outpatient treatment with local anesthesia or without anesthesia in the future.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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