

# Hysteroscopic Transcervical Resection of Uterine Septum

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## ABSTRACT

**Objective:** To explore the method of diagnosis for uterine septum and the clinical effect of hysteroscopic transcervical resection of the septum.

**Methods:** One-hundred ninety cases of patients with uterine septum who were diagnosed and treated at our hospital during 2007–2011 were selected, and their general information, perioperative status, postoperative recovery treatment, and postoperative pregnancy rates were statistically analyzed.

**Results:** All 190 patients were cured with one surgery, with an average hysteroscopic operating time of  $22.60 \pm 10.67$  minutes and intraoperative blood loss of  $15.74 \pm 9.64$  mL. There were no complications such as uterine perforation, water intoxication, infection, or heavy bleeding. Among the 115 patients that we followed up, 86 became pregnant and delivered infants, 81 of which were born at term and 5 that were born premature.

**Conclusion:** The combination of hysteroscopy and laparoscopy is still the most reliable method for the diagnosis of uterine septum. With a shorter operative time, less blood loss, a significantly increased postoperative pregnancy rate and live birth rate, and a significantly lower spontaneous abortion rate, transcervical resection of the septum was the preferred method for the treatment of uterine septum, and surgical instruments and skills were critical to the prognosis of uterine septum.

**Key Words:** Uterine septum, Hysteroscopy, Electroresection.

## INTRODUCTION

When the paramesonephric ducts meet on both sides but fuse incompletely, a septum can be formed in the uterine cavity. Uterine septum is the most common type of congenital uterine malformation, accounting for approximately 80% to 90% of uterine malformations.<sup>1</sup> Septum tissues have fewer blood vessels and a relatively high fiber content, and the endometrium covering the septum shows a relatively poor response to hormones, affecting fertilized egg implantation as well as normal growth and development of the placenta, which may lead to infertility, miscarriage, premature birth, abnormal fetal position, and so on. Among all uterine malformations, uterine septum is the only one that can be treated and corrected by hysteroscopic surgery.<sup>2</sup> With the development of gynecological endoscopic technology, the diagnostic and treatment techniques of uterine septum are continuously being improved and perfected. Transcervical resection of the septum (TCRS), with advantages such as shorter operating time, less surgical trauma, and fewer complications, has become increasingly popular in clinical application. In this paper, the general information, perioperative status, postoperative recovery treatment, and postoperative pregnancy rate in 190 patients with uterine septum who underwent TCRS were statistically analyzed.

## METHODS

### Clinical Data

One-hundred ninety patients with uterine septum were selected from Nanjing Maternity and Child Health Care Hospital from January 2007 to June 2011; their average age was  $28.04 \pm 3.54$  years. Of the 190, 170 patients wanted to become pregnant and conceived postoperatively. Other general information on the patients is shown in **Table 1**.

### Diagnostic Criteria

Buttram's classification criteria were used as the diagnostic criteria.<sup>3</sup> If the septum extends from the fundal zone to the internal cervical os, or even to the external cervical os, completely dividing the endometrial cavity into two components, this would form a complete septum. If the sep-

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**Table 1.**  
General Information of Patients

	Number of Cases	Percentage
Spontaneous abortion	92	54.12 <sup>a</sup>
Missed abortion	40	23.53 <sup>a</sup>
Ectopic pregnancy	5	2.94 <sup>a</sup>
Primary infertility	11	6.47 <sup>a</sup>
Secondary infertility	11	6.47 <sup>a</sup>
Partial septum	166	87.37
Complete septum	24	12.63
Uterus didelphys	12	6.32
Partial vaginal septum	16	8.42
Complete vaginal septum	1	0.53
Uterus didelphys complicated with vaginal septum	9	4.74
Preterm/term delivery	2/2	—

<sup>a</sup>Percentage of patients with fertility requirements.

tum begins at the fundus but does not reach the internal cervical os, only partially dividing the endometrial cavity, this would be a partial septum.

### Diagnostic Methods

Gynecological examination, ultrasonography, hysterosalpingography (HSG), magnetic resonance imaging (MRI) and combined hysteroscopy and laparoscopy were all used as methods of diagnosis.

### Preoperative Preparation

The patients were hospitalized and underwent surgery 3 to 7 days after the end of menstruation. Before operation, systemic physical examination was performed to exclude surgical contraindications, including leukorrhea; blood, urine, blood coagulation, liver, and kidney function abnormalities; and abnormalities on electrocardiogram and chest radiograph. Disposable catheters were placed in the cervical canal or 600  $\mu$ g of misoprostol was placed in the posterior vaginal fornix on the night before surgery, and 80 mg of phloroglucinol was injected intramuscularly to soften the cervix 30 minutes before the operation.

### Operative Procedure

After anesthesia was administered successfully, we dilated the cervical os to 10 to 10.5 cm using a cervical dilator,

then 5% glucose solution was continuously perfused and the uterine distention pressure was set at 150 mm Hg. An electroresectoscope was placed to confirm the location, size, and range of the septum. The septum was then incised by needle electrode, and B ultrasonography or laparoscopy was used for overall monitoring during the operation. For patients with complications such as infertility, uterine fibroid, ovarian tumor, pelvic adhesions, hydrosalpinx, tubal atresia, and pelvic endometriosis, additional procedures such as hydrotubation, hysteromyomectomy, ovarian tumor removal, pelvic adhesion decomposition, salpingotomy or partial salpingectomy, and pelvic endometriosis surgery were also performed. At the end of the operation, a balloon (filled with 5–8 mL of normal saline solution) was placed into the uterine cavity.

### Postoperative Treatment

Antibiotics were administered for 2 to 3 days to prevent infection. The balloon was replaced every other day and was replaced by a metal ring 3 to 6 days after surgery. Two to three artificial menstrual cycles were induced (estradiol valerate 6 mg/day for 21 days + dydrogesterone 20 mg/day for 10 days) to promote endometrial repair. Two to three months after surgery, hysteroscopy and ring removal were performed again to observe the postoperative intrauterine conditions.

### Follow-Up

Hysteroscopy was performed for all 190 patients 2 to 3 months after surgery, and for the 115 patients who had fertility requirements and no complications (those affecting pregnancy rate such as endometriosis and hydrosalpinx), pregnancy and delivery follow-up for 12 to 30 months was done.

## RESULTS

### Diagnosis of Uterine Septum

The accuracy of various examination methods is shown in **Table 2**. Briefly, the diagnostic accuracy rate for B ultrasonography, MRI, HSG, hysteroscopy, and combined hysteroscopy and laparoscopy were 93.38%, 47.37%, 52.63%, 97.22%, and 100%, respectively. The diagnostic results of these patients are shown in **Table 1**.

### Intraoperative Status

During the operations, 117 patients underwent B ultrasonographic monitoring, and the others underwent lapa-

roscopic monitoring. The mean operating time (excluding laparoscopy and surgical time), intraoperative blood loss, preoperative uterine cavity depth, postoperative ring placement time (intraoperative ring placement in 13 cases, excluding 7 cases without ring placement), and postoperative length of stay were  $22.60 \pm 10.67$  minutes,  $15.74 \pm 9.64$  mL,  $7.01 \pm 1.07$  cm,  $4.85 \pm 1.33$  days, and  $7.09 \pm 0.45$  days, respectively, as shown in **Table 3**. Among 171 patients who had intraoperative balloon placement, 6 had fever 1 to 3 days after surgery, but no other complications occurred. At hysteroscopic re-examination 2 to 3 months after surgery, the cavity shape had returned to normal in 185 patients. Endometrial coverage was seen at the former septum site, and both tubal openings were clear. Three patients had uterine adhesions and underwent electroresection, and two patients underwent secondary hysteroscopic electroresection of septum (**Table 4**).

**Follow-Up**

One-hundred fifteen patients who had fertility requirements and no complications (those affecting pregnancy rate such as endometriosis and hydrosalpinx) were followed up for 12 to 30 months. Eighty-six patients became pregnant and delivered infants: 81 were born at term and 5 were born premature (**Table 4**). Among 92 patients who had a history of spontaneous abortion, only 5 continued to have this complication.

**DISCUSSION**

The methods to diagnose uterine septum mainly include ultrasonography, HSG, MRI, hysteroscopy, and laparoscopy. Ultrasonography is commonly used and simple, and the typical manifestation of the “inverted V” shape of the uterus could be clearly shown. However, the coronal plane imaging of the uterus was impossible with it, and the diagnostic accuracy of ultrasonography was only 93.38% in this study. HSG can show the size and length of the septum in a “Y” shape, and its angulation is normally less than 90 degrees, whereas the angulation of the uterus bicornis is normally more than 90 degrees; but HSG still cannot fully distinguish between the uterine septum and the uterus bicornis, as well as the uterus didelphys. MRI is important in the diagnosis of uterine septum because early scholars have proposed its accuracy to be 100%<sup>4</sup>; however, MRI accuracy in our study was only 52.63%, and this may be related to varied diagnostic techniques of examining hospitals and to MRI film-reading standards for septum images at various hospitals. In hysteroscopy, the septate uterine cavity manifests itself in a typical “cat’s eye” shape. Although hysteroscopy has high diagnostic accuracy, it is relatively difficult to distinguish the uterine septum from the uterus bicornis and the saddle-shaped uterus, which makes misdiagnosis possible. Furthermore,

**Table 2.**  
Accuracy of Various Examination Methods

	Number of Cases	Number of Missed or Misdiagnosed Cases	Accuracy Rate (%)
B ultrasonography	151	10	93.38
HSG	19	10	47.37
MRI	57	27	52.63
Hysteroscopy	70	2	97.22
Hysteroscopy + laparoscopy	73	0	100

**Table 4.**  
Postoperative Follow-Up Status

	Number of Cases	Percentage
Normal intrauterine 2–3 months after surgery	185	97.37
Transcervical resection of adhesions 2–3 months after surgery	3	1.58
Secondary electroresection of septum 2–3 months after surgery	2	1.05
Full-term delivery	81	70.43
Premature delivery	5	4.35
Preoperative/postoperative spontaneous abortion	92/5	—

**Table 3.**  
Perioperative Status

Operating Time (min)	Intraoperative Blood Loss (mL)	Uterine Cavity Depth (cm)	Postoperative Ring Placement Time (d)	Fever After Balloon Placement (cases)	Postoperative Hospital Stay (d)
$22.60 \pm 10.67$	$15.74 \pm 9.64$	$7.01 \pm 1.07$	$4.85 \pm 1.33$	6	$7.09 \pm 0.45$

Data are given as mean  $\pm$  SD.

in laparoscopy, differentiation of the uterus bicornis and the saddle-shaped uterus should rely on HSG or B ultrasonography by measuring the distance between the lowest point protruding into uterine cavity and the uterine horn connecting line. However, as the gold standard for uterine septum diagnosis, the combination of hysteroscopy and laparoscopy raised the diagnostic accuracy of uterine septum up to 100%.

The common methods of TCRS include electroresection, microscissors, and laser. Microscissors do not require cervical os dilation or cause thermal damage to surrounding tissues and organs, and they can reduce the electrosurgical risks and occurrence of water intoxication. However, their drawbacks include the impossibility of synchronized bleeding stop, a relatively long operating time and excessive equipment wear, and the requirement for regular replacement of the scissors. Laser surgery has a short operating time, a lower amount of bleeding, a good hemostatic effect, and no damage to surrounding organs, and it can be used in all types of uterine distention fluids. However, it still has some disadvantages—its high cost, high operation requirements, and increased risk of gas embolism caused by application of some gases.<sup>5</sup> Comparatively, the procedure of hysteroscopic electrosurgical excision of the uterine septum is more widely accepted and used among endoscopists.

### Septum Resection Range

Because of the traction effect of the anterior and posterior uterine walls, a slight retraction may occur after uterine septum incision, and normally there is no need for excessive septum resection. If the separation is too deep, damage may be caused to the uterine muscle wall, resulting in heavy bleeding or even uterine perforation, whereas if the separation is too shallow, residual septum may occur, affecting the surgical outcomes. The depth of septum resection is determined by either B ultrasonography or laparoscopic monitoring, or by the relative position of the incised portion and the uterine horns. In addition, in our study, if there was significant active bleeding when the septum was gradually cut to the fundus, we empirically stopped any further removal because it was related to the components of the uterine septum. For the resection range of the complete septum, the septum should be cut from the internal cervical os upward to the fundus, and the intracervical septum or uterus didelphys septum should not be resected to avoid cervical incompetence and the artificially increased probability of miscarriage and premature birth caused from it. However, in our postoperative follow-up of several patients who underwent TCRS and partial ligation, cervical incompetence did not occur.

As confirmed in our clinical investigation, the pregnancy and full-term delivery rate of patients who underwent TCRS were significantly increased, whereas the premature delivery and spontaneous abortion rates were significantly lowered, which is consistent with the findings of many other scholars.

It was traditionally believed that the postoperative intrauterine device (IUD) placement and hormone therapy, as well as artificial cycle treatment, could help prevent the uterine wound adhesions and promote endometrial repair. In the early literature, some scholars have suggested that estrogen had no obvious significance to the prevention of post-TCRS intrauterine adhesions.<sup>6</sup> On the contrary, the placement of an IUD would result in an intrauterine local inflammatory response and an increased probability of the occurrence of uterus and fallopian tube infection. Recently, the study of Tonguc et al.<sup>7</sup> also suggested that estrogen and IUD placement had no significance in the prevention of post-TCRS intrauterine adhesions, nor could it improve the postoperative pregnancy rate. Therefore, further retrospective clinical analysis on the use of estrogen and IUD is needed.

### CONCLUSION

In brief, with a shorter operating time, lower blood loss, a significantly lower postoperative abortion rate, and a significantly improved pregnancy rate, TCRS is the preferred method for the treatment of uterine septum.

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