

# Reproductive Outcomes of Hysteroscopic Septoplasty Techniques

Ozlem Dural, MD, Cenk Yasa, MD, Ercan Bastu, MD, Funda Gungor, Ugurlucan, MD, Sultan Can, MD, Gamze Yilmaz, MD, Faruk Buyru, MD

## ABSTRACT

**Background and Objectives:** Since little is known regarding the correlation between different techniques used during hysteroscopic septoplasty and reproductive outcomes, we aimed to evaluate the results of two different techniques of hysteroscopic septoplasty (HS).

**Methods:** Data were retrospectively reviewed on 49 patients who underwent HS for symptomatic septate uterus from January 1, 2010, through April 30, 2014. The patients were divided into 2 groups based on the HS technique used. Group I consisted of 27 patients who underwent HS by monopolar hook cautery with the operating hysteroscope. Group II consisted of 22 patients who had the procedure performed with scissors and guided by an office hysteroscope. All the procedures in the both groups were performed in the operating room under general anesthesia. Pregnancy outcomes within the first year after HS for both groups were evaluated.

**Results:** Reproductive outcomes were obtained from 44 patients who attempted to conceive after HS within the first year. In the 25 patients in group I, 23 had pregnancies, of which 15 (65.2%) continued to term, 3 (13%) ended in a preterm live birth, and 5 (21.7%) ended in loss of pregnancy (abortion). In the 19 patients in group II, there were 17 pregnancies, of which 11 (64.7%) continued to term, 2 (11.7%) ended in a preterm live birth, and 4 (23.5%) ended in first- or second-trimester abortion. The overall live-birth rate was 78.2% in group I and 76.4% in group II ( $P = .85$ ).

**Conclusions:** Our data show that the rates of pregnancy that reach term and overall rates of live births are similar between the 2 HS techniques. Additional studies are needed to evaluate the impact of the techniques on reproductive outcomes.

Ozlem Dural, MD, Cenk Yasa, MD, Ercan Bastu, MD, Funda Gungor, Ugurlucan, MD, Sultan Can, MD, Gamze Yilmaz, MD, and Faruk Buyru, MD, Istanbul University School of Medicine, Department of Obstetrics and Gynecology, Istanbul, Turkey.

Address correspondence to: Ozlem Dural, MD, Sehremeni Mah, Turgut Özal Cad. 34390 Fatih, Istanbul, Turkey; Telephone: +905332318526; Fax: +902124400048; E-mail: cinozlem@hotmail.com

DOI: 10.4293/JSLS.2015.00085

© 2015 by JSLS, Journal of the Society of Laparoendoscopic Surgeons. Published by the Society of Laparoendoscopic Surgeons, Inc.

**Key Words:** Hysteroscopic surgery, Reproductive outcome, Septate uterus.

## INTRODUCTION

Septate uterus is a commonly encountered congenital malformation of the uterus characterized by abnormal resorption of the Müllerian canal during embryogenesis.<sup>1</sup> Its reported incidence ranges between 1 and 3% and has been associated with poor reproductive outcomes, such as abortion and preterm births.<sup>1,2</sup>

Hysteroscopic septoplasty (HS) is a safe and routinely used procedure for the treatment of septate uterus in patients with a history of repeated abortion, preterm birth, and infertility.<sup>3-6</sup> Although there are no prospective randomized controlled trials, studies have shown that septum resection helps increase the rate of pregnancy and live and term births and thus contributes to an improvement in obstetric outcomes.<sup>4-9</sup> Only a few studies have compared different techniques of HS, and the effect of instruments used during the procedure on reproductive outcomes has not yet been determined.<sup>10-12</sup> In the present study, we sought to determine the reproductive outcomes of 2 different HS techniques.

## MATERIALS AND METHODS

From January 1, 2010, through and April 30, 2014, all patients who underwent HS for the treatment of septate uterus were retrospectively evaluated. Patients aged from 19 to 39 years and with a history of infertility, recurrent abortion, or preterm birth were included in the study. Those who had undergone any form of assisted reproductive techniques after HS were excluded. Other exclusion criteria included patients who had a complete septate uterus with double cervix or needed a second hysteroscopic operation. Each participating woman was asked to sign a written informed consent before undergoing the procedure. The study was approved by the ethics committee of Istanbul University, Istanbul Medical Faculty.

The procedures were performed during the proliferative phase, usually within 5 days after the end of menstruation.

Intravenous cefazolin 1 g (Cefozin; Bilim Ilac, Istanbul, Turkey) was given as a surgical prophylaxis before surgery. All hysteroscopic septum resections were performed in the operating room under general anesthesia with diagnostic laparoscopy, which is applied for the differentiation between a septate and bicornuate uterus by experienced surgeons from the Department of Reproductive Endocrinology and Infertility. Neither an intrauterine Foley catheter nor estrogen replacement therapy was used after the procedures.

The patients were divided into 2 groups on the basis of the technique used for HS. Group I involved 27 patients who had HS performed with a monopolar hook with the operating hysteroscope (Karl Storz Endoscope, Tuttlingen, Germany). In this group, the cervix was dilated to 8 mm with a Hegar dilator, and the uterine cavity was then entered under the guidance of an operative hysteroscope. Cavity distention was obtained by applying a 5% mannitol solution with continuous irrigation flow. The cutting current was set at 50–70 W. The bilateral tubal ostia were visualized after entry into the uterine cavity. A hook was placed 90° perpendicular to the septum, and resection was performed in a superolateral fashion, starting from the midline. Resection proceeded gradually until the muscular fibrils of the uterine fundus were seen. During all operative procedures, the amount of fluid given or lost via the hysteroscope was measured, and electrolyte balance was maintained accordingly.

Group II included 22 patients who underwent HS with scissors guided by a 5-mm office hysteroscope (Karl Storz Endoscope). This hysteroscopic system comprises specialized channels in the metal sheath surrounding the telescope that served for irrigation and suction and insertion of surgical equipment, such as biopsy forceps and scissors. The uterine cavity was entered without cervical dilatation by using the no-touch technique. By this technique, the vagina was entered with the hysteroscope, and the uterine cavity was entered by the following anatomical pathway: cervix, to external os, to cervical canal, to internal os. Saline infusion was used for uterine distension. After the bilateral tubal ostium was visualized, the septum was resected in a superolateral fashion by using the hysteroscopy scissors. The procedure ended when the muscular fibrils of the uterine fundus was seen.

Pregnancy outcomes within the first year after the procedure were queried by contacting all patients in both groups via telephone, and the responses were recorded. Patients with a positive pregnancy history were asked

**Table 1.**  
Rates of Attempted and Successful Conception During the First Year After HS

| Conception Status           | Group I<br>(n = 27) | Group II<br>(n = 22) | P    |
|-----------------------------|---------------------|----------------------|------|
| Median age (years)          | 27.5                | 28                   | 0.83 |
| Attempted to conceive (%/n) | 92.5/25             | 86.3/19              | 0.47 |
| Conceived (%/n)             | 85.1/23             | 77.2/17              | 0.47 |

about the occurrence of a first- or second-trimester abortion or preterm labor, and all data regarding term or preterm live-birth rates and abortion rates, as well as live-birth rates, were recorded.

### Statistical Analysis

Statistical analysis was performed with JMP software version 10.0.0 (SAS, Cary, NC, USA). Patient characteristics were analyzed via descriptive statistics. For continuous variables, the median and range were calculated. For categorical variables, the numbers and percentages in each category were recorded. Differences between parameters were compared by Student's *t* test. Frequency distributions were compared with the  $\chi^2$  test.  $P < 0.05$  was considered statistically significant, and all of the performed tests were 2-sided.

## RESULTS

Reproductive outcomes were obtained from 44 patients who attempted to conceive after HS within the first year. The remaining 5 patients chose to postpone pregnancy plans and admitted to using various contraceptive methods during the year after HS (**Table 1**). All procedures were completed uneventfully, with no intraoperative or early postoperative complications observed in either group. The patients were discharged on the day of the procedures.

Group I included 25 patients with a median age of 27.5 years (range, 19–38). There were 23 pregnancies in this group, of which 15 (65.2%) reached term, 3 (13%) ended in a preterm live birth, and 5 (21.7%) ended in pregnancy loss in the first or second trimester. The overall live-birth rate among these patients was 78.2%. In group I, there was 1 case of a complete uterine rupture in the fundal region of the uterus at 37 weeks' gestation in a pregnancy

**Table 2.**  
Pregnancy Outcomes in Group I and II

| Outcome                                       | Pregnancies in Group I<br>(n = 23) | Pregnancies in Group II<br>(n = 17) | P    |
|---|------------------------------------|-------------------------------------|------|
| Term birth rate (%/n)                         | 65.2/15                            | 64.7/11                             | 0.97 |
| Preterm live birth rate (%/n)                 | 13/3                               | 11.7/2                              | 0.90 |
| Abortion rate (%/n)                           | 21.7/5                             | 23.5/4                              | 0.89 |
| Overall live birth rate (%/n)                 | 78.2/20                            | 76.4/15                             | 0.85 |
| Complication rate                             | None                               | None                                | —    |
| Uterine rupture in subsequent pregnancy (%/n) | 4.3/1                              | None                                | 0.28 |

that occurred after an uncomplicated hysteroscopic septum resection.

There were 19 patients in group II, with a median age of 28 years (range, 21–39). Seventeen pregnancies occurred in this group, of which 11 (64.7%) reached term, 2 (11.7%) ended in a preterm live birth, and 4 (23.5%) ended in pregnancy loss in the first or second trimester. The overall live-birth rate in this group was 78.2%.

The median age was similar in the 2 groups ( $P = .83$ ). There was no statistically significant difference between the 2 groups in birth rate ( $P = .97$ ), preterm live-birth rate ( $P = .90$ ), abortion rate ( $P = .89$ ), and overall live-birth rate ( $P = .85$ ). Intraoperative or early postoperative complications did not occur in either groups. Although there was no statistically significant difference between the groups, a case of uterine rupture in a pregnancy after HS occurred in only 1 patient (group I;  $P = .28$ ) (Table 2).

## DISCUSSION

Although studies have documented an increase in obstetric outcomes, such as live- and term-birth rates, after hysteroscopic septum resection among patients with a history of habitual abortion, no prospective randomized studies have been published to date.<sup>4–9</sup> A systematic review of 18 studies that included 1501 patients reported pregnancy and live-birth rates to be 60 and 45%, respectively, after septum resection.<sup>13</sup> However, published studies investigating the relation between unexplained infertility and uterine septum and the benefits of HS in these patients have reported conflicting results.<sup>4,6,7,14</sup> In patients with an incidental finding of uterine septum but without a history of habitual abortion or infertility, the decision to proceed with HS remains debatable.<sup>8,14,15</sup>

The effect of surgical instruments and energy devices used during hysteroscopy on reproductive outcomes has not

been clearly shown by previous studies. In a retrospective study conducted by Cararach et al,<sup>10</sup> the outcomes of 2 different instruments (scissors vs resectoscope) were compared. Higher pregnancy rates were found in the group in whom scissors was used. In another study, Fedele et al<sup>11</sup> compared microscissors, resectoscope, and argon laser therapy and did not find any differences in regard to reproductive outcomes. Although there are studies advocating for the safe use of bipolar cautery compared with monopolar cautery, a clear-cut consensus on the effect of instruments on outcome has not been reached yet.<sup>12</sup>

Uterine rupture during pregnancy after HS is a very rare complication, with very few cases reported.<sup>16–19</sup> In our study, we had 1 case of uterine rupture in a patient in group I at gestational week 37 after uncomplicated hysteroscopic septum resection. Even though perforations that occur during HS are considered to be a risk factor for uterine rupture in subsequent pregnancies, this complication could happen after uncomplicated HS, as in our case.<sup>18,19</sup> Furthermore, given that HS was performed by using energy devices in most of these cases, the use of electrosurgery can also be regarded as a risk factor for uterine rupture. The weakening of the myometrial tissue caused by the vascular damage that occurs during electrosurgery has been proposed as a cause. Although prospective randomized trials are lacking, office-based hysteroscopy with scissors could be evaluated as a safer surgical alternative than electrosurgery.

The current study is limited by its retrospective nature, which does not support a robust interpretation of the collected data. However, this study is the first to compare the conventional electrosurgical technique with a less invasive technique in which a 5 mm hysteroscope with scissors are used for resection in an office setting without the need for cervical dilatation. In the study, all procedures were performed under general anesthesia, with

diagnostic laparoscopy performed to exclude the possibility of a bicornuate uterus. With the aid of 3-dimensional ultrasonography (3D USG) and magnetic resonance imaging (MRI), performing the differential diagnosis of septate uterus and bicornuate uterus in a safe manner has become feasible without the need for diagnostic laparoscopy. In the patients in whom uterine septum is diagnosed by 3D USG or MRI, HS performed with scissors during office hysteroscopy can also become an outpatient procedure without the need for general anesthesia. Studies that compare the results of outpatient HS with conventional electrosurgical technique performed with general anesthesia may also be conducted.

There is a scarcity of data regarding whether using a specific instrument during HS will improve reproductive outcome. Our data show that the rates of pregnancy reaching term and live births are similar between the 2 HS techniques. Additional studies are needed to examine the safety of the techniques and to evaluate their impact on conception and successful pregnancy.

#### References:

1. Raga F, Bauset C, Remohi J, Bonilla-Musoles F, Simon C, Pellicer A. Reproductive impact of congenital müllerian anomalies. *Hum Reprod.* 1997;12:2277–2281.
2. Acien P. Incidence of müllerian defects in fertile and infertile women. *Hum Reprod.* 1997;12:1372–1376.
3. Homer HA, Li TC, Cooke ID. The septate uterus: a review of management and reproductive outcome. *Fertil Steril.* 2000;73:1–14.
4. Mollo A, De Franciscis P, Colacurci N, et al. Hysteroscopic resection of the septum improves the pregnancy rate of women with unexplained infertility: a prospective controlled trial. *Fertil Steril.* 2009;91:2628–2631.
5. Valle RF, Ekpo GE. Hysteroscopic metroplasty for the septate uterus: review and meta-analysis. *J Minim Invasive Gynecol.* 2013;20:22–42.
6. Pabuccu R, Gomel V. Reproductive outcome after hysteroscopic metroplasty in women with septate uterus and otherwise unexplained infertility. *Fertil Steril.* 2004;81:1675–1678.
7. Grimbizis GF, Gamus M, Tarlatzis BC, Bontis JN, Devroey P. Clinical implications of uterine malformations and hysteroscopic treatment results. *Hum Reprod Update.* 2001;7:161–174.
8. Kowalik CR, Goddijn M, Emanuel MH, et al. Metroplasty versus expectant management for women with recurrent miscarriage and a septate uterus. *Cochrane Database of Systematic Reviews.* 2011:CD008576. Available at [http://www.cochrane.org/CD008576/MENSTR\\_metroplasty-versus-expectant-management-for-women-with-recurrent-miscarriage-and-a-septate-uterus](http://www.cochrane.org/CD008576/MENSTR_metroplasty-versus-expectant-management-for-women-with-recurrent-miscarriage-and-a-septate-uterus).
9. Bendifallah S, Faivre E, Legendre G, Deffieux X, Fernandez H. Metroplasty for AFS class V and VI septate uterus in patients with infertility or miscarriage: reproductive outcomes study. *J Minim Invasive Gynecol.* 2013;20:178–184.
10. Cararach M, Penella J, Ubeda A, Labastida R. Hysteroscopic incision of the septate uterus: scissors versus resectoscope. *Hum Reprod.* 1994;9:87–9.
11. Fedele L, Arcaini L, Parazzini F, Vercellini P, Di Nola G. Reproductive prognosis after hysteroscopic metroplasty in 102 women: life-table analysis. *Fertil Steril.* 1993;59:768–772.
12. Garuti G, Luerti M. Hysteroscopic bipolar surgery: a valuable progress or a technique under investigation? *Curr Opin Obstet Gynecol.* 2009;21:329–334.
13. Nouri K, Ott J, Huber JC, Fischer EM, Stögbauer L, Tempfer CB. Reproductive outcome after hysteroscopic septoplasty in patients with septate uterus: a retrospective cohort study and systematic review of the literature. *Reprod Biol Endocrinol.* 2010;8:52.
14. Chan YY, Jayaprakasan K, Zamora J, Thornton JG, Raine-Fenning N, Coomarasamy A. The prevalence of congenital uterine anomalies in unselected and high-risk populations: a systematic review. *Hum Reprod Update.* 2011;17:761–771.
15. Bosteels J, Weyers S, Puttemans P, et al. The effectiveness of hysteroscopy in improving pregnancy rates in subfertile women without other gynaecological symptoms: a systematic review. *Hum Reprod Update.* 2010;16:1–11.
16. Ergenoglu M, Yeniel AO, Yıldırım N, Akdemir A, Yucebilgin S. Recurrent uterine rupture after hysteroscopic resection of the uterine septum. *Int J Surg Case Rep.* 2013;4:182–184.
17. Satiroglu MH, Gozukucuk M, Cetinkaya SE, Aydinuraz B, Kahraman K. Uterine rupture at the 29th week of subsequent pregnancy after hysteroscopic resection of uterine septum. *Fertil Steril.* 2009;91:934.e1–e3.
18. Sentilhes L, Sergent F, Roman H, Verspyck E, Marpeau L. Late complications of operative hysteroscopy: predicting patients at risk of uterine rupture during subsequent pregnancy. *Eur J Obstet Gynecol Reprod Biol.* 2005;120:134–138.
19. Sentilhes L, Sergent F, Berthier A, Catala L, Descamps P, Marpeau L. Uterine rupture following operative hysteroscopy. *Gynecol Obstet Fertil.* 2006;34:1064–1070.