

Fertility and Pregnancy Outcomes Following Hysteroscopic Septum Division

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Abstract

Objectives: We sought to evaluate retrospectively the efficacy of hysteroscopic metroplasty in a population of women with a history of recurrent pregnancy loss or infertility who were also known to have a uterine septum.

Methods: Hysteroscopic metroplasty was performed on 26 women with a uterine septum and a history of either recurrent pregnancy loss or infertility. The metroplasty was performed using a Versapoint bipolar needle device (in 23% of cases) or a resectoscopic knife electrode with cutting current (in 77% of cases). The main outcome measures were rates of clinical pregnancy and live birth.

Results: Nineteen women had a hysteroscopic metroplasty because of recurrent pregnancy loss. Postoperatively, the pregnancy rate was 95%, and the live birth rate was 72%. The seven infertile patients had pregnancy and live birth rates of 43% and 29%, respectively.

Conclusion: Hysteroscopic metroplasty using either the Versapoint bipolar needle device or a knife electrode is both safe and effective. In women with recurrent pregnancy loss, future fertility is not impaired, and live birth rates are significantly improved.

Résumé

Objectifs : Nous avons cherché à évaluer, de façon rétrospective, l'efficacité de la métroplastie hystéroscopique chez une population de femmes qui présentaient des antécédents de fausses couches récurrentes ou d'infertilité, ainsi qu'une cloison utérine connue.

Méthodes : Une métroplastie hystéroscopique a été effectuée chez 26 femmes qui présentaient une cloison utérine et des antécédents de fausses couches récurrentes ou d'infertilité. La métroplastie a été effectuée au moyen d'un dispositif à aiguille bipolaire Versapoint (dans 23 % des cas) ou d'une électrode couteau résectoscopique avec courant coupant (dans 77 % des cas). Les taux de grossesse clinique et de naissance vivante constituaient les principaux critères d'évaluation.

Résultats : Dix-neuf femmes ont subi une métroplastie hystéroscopique en raison de fausses couches récurrentes. À la suite de l'intervention chirurgicale, le taux de grossesse était de 95 % et le taux de naissance vivante était de 72 %. Les sept

patientes infertiles ont connu des taux de grossesse et de naissance vivante de 43 % et de 29 %, respectivement.

Conclusion : La métroplastie hystéroscopique, qu'elle soit effectuée au moyen d'un dispositif à aiguille bipolaire Versapoint ou d'une électrode couteau résectoscopique, est une intervention sûre et efficace. Chez les femmes qui connaissent des fausses couches récurrentes, la fertilité future n'est pas affectée et les taux de naissance vivante présentent une nette amélioration.

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INTRODUCTION

Incomplete resorption of the müllerian ducts during embryogenesis leads to müllerian anomalies including bicornuate, septate, and arcuate uteri. The American Fertility Society (now the American Society for Reproductive medicine) in 1988 classified uterine abnormalities into six major anatomic types according to the degree of failure of normal development.¹ The true incidence of uterine defects in the general population is not known, but the mean incidence in the general population of fertile women is approximately 4.3%, and in infertile women it is 3.5%.² In patients with recurrent pregnancy loss, the incidence of uterine defects can be as high as 13%.² The most common uterine abnormality is septate uterus, accounting for approximately 35% of all uterine anomalies.²

Some müllerian defects are associated with minimal obstetric risk, but septate uterus is associated with the highest incidence of reproductive failure and obstetric complications. Women with septate uterus have a marked increase in risk of spontaneous abortion, preterm delivery, abnormal fetal lie, and Caesarean section.³ Of all clinical pregnancies in the general population, 15% to 20% will end in spontaneous abortion. The mechanism by which a uterine septum causes an adverse pregnancy outcome is not completely understood. The most widely accepted theory is that the excessive amount of fibroelastic tissue and poor blood supply of the septum can have an adverse effect on placentation.⁴⁻⁷ Conversely, however, one study has found decreased

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connective tissue and increased vascularity in histologic assessment of a uterine septum.⁸ Despite the uncertainty about the histology of uterine septa, the increased rate of adverse pregnancy outcome associated with a septate uterus is undisputed. A study using sonography to localize the site of uterine implantation in women with a uterine septum consistently identified viable pregnancies when implantation occurred on the lateral wall of the uterus, but when the implantation site was on the septum, seven out of eight pregnancies resulted in spontaneous abortion.⁴

Removal of the uterine septum is usually considered beneficial in patients with recurrent pregnancy loss. Incidental discovery of a uterine septum may occur during the evaluation of infertility. The use of metroplasty in these patients is controversial. Most authors recommend treatment as a prophylactic measure to prevent pregnancy complications.^{2,9-11} Initially, uterine septa were treated transcervically, as described by Ruge in 1884.¹² The transcervical approach was later replaced by complex abdominal procedures.¹³⁻¹⁵ Recently, the advent of operative hysteroscopy has rejuvenated the transcervical approach.^{16,17} The advantages of the outpatient hysteroscopic approach include having no postoperative delay in conception, having no contraindication to vaginal delivery, and generating less cost to the health care system because of a shorter operating time and shorter hospital stay.

The aim of this study was to assess retrospectively the efficacy of hysteroscopic metroplasty in a population of women with recurrent pregnancy loss or infertility. The primary outcomes of interest were pregnancy and live birth rate.

MATERIALS AND METHODS

Twenty-six women underwent hysteroscopic metroplasty between January 1997 and May 2004 at St. Joseph's Health Care, London, Ontario. The same surgeon (GAV) performed all the procedures. Information about the presenting complaint was obtained from the records of the primary surgeon. Patients were contacted for telephone interviews between May and December 2004, and informed consent was obtained from all patients during the telephone interview. The presenting complaints in these patients included recurrent pregnancy loss (19/26, 73%) and infertility (7/26, 27%). Six of the women each had two previous pregnancy losses, and the remaining 20 each had three to five previous losses (average of 2.7 losses). Of the women with two miscarriages, four had a previous Caesarean section for preterm labour (at less than 30 weeks' gestational age) with malpresentation after experiencing two pregnancy losses prior to the Caesarean section. All miscarriages occurred in the first trimester. Five of the women had primary

infertility, and two had secondary infertility. All women had the diagnosis of uterine septum made by hysterosalpingography or saline infusion sonography. At the time of metroplasty, all patients underwent both laparoscopy and hysteroscopy to confirm the diagnosis. According to the American Society for Reproductive Medicine (ASRM) classification, 22 patients had a complete uterine septum (class Va) and four had a partial septum (class Vb).

All patients had hysteroscopic metroplasty performed as an outpatient procedure. Surgery was performed in an operating theatre under general anaesthesia. A diagnostic laparoscope was introduced through a subumbilical incision and ancillary probes inserted in the left or right lower quadrant. The abdomen and pelvis were inspected for any pathology including adhesions and endometriosis. If endometriosis was visualized, it was treated by CO₂ laser ablation or resection. The contour of the uterus was outlined to ensure there were no other müllerian defects such as uterus didelphys or bicornuate uterus. The cervix was dilated to 6 or 10mm using Hegar dilators, and either a 5 or a 10 mm Storz hysteroscopic resectoscope (Karl Storz, Tutlingen, Germany) was introduced into the uterine cavity. The uterine cavity was distended and both tubal ostia were visualized on either side of the septum. Septum division was performed using either the Versapoint bipolar needle device (in 6 of the 26 procedures) with saline distension (Gynecare, Division of Ethicon, Somerville, NJ) or a knife electrode and a 26 F Storz Resectoscope (Karl Storz, Tutlingen, Germany) using cutting waveform current (in 19 of 26 procedures) and a 1.5% glycine solution for uterine distension. One patient had a stenotic cervix that was resistant to dilatation, and resection was performed using a Ho:YAG laser fibre through a 5 mm hysteroscope. In all cases, transection of the septum began in the midline at the inferior margin and was carried cephalad until there was no residual septum between the ostia. Postoperatively, all patients had intrauterine insertion of a 14 Foley catheter with the balloon inflated to splint the uterus; this was removed on the fifth postoperative day. In addition, all patients took oral cephalexin 250 mg four times daily for seven days, and Ovril (levonorgestrel 250 µg and ethinyl estradiol 50 µg, Wyeth), two tablets daily for the first five days after the procedure, then one daily for 21 days.

Patients did not have a follow-up hysteroscopy or hysterosalpingogram following metroplasty. One patient had a sonohysterogram performed after she had a pregnancy loss following the initial metroplasty. This patient was found to have residual septal tissue and had a repeat hysteroscopic metroplasty performed by the same surgeon.

Demographic data and clinical outcomes of patients undergoing hysteroscopic metroplasty

	Age in years (mean)	Gravida/para (mean)	Duration of follow-up (months)	Clinical pregnancy rate	Live birth rate
RPL	30.4 (24–33)	3.1/0.2	58	18/19 (95%)	13/18 (72%)
Infertility	31.4 (25–36)		40	3/7 (43%)	2/7 (29%)
Primary	32.2 (25–36)	0/0	40	3/5 (60%)	2/5 (40%)
Secondary	29.5 (29–31)	1/1	40	0	0

RPL: Recurrent pregnancy loss.

There were no intraoperative or immediate postoperative complications.

RESULTS

Demographic characteristics of the patients at the time of surgery and the initial pregnancy outcome following metroplasty are shown in the Table. A clinical pregnancy was defined by a positive serum β -hCG and the presence of a gestational sac on transvaginal sonography. Nineteen women had hysteroscopic metroplasty for recurrent pregnancy loss, and all but one patient achieved pregnancy post procedure (95%). The patient who did not conceive underwent follow-up at only six months post procedure. Of the 18 women who conceived, five had a repeat first trimester pregnancy loss (27%) and 13 (72%) had a live birth at between 34 and 39 weeks' gestation (average 37.2 weeks). Three of these patients had a preterm Caesarean section for premature rupture of membranes with fetal malpresentation, one at 34 weeks and the others at 36 weeks' gestation. Of the patients with infertility, three of five women with primary infertility conceived post metroplasty (neither of the women with secondary infertility conceived). Of the three pregnancies, one resulted in a first trimester loss and two resulted in vaginal delivery at term. In total, 21/26 (81%) women conceived and 15/26 (58%) had live births. Of the women who had live births, 11 had metroplasty performed using a knife electrode and four using Versapoint; 13 of the women with a live birth had ASRM class Va septum and two had ASRM class Vb septum. Of the six women who had first trimester losses post procedure, four had metroplasty using the knife electrode and two using Versapoint. All of these women were found to have class Va septum.

Diagnostic laparoscopy was performed on all 26 patients prior to metroplasty. Ten women were found to have minimal to mild endometriosis (39%) and had ablation or resection of the endometriosis at the time of laparoscopy. Of the five women with primary infertility, 60% were found to

have endometriosis. In the recurrent pregnancy loss group, 37% had endometriosis.

DISCUSSION

Our study supports the use of hysteroscopic metroplasty to improve pregnancy outcome in women with a history of recurrent pregnancy loss, although the lack of a control group in the study limits our conclusions. In addition, our patients did not have a post-procedure hysteroscopy or hysterosalpingogram to confirm the absence of residual septum.

However, our findings are similar to those identified in a review of reproductive outcome before and after hysteroscopic metroplasty.⁹ In this review, miscarriage and preterm delivery rates prior to metroplasty were 88% and 9%, respectively, and the live birth rate was only 3%. Post metroplasty, these rates were 14%, 6%, and 80%, respectively.

Many authors believe that recurrent pregnancy loss is the main or sole indication for metroplasty. It is debatable whether patients with an incidental finding of uterine septum during infertility investigations should undergo division of the septum. Some authors suggest prophylactic metroplasty to prevent complications in future pregnancies.^{2,9–11} One study retrospectively examined the reproductive performance of infertile patients before and after metroplasty and found that metroplasty did not impair fertility post procedure.² We found that hysteroscopic metroplasty did not impair future fertility in patients with recurrent pregnancy loss.

The value of uterine splints and estrogen therapy after hysteroscopic metroplasty has also been debated. Originally, both ancillary measures were thought necessary to prevent fusion of a freshly cut septum and intrauterine adhesion formation.^{18–20} Current literature suggests splints and hormonal therapy are not necessary after hysteroscopic metroplasty.^{17,21–23} The role of antibiotic therapy after hysteroscopic metroplasty has not been firmly established.

Hysteroscopic metroplasty is now the accepted approach for surgical removal of a uterine septum. A hysteroscopic procedure has many benefits over an abdominal approach, including minimal associated morbidity, the ability to perform the procedure on an outpatient basis, no delay in conception, and the ability to have a subsequent vaginal delivery. However, the hysteroscopic route is not without risks. Metroplasty itself, with or without perforation, may weaken the uterine wall and predispose to uterine rupture in subsequent pregnancies. Although the incidence is rare, there have been several case reports of rupture post hysteroscopic metroplasty in recent years.^{24–28} Patients considering pregnancy after this procedure should be advised of the small risk of uterine rupture.

Thirty-eight percent of women in our patient population were found to have minimal to mild endometriosis at the time of laparoscopy. It is not unusual to find endometriosis in women with known müllerian abnormalities. Of women undergoing hysteroscopic metroplasty, 26% to 35% have been found to have endometriosis.^{29,30} Another study found up to 43% of infertile patients with a uterine septum to have laparoscopic evidence of endometriosis.¹⁷

CONCLUSION

We have shown that hysteroscopic metroplasty to remove a uterine septum in women with recurrent pregnancy loss is safe and may be an efficacious procedure. While there may also be a benefit for infertile women who have a uterine septum, the small number of infertile women who underwent metroplasty in this study does not allow us to reach a meaningful conclusion.

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