

Original Research

Evaluation of Fertility Rate in the Couples after Uterine Septum Resection

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Abstract: **Introduction:** Uterine septum is one of the most common congenital abnormalities in women that leads to numerous gynecological problems and adverse obstetrics outcomes. This study aimed to evaluate the effects of Hysteroscopic Resection on pregnancy outcomes in women undergone the surgery.

Methods: In this quasi-experimental study, 90 women were included from April 2016 to June 2018 from patients attending to Rasoul Akram hospital of Tehran. The inclusion criteria included: the age lower than 35 years old, primary infertility, idiopathic recurrent spontaneous abortion, BMI between 19 and 30, and having informed consent. Septum was resected by scissor upward and lateral. After 10 months of follow-up in average, we assessed rate of live births, abortions, birth weight and presentation.

Results: 82 individuals were assessed for occurrence of conception (response rate=91%). The mean age of patients was 30.01 ± 6.76 years and the mean BMI was 26.25 ± 4.88 . Out of 82 patients, 36 patients were pregnant, of whom 16 (44.4%) had abortions. 5 (14.9%) of the pregnancies ended with preterm birth, and 6 (17%) ended with stillbirth.

Conclusion: The present study showed that the infertile patients with uterine septum and with no other causes of infertility were more likely to be pregnant compared to other patients with idiopathic infertility. Our study showed that post-operation fertility following Hysteroscopic Resection was lower than that in previous reports. According to the findings of this study, scissors may be safe, effective and cost-effective method for removing uterine septa.

Keyword: Septoplasty; Septate uterine; Recurrent abortion; Infertility

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1. Introduction

Uterine septum is one of the most common congenital abnormalities in women that leads to gynecological problems and adverse fertility outcomes. It is the most common major abnormality in the general population (3-5%) and in women with recurrent abortions (5- 25%) so that it is reported that 80-90% of the uterine abnormalities are related to the uterine septum(1). The uterine septum occurs as a

result of the incomplete absorption of the paramesonephric (Müllerian) duct in the first trimester of pregnancy(2). The septum is absorbed from the surface of the cervix and continues upward along to the fundus. Based on the size of the septum, the uterine cavity may be partially affected or completely divided into two uterus cavities separated by two endocervical canals(3, 4). Although patients with uterine septum are normally asymptomatic and are able to become pregnant, the uterine septal can increase the risk of spontaneous abortion, infertility, preterm labor, and abnormal fetal placement(5). Septate uterus with incomplete septum refers to the uterus, which includes the fundus, cervix and septum that extends from the upper end of the endo-

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metrial cavity to the cervix. The complete uterine septum has a single fundus that extends from the highest point of the endometrial cavity to the cervix(5). The mechanism by which the uterine septum causes undesirable reproductive effects is not completely clear, however, it is accepted that the increase of tissue fibroelastin and low blood storage of septum can adversely affect the placental replacement (3, 5, 6).

In the past, metroplasty was used for septum correction that might lead to postoperative adhesion and complications due to the abdominal incision for patients; however, nowadays, it has been replaced by Hysteroscopic Septoplasty (HS) that has a short period of convalescence with lower complications (7, 8). Some evaluations have suggested different therapies after removing septum to prevent Asherman syndrome. The use of estrogen, progesterone and hormone therapy is still not fully accepted and discussed, and its efficacy in studies has not been fully validated(9, 10). Estrogen has been said to increase the rate of endometrial growth and progesterone delays the endometrial tissue loss and in this way, they can accelerate spontaneous ovulation and normal growth of endometrial tissue(11). Similarly, some studies have suggested the use of intrauterine objects, such as IUDs, to keep uterine cavity dilated and to prevent the coagulation of the endometrial septum of uterus(12, 13).

Although there is a controversy on the efficacy of septoplasty in infertility, there are many retrospective studies on the efficacy of septoplasty in primary infertility. However, HS has many advantages in patients with a history of primary abortion and is associated with an increase in the chance of a live birth and a reduction in the risk of abortion and onset of preterm labor (16). This study aims to evaluate the effects of surgery on pregnancy in patients with infertility and previous abortions. In this prospective study which has the more potential to evaluate postoperative patients' data, unlike most studies, there is no hormonal treatment or the intrauterine device following the septal resection.

2. Method

This is a quasi-experimental study conducted on 90 women who referred to Rasoul Akram Hospital in Tehran and were randomly included in the study using a randomized table of numbers in the period from April 2016 to June 2018, with chief complaint of infertility or recurrent abortion. This study was approved by ethics committee of Iran University of Medical Sciences (IR.IUMS.SMD.REC1396.9311290017). Patients were included in the study after explaining the complications of the treatment and obtaining the written consent of the participants and ensuring that they had inclusion

criteria. The inclusion criteria included: the age lower than 35 years old, primary infertility, idiopathic recurrent spontaneous abortion, BMI between 19 and 30, and having informed consent. Also, the exclusion criteria included abnormal hormonal examination (TSH, FSH Prolactin), the abnormal evaluation of the spouse's semen analysis, severe dysmenorrhea, dyspareunia, chronic pelvic pain, the symptoms of endometriosis or CEA125>35.

Infertility was defined as not conceiving for 12 months or more without use of contraception and recurrent abortion was defined as the three or more abortion that are not necessarily consecutive (7). After the above measures and the endorsement of the infertility and the existence of a septum, the patients were candidate for the diagnostic and therapeutic hysteroscopy. After menstruation, hysteroscopy was performed using a 12-degree lens hysteroscope (Germany, Tuttlingen STORZ KARL). The duration of each diagnostic hysteroscopy was about 10 minutes and the therapeutic hysteroscopy was about 20 minutes.

The patients were exposed to the general anesthesia without intubation, and Propofol was used for anesthetizing the patients. Cervical dilation with drugs was not performed due to the cervical incompetence and the disruption of hysteroscopy. Normal Saline was used as media and septum was resected by scissor upward and lateral. The final limit of surgery was taken into consideration when blood vessels (myometrium) were observed. Azithromycin (500 mg every 12 hours for seven days) was prescribed after surgery for all patients.

Patients were advised not to have a sexual relationship 6 month after surgery and after that they can make decision to be pregnant. For all patients since the operation until 18 months after operation, follow-up was performed. The patient's characteristics information was stored on the questionnaire and after 18 months, researcher asked them to report the results of the fertility by telephone. The outcomes of the surgery, pregnancy occurrence, pregnancy results (abortion, term delivery,

Table 1: Characteristics of patients

Variable	Value
Age (mean ± SD)	30.01 ± 6.76
BMI (mean ± SD)	26.25 ± 4.88
Blood pressure (mean ± SD)	12.30 ± 1.07
ART (No. (%)) / (mean ± SD)	46 (56.1%), 1.33±1.74
Menstruation	
Regular	59 (72%)
Irregular	23 (28%)
Uterus septum	
Partial	47 (57.3%)
Total	35 (42.7%)
Vaginal septum	3 (3.7%)

preterm delivery), and the relationship between these results and the existence of the septum was evaluated. Data obtained was analyzed using the SPSS 21, and the significant level was considered as 0.05.

3. Result

Morphology of the 90 patients referred at the beginning of the study, eight patients were excluded from the study due to lack of access in the follow-up (response rate=91%). Finally, the study was performed on 82 patients, and the rest of the patients with uterine septum and primary infertility or spontaneous recurrent abortions were followed up with in terms of mean fertility for 10.33 month with a standard deviation of 6.43. In this study, the mean age of patients was 30.01 ± 6.76 years old. The mean BMI was 26.25 ± 4.88 . The patient's baseline characteristics are summarized in Table 1. Out of 82 patients during the follow up and after hysteroscopic resection of uterine septum, 36 patients were

pregnant, of whom 16 (44.4%) had abortions. The occurrence of preterm birth was 5 (14.9%) and the still-birth was 6 (17%).

Table 2 also shows the fertility information of patients after the hysteroscopic resection of the septum.

Compared to patients who had a history of abortion, the number of successful deliveries was 13 (31.7%) versus 17 (41.5%), which was not statistically significant. ($P = 0.39$). However, the number of abortions after septoplasty in the group with the abortion history was 12 (29.3%) and in the group with no history of abortion was 4 (9.8%) that was statistically significant (0.049). moreover, the age of mothers and the weight of newborns in the two groups were not statistically significant as shown in Table 3.

Table 4 shows the data of fertile and infertile mothers after intervention. As shown in Table 4, the age of mothers was significantly different in two groups ($P = 0.001$). The mean age in the fertile mothers group was 27.28 and 32.15 in the infertile mothers group. Also, the rate of previous abortion in a group who experienced pregnancy after the present study was 16 (44.4%), and this

Table 2: Reproductive outcome after hysteroscopy septum

Variable	Value
Number of pregnancies	36
Gestational age at delivery (mean \pm SD) week	36.71 \pm 4.41
Birth weight (mean \pm SD) gr	3108.125 \pm 595.89
Septoplasty time to Pregnancy (mean \pm SD) month	9.43(12.92%)
Abortion	16 (44.4%)
Preterm live birth	5 (14.9%)
Deliveries	
Cesarean section	14(39%)
Vaginal delivery	6 (17%)
Presentation	
Cephalic	16 (80%)
Breech	4 (20%)
Still birth	6 (17%)

Table 3: Obstetric outcome after a hysteroscopic septum resection of women with and without a history of abortion

Variable	Abortion (n=41)	Non abortion (n=41)	P value
live births	13 (31.7%)	17 (41.5 %)	0.391
Abortion	12 (29.3%)	4 (9.8%)	0.049
Pregnancy age	36.37 (5.13)	37 (3.83)	0.683
Birth weight	3170 (429.57)	3065.78 (695.59)	0.635

Table 4: Postoperative fertility group compared to postoperative infertility group

Variable	fertility (n=36)	infertility (n=46)	P value
Age	27.28 (5.23)	32.15 (7.09)	0.001
Abortion	16 (44.4%)	24 (52.2%)	0.824
Use of progesterone	18 (51.4%)	2 (4.9%)	0.0001

was 24 (52.2%) in those who did not become pregnant after study, which was not statistically significant ($P = 0.8$). The use of progesterone in subjects who had experienced a pregnancy test was 18 (51.4%), and in infertile patients was 2 (4.9%), which was statistically significant ($P = 0.001$). No patient had uterine rupture after hysteroscopic resection of septum by scissor.

4. Discussion

Septate uterus can be diagnosed by hysterosalpingography, transvaginal ultrasound or other imaging techniques such as MRI. In the meantime, gold standard for diagnosis of septate uterine is hysteroscopy (14).

Literature show that infertile patients with uterine septum and with no other causes of infertility are more likely to be pregnant compared to other patients with idiopathic infertility (7, 15, 16). Today, laparotomy has been replaced by hysteroscopic metroplasty that has many advantages over laparotomy. The tools available for hysteroscopic metroplasty include endoscopic scissors, collin knives, lasers and bipolar energy (versapoint) (17). Fertility rates with these techniques have been reported to be similar and there are also controversial issues regarding their use (13). The endoscopic scissors were used in the present study.

The most important long-term complication of septoplasty is postoperative adhesion (8). Some studies have suggested this may be prevented by inserting a foreign body like IUD in the uterus or by enhancing the cell growth and distribution of the endometrial layer of uterus by the hormones (15, 18, 19). Although, this has not been completely confirmed and further clinical trials are needed to prove this. We did not use any foreign body or postoperative hormone therapy in our study. The rupture of the cervix and uterus due to dilators or the hysteroscope are some complications of the HS. The incidence of this type of rupture is reported to be about 5%. We did not use dilators in our study to prevent these complications and the rate of uterine and cervix rupture in our study was 0%.

According to available hysteroscopic metroplasty studies, the abortion rate reduces from about 80-90% to about 20%. Also, the term delivery rate ranges from about 5% to over 80%, while preterm delivery rates are reported to remain unchanged (7%) (15, 16, 20). Among infertile women, after septoplasty without any other causes of infertility, pregnancy rates have been reported 38-41% (7). Usually, the uterine septum is detected during infertility, and the amount of uterine septum in infertile women is higher than the general population, and it seems to be related to infertility (6).

Masihi et al. (9) showed that the incidence of abortion in the post-treatment period was 10%. In their study, 50 patients underwent septoplasty by hysteroscopy. 32% of patients had thin partial septum, 48% thick partial septum, and 20% had complete septum. In Paradisi study (11), 112 patients underwent septum resection,

with a fertility rate of 47.3% and abortion rates of 45.8%. Also, in the study of Bendifallah et al. (8), 78 patients had a fertility rate of 60.9%. 48% of whom had normal delivery.

In addition, in Roy's study (15) that was conducted on 170 patients with uterine septum, infertility and recurrent abortion, 152 patients were followed up completely during 28.5 months, of which 6.6% of the patients did not become pregnant. Among pregnant women, 79.5% had term delivery, 7.5% had preterm delivery and 12.9% had abortions. In Selvaraj's study (19), 26 patients with uterine septal were subjected to HS and the percentage of pregnancy in these patients was 86% and live birth was 67%.

In the present study, the occurrence of fertility was 43.9% among the subjects, which was close to that of Paradisi et al. And was less than the results of other studies. Similarly, the percentage of live birth in our study in two groups with a history of abortion and without a history of abortion was 78.9% and 90%, which was higher than the Selvaraj study. In Ventolini et al. (16) survey, 23 patients were studied, of whom 77.8% had a fertility septum resection after the intervention, of whom 22.2% had abortion. Fertility rates in the study of Ventolini were higher than the present study, and the rate of abortion was lower. In the study of Venturoli (17), 141 patients with uterine septum were studied. After HS, the incidence of pregnancy in patients with infertility was 52.1% and in patients with recurrent abortion was 52.7%.

k.k.roy et al. (2009) (15) conducted a retrospective study of 170 patients with uterine septum, after cervical dilatation and septum resection, the rate of miscarriage, delivery, and infertility, respectively, and after surgery was 9.1, 2.5, 15.1, 12.9, 79.5% and 6.6%. The mortality rate was 56.5%.

Dural et al. (21) reviewed the fertility results of patients who had been treated with a resectoscope or a knife. They found a higher pregnancy rate for those who were operated with a knife. While Fedele et al. found no significant difference between the fertility outcome of people with microscopic knives, argon lasers and resectoscopes. Therefore, further research is needed to determine the relationship between these methods and fertility rates. Several studies have reported pregnancy outcomes after septoplasty without postoperative hormone therapy and concluded that the rate of pregnancy in patients is increased (11, 16, 17, 20, 22). Other studies have shown that the use of IUD, estrogen, or both, does not prevent intrauterine adhesion (13, 21). While other studies have suggested that using IUD and hormone therapy can improve the amount of pregnancy after septoplasty. Esmailzadeh et al. (23) concluded that the results of using hormone therapy in one group and IUD in the other group after septoplasty was the same and there was no statistically significant difference in the results of fertility.

Nouri et al. (2) analyzed 18 studies on 1501 patients with infertility complaints or recurrent abortions after

hysteroscopic septoplasty, with a 60% prevalence of pregnancy and a 45% live birth rate. Also, in their study, these numbers were slightly higher, 69% and 49% respectively. They used misoprostol for cervical dilation in contrast to the present study.

Therefore, hysteroscopic withdrawal of uterine septum is desirable as a method for improving the fertility outcome in patients with uterine septum or with a history of recurrent abortion and can improve the fertility outcome. It is suggested that in order to obtain stronger results, a double-blind clinical trial study should be performed among patients with uterine septal and infertility or recurrent abortion in order to evaluate the hysteroscopic septoplasty effect in improving fertility.

4.1. Limitations:

This study was performed only for the study group without the control group. Although we tried to compare therapeutic effect with various previous studies, hence it seems difficult to conclude that hysteroscopic septotomy using scissors is safe and can increase fertility.

5. Conclusion

In this study, we evaluated fertility results in patients with uterine septum who referred to recurrent abortion or infertility after histological examination of septum. The results of this study showed that increased fertility of patients after histopathologic septal withdrawal was observed. Although more comprehensive studies need to be conducted, but according to the findings of this study, scissors seems to be safe, effective and cost-effective method for removing uterine septa.

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7. Conflict of interest

All authors declare that there is no conflict of interest in this study.

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9. Author's contributions

M Vahdat, S Rokhgireh and MA Hosseini, project development; Data collection and data analysis, E Afshari and S Mohammadpour; Manuscript writing, E Afshari and

MA Hosseini; Manuscript editing, M Vahdat, S Rokhgireh, E Afshari, S Mohammadpour and MA Hosseini.

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