

Reproductive Outcome after Hysteroscopic Metroplasty for Septate Uterus

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Abstract

Background: Septate uterus, one of the most common forms of congenital uterine malformations, negatively affects female reproductive health. Traditionally, it is diagnosed by laparoscopy and hysteroscopy. Hysteroscopic metroplasty is a simple and safe approach for the removal of the uterine septum and it is considered the first-line therapy for restoring the uterine cavity, with high levels of improvement to subsequent reproductive outcomes.

Aim of Study: Was to demonstrate the reproductive outcome after operative hysteroscopic metroplasty for women having septate uterus.

Patients and Methods: This study is a prospective study, was carried out on 100 women attending the infertility clinic of the El Shatby University Hospital and Private Hospital, during period from October 2019 till October 2021.

Result: In Preoperative HSG there were 18 (18%) with Septate uterus and 82 (82%) with Sub-septate uterus and in Post-operative HSG all patients had normal uterus. There was statistically significant relation between Outcome and Preoperative HSG. There was statistically significant relation between Outcome and Baseline transvaginal U/S.

Conclusion: Hysteroscopic uterine metroplasty may improve the reproductive performance of the septate uterus, and it may be considered and highly recommended in clinical practice. Resection of the cervical septum may increase the probability of a live-birth pregnancy for patients with a cervical septum, and this procedure could be recommended for cases of a complete uterine septum.

Key Words: *Septate uterus – Primary infertility – Hysteroscopic metroplasty.*

Introduction

SEPTATE uterus, i.e. an incompletely septated uterus or uterus subseptus, is one of the most common forms of congenital uterine malformations [1]. The incidence of congenital uterine malforma-

tions has been reported to be as high as 3-4% in the general female population and to be significantly higher in patients with infertility and recurrent pregnancy loss [2].

Congenital uterine anomalies resulting from müllerian fusion defects are the most common malformations of the reproductive system. Among these anomalies, the septate uterus is associated with the highest incidence of reproductive failure and obstetric complications, including recurrent abortions of the first and second trimester, intrauterine growth retardation, abnormal fetal presentation, and premature delivery. This is the most common structural uterine anomaly. Müllerian fusion defects cause 15%-25% of spontaneous abortions; most are due to septate uteri [3].

Most publications on septate uterus report a very high pregnancy wastage rate, frequently exceeding 70%. Hysteroscopic division of the uterine septum (metroplasty) is now the accepted treatment for such cases, despite the lack of good prospective, randomized controlled trials and the small size of many reported series. A majority of these studies are retrospective and compare the reproductive outcome before and after metroplasty. Patients with otherwise unexplained, primary infertility associated with septate uterus have been reported in many series. However, the role of the uterine septum in this regard and indications for metroplasty remain controversial [4].

The failure of absorption of the partition between the two fused müllerian ducts results in a septum that divides the uterine cavity; the external appearance remains that of a single uterus. The extent of the septum varies: It might be partial, involving part of the uterine cavity, or so complete as to divide both the uterine cavity and endocervical canal into two equal or unequal components. Before

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the development of modern operative hysteroscopy, the accepted surgical techniques required laparotomy, the placing of a uterine incision and, depending on the individual technique, either removal (Strassmann or Jones) or section (Tompkins) of the septum [5].

Hysteroscopic metroplasty is now considered the first therapeutic option for septate uterus. This approach offers many advantages: Shorter operating time and hospitalization period; reduced risk of intra- and postoperative morbidity and no risk of postoperative pelvic adhesions, an increased rate of vaginal delivery [6].

Aim of the work was to demonstrate the reproductive outcome after operative hysteroscopic metroplasty for women having septate uterus.

Patients and Methods

This study was a prospective study, was carried out on 100 women attending the infertility clinic of the El Shatby University Hospital and Private Hospital, during period from October 2019 till October 2021.

Inclusion criteria:

Infertility (either 1ry or 2ry), age between 20 & 35 years, and patient having intrauterine septum otherwise unexplained infertility.

Exclusion criteria:

Chronic medical diseases as DM, hypertension and thyroid dysfunction, and any coinciding cause of infertility.

All patients were subjected to:

- History taking Personal history (age, marital status, parity, address, occupation and any special habits).
- Complaint of each woman in the study: Period of infertility, type of infertility whether primary or secondary, hirsutism and acne.
- Menstrual history with emphasis on menstrual dating and regularity.
- Obstetric history: History of similar condition (recurrent abortion); number of abortions, induced or spontaneous, followed by surgical evacuation or not and if there were any post abortive complications.
- Contraceptive history: (Type & duration).
- Past history of any medical problem: As [hypertension, diabetes mellitus and deep venous thrombosis (DVT)], history of blood intake, allergy to certain drugs and any previous operations including cesarean section (CS).

- Patients will undergo a baseline transvaginal ultrasound evaluation, preoperative HSG, postoperative HSG.
- Family history of infertility or consanguinity.
- Clinical examination: Vital signs: Blood pressure, pulse and temperature, weight, height, and BMI.
- Surgical details: Uterine septoplasty was performed under general anaesthesia. All procedures were performed in the follicular phase of the menstrual cycle, usually within seven days after the end of menstruation.

After cervical dilation with Hegar's dilators up to a width of 10mm, an operative hysteroscope (Storz 10mm fibreoptic resectoscope; Storz GmbH, Germany) was inserted. The uterine cavity was distended with a 1.5% glycine solution with a continuous irrigating flow. The hysteroscope's hook was placed in contact with the septum and an incision was made perpendicular to the septum. All operations were performed with monopolar electrosurgery, no scissors or lasers were used.

Ethical:

An informed verbal consent from all participants was taken and confidentiality of information was assured. An official written administrative permission letter was obtained from dean of faculty of medicine, Al-Azhar University hospital manager, head of Obstetrics and gynecology department in the same University. In the same university, the title and objectives of the study were explained to them to ensure their cooperation. Permission from the medicine ethical committee was also obtained and approval from institutional review board was taken.

Statistical analysis:

Analysis of data was done using Statistical Program for Social Science version 20 (SPSS Inc., Chicago, IL, USA). Quantitative variables were described in the form of mean and standard deviation. Qualitative variables were described as number and percent. In order to compare parametric quantitative variables between two groups, Student t test was performed. Qualitative variables were compared using chi-square (X^2) test or Fisher's exact test when frequencies were below five. Pearson correlation coefficients were used to assess the association between two normally distributed variables. When a variable was not normally distributed, A p -value <0.05 is considered significant.

Results

The mean age of studied group was 28.37 (± 4.21 SD) with range (22-35) years, among the studied

group there were 59 (59%) working and there were 26 (26%) rural resident and were 71 (71%) urban resident. There were 94 (94%) with regular menstrual and 6 (6%) with irregular menstrual with mean duration 4.06 (± 0.86 SD) and range (3-5) days. There all the cases were primi with no abortion history and primary infertility, and there were 11 (11%) with family history of Infertility (Table 1).

Table (1): Distribution of studied patients according to demographic data, menstrual history and Obstetric history.

	Cases	
	No.	%
Demographic data		
<i>Age (years)</i>		
Range	22-35	
Mean \pm SD	28.37 \pm 4.21	
Menstrual history		
<i>Regularity</i>		
Regular	94	94.0
Irregular	6	6.0
<i>Age (Days)</i>		
Range	3-5	
Mean \pm SD	4.06 \pm 0.86	
Obstetric history		
<i>Parity</i>		
0	100	100.0
<i>Abortion</i>		
0	100	100.0
<i>Type of infertility</i>		
Primary	100	100.0
<i>Family history of Infertility</i>		
No	89	89.0
Yes	11	11.0

Table (2) shows that among the studied group there were 82 (82%) with septum present doesn't extend to cervix and 18 (18%) with septum present extend to cervix and there were 37 (37%) With indentation <10mm and were 63 (63%) with uniformly convex.

Table (2): Distribution of studied patients according to Baseline transvaginal U/S.

Baseline transvaginal U/S	Cases	
	No.	%
Fundal contour		
Septum present doesn't extend to cervix	82	82.0
Septum present extends to cervix	18	18.0
External contour		
With indentation <1 0mm	37	37.0
Uniformly convex	63	63.0

Table (3) shows that in Preoperative HSG there were 18 (18%) with Septate uterus and 82 (82%) with Sub-septate uterus and in Post-operative HSG all patients had normal uterus.

Table (3): Comparison between Pre and Post-operative HSG.

	Cases				χ^2	P
	Pre-operative		Post-operative			
	No.	%	No.	%		
Septate uterus	18	18.0	0	0.0	200.0	<0.001 *
Sub-septate uterus	82	82.0	0	0.0		
Normal	0	0.0	100	100.0		

There were 64 (64%) who weren't pregnant, 33 (33%) who were pregnant in single baby and 3 (3%) who were pregnant in twins and 3 (3%) of pregnant women aborted (Table 4).

Table (4): Distribution of studied patients according to Outcome after six months.

	Cases	
	No.	%
Chemical Pregnancy		
No	64	64.0
Yes	36	36.0
Clinical pregnancy		
No	64	64.0
Single	33	33.0
Twins	3	3.0
Miscarriage		
No	97	97.0
Yes	3	3.0

There was statistically significant relation between Outcome and Preoperative HSG (Table 5).

Table (5): Relation between Outcome and Preoperative HSG.

	Cases						χ^2	P
	No (N=54)		Single (N=33)		Twins (N=3)			
	No.	%	No.	%	No.	%		
Septate uterus	17	17.0	1	1.0	0	0.0	8.848	0.012*
Sub-septate uterus	47	47.0	32	32.0	2	2.0		

There was statistically significant relation between Outcome and Baseline transvaginal U/S (Table 6).

Table (6): Relation between Outcome and Baseline transvaginal U/S.

	Cases						χ^2	P
	No (N=54)		Single (N=33)		Twins (N=3)			
	No.	%	No.	%	No.	%		
Septum present doesn't extend to cervix	47	47.0	32	32.0	2	2.0	8.848	0.012 *
Septum present extendsto cervix	17	17.0	1	1.0	0	0.0		
<i>External contour</i>								
With indentation <10mm	31	31.0	5	5.0	1	1.0	10.367	0.006*
Uniformly convex	33	33.0	28	28.0	2	2.0		

Discussion

This study showed that the mean age of studied group was 28.37 (± 4.21 SD) with range (22-35) years, among the studied group there were 59 (59%) working and there were 26 (26%) rural resident and were 71 (71 %) urban resident.

In a study by Saridogan et al., [7] they includes all women (99) who underwent hysteroscopic surgery for uterine septum between January 2001 and December 2019. During the study period, 99 women were treated for intrauterine septum, with a mean age of 35.6 years (range 24-48 years).

Amer et al., [8] showed that his study was carried out on 16 women with uterine septum in childbearing period complaining of either infertility or recurrent miscarriage fulfilling the inclusion criteria, attending to Ain Shams University Maternity Hospital between May 2017 and April 2018. He showed that 75% aged below 30.

This study demonstrated that there all the cases were primi with no abortion history and primary infertility, and there were 11 (11%) with family history of Infertility.

Saridogan et al., [7] showed that the majority of patients was referred with a history of infertility, followed by miscarriage (1 or 2 miscarriages) and recurrent miscarriage (≥ 3 miscarriages). The total number of miscarriages in the recurrent miscarriage group was 51, with an average of 3.6 miscarriages (range 3-5).

Wang et al., [9] showed that 45 women in the spontaneous abortion group had 72 pregnancies, of which 68 (94.44%) ended in miscarriage, 3 (4.17%) ended in preterm delivery, and 1 (1.39%) ended in term delivery.

This study illustrated that among the studied group there were 82 (82%) with septum present doesn't extend to cervix and 18 (18%) with septum present extend to cervix and there were 37 (37%)

With indentation <10mm and were 63 (63%) with uniformly convex.

Dykes et al., [10] showed that the key imaging feature to assess is the external contour of the uterine fundus. A deep fundal cleft (> 1 cm) is consistent with a bicornuate uterus, whereas a shallow cleft, a flat contour, or a convex fundal contour is diagnostic of a septate uterus. It is also important to determine whether a bicornuate uterus is complete or partial because spontaneous abortion and preterm labor are reportedly higher with a complete bicornuate compared to partial.

This study demonstrated that there were 64 (64%) who weren't pregnant, 33 (33%) who were pregnant in single baby and 3 (3%) who were pregnant in twins and 3 (3%) of pregnant women aborted.

Wang et al., [9] showed that After resection of the septum, 80 pregnancies in 70 patients were achieved during the follow-up period of 24 months. There were 32 pregnancies in the primary infertility group and 43 women achieved 48 pregnancies in the abortion group. The number of miscarriages was less after resection of the septum compared with before resection in the abortion group. Furthermore, the number of live births was much higher after resection of the septum compared with before resection in the abortion group several observational studies showed that hysteroscopic septum incision was associated with improved clinical pregnancy rates in women with infertility. Additionally, many retrospective studies have suggested that a septal incision leads to improved miscarriage rates and obstetric outcomes. Therefore, although a few studies have not shown an improvement in reproductive outcome following hysteroscopic uterine metroplasty, this operation is highly recommended in patients with fertility requirements [9].

The clinical effectiveness of hysteroscopic-metroplasty varies depending on the situation. The

cumulative probability of pregnancy and that of livebirth pregnancy for the 24-month follow-up were significantly different between the study groups. Patients with primary infertility would benefit from this procedure, but would still have a lower pregnancy rate than patients with recurrent miscarriages. This indicates that there are other factors influencing fertility in the population of women with primary infertility and that additional research is required. However, the effect of this procedure on improving the clinical pregnancy and miscarriage rates are undeniable [11].

This study cleared there was statistically significant relation between Outcome and Preoperative HSG.

In a study by Nappi et al., [12] 18 patients were treated for septate uterus between 2013 and 2016. The indications for hysteroscopicmetroplasty were recurrent abortion in 11 of the women and primary infertility in the other seven. We used a 5mm-office hysteroscope with a diode laser fibre. After exploration of the cavity, the septum was divided with use of the laser fibre. Heshowed that pregnancy outcomes related to previous fertility history. One patient had post-partum haemorrhage due to a retained placenta. No uterine rupture during pregnancy or delivery occurred and one case of placenta accrete was noted.

Several authors propose metroplasty using 4 mm endoscopic scissors introduced into the uterine cavity; this approach has resulted in a pregnancy rate of 91,7% with a delivery rate of 72,7%. Other authors prefer using a resectoscope (with a pregnancy rate of 80-85% and a delivery rate of 81-89%) while others prefer use of a laser with a pregnancy and delivery rate similar to that of a resectoscope [13].

Recently, the diode laser has been introduced into hysteroscopy. Due to its 980nm wavelength, it achieves high absorption simultaneously for haemoglobin and water, thereby providing its haemostatic properties, and thus offers a high capacity for ablation and vaporization. A diode laser can be used in direct contact with the tissue [14].

Strength of this study is its large sample size. Furthermore, data were entered prospectively at the time of clinical management, and follow-up data were obtained for all patients, which increased the generalizability of our results.

Limitations of our study are that we did not have a non-surgical control group, which potentially limits the evidence strength of the results. Addi-

tionally, factors such as preoperative management to thin the endometrium, operating time, operation equipment, distending media used, intraoperative bleeding, and complications, were not included.

In particular, similar to previously studies, the major flaw in our study is the before/after design. The effectiveness of removing the septum remains controversial because the reproductive outcome without surgery is usually good in this population. Bias can only be eliminated by well designed, randomized, controlled trials. Therefore, results of the first registered, multicenter, randomized controlled trial are highly expected.

Conclusion:

Hysteroscopic uterine metroplasty may improve the reproductive performance of the septate uterus, and it may be considered and highly recommended in clinical practice.

Recommendations:

- Further studies on large geographical scale and on larger sample size to emphasize our conclusion.
- Resection of the cervical septum may increase the probability of a live-birth pregnancy for patients with a cervical septum, and this procedure could be recommended for cases of a complete uterine septum.
- Although obviously a rare complication, patients should be made aware of this potentially serious late complication of hysteroscopicseptoplasty.
- 3D ultrasound imaging and office hysteroscopy are recommended for the diagnosis of uterine anomalies.

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محجوزة الرحم: القدرة الإنجابية بعد رأب الرحم بالمنظار الرحمي

خليفة الدراسة: الرحم المنفصل، أحد أكثر أشكال تشوهات الرحم الخليفة شيوعاً، يؤثر سلباً على الصحة الإنجابية للإناث. تقليدياً، يتم تشخيصه عن طريق تنظير البطن وتنظير الرحم. حوالة الرحم هي طريقة بسيطة وأمنة لإزالة الحاجز الرحمي، وتعتبر العلاج الأول لاستعادة تجويف الرحم، مع مستويات عالية من التحسين لنتائج الإنجاب اللاحقة.

الهدف من الدراسة: كان لإثبات النتيجة الإنجابية بعد جراحة الرحم بالمنظار للنساء اللواتي يعانين من انسداد الرحم.

المريضات وطرق الدراسة: هذه الدراسة هي دراسة استطلاعية أجريت على ١٠٠ سيدة يترددن على عيادة العقم بمستشفى الأزهر الجامعي والمستشفى الخاص خلال الفترة من أكتوبر ٢٠١٩ حتى أكتوبر ٢٠٢١.

نتائج الدراسة: من بين المجموعة المدروسة كان هناك ٨٢ (٨٢٪) مع وجود الحاجز لا يمتد إلى عنق الرحم و١٨ (١٨٪) مع وجود الحاجز يمتد إلى عنق الرحم وكان هناك ٣٧ (٣٧٪) بمسافة أقل من ١٠ ملم وكان هناك ٦٣ (٦٣٪) مع محذب بشكل موحد. كان هناك علاقة ذات دلالة إحصائية بين النتيجة وتصوير الرحم قبل الجراحة. كانت هناك علاقة ذات دلالة إحصائية بين النتيجة وخط الأساس عبر المهبل U/S.

الاستنتاج: قد يحسن رأب الرحم بالمنظار من الأداء التناسلي للرحم المنفصل، ويمكن اعتباره والتوصية به بشدة في الممارسة السريرية.