



Effectiveness of Hysteroscopic Metroplasty of Uterine Septum on Reproductive Outcome: A Descriptive Case Series Study

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ABSTRACT

Background: Surgical repair with resection of the septum hysteroscopically, or hysteroscopic metroplasty, provides excellent post-treatment results with significant improvement in pregnancy rates post-procedure. **Aim:** To define the effectiveness of therapeutic intervention through operative hysteroscopic intrauterine septum resection in increasing pregnancy rate and reducing patients' complaints in women with primary infertility, history of preterm labor, or recurrent miscarriage. **Patients & methods:** This descriptive case series study was conducted on 23 female patients of reproductive age with primary infertility, a history of preterm labor or recurrent miscarriage who underwent operative hysteroscopic resection of intrauterine septa

Results: The reproductive outcome in all patients shows that 16 women (69.6% of total participants) had pregnancy. No pregnancy occurred in 7 patients (30.4%). Of those, 3/16 patients (18.8% of whom had pregnancy) aborted, 10/16 patients (62.5% of pregnant patients) continued to term pregnancy, & 3 /13 studied cases (18.8% of pregnant) had a preterm delivery, the live birth rate was 81.3% (13/16). The best reproductive outcome occurred in the miscarriage group, in which the pregnancy rate & live birth rate were (75%) & (93.4%) respectively, followed by the primary infertile group (70%) and (86%). History of preterm labor group came in the last with (60%) pregnancy rate and (67%) live birth rate. **Conclusion:** Correction of intrauterine septum, even if a small incomplete type, improves the chance of conception in infertile women who have no other causes for infertility and increases the live birth rate with a decrease in miscarriage rate.

Key words: Hysteroscopic metroplasty, uterine septum, preterm labor

INTRODUCTION

Trans-abdominal surgery was originally thought to be the standard approach to treat uterine irregularities; however, there were several risks associated with this procedure, such as the possibility of pelvic adhesions that could cause infertility later, extended hospital stays, & a longer recovery period before conception. By permitting a vaginal approach, hysteroscopic surgery offers a straightforward surgical process & a reduced length of hospital stay (1).

Currently, uterine septa & other intrauterine abnormalities such as sub-mucosal fibroids, polyps, & intrauterine adhesions can be effectively treated with surgical hysteroscopy (2).

Unlike a bicornuate uterus, which has an indented fundus & 2 endometrial cavities, a septate uterus has a normal exterior surface but 2 endometrial cavities. A deficiency in the canalisation or

resorption of the midline septum among the 2 Müllerian channels gives rise to the septate uterus. The degree of septation ranges from a minor midline septum to a septate uterus with a longitudinal vaginal septum due to complete resorption failure. The distance between the septum & the internal os defines partial & complete uterine septum; the classification is unaffected by the existence or absence of a complete or partial vaginal septum (3).

Arcuate uteri are classed as septate uteri, bicornuate uteri, or normal variants; they have a modest midline septum & a minimal & frequently large fundal cavity indentation (4). Clinically, symptoms might range from the development of poor reproductive results to being asymptomatic and going untreated (5).

Surgical repair with resection of the septum hysteroscopically, or hysteroscopic metroplasty, provides excellent post-treatment results with significant improvement in pregnancy rates post-procedure (6).

Following surgical hysteroscopy & pharmaceutical treatment for structural uterine abnormalities, the percentage of successful pregnancies rises dramatically (7).

This research aimed to define the effectiveness of therapeutic intervention through operative hysteroscopic intrauterine septum resection in increasing pregnancy rate and reducing patients' complaints in women with primary infertility, a history of preterm labor, or recurrent miscarriage.

PATIENTS & METHODS

This descriptive case series study had been conducted on 23 female patients of reproductive age with primary infertility, a history of preterm labor, or recurrent miscarriage who underwent operative hysteroscopic resection of intrauterine septa.

Inclusion criteria: Female patients diagnosed with complete or incomplete uterine septum affecting their reproductive performance who underwent operative hysteroscopy for uterine septum, female studied cases with primary infertility, female studied cases with a history of preterm labor, female studied cases with recurrent miscarriage & age: 18-35 years

Exclusion criteria: Hysteroscopy contraindications include studied cases with other causes of infertility, marked cervical stenosis, recent or ongoing pelvic inflammatory disease, known cervical malignancy, pregnancy, excessive uterine bleeding, or recent uterine perforation.

Sample size: The sample size was 23 cases, according to statistical power 95%. The sample size had been calculated based on the incidence of pregnancy 12 months after hysteroscopic metroplasty. In the reviewed literature, the incidence was reported in a wide range, with an average of 60%. To attain eighty percent statistical power, a minimum suitable sample of ten cases was required, with alpha set at 0.05 & 20 percent as the highest acceptable error. StatCalc (Epi Info version 7.0.8.3 for MS Windows, CDC, USA, 2011) was used to calculate the sample size.

Methods:

Patients underwent hysteroscopic resection of the intrauterine septum. Preterm labour, recurrent miscarriages, & primary infertility were the indications for hysteroscopic septum excision. The right indications, a thorough medical history, & a physical examination that included pelvic, abdominal, & general exams were used to determine which studied cases would be seen. Husbands will undergo routine laboratory assessments, hormone assays, & semen analyses. Physicians & direct patient reports provided information regarding the ensuing fertility. The fertility & the result of pregnancies after operative hysteroscopic resection of the intrauterine septum were analyzed according to treatment results.

Possible risks (mention whether there is any risk or not): There is a risk of complications from operative hysteroscopy and complications from general anesthesia. “No complications occurred to any patients.”

Primary results (Most important results to be evaluated): Reproductive outcome for the patients within 12 months post hysteroscopic septum resection, i.e., number and fate of pregnancies (abortions, preterm labors, and term labors) which had occurred during the follow-up period.

Secondary result parameters (other results to be evaluated): Improvement of any associated complaints like abnormal uterine bleeding, pelvic pain, dysmenorrhea, etc

Statistical analysis: When applicable, statistical descriptions of the data were provided using the mean $\pm$ standard deviation, median & range, or frequencies (number of cases) & percentages. The statistical computations were conducted using IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) release 22 for Microsoft Windows & Microsoft Excel 2007 (Microsoft Corporation, NY, USA).

RESULTS

The age range was 18-40 years, with a mean of 30.48 ± 5.03 years, and the BMI of the participants was 18-35 kg/m², with a mean of 26.48 ± 5.4 kg/m² (Table 1).

Table 1: Socio-demographic profile of the participants (n=23).

Sociodemographic profile		
Age	< 30	10(43%)
	≥ 30	13(57%)
BMI (kg/m ²)	<25	8(35%)
	≥ 25	15(65%)

According to the chief complaint, Patients who complained of primary infertility were 10 (43.5%). Those who complained of a history of preterm labor were 5(21.7%), while there were eight patients (34.8%) who suffered from habitual abortion (Table 2).

Table 2: Distribution of the patients according to chief complaint

Chief complaint	Number	%
primary infertility	10	43.5%
history of preterm labor	5	21.7%
Habitual abortion	8	34.8%

Table 3 shows the distribution of associated symptoms in patients. The most frequent symptom was dysmenorrhea in 7 studied cases (30.4%), followed by menorrhagia in 3 patients (13%) and

hypomenorrhea in 2 patients (8.7%). One patient (4.3%) complained of associated metrorrhagia. Ten patients (43.5%) had no associated symptoms.

Table 3: Distribution of the patients according to associated symptoms

Symptom	Number of patients (%)
Dysmenorrhea	7 (30.4%)
menorrhagia	3 (13%)
Hypomenorrhea	2 (8.7%)
Metrorrhagia	1(4.3%)
No associated symptoms	10 (34.5%)
Total	23 (100%)

Table 4 shows the reproductive outcome in all patients; 16 women (69.6% of total participants) had a pregnancy, while seven patients (30.4%) had no pregnancy. Of those, 3/16 patients (18.8% of whom had a pregnancy) aborted, 10/16 patients (62.5% of pregnant patients) continued to term pregnancy, & 3/13 studied cases (18.8% of pregnant) had preterm delivery. The live birth rate was 81.3% (13/16).

Table 4: Reproductive outcome in all cases after operative hysteroscopy

Outcome	Pregnancy	Spontaneous abortion	Preterm <36 weeks	Term
	16/23	3/16	3/16	10/16
Total	69.6%	18.8%	18.8%	62.5%

The best reproductive outcome occurred in the miscarriage group, in which pregnancy rate & live birth rate are (75%) & (93.4%) respectively, followed by the primary infertile group (70%) and (86%); the history of preterm labor group comes in the last with (60%) pregnancy rate & (67%) live birth rate. Regarding the abortion rate, it is (33%) in the group of preterm labor, but it is (16.6%) in the recurrent miscarriage group, while it is (14%) in the primary infertility group. No preterm labor occurred in the group with a history of preterm labor, while it was (28%) and (16.6%) in primary infertility and recurrent miscarriage groups, respectively. Regarding term labor rate, it was (58%), (67%) and (66.8%) in primary infertility, history of preterm labor, and recurrent miscarriage groups, respectively.

Table 5: Reproductive outcome in all cases after operative hysteroscopy according to type of main complaint

	Primary infertility group No. (10)	history of preterm labor No. (5)	Miscarriage Group No. (8)	Total No. (23)
No pregnancy	3	2	2	7
Pregnancy	7/10 (70%)	3/5(60%)	6/8(75%)	16/23(69.9%)
Abortion	1/7(14%)	1/3(33%)	1/6(16.6%)	3/16(18.7%)
Preterm labour	2/7(28%)	0/3	1/6(16.6%)	3/16(18.7%)
Term labour	4/7(58%)	2/3(67%)	4/6(66.8%)	10/16(62.6%)
Livebirth	6(86%)	2/3(67%)	5/6(93.4)	13/16(83.3%)

According to the mode of delivery, two patients (15.4%) 13 delivered vaginally, one of their term while the other preterm delivery, while 11 patients (84.6%) delivered by CS, two of them preterm (Table 6).

Table 6: Distribution of patients who give birth according to mode of delivery

	Vaginal delivery	Cesarean section
Total Number	2	11
Percent	15.4%	84.6%
Preterm delivery	1	2
Term delivery	1	9

According to Table7, which shows the distribution of studied cases relieved from associated complaints, ten out of 13 with associated symptoms had been relieved (77%).

Table 7: Distribution of studied cases relieved from associated complaints

Chief complain	Studied cases relieved group (percent)	Studied cases Not relieved from symptoms	Total number of studied cases in the group
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AUB	3 (75%)	1 (25%)	4
menorrhagia	3 (100%)	0	3
metrorrhagia	0	1	1
Dysmenorrhea	5 (71.5%)	2 (28.5%)	7
hypomenorrhea	2 (100%)	0	2
total	10 (77%)	3 (23%)	13

DISCUSSION

The age range was 18-40 years with a mean of 30.48 ± 5.03 years, and the range of BMI of the participants was 18-35 kg/m² with a mean of 26.48 ± 5.4 kg/ m².

A study done by Vahdat et al. (8) on 82 patients with BMI between 19 and 30, with ages **lower than 35 years old, divided into three groups:** primary and secondary infertility and idiopathic recurrent spontaneous abortion.

According to the chief complaint, Patients who complained of primary infertility were 10 (43.5%). There were 5 patients who complained of a history of preterm labor (21.7%), while there were eight patients (34.8%) who suffered from habitual abortion. The most frequent symptom was dysmenorrhea in 7 studied cases (30.4%), followed by menorrhagia in 3 patients (13%), hypomenorrhea in two patients (8.7%), and one patient (4.3%) complaining of associated metrorrhagia. While 10 Patients (43.5%) have no associated symptoms. In the present research, after hysteroscopic metroplasty for uterine septum, 16/23 studied cases had pregnancy (69.9%), spontaneous abortion occurred in 3/16 patients (18.7%), while another 3/16 (18.7%) patients delivered living preterm babies and 10/16 (62.6%) had term pregnancy. So, the live births rate was 81% (13/16).

These results are like those of research by Ghahiry et al. (9) on patients who underwent hysteroscopic metroplasty. In that study, the pregnancy rate after metroplasty was sixty five percent, of which > seventy percent achieved live births.

Nouri et al. (10) reported in their study results near our study pregnancy rate (69%) (n=34), which is equal to that of the current study, and 71% had live births (n=24).

Wang et al. (11) reported a pregnancy rate of (56%) (n=13/23), and live birth was 92% (n=12/13), which are near to those of the current study.

According to the mode of delivery, two patients (15.4%) and 13 delivered vaginally; one of their terms was preterm delivery, while CS delivered 11 patients (84.6%), and two of them were preterm. The best reproductive outcome occurred in the miscarriage group, in which pregnancy rate & live birth rate are (75%) & (93.4%) respectively, followed by the primary infertile group (70%) and (86%); the history of preterm labor group comes in the last with (60%) pregnancy rate & (67%) live birth rate. Regarding the abortion rate, it is (33%) in the group of preterm labor, but it is (16.6%) in the recurrent miscarriage group, while it is (14%) in the primary infertility group. No preterm labor occurred in the group with a history of preterm labor, while it was (28%) and (16.6%) in primary infertility and recurrent miscarriage groups, respectively. Regarding term labor rate, it was (58%), (67%) and (66.8%) in primary infertility, history of preterm labor, and recurrent miscarriage groups, respectively.

Hollett-Caines et al. (12) reported a much higher pregnancy rate after septoplasty than the current study (80%) (n=21/26), and live births were 15/21 (71%).

Additionally, in **Roy et al. (13)** 152 studied cases were followed up entirely for 28.5 months, which is comparable to the follow-up length in the present research, of 170 studied cases with a uterine septum, infertility, & recurrent abortion. Of these studied cases, 6.6 percent did not become pregnant. 7.5 percent of preterm births among pregnant women occurred, compared to 79.5 percent of term births, the live birth rate was 87%, and 12.9% had abortions.

Selvaraj et al. (14) reported after hysteroscopic septum resection performed on 19 primary infertile patients postoperatively, the pregnancy rate was 32% (n=6), & the live birth rate was 67% (n=4), 33% (n=2) had miscarriage.

The number of patients in the **Ventolini et al. (15)** survey was 23 patients, equal to that of the current study, of whom 77.8 percent had a fertility septum resection after the intervention, of whom 22.2 percent had an abortion. The fertility rate and abortion rate in the research of Ventolin were higher than in the current research, which is (69.9%) and (18.7%) respectively.

According to the distribution of patients relieved from associated complaints, ten patients out of 13 with associated symptoms had been relieved (77%).

Grimbizis et al. (16) discovered that although the chances of conception were comparable to those of the overall infertile population, the prognosis for pregnancies was worse in studied cases with infertility & recurrent miscarriages who suffered from untreated uterine abnormalities. They recommended that hysteroscopic metroplasty be used to improve the outcomes of pregnancies rather than to increase an infertile studied case's capacity for conception **(16)**.

Our study's limitations include not having a non-surgical control group and having a low number of patients, which could potentially limit the strength of the evidence. Bias could only be eliminated by well-designed, randomized, controlled trials.

CONCLUSION

Correction of intrauterine septum, although small incomplete type, increases the chance of conception in infertile females who have no other reasons for infertility and increases the live birth rate with a decrease in miscarriage rate.

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