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Reproductive outcome of septate uterus after hysteroscopic metroplasty

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Abstract We evaluated the reproductive outcome after hysteroscopic metroplasty in the patients with septate uterus. The reproductive performance of 361 patients with septate uterus during the follow-up period of 18 months after the surgery was analyzed retrospectively for a period of 10 years. A total of 180 (49.8%) pregnancies were achieved after metroplasty during the follow-up period of 18 months. Of the 180 pregnancies 117 (57.2%) reached to term and 34 (18.8%) ended in preterm delivery and the remaining 29 (16%) resulted in abortion. Of the preterm babies 18 (52.9%) were able to live. We obtained 135 (75%) live babies totally. Hysteroscopic metroplasty improves the reproductive performance of septate uterus significantly especially in the cases with recurrent pregnancy loss and should be considered highly as a corrective approach for such patients.

Keywords Septate uterus · Hysteroscopy · Metroplasty · Miscarriage · Infertility

Introduction

Congenital anomalies of the müllerian ducts are rather commonly seen and have been known for a long period of time as one of the main causes of obstetric complications [14]. They are generally associated with impaired reproductive performance such as infertility, recurrent pregnancy loss, preterm births and abnormal fetal presentations [13, 17]. The overall incidence of müllerian defects is estimated to be 5% [1]: it is 2–3% in fertile women, 3% in infertile women, 5–10% in women with

recurrent miscarriages and more than 25% in women with late miscarriages and preterm deliveries [1]. Among the Müllerian duct anomalies [16] septate uterus is the most common and is associated with the highest incidence of poor reproductive outcome and obstetric complications [9, 10]. Recurrent early spontaneous abortion is the most frequently seen (>60%) complication related to septate uterus [9, 10]. Hysteroscopic metroplasty is accepted as the most effective approach in correcting this anomaly with high improvement in the subsequent reproductive outcome [6, 7].

Our aim in carrying out this retrospective study was to evaluate the reproductive outcome of our patients during 10 years who underwent hysteroscopic metroplasty for correction of septate uterus.

Materials and methods

We carried out a retrospective study comprising of 361 women who applied to our hospital with primary infertility and recurrent pregnancy loss and were diagnosed with different degrees of septate uterus [2]: 101 total septate uterus, 231 subtotal septate uterus, and 29 total septate uterus with double cervix. Hysteroscopic metroplasty was performed on these patients for correction at the infertility clinic of Zekai Tahir Burak Women's Health Education and Research Hospital during 1990–2000.

Hysterosalpingography (HSG) was performed on the patients on admission. When septate uterus was suspected, we performed laparoscopy consequently. Our aim was to check serosal surface of the uterus in order to identify septate uterus from the bicornuate uterus. We also observed the tubes, ovaries and abdominal cavity to define any concurrent pathologies such as endometriosis, polycystic ovary, unilateral or/and bilateral tubal occlusion, hydrosalpinx and adhesion related to infertility. We also evaluated the male factor as another infertility factor by semen analysis. Since we focused only on septate uterus in our study we excluded the patients with the extrauterine factors mentioned above.

In order to carry out our study we reviewed the patient charts for age, main complaints, obstetric history and reproductive outcome and we distributed these 361 patients in our series into groups according to their types of septate uterus [12]. The cases were collected in three groups according to their main complaints. The first group consisted of 193 patients with complaints of primary infertility who failed to achieve pregnancy for over 2 years with a mean age of 24. The second group consisted of 109 patients

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who had one or two spontaneous abortions with a mean age of 25 and the third group was consisted of 59 patients who experienced 3 to 11 consequent abortions with a mean age of 28.

In our series all the patients received 600 mg danazol per day for preoperative preparation of the endometrium for 6 weeks. The hysteroscopic metroplasty was performed during the early follicular phase of the menstrual cycle. All patients received antibiotic for prophylaxis in order to reduce the risk of secondary pelvic inflammatory disease. All the procedures were performed under general anesthesia and in sterile condition. Rigid Storz hysteroscope (Storz Endoscopy, Tuttlingen, Germany) and 26-F resectoscope (Storz) with specific loop electrode (model 27046-6) were used during operation. The cutting current was set at 50–70 W. The uterine cavity was distended with 1.5% glycine at an inflow pressure of 60–90 mmHg, and the mean amount of the absorbed distention medium was 1500 ml (range 800–2900 ml). After visualizing both of the tubal ostia, the incision of septa was started from the lower margin and continued upward with horizontal section until the hysteroscope could be moved freely from one tubal ostium to the other without obstruction and both tubal ostia could be visualized. Increase of blood at the fundus was a sign of reaching the junction of the septum and myometrium. Among our 130 cases with complete septate uterus, 29 of them had double cervix. A pediatric Foley catheter was inserted into one hemicervix in order to prevent leakage of the distending medium from the opposite uterine cavity and then the hysteroscope was introduced into the contralateral hemicervix. Because there is always a risk for secondary cervical incompetence after hysteroscopic metroplasty, the transcervical dissection of the septum was started at the level of internal cervical os in order to conserve the cervical portion of the septum until the Foley catheter bulb was seen. After this lysis was performed in the usual method mentioned above. Intrauterine device (IUD) was inserted into the uterine cavity in all the patients after the procedure and they were advised to use cyclic estrogen-gestagen therapy for 2 months to reduce the formation of adhesions and speed rapid epithelialization. IUD was removed 2 months after the operation and follow-up HSG was done to evaluate the effectiveness of the procedure. The cases with residual notch larger than 1 cm were corrected by rehysteroscopy. We evaluated the reproductive outcome of each patient in whom hysteroscopic metroplasty was performed during the follow-up period of 18 months.

Statistical analysis was performed by using the χ^2 test. The cumulative pregnancy rate for 18 months of follow-up period was by Kaplan-Maier analysis. The comparison of pregnancy probability between three groups was evaluated by using log Rank test (Fig. 1). The Statistical Package for Social Sciences (SPSS, Chicago, Ill., USA) was used for analysis and $P < 0.05$ was considered as statistically significant.

Result

The time from inserting the hysteroscope into the cavity to its removal took 12–30 min (mean 20). Fluid overload syndrome was observed in five patients. Uterine perforation occurred in ten patients during hysteroscopy. Five of these cases were repaired by laparoscopy right after the septum incision. The other five however, had to be repaired by laparotomy due to the size of the perforation (>1). In 312 (86.4%) of our patients postoperative HSG revealed symmetric uterine cavities with rare fundal notches less than 1 cm wide. We achieved satisfactory results at the first hysteroscopy in these patients. However, rehysteroscopy was necessary for 49 patients (13.6%) due to the larger than 1 cm residual notch. The distribution of the 49 patients requiring rehysteroscopy were as follows: 16 patients (7%) with subtotal septate

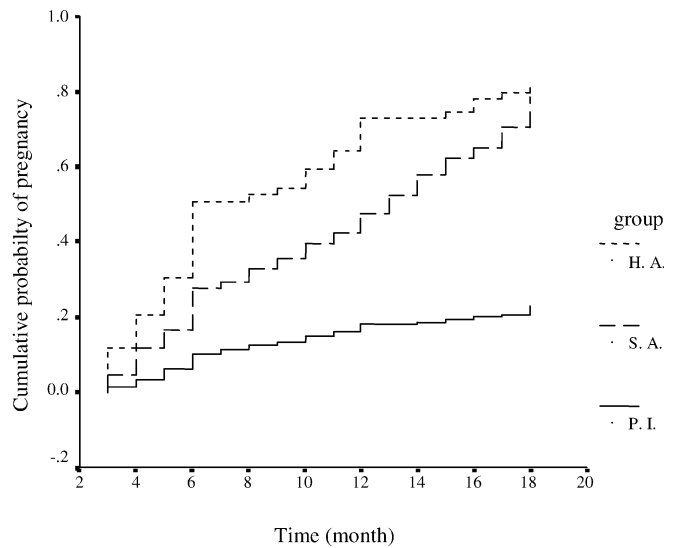


Fig. 1 Cumulative 18-month probability of becoming pregnant in 193 women with complaints of primary infertility (P.I; straight line), and 109 with complaints of spontaneous abortion (S.A; dashed line), and 59 with complaints of habitual abortion (H.A; dotted line)

Table 1 The rate of rehysteroscopy according to the type of septate uterus in our series

Type of septate uterus	n	%
Subtotal septate uterus	16	7.0
Total septate uterus	25	25.0
Total septate uterus with double cervix	8	27.5
Total	49	13.6

uterus, 25 (25%) with total septate uterus, and 8 (27.5%) with total septate uterus including double cervix (Table 1). The need for rehysteroscopy in subtotal septum cases was lower than the other two groups statistically ($P < 0.0001$).

In our series, before metroplasty, 109 cases in the spontaneous abortion group had 183 pregnancies from which 168 (91.8%) ended in miscarriage, 13 (7.1%) in preterm delivery and there were only 2 (1.1%) pregnancies that reached to term. In the habitual abortion group 59 cases had 262 pregnancies from which 252 (96.1%) ended in miscarriage, 10 (3.8%) in preterm delivery. There were no pregnancies that reached to term in this group. Thus a total of 361 cases had 445 pregnancies but there were only 11 (2.4%) live babies (Table 2). However, after the metroplasty there was an impressive change in the results (Table 2). A total of 180 (49.8%) pregnancies were achieved after metroplasty during the follow-up period of 18 months. There were 45 pregnancies (25%) in the primary infertile group which resulted in 23 (51.1%) term and 7 (15.5%) preterm deliveries. In the spontaneous abortion group 86 women achieved 17 (19.7%) preterm and 60 (69.7%) term deliveries. The number of miscarriages decreased from 168 (91.8%) to 9 (10.4%). In the habitual abortion group 49 pregnancies

Table 2 Comparison of reproductive outcome before and after hysteroscopic metroplasty in the study groups

	Primary infertility (n=193)		Spontaneous abortion (n=109)		Habitual abortion (n=59)		Total (n=361)	
	n	%	n	%	n	%	n	%
Before metroplasty								
Pregnancies	0	–	183	–	262	–	445	–
Miscarriages	0	–	168	91.8	252	96.1	420	94.3
Preterm deliveries	0	–	13	7.1	10	3.8	23	5.1
Term deliveries	0	–	2	1.1	0	–	2	0.4
Live babies	0	–	8	4.3	3	1.1	11	2.4
After metroplasty								
Pregnancies	45		86	–	49	–	180	–
Miscarriages	15	33.3	9	10.4	5	10.2	29	16.1
Preterm deliveries	7	15.5	17	19.7	10	20.4	34	18.8
Term deliveries	23	51.1	60	69.7	34	69.3	117	65.0
Live babies	26	57.7	70	81.3	39	79.5	135	75.0

had 10 (20.4%) preterm and 34 (69.3%) term deliveries. The number of miscarriages decreased from 252 (96.1%) to 5 (10.2%; Table 2).

The cumulative pregnancy probability in the primary infertile group during the first 6 months was 20 (10.4%), 35 (18.1%) during 6–12 months and 45 (23.3%) after 18 months. The cumulative pregnancy probability in the spontaneous abortion group was 30 (27.5%) for the first 6 months, 52 (47.7%) during 6–12 months and 86 (78.9%) after 18 months. The cumulative pregnancy probability in the habitual abortion group was 30 (50.8%) for the first 6 months, 43 (72.9%) during 6–12 months and 59 (83.1%) after 18 months (Fig. 1). We found statistically significant difference between three groups in pregnancy probability ($P < 0.001$, log rank test).

Discussion

Transabdominal metroplasty was used as the only traditional correction method for septate uterus in the past. However, it has become obsolete because of its several hazards like the risk of pelvic adhesions which lead to subsequent infertility, prolonged hospital stay and a longer postoperative interval before conception (3–6 months). Moreover it could cause surgical damage to uterine fundus by increasing the risk of scar rupture during pregnancy or make cesarean section fundamental for the subsequent pregnancy [14]. However, hysteroscopic metroplasty has outdated and replaced transabdominal metroplasty by enabling vaginal approach to the correction of septate uterus and providing several advantages such as simple and short surgery with shorter hospitalization time. The morbidity is low and the most important of all it allows subsequent vaginal delivery. Such factors make hysteroscopic metroplasty a superior approach to abdominal metroplasty.

Up to date most of the data collected from the retrospective studies which were carried out to evaluate the

effectiveness of hysteroscopic metroplasty for the reproductive outcome of septate uterus suggested that this procedure decreased the miscarriage rate from 60% down to 15% and increased the pregnancy rate significantly from 5–20% to 81–91% [4, 8, 15]. The results of our series were compatible with the literature. The total miscarriage rate dropped down to 16.1% from 94.3% and the total term pregnancy rate of our cases increased to 65% from 0.4% which confirmed that hysteroscopic metroplasty should be considered as the most effective approach in women with septate uterus when there is a history of miscarriages or infertility.

The effectiveness of hysteroscopic metroplasty shows differences depending on the patient groups. Especially the group containing primary infertility patients have lower results than the patients with miscarriages. Fedele et al. [8] reported the cumulative live birth rate as 39% in the infertility group and 62% in the group with miscarriages for the follow-up period of 36 months. In our series the results were compatible with their results (Table 2). Our cumulative live birth rate was 57.7% in the infertility group, 81.3% in the spontaneous abortion group and 79.5% in the habitual abortion group during the follow-up period of 18 months. According to these results the miscarriage rate in the spontaneous abortion group decreased to 10.4% from 91.8% and in the habitual abortion group to 10.2 from 96.1% which suggested that there is a significant improvement achieved by hysteroscopic metroplasty.

The cumulative pregnancy probability for the 18 months follow-up period showed significant statistical differences among the study groups ($P < 0.001$, log rank test). It was 23.3% in the primary infertile group, 78.9% in the spontaneous abortion group, and 83.1% in the habitual abortion group.

Hysteroscopic metroplasty can at certain times need to be followed by a second procedure depending on the width of the residual septa [3]. Since it would not reduce the reproductive performance, Fedele et al. [8] suggested to leave the notches smaller than 1 cm untouched rather

than risk harming the myometrial tissue. Of the cases in our series 86.4% revealed symmetric uterine cavities with a small fundal notch smaller than 1 cm on postoperative HSG. Colocurci et al. [5] claimed a total uterus correction in 85.5% of their cases after the first hysteroscopy which was compatible with our results. We performed re-hysteroscopy for only 13.6% of our cases. Re-hysteroscopy was necessary especially for the patients with complete septum involving the cervix (27.5%) due to the width of the septum (Table 1).

According to the pregnancy result of our patients, cesarean section rate was 58% (63% in term; 41% in preterm) which was higher than general population. Although the patients were informed about the possibility of vaginal delivery; the majority of them – especially the term group – preferred cesarean not because of obstetrical indications but for the preciousness of the pregnancy due to their history of infertility and poor reproductive outcome.

Many authors pointed out that septate uterus would lead to poor reproductive prognosis in the majority of cases with a fetal survival rate of 6–28% and a high rate of spontaneous abortion over 60% [9, 10, 11, 12, 13]. Our results showed an improvement with a fetal survival rate of 74.4% including term and preterm babies and a term delivery rate of 64.4%. The results found by Raga et al. [17] were 51.7% for the term deliveries and 62% for live birth after hysteroscopic metroplasty which was also a good prognosis.

These data we obtained from our retrospective study show that hysteroscopic metroplasty can improve the reproductive performance of septate uterus significantly and it should be considered and recommended highly as a corrective approach for these patients.

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