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## Research Article

# Comparison Between Scissors and Resectoscope in Resection of Uterine Septum

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## ABSTRACT

**Background:** Septate uterus is a common congenital uterine malformation. It is due to abnormal resorption of the Mullerian canal in embryonic life. Poor reproductive outcomes (e.g., abortion and preterm births) are associated with septate uterus.

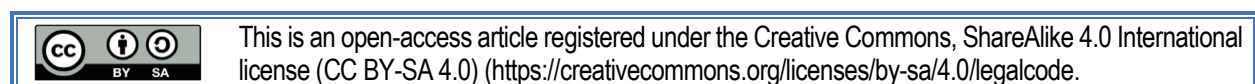
**Aim of the work:** The present study aimed to compare scissors and resectoscope regarding the efficacy and safety in resection of uterine septum.

**Patients and Methods:** This study was conducted in the outpatient clinic of Al-Azhar University Hospital (New Damietta) from December 2017 to October 2020. Women were assigned into one of the two groups. The first included fifteen women, who underwent septoplasty by scissor and the Group II included fifteen women who were submitted to septoplasty by bipolar resectoscope.

**Results:** Group (I) had a higher pain score in group I than group II with a significant difference. Mild pain was reported in 10 cases (66.7%) in group I and 4 (26.7%) in group II. However, moderate pain was reported for 5 cases (33.3%) and 11 cases (73.3%) in groups I and II, respectively, with a statistically significant difference. However, both groups were comparable regarding patient characteristics, operative data, postoperative complications and postoperative results of hysteroscopy, three months after the resection of the uterine septum.

**Conclusion:** Scissor is preferred over the bipolar resectoscope especially in thin septum. It is associated with comparable outcome to the bipolar resectoscope. However, bipolar resectoscope was associated with significantly higher pain scores than scissors.

**Keywords:** Hysteroscopy; Septoplasty; Resectoscope; Scissor; Septum.



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## INTRODUCTION

Congenital uterine abnormalities are developed with the deviation from the normal anatomical development due to embryological mal-development of the Mullerian ducts. The association between Mullerian tube defects and infertility was reported. However, it is still under debate <sup>(1)</sup>. Uterine septum is the most common site for congenital malformations of the uterus. It accounts for 80% to 90% of uterine malformations <sup>(2)</sup>. The septum is a longitudinal partition of the uterus. The outer surface of the uterus had a normal typical shape. However, the septum may include only the superior part of the uterine cavity leading to an incomplete septum or "a septate uterus". The septum may include the total length of the uterine cavity leading to the development of a double uteri and double cervix. It may extend caudally to include the vagina leading to formation of a double vagina <sup>(3)</sup>. Uterine malformations are significantly higher in infertile women and in those with recurrent pregnancy loss <sup>(4,5)</sup>. The septate uterus is linked to poor reproductive outcome (e.g., higher first and second trimesters abortion, premature delivery, abnormal presentation, and increased rate of cesarean section (SC) <sup>(6)</sup>.

Hysteroscopy is a recently introduced minimally invasive procedure. It could be used for the diagnosis and treatment of different intrauterine and endocervical conditions. It is useful for uterine conditions like Asherman's syndrome, endometrial polypi, uterine bleeding, endometrial uterine ablation, myomectomy, Mullerian duct abnormalities, septal conditions, evacuation of retained products (in selected cases) and for removal of embedded intrauterine devices (IUDs) <sup>(7)</sup>. Hysteroscopic metroplasty can be completed through different techniques. It includes, but not limited to, flexible mechanical scissors, electrosurgery with specially designed electrodes to be fitted for the hysteroscope or resectoscope, bipolar electrodes, laser and morcellators <sup>(8)</sup>. Each modality had its own advantages and disadvantages, which advocates or limits its use <sup>(9)</sup>. However, there is no consensus about the ideal technique. Thus, the current work was designed to compare scissors and resectoscopes regarding the efficacy and safety in resection of the uterine septum.

## PATIENTS AND METHODS

**Study design:** This was a prospective clinical study. It included women after septoplasty. They were selected from the outpatient clinic of Al-Azhar University Hospital (New Damietta) from December 2017 to October 2020. This study included 30 women, who were scheduled for one of the two study groups. Group I included women who were submitted to septoplasty by scissor and Group II included women who underwent septoplasty by bipolar resectoscope. An informed consent had been obtained from each woman and her husband. Women with history of recurrent pregnancy loss, primary or secondary infertility, failed intracytoplasmic sperm injection (ICSI) trial or before ICSI trial, were included in the study. The study protocol was approved by the local research ethics committee of the department of Obstetrics

and Gynecology, Damietta Faculty of Medicine, Al-Azhar University, Damietta (Egypt). On the other hand, women older than 38 years, with previous history of uterine surgery and who had bicornuate septate uterus, were excluded from the study.

### Methods:

Women were submitted to full history taking, complete clinical examination (general, abdominal, and pelvic). Then all had been submitted to routine and special investigations (e.g, ABO-Rh blood grouping, complete blood count (CBC), random blood glucose level assay, and urine analysis. The hysteroscopy was performed 3-5 days post-menstruation.

**Hysteroscopic Technique** was completed in line with El Saman <sup>(10)</sup>. Prophylactic antibiotic Augmentin 1 gram iv was given prior to the procedure. All patients were operated under general anesthesia. The patient perineum should be just past the edge of the table. Normal saline was used for uterine distension at a pressure of approximately 40 mm Hg connected to the inflow channel on the sheath with intravenous tubing.

Cases that were operated on with scissors underwent the following: The labia being gently separated with fingers, the tip of hysteroscope was positioned in the vaginal introitus, the vagina was distended with saline through a small channel in the hysteroscope. Then the hysteroscope was introduced through the cervical canal into the cavity. Patient who operated-on with resectoscope underwent cervical dilatation up to Higger 8 before introducing the resectoscope. Septoplasty was done by either scissor with office hysteroscopy (5 Fr, Karl Storz gmbh of Tuttlingen Germany) or by bipolar resectoscope (Karl Storz, Autocon II 400) after dilatation of cervix to 8.5-9 mm. The duration of the procedure and fluid defects were calculated in each procedure. Pain scores were measured by visual analogue scale after explanation for each woman and repeated training. This scale extends between 0 to 10. Zero denotes absent pain and 10 describes the worst pain <sup>(11)</sup>. From 0 to 3 describes mild pain and values above 3 to 7 describes moderate pain, while severe pain recognized with values more than 7 to 10.

Any complication was documented. An outpatient hysteroscopy was routinely performed 3 months after metroplasty to diagnose postoperative uterine synechiae.

**Statistical analysis:** The collected data analyzed by the statistical package for social sciences (SPSS) version 19 (SPSS Inc, Chicago, USA). Quantitative data were expressed as the mean  $\pm$  standard deviation (SD). Qualitative data were presented as relative frequency and percentage distribution. For comparison between two groups, the independent samples (*t*) test. For comparison between categorical groups, the student T test was used. For all tests, P values < 0.05 were considered significant. For all tests, P values > 0.05 were considered insignificant.

## RESULTS

In the present study, there were comparable between both groups regarding age and BMI; age was  $24.67 \pm 3.6$  years in group I Vs  $26.18 \pm 3.6$  years in group II and BMI was  $25.45 \pm 1.5 \text{ kg/m}^2$  Vs  $26.12 \pm 1.01 \text{ kg/m}^2$  respectively (Table 1). There were comparable between both groups regarding infertility, recurrent abortion, Failed intracytoplasmic sperm injection (ICSI) and prior ICSI (Table 2). There were comparable between studied groups regarding operative time, fluid deficit and blood loss with no significant differences but there were highly significant differences between studied groups regarding pain score  $3.58 \pm 1.31$  in group I Vs  $6.81 \pm 2.32$  in group II (Table 3). The visual analog scale showed 10 cases (66.7%) suffered from mild pain in group I and 4 (26.7%)

in group II and 5 cases (33.3%) suffered from moderate pain in group I and 11 cases (73.3%) in group II with statistically significant differences (Table 4). There were 4 cases (26.7%) suffered from post-operative fever in group I and 3 cases (20%) in group II, in addition to there was 1 case (6.7%) in group II suffered from pulmonary edema and 1 (6.7%) suffered from in-complete removal of septum in group I and 1 (6.7%) in group II with no statistically significant differences. In the present study, there were 3 cases (20%) suffered from Reformation of septum in group I and 1 cases (6.7%) in group II and also there was two case (13.3%) in group I Vs 3 (20%) in group II suffered from intra-uterine adhesion, in addition to there was 2 cases (13.3%) with filmy adhesion in group I versus 3 (20%) in group II with no statistical significant differences (Table 5).

Table (1): Demographic data of the studied cases.

Parameters		Mean	SD	Minimum	Maximum	test	P value
Age (years)	Group I	24.67	3.6	20	30	0.99	0.33
	Group II	26.18	3.6	21	30		
BMI (kg/m <sup>2</sup> )	Group I	25.45	1.5	23.5	28.4	1.24	0.23
	Group II	24.5	1.01	24.5	27.8		

Table (2): Comparison between studied cases regarding indication.

	Group I	Group II	$\chi^2$	P value
Infertility	2 (13.3%)	4 (26.7%)	7.12	0.06
Recurrent abortion	5 (33.3%)	2 (13.3%)		
Failed ICSI	1 (6.7%)	6 (40.0%)		
Prior to ICSI	7 (46.7%)	3 (20.0%)		

Table (3): Comparison between studied cases regarding operative time, fluid deficit, blood loss and pain score

Parameters		Mean	SD	Minimum	Maximum	test	P value
Operative time (Min)	Group I	9.52	2.77	5.3	12.3	0.76	0.45
	Group II	8.81	1.66	4.9	11.5		
Fluid deficit (ml)	Group I	525.2	47.18	476	568	1.03	0.31
	Group II	515.4	77.9	452	518		
Blood loss (cc)	Group I	32.73	11.91	20	50	0.63	0.54
	Group II	36.36	15.18	15	70		
Pain score	Group I	3.58	1.31	2	6	6.37	<0.001
	Group II	6.81	2.32	2	10		

Table (4): Pain score of the studied cases.

Score	Group I	Group II	$\chi^2$	P value
0 (No pain)	0 (0%)	0 (0%)	4.8	0.02
1-3 (Mild pain)	10 (66.7%)	4 (26.7%)		
4-6 (Moderate pain)	5 (33.3%)	11 (73.3%)		

Table (5): Post-operative data of the studied cases.

Parameters		Group I	Group II	Test	P value
Post-operative complications	Fever	4 (26.7%)	3 (20.0%)	0.43	0.67
	Pulmonary edema	0 (0%)	1 (6.7%)	1.01	0.31
	In-complete removal of septum	1 (6.7.0%)	1(6.7%)	0.0	1.0
Post-hysteroscopic evaluation	Reformation of septum	3 (20%)	1 (6.7%)	1.07	0.28
	Intra-uterine adhesion	2 (13.3%)	3 (20%)	0.49	0.62
	Type of adhesion (Filmy adhesions)	2 (13.3%)	3 (20%)	0.49	0.62

## DISCUSSION

Hysteroscopic metroplasty is an accepted method for surgical treatment of the uterine septum. Hysteroscopic technique has many advantages over the abdominal approach. This includes low morbidity, performing the process as outpatient procedure, no delay in conception and the ability to subsequently delivery by normal vaginal <sup>(12)</sup>. The resection of the septum could be completed by cold scissors, unipolar or bipolar cautery, laser, or uterine morcellator. However, no consensus yet <sup>(13)</sup>.

This work aimed to compare scissors and resectoscope regarding the efficacy and safety in resection of uterine septum. The age and BMI were comparable between each of the studied groups; respectively. These results agree with Sardo *et al.* <sup>(14)</sup> who showed that no statistical differences observed in the main baseline characteristics between groups with hysteroscopic metroplasty regarding age and BMI, group main age was  $32.2 \pm 5.9$  and BMI was 23.8. Esmailzadeh *et al.* <sup>(15)</sup> reported that the mean age of the patients who suffered from infertility with septum were  $30.5 \pm 5.1$  years and mean BMI were  $27 \pm 4.3$  kg/m<sup>2</sup>. Different age groups & BMI between studies did not affect the efficacy of the procedure.

In the present study, it was comparable between both groups regarding indication (infertility, recurrent abortion, failed intracytoplasmic sperm injection (ICSI) and prior ICSI). Esmailzadeh *et al.* <sup>(15)</sup> reported no significant difference between infertility types in patients undergoing hysteroscopic metroplasty, so infertile patients in our study were picked in one group. Nouri *et al.* <sup>(4)</sup> done their study on sixty-four women underwent hysteroscopic septoplasty and found 19 % of cases done septoplasty due to recurrent abortion. Wang *et al.* <sup>(16)</sup> studied many clinical indications including abortion (78%) and infertility (13%). Kamel *et al.* <sup>(17)</sup> worked on patients with infertility, miscarriage, preterm birth or asymptomatic.

In the present study, operative time was  $9.52 \pm 2.77$  minutes for the scissors group vs  $8.81 \pm 1.66$  for resectoscope ( bipolar ), with no significant difference between studied groups this result is comparable with other studies. Kamel *et al.* <sup>(17)</sup> found that in the mini-scissor group operative time was  $12.6 \pm 2.8$  vs  $12.8 \pm 2.6$  minutes in bipolar twizzle group with p value 0.25. They worked on an ambulatory basis with no analgesia. These results agree with Roy *et al.* <sup>(18)</sup> who done their work to compare between unipolar and bipolar resectoscope for septal resection and reported nonsignificant difference in operation time between the two groups. They found that the mean operative time for resectoscope was 10.82-minute a longer operative time documented in the work of Wang *et al.* <sup>(16)</sup> which was  $22.60 \pm 10.67$  minutes, this can be attributed to the use of US as a guide during operation while we used fallopian ostia as landmark, operator skills may also play a role.

The fluid deficit had no significant differences between both groups,  $525.2 \pm 47$  ml vs  $515.4 \pm 77$  ml. This was near to the work

of Kamel *et al.* <sup>(17)</sup> which was 519 min vs 480 minutes, while Roy *et al.* <sup>(18)</sup> had fluid deficit from 595 ml to 718 ml in all these studies fluid deficit was not significantly different between studied groups.

In the present study there was a significant difference between studied groups regarding pain score. It was  $3.58 \pm 1.31$  in group I Vs  $6.81 \pm 2.32$  in group II. The visual analog scale showed 10 cases (66.7%) suffered from mild pain in group I and 4 (26.7%) in group II and 5 cases (33.3%) suffered from moderate pain in group I and 11 cases (73.3%) in group II with statistically significant differences. Patients in group II (bipolar) had higher pain scores than patients who underwent mechanical metroplasty (scissor). This could be explained by the transmission of bipolar thermal energy as soon as the resection started, causing stimulation of the adjacent uterine wall <sup>(19)</sup>. In the study of Kamel *et al.* <sup>(17)</sup>, pain score was 4.1 vs 6.9 and the P value was 0.013 which was also significant.

In the present study, there were 4 cases (26.7%) suffered from post-operative fever in group I and 3 cases (20%) in group II, with no statistical significance. Wang *et al.* <sup>(16)</sup> found 6 cases out of 191 with post-operative fever in the cases where they used Foley's catheter.

The advantages of hysteroscopic repair of septate uteri include less morbidity, no abdominal or transmyometrial incisions, and a shorter time until the patient can return to normal activities. Because no abdominal incision is made in this method, possible infection and intraabdominal adhesions that may cause future fertility problems or pain are avoided <sup>(20)</sup>.

In the present study, reformation of septum and Intra-uterine adhesion were comparable between both groups with no statistically significant differences. there were 3 cases in the first group ( 20% ) vs one case in the second group. Nouri *et al.* <sup>(4)</sup> reported about 13% of cases needed redoing due to septum reformation in the study of Roy *et al.* <sup>(18)</sup> total of 3 cases out of 70 had reformation of septum plus one case of adhesion.

The patients were evaluated postoperatively by 2<sup>nd</sup> look hysteroscopy performed after three months. The postoperative adhesions after hysteroscopic metroplasty may lead to infertility and scar rupture in future pregnancies. In addition, laparotomy also results in a longer hospital stay. Even in cases where laparotomy is required, hysteroscopic metroplasty is still the preferred approach to prevent potential subsequent risk especially scar rupture in future pregnancies <sup>(21)</sup>.

Bettocchi *et al.* <sup>(22)</sup> reported that office hysteroscopic metroplasty was successfully performed using 5Fr scissors through an office hysteroscopy with an outer sheath measuring 4 mm in diameter without any analgesia or anaesthesia. Although the introduction of mini-hysteroscopes reduces uterine injury, and the safety of bipolar surgery in reducing electrolyte imbalance and thermal injury.

**Conclusions:** Septoplasty is done either by scissor or by bipolar resectoscope. Scissors are performed over the bipolar resectoscope in case of thin uterine septum while bipolar resectoscope is preferred over the scissor in case of thick uterine septum. Further research is still needed to clarify character of the uterine cavity after hysteroscopic metroplasty either by scissors or bipolar resectoscope and to determine the reproductive outcome after operation.

**Limitations of this study** include the small number of cases that meet the inclusion criteria.

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