Spontaneous pregnancy after Hysteroscopic Metroplasty of Uterine Septa for Infertile and Bad Obstetric History Patients

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Abstract

Background: Intrauterine environment is considered one of the most important factors for successful pregnancy. Repair of uterine septal defects can help to achieve live birth in patients with history of infertility and Bad Obstetric History (BOH).

Objective: To evaluate the spontaneous pregnancy and live birth outcome following hysteroscopic septal resection in patients with history of primary infertility and bad obstetric history.

Methodology: This is a retrospective study, including one hundred patients, attended infertility centre Misurata during the period (January 2016-December 2017). Mean age 30 years (SD± 5.5). They had history of infertility and bad obstetric history (abortion and preterm delivery). Hysteroscopic metroplasty performed via bipolar versapoint system. Reproductive performance in the form of live birth after septum resection analysed during the period of one year after the operation.

Results: Hysteroscopic septal resection was performed on sixty patients (60%) with primary infertility, postoperative pregnancy rate was 28.3%, live birth rate was 21.7%, other forty patients (40%) with abortion and BOH, 50% got spontaneous pregnancy, 42.5% of them got live birth these differences are significant.

Conclusion: Hysteroscopic septum resection using bipolar versapoint system can significantly improve the live birth rates in patients with history of infertility and BOH.

Recommendation: Use of hysteroscopy routinely in cases with of infertility and Bad Obstetric History (BOH) for the diagnosis and treatment of uterine pathologies.

Keywords: Infertility, Bad Obstetric History, Hysteroscopic metroplasty, Spontaneous Pregnancy.

الحمل العفوى بعد التنظير الرحمى وتصحيح الحواجز الرحميه لمرضى العقم وذوى الولادة السيئة التاريخ

الخلفيه: البيئة الرحمية تعتبر واحده من أهم العوامل لنجاح الحمل. إصلاح عيوب الحاجز الرحمى يمكن ان يساعد على استكمال الحمل والولادة الحية للمرضى الذين يعانون من تاريخ العقم المبدئى وتاريخ الحمول السيئه.

الهدف: تقييم حدوث الحمل العفوى والولادة الحيه بعد استئصال الحاجز الرحمى فى المرضى الذين يعانون من تاريخ العقم الاوليه وتاريخ الولادة السيئة.

المشاركين وطريقه البحث: دراسه مرتجعه، لعدد ١٠٠ من المرضى الذين حضروا لمركز العقم بمدينه مصراته خلال الفترة (يناير ٢٠١٦– ديسمبر ٢٠١٧). متوسط العمر (٣٠ سنة± ٥,٥ انحراف معياري) وكان لديهم تاريخ من العقم المبدئى والولادة السيئة التاريخ (الإجهاض والولادة المبتسرة). اجراء عمليه التقويم بالمنظار الرحمى عن طريق نظام فيرسابونت ثنائى القطب. يتم تحليل الأداء الإنجابى فى شكل الولادة الحية بعد استئصال الحاجز خلال فتره سنه واحده بعد العملية.

النتائج: أسفرت نتائج هذه الدراسه عن حدوث حمل بعد العملية الجراحية ٢٨,٣%، وكان معدل الولادات الحية ٢١,٧% تم اجراء لعدد ٦٠ (٦٠%) من الحالات فى حالات العقم الاولى. وكان معدل الحمل لعدد ٤٠ (٤٠%) فى حالات الإجهاض وذوات تاريخ الحمول السيئه هى ٥٠% حصلوا على الحمل العفوى، ٤٢,٥% منهم حصلوا على الولادة الحية.

الإستنتاج: يمكن استئصال الحواجز الرحميه باستخدام نظام Versapoint ثنائى القطب التى تساعد على تحسين كبير فى معدلات.

الحمل العفوى والولاده الحيه للمريضات اللاتى يعانون من العقم ووتاريخ الحمول السيئه.

التوصية: استخدام تنظير الرحم بشكل روتينى فى حالات العقم والولادة السيئة لتشخيص وعلاج الحواجز الرحميه.

Introduction:

Infertility is a worldwide problem of reproductive health, it is affects an estimated 15% of couples globally, amounting to 48.5 million couples.[1] Successful pregnancy outcome depends on many factors. Quality of embryos and intrauterine environment considered to be the most important factors. Any intrauterine lesion such as uterine septum, polyp, adhesion, submucosal myoma are likely to cause implantation failure.[2] Visualization of the uterine cavity, identification of pathology and performing hysteroscopic guided biopsy and therapeutic procedures made hysteroscopy an important tool in infertility evaluation.[3]

Septate uterus, a type of congenital uterine malformation resulting from incomplete absorption of the septum after fusion of the bilateral mullerian ducts during embryogenesis. Malformations seem to be influenced by a genetic heterogeneity and/or polygenic multifactorial inheritance.[4]

Prevalence of congenital uterine anomaly has been estimated to range of (4.3- 6.7%), (3.4- 8.0%) and (12.6- 18.2%) of general population, the infertile population, and in recurrent miscarriage populations respectively,[5] suggesting a link with infertility, miscarriage, abnormal fetal malposition, and premature birth.[6] Given that infertility can be the result of multiple factors, it is often difficult to determine if the uterine septum is the sole reason for infertility.[7]

European Society of Human Reproduction and Embryology and the European Society for Gynaecological Endoscopy (ESHRE- ESGE) defined uterine septum an internal indentation extending> 50% of myometrial wall thickness. A partial septate uterus refers to a single fundus and cervix with a uterine septum extending from the top of the endometrial cavity toward the cervix. The size and shape of the septum can vary by width, length, and vascularity.

Eshre Classification:

- Class U0: Normal uterus is any uterus having either straight or curved interostial line but with an internal indentation at the fundal midline not exceeding 50% of the uterine wall thickness.
- Class U1: Dysmorphic uterus incorporates all cases with normal uterine outline but with an abnormal shape of the uterine cavity excluding septa. Class I is further subdivided into three categories include (T shape uterus, infantile uterus and others minor deformity of uterine cavity).
- Class U2 or septate uterus: An internal indentation at the fundal midline exceeding 50% of the uterine wall thickness which subdivided into two categories (U2A partial uterine septum and U2B complete uterine septum).
- Class U3 or bicorporeal: Uterus with an abnormal fundal outline; further divided into three subclasses according to the degree of the uterine corpus deformity (Partial bicorporeal, complete bicorporeal, bicorporeal septate uterus).
- Class U4 or hemi- uterus: Incorporates all cases of unilateral formed uterus. further divided into two sub- classes depending on the presence or not of a functional rudimentary cavity (Hemi- uterus with a rudimentary, hemi- uterus without rudimentary).
- Class U5 or aplastic uterus: Incorporates all cases of uterine aplasia, further divided into two sub- classes depending on the presence or not of a functional cavity in an existent rudimentary horn (Aplastic uterus with rudimentary and aplastic uterus without rudimentary).
- Class U6: Is kept for still unclassified cases.[8]

A complete septate uterus has a single uterine fundus, with a septum extending from the fundus and continuing through the cervix or may extend into a duplicated cervix. Both may be seen in combination with a longitudinal vaginal septum. This configuration must be differentiated from the uterus didelphys in which the uterine horns are separated. Both anomalies have duplicated cervices and typically are associated with a longitudinal vaginal septum. In addition, a combined bicornuate/ septate configuration of the uterus has been described in which the external fundus has an indentation consistent with a bicornuate shape, but at hysteroscopy there is a septum dividing the endometrial cavities. The septum may be of variable length and width, and the cervix may be single, septate, or duplicated.[5]

The diagnosis of a malformed uterus can be made during physical examination when obvious anomalies of the vagina and cervix are present, the subtlest uterine anomalies can be discovered and confirmed only by other methods of evaluation (Hysterosalpingography, and sonography in all its modes, and hysteroscopy). Differentiation of a bicornuate from a septate uterus may require additional evaluation via ultrasonography and/ or laparoscopy.[9] New methodological and technological developments have made diagnostic and operative office hysteroscopy more efficient, cost effective, safe, and useful.[10] It can be used to diagnose as well as for therapeutic purposes. Other advantages are shorter hospital stay, reduced risk of adhesions, short operating time and increased rate of vaginal delivery following the procedure, quicker return to normal day to day life activities.[11]

Post- Operative Treatment:

The postoperative hormone therapy using oestrogen and progesterone is controversial because their efficacy has not been demonstrated in well-designed, prospective, randomized studies. They utilized hormone replacement therapy (HRT) and/ or temporary splints such as the intrauterine device (IUD) to maintain the uterine cavity distended to denuding endometrial cavity to prevent septal fusion.[7] Autocross- linked polysaccharide, a cross- linked gel derived from hyaluronic acid have been used to prevent adhesions after hysteroscopic metroplasty. The uterine septal width and, to a lesser extent, surface area, determine which patients may benefit from targeted antiadhesion prophylaxis which reduces the risk of abnormal anatomic results such as residual septum or intrauterine adhesion.[12] The optimal waiting periods for subsequent fertility treatment after hysteroscopic surgeries are (1- 2) months for polypectomy and septal incision.[13]

Methodology:

- Study Design: A Retrospective Study.
- Participants: Files of all patients attending at Misurata infertility centre, during the period of (January 2016 till December 2017). Two hundred and fifty- six (256 cases) had uterine septal defects. Their infertility investigations included: basal hormonal assays, transvaginal ultrasound, hysterosalpingography (HSG) and hysteroscopy.

  One hundred patients (100 patients) were included in the study, mean age 30 years (SD± 5.5), 60% with history of primary infertility and 40% with bad obstetric history (History of abortion, preterm delivery).
- Exclusion Criteria Included:
  1. Age: exclusion of older age group (40 years& more, 68 patients).
  2. Patients who had other factors of infertility such as PCOS, endometriosis, premature ovarian failure, tubal block and male factor infertility (70 patients).
  3. Another eleven (11 patients) underwent ICSI immediately after septal resection.
  4. Seven patients could not be contacted.
- Hysteroscopic examination: The procedures were performed during the follicular phase of the menstrual cycle, usually within a week after the end of menstruation, under general anaesthesia as a day case. All cases received 400µg vaginal misoprostol ten hours before the procedure. An initial transvaginal ultrasound scan was done. Under aseptic conditions, a sterile speculum inserted into the vagina, and the cervix was visualized, the anterior lip was grasped with a single toothed tenaculum. Using Karl Storz Hysteroscopy (Karl Storz Gmb H. and Co. KG, Tuttlingen, Germany) Rigid 30°, with 5 mm outer diameter of the sheath. Normal saline or glycine were used as the distension medium, keeping the uterine pressure (100- 150) mm of mercury, was maintained using electronic pomp (Karl Storz). Light source was Karl Storz, 300 W. The endocervical canal, uterine cavity, endometrium, tubal ostia, were inspected. Intrauterine cavity visualized, and septoplasty done using bipolar cautery and scissor for resection the septum (87 patients were diagnosed as partial uterine septum (U2A), and 13 patients with complete uterine septum (U2B)). Electrocautery used to coagulate bleeding from small vessels. Chronic endometritis at hysteroscopy was defined as micro polyps, stromal oedema, and focal or diffuse hyperaemia which may coexist with uterine septum in (36 patients). Average operating times (10- 18) minutes. All patients discharged in the same day of the procedure without any complication.
- Postoperative treatment: Prophylactic antibiotics were routinely given for all patients (Oral Vibramycin 100 mg and vaginal Flagyl suppositories twice daily, for ten days). Additionally, patients discharged on oestrogen (Progynova 2 mg) tablet twice daily for 14 days in (84 patients) of partial uterine septum (U2A), Intrauterine devices (IUCD) were inserted for three cycles to eight patients (8 cases) with complete uterine septum (U2B).

Statistical Analysis:

Data was performed using IBM SPSS Statistics version 21.0.0 software. Continuous variables were represented as mean and SD. Categorical data were represented by frequency with percentage and were analysed by chi- square test, in data analysis P< 0.05 was consider as statistically significant.

Limitations Of The Study:

1. Use of non- controlled trial affected the study.
2. Inability to accurately measure the residual uterine septum intraoperative which necessitate performance of second look hysteroscopic examination.
3. Difficulty in the follow up for long period of time, and loss of contact with some patients.

Results:

A total of one hundred patients with history of primary infertility and with bad obstetric history (Abortion or preterm delivery) underwent operative hysteroscopy.

The mean age of the patient (30.61 years± 5.54) and fertility duration of (6.2 years± 2.76) where recruited in the study. More than half of the patients (58%) with primary infertility for average of 6.2 years. Table (1)

Table (1) The demographic characters the study population

Number Of Patients	(N= 100)
Age (years) mean and SD	30.6± 5.54
Duration of infertility (years) mean and SD	6.2± 2.76
Number of miscarriages before septum resection	1.9± 1.105

The pregnancy and live birth rate improved obviously after uterine septum resection, especially in youngest age group, statistically significant (P- 0.01), so got pregnant after septum resection depend on age. Table (2)

Table (2) comparison between patients with abortion before uterine septum resection and pregnancy outcome after septum resection

Age Group\ YEars	No. Of Patients	Abortion Before Septum Resection	Spontaneous Pregnancy After Septum Resection		Chi Square	P- Value
			aborted	Live Birth		
19- 24	18	7	1	10	11.3	0.01*
25- 29	22	8	1	8		
30- 34	32	10	4	9		
35- 39	28	11	1	3		
Total	100	36	7	30		

*Statistical significance P level<0.05

All patients except three received postoperative treatment they divided into two group of patients, those with partial uterine septum had estrogen tablets 2 mg twice a day for two weeks and the other group with complete uterine septum IUCD inserted for three months, to reduce the adhesion at site of resection, the pregnancy outcome not significantly change with different postoperative treatment moreover, the pregnancy outcome not affected with coexistence of endometritis which represent 36% of patients. Table (3).

Table (3) Effect of postoperative treatment and coexistence of endometritis with uterine septum on reproductive outcome:

		Got Pregnant After Septum Resection		Total	Chi Square	P- Value
		No	Yes			
Treatment Post-Operative	None	2	1	3	0.235	0.99*
	Estrogen	56	33	89		
	IUCD	5	3	8		
	Total	63	37	100		
Endometrial Finding	Normal	39	25	64	0.327	0.668*
	Endometritis	24	12	36		
	Total	63	37	100		

*Statistical non- significance P> 0.05

The study had two groups according to hysteroscopic classification of uterine septum, first group with partial uterine septum (U2A 87%) and the other group patient with complete uterine septum (U2B 13%). Pregnancy with live birth baby significantly improved after septum resection in patient with partial uterine septum (P= 0.005), in contrast, patients with complete septum the pregnancy rate not significantly changed after the operation. Table (4).

Table (4) Type of septum resected and the spontaneous pregnancy outcome

Type Of Septum Resected	Age Group Of Patients	Pregnancy After Septum Resection			Chi Square	P- Value
		No	Yes	Total		
U2A (Partial Uterine Septum)	19- 24	4	10	14	12.54	0.005*
	25- 29	12	6	18		
	30- 34	17	12	29		
	35- 39	22	4	26		
	Total	55	32	87		
U2B (Complete Uterine Septum)	19- 24	3	1	4	3.39	0.450
	25- 29	1	3	4		
	30- 34	2	1	3		
	35- 39	2	0	2		
	Total	8	5	13		

*Statistical significance P< 0.05

Discussion:

Uterine septum is the most common uterine malformation, there is a reduction in clinical pregnancy rates in women with canalization defects, and increased relative risk for second trimester miscarriage, preterm delivery and fetal malpresentation.[14] It is thought that narrowing of the uterus and reduced uterine extensibility have a negative impact on pregnancy.[15]

Hysteroscopic septum resection is a safe and effective method, followed by a significant improvement in the reproductive outcome by reducing miscarriage rate and preterm labor and increasing term delivery.[10][16][17]

Paradisi et.al. (2013) in their study, reported low pregnancy outcome after septum resection with increase the age of patients, which might have been related to an age- related decrease in ovarian function, therefore early surgery and enough excision must be ensured to achieve the desired results for fertility.[16] In current study, the miscarriage and preterm delivery rate were reduced post septum resection. The reported incidence of pregnancy rate after metroplasty varies from 40% to 60%.[18]

We have reported an incidence rate of 30% live birth rate after the procedure. For patients with primary infertility, live birth rate increased. For bad obstetric history live birth rate were much improved.

Pregnancy rate after septoplasty was higher in younger age group and rate decreased after 35 years (10%) of all live birth. Statistical analysis stated that the pregnancy rate and live birth rate in different age groups, was significant in partial uterine septum, where as in complete uterine septum, it was not significant, these variations might be due to small sample size of this group.

Previous study reported that the uterine cavity typically heals by two months postoperative (IUD and hormonal therapy).[15] In this study, there was no difference seen in reproductive outcome between these varied treatment modalities.

The incidence of uterine rupture after septal resection is increased as reported in the literature though we did not find any correlation, it could be due to small sample size. But patients undergoing this procedure should be made aware of this fact and they should again be counselled during pregnancy.

Conclusion:

Hysteroscopic septum resection using bipolar versapoint system safe and can significantly improve the live birth rates in patients with history of infertility and BOH particularly in young patients.

Recommendations:

1. Need for randomized controlled studies (RCT) with adequate controls to justify the hysteroscopic use for uterine septal resection in the treatment of infertility, miscarriage and preterm delivery which can improve spontaneous pregnancy and achieve term live birth.
2. Use of three dimensional ultrasound before hysteroscopy for diagnosis and accurate measurement of uterine septum.

Acknowledgements:

The authors declared that this study received no financial support.

Conflict of Interest:

No conflict of interest was declared by the authors.

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