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## Effectiveness of Hysteroscopic Surgery for Intrauterine Lesions on Pregnancy Rates in Patients with Primary infertility

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### ABSTRACT

**Background:** Hysteroscopy, a technique of exploring and manipulating the endometrial cavity transcervically, has revolutionized the diagnosis and management of intrauterine illness in gynecologic practice. It is a minimally invasive procedure that may be used to analyze data and treat a variety of intrauterine and endocervical issues.

**Aim of the work:** To find out whether there was a role for operational hysteroscopy in boosting pregnancy rates and decreasing patient complaints in women with primary infertility and identified intrauterine abnormalities.

**Patients and methods:** This is prospective research that took place at Elhussein & Elsayed Galal University hospital, Al-Azhar University and this study included 100 of patients whom suffered from 1ry infertility due to intrauterine lesions such as (Polyp-Submucous fibroid-Intrauterine adhesions- Septum) during the period of (2020 & 2021).

**Results:** After operative hysteroscopy the reproductive outcome was 54 out of 100 patients (54%) achieved pregnancy. Of those, 51 women had singleton pregnancies while 3 women had twin pregnancies. Of the 54 patients who achieved pregnancy, 14 patients aborted, 32 patients continued to term pregnancy and 8 patients had preterm delivery and live births was 40 (74%).

**Conclusion:** Our results imply that correcting any uterine anomalies, no matter how modest, enhances the chances of conception in infertile women with no other underlying reasons of infertility.

**Keywords:** Hysteroscopy; Intrauterine lesions; Primary infertility; Pregnancy.

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**Authorship:** All authors have a substantial contribution to the article.

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### INTRODUCTION

Infertility is a major aspect of reproductive health that has a lot of societal ramifications. It is estimated that 72.4 million couples globally are infertile, with 40.5 million of them seeking fertility therapy right now.<sup>1</sup>

The complicated process of embryo implantation is essential for successful human reproduction. The embryo comes into direct touch with the hormonally prepared endometrium during implant. One of the requirements for successful implantation is a uterine cavity that is physically normal. Congenital uterine defects and acquired uterine illnesses may obstruct normal implantation and placentation, resulting in infertility and miscarriages.<sup>2</sup>

Now operative hysteroscopy is a well-established treatment method for intrauterine lesions i.e., sub-mucosal fibroids, polyps, uterine septa and intra-uterine adhesions.<sup>3</sup>

Hysteroscopy has become significantly more efficient, cost-effective, safe, and beneficial as a

result of new methodological, technical, and technological improvements. In addition, a variety of diagnostic and operational hysteroscopic tests may now be conducted in the office without the requirement for an operating room, analgesia, or anesthesia. 4 Abnormal uterine bleeding (AUB) is the most frequent reason for hysteroscopy; however, it's also often utilized in situations of infertility.<sup>4</sup>

Although uterine factors, such as anomalies in the myometrium and endometrium, account for approximately 2–3% of all instances of infertility, they are substantially more frequent in infertile women (40–50%).<sup>2,5</sup>

They may induce infertility and miscarriage by interfering with natural implantation and placentation, as well as putting assisted reproduction at risk.<sup>2,5</sup>

The uterine capacity for reproduction is assessed during the infertility workup, either at the initial evaluation or when any recommended reproductive management procedure is planned. Indeed, the uterine cavity and its inner layer, the endometrium,

are thought to be critical for embryo implantation and proper placentation.<sup>2</sup>

For diagnosing and treating endometrial polyps, hysteroscopy is the best model. Several evaluations of women with infertility and polyps found that hysteroscopic polypectomy resulted in a considerable increase in pregnancy rates.<sup>6</sup>

Myomas may be reached with operational hysteroscopy, which is the conventional surgical method, due to their submucosal location. Several short case series studies have been reported revealing good reproductive outcomes in infertile women following hysteroscopic excision of submucosal myomas.<sup>7</sup>

Many researches have indicated that hysteroscopic uterine septum excision is advantageous, with considerable improvements in pregnancy rates after the treatment.<sup>8</sup>

The study's goal was to see whether there was a role for operational hysteroscopy in boosting pregnancy rates and decreasing patient complaints in women with primary infertility and identified intrauterine abnormalities.

## PATIENTS AND METHODS

This is prospective research that took place at El-Hussein & Elsayed Galal University hospital, Al-Azhar University and this study included 100 of patients whom suffered from 1ry infertility due to intrauterine lesions such as (Polyp-Submucous fibroid-Intrauterine adhesions- Septum) during the period of (2020 & 2021).

Inclusion criteria: Age: childbearing period, patients undergoing operative hysteroscopy, and patients with primary infertility due to intrauterine lesions such as (Polyp-Submucous fibroid-Intrauterine adhesions-Septum).

Exclusion criteria: Cervical stenosis, recent or current pelvic inflammatory disorder, established cervical tumor, pregnancy, and profuse uterine hemorrhage, or recent uterine perforation, patients with secondary infertility, previous cervical surgery, and patients with associated male factor infertility are all contraindications to hysteroscopy.

Methodology in details:

This study performed on 100 Patients in reproductive age complaining of primary infertility.

They undergo of hysteroscopic resection of submucous myoma, polypectomy or resection of intrauterine septum.

Indication for hysteroscopic resection is primary infertility.

Selection of patients based on appropriate indications, by complete History: (medical, menstrual, potential STD exposure and previous fertility and substance use including caffeine) and physical examinations including; general, abdominal and pelvic examinations.

Routine laboratory evaluations, hormonal assay and TVS for antral follicular count and semen analysis for husbands carried out.

Information on following fertility gleaned from hospital records, clinicians, and direct patient reports.

Fertility and pregnancy outcomes following operational hysteroscopy were studied based on the kind of intrauterine lesion (submucous fibroid, polyp, and septum) and the major complaint.

Ethical consent:

The research was approved by the academic and ethical council of Al-Azhar University. Every patient completed an informed written permission form acknowledging their willingness to undergo the procedure. This research was carried out in conformity with the World Medical Association's Code of Ethics (Declaration of Helsinki) for human studies.

Statistical analysis:

SPSS (Statistical Package for Social Sciences) version 22 for Windows® was used to code, process, and analyze the obtained data (IBM SPSS Inc, Chicago, IL, USA). The Shapiro-Wilk test was used to determine whether the data had a normally distributed. Frequencies and relative percentages were used to depict qualitative data. To compute the difference between two or more sets of qualitative variables, use the Chi square test ( $\chi^2$ ). The median  $\pm$  standard deviation (SD) were used to convey quantitative data (Standard deviation). To compare two independent groups of normally distributed variables, the independent samples t-test was utilized (parametric data). P values of less than 0.05 were regarded substantial.

## RESULTS

The socio-demographic profile of the participants. The age ranged from 22 to 42 years old with a median of  $28.9 \pm 4.3$  years, the median duration of infertility was  $4.6 \pm 3.3$  years and that of BMI of the participants were  $27.6 \pm 3.9$  kg/m<sup>2</sup> (Table 1).

The reproductive outcome in all participants was as follows: 54 women out of 100 (54%) achieved pregnancy. Of those, 51 women (94.4%) had singleton pregnancies while 3 women (5.6%) had twin pregnancies. Of the 54 patients who achieved pregnancy, 14 patients (25.9%) aborted, 32 patients (59.3%) continued to term pregnancy and 8 patients (14.8%) had preterm delivery (Table 2).

Live births occurred mostly in polypectomy group which was 20 patients out of 42, while live birth rate was (45.5%) (n=10 of 22) in patients for whom resection for uterine septum has been done. But it was (30%) 6 of the 20 patients with uterine fibroids for whom hysteroscopic myomectomy was done. And only in 4 patients of the 16 patients (25%) who underwent hysteroscopic myomectomy and polypectomy for both uterine fibroids and polyps respectively (Table 3).

The distribution of treatment outcomes based on the most common complaints; Best results achieved in AUB group with pregnancy rate up to 64.7% in 22 patients in the group, they gave 18 live births which was 45% of live births of the entire study (Table 4).

Distribution of patients relieved from main complaints according to type of intrauterine pathology; polyps group comes in the first place with relief rate 57.1%, while treated intrauterine fibroids a rate of 50% relief (Table 5).

The distribution of treatment outcomes based on the most common complaints; Best results achieved in AUB group with success rate up to 64.7% (Table 6).

All patients (n= 100)		Frequency	Percentage
Age (years)	≤ 25	30	30.0%
	25 – 30	34	34.0%
	≥ 30	36	36.0%
Duration of infertility (years)	3 or less	40	40.0%
	> 3–6	36	36.0%
	> 6	24	24.0%
Menarche age	< 13	62	62.0%
	≥13	38	38.0%
BMI (kg/m2)	< 25	24	24.0%
	≥ 25	76	76.0%
Occupation	Housewife	64	64.0%
	Worker	36	36.0%
Data is expressed as frequency and percentage.			

**Table 1:** Socio-demographic profile of the participants

All patients (n= 100)		Frequency	Percentage
Pregnancy rate		54	54.0%
Number	Single	51	94.4%
	Twin	3	5.6%
Outcome	Spontaneous abortion	14	25.9%
	Preterm labor	8	14.8%
	Full term labor	32	59.3%
Mode of delivery	CS	23	57.5%
	VD	17	42.5%
Live births rate		40	40.0%
Data is expressed as frequency and percentage.			

**Table 2:** Reproductive outcome in all cases after operative hysteroscopy

All patients (n= 100)		Septum	Fibroid	Polyp	Polyps & fibroid
Pregnancy rate		54.5% (12)	50.0% (10)	57.1% (24)	50.0% (8)
Number	Single	91.7% (11)	80.0% (8)	100.0% (24)	100.0% (8)
	Twin	8.3% (1)	20.0% (2)	0.0% (0)	0.0% (0)
Outcome	Spontaneous abortion	16.7% (2)	40.0% (4)	16.7% (4)	50.0% (4)
	Preterm labor	0.0% (0)	20.0% (2)	25.0% (6)	0.0% (0)
	Full term labor	83.3% (10)	40.0% (4)	58.3% (14)	50.0% (4)
Mode of delivery	CS	50.0% (5)	83.3% (5)	60.0% (12)	25.0% (1)
	VD	50.0% (5)	16.7% (1)	40.0% (8)	75.0% (3)
Live births rate		45.5% (10)	30.0% (6)	47.6% (20)	25.0% (4)
Data is expressed as frequency and percentage.					

Table (3): Reproductive outcome in all cases after operative hysteroscopy

All patients (n= 100)	Infertility	Infertility & AUB	Infertility & Dysmenorrhea	Infertility, AUB & Dysmenorrhea	Infertility & hypomenorrhea
Pregnancy rate	60.0% (18)	64.7% (22)	50.0% (8)	33.3% (6)	0.0% (0)

Number	Single	83.3% (15)	100.0% (22)	100.0% (8)	100.0% (6)	0.0% (0)
	Twin	16.7% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)
Outcome	Spontaneous Abortion	22.2% (4)	18.2% (4)	25.0% (2)	66.7% (4)	0.0% (0)
	Preterm labor	22.2% (4)	18.2% (4)	0.0% (0)	0.0% (0)	0.0% (0)
	Full term Labor	55.6% (10)	63.6% (14)	75.0% (6)	33.3% (2)	0.0% (0)
Mode of delivery	CS	57.1% (8)	61.1% (11)	66.7% (4)	0.0% (0)	0.0% (0)
	VD	42.9% (6)	38.9% (7)	33.3% (2)	100.0% (2)	0.0% (0)
Live births rate		46.7% (14)	52.9% (18)	37.5% (6)	11.1% (2)	0.0% (0)
Data is expressed as frequency and percentage.						

**Table 4:** Reproductive outcome in all cases after operative hysteroscopy

All patients (n= 100)	Frequency	Percentage
Septum	12	54.5%
Fibroid	10	50.0%
Polyp	24	57.1%
Polyps & fibroid	8	50.0%
Data is expressed as frequency and percentage.		

**Table 5:** Distribution of patients relieved from chief complains according to type of pathology

All patients (n= 100)	Frequency	Percentage
Infertility	18	60.0%
Infertility & AUB	22	64.7%
Infertility & Dysmenorrhea	8	50.0%
Infertility, AUB & Dysmenorrhea	6	33.3%
Infertility & hypomenorrhea	0	0.0%
Data is expressed frequency.		

**Table 6:** Distribution of patients relieved from chief complains according to chief complaint

## DISCUSSION

All women in reproductive age suffered from primary infertility for at least 1 year. The mean period of follow-up was  $15.51 \pm 8.2$  months. The median time required to get pregnant was  $8.59 \pm 3.4$  months. They underwent operative hysteroscopy for resection of submucous myoma, polypectomy or resection of intrauterine septum. All operations were done during the mid-follicular phase of the menstrual cycle.

While hysteroscopy has a high diagnostic performance, distinguishing the uterine septum from the uterus bicornis and the saddle-shaped uterus might be challenging, resulting in misdiagnosis. The combination of hysteroscopy and laparoscopy, as the gold standard for uterine septum diagnosis, increased

the diagnostic accuracy of the uterine septum to 100%.<sup>9</sup>

For about two years in this study, we advocated the use of operative hysteroscopic septoplasty, polypectomy and myomectomy for uterine septum, polyps and fibroids respectively in patients with primary infertility prior to any infertility treatment in general and assisted reproductive therapy as well, we compared the treatment results of each pathology treated to those of other pathologies in the whole group. The data in our study suggest that hysteroscopic septoplasty, polypectomy, and myomectomy, for accessible uterine lesions in patients with primary infertility are beneficial prior to infertility treatment in general and IVF/ET as well. In addition, based on the outcomes of full term, preterm and live birth rates and mean gestational age in

pregnancy, again, it appears that the surgery is of benefit with respect obstetric outcome.

In a study done by Ghahiry et al.<sup>10</sup> Before hysteroscopic myomectomy, the most common complaint was AUB, which was treated in more than half of the cases.

In current study the reproductive outcome in all participants was as follows: fifty-four women out of 100 (54%) achieved pregnancy. Of those, 51 women (94.5%) had singleton pregnancies while 3 women (5.5%) had twin pregnancies. Of the 54 patients who achieved pregnancy, 14 patients (26%) aborted, 32 patients (59%) continued to term pregnancy and 8 patients (14%) had preterm delivery.

85% of pregnancies occurred within the first year of follow-up, with an average period from surgery to conception of 8.5 months. Others have seen a similar little delay in conception.<sup>11</sup> As a result, it is highly advised that people try to conceive as soon as possible following the treatment.

Several studies have shown that hysteroscopic procedures on endometrial polyps, intrauterine septum, and/or uterine myoma enhance conception rates. After hysteroscopic myomectomy, septum resection, and polypectomy, 24 percent of women got pregnant, according to Szymaski et al.<sup>12</sup>

Sanders<sup>13</sup> found a pregnancy prevalence of 47 percent in prior infertile patients and a greater pregnancy rate following hysteroscopy polypectomy (78 percent) compared to 42 percent in infertile patients with normal endometrial cavities in a literature evaluation of published case series.

Because the presence of eumenorrhea chronic functioning endometrial polyps, even if small, is likely to hinder fertility, Shokeir et al.<sup>14</sup> indicated that diagnostic hysteroscopy should be utilised frequently in the workup of infertile women. Pérez-medina et al.<sup>6</sup> and Spiewankiewicz et al.<sup>15</sup> found that 65 percent and 80 percent of patients having surgery were conceived, respectively.

According to type of pathology in the study, after hysteroscopic metroplasty which had been done for 22 patients with intrauterine septum 12 patients had gestation (54.5%), of which 2 had abortions and 10 had term gestation (83%). Among the 20 patients with uterine myoma for whom hysteroscopic myomectomy done, 10 patients (50%) achieved pregnancy, 6 had live births while abortion occurred in 4 patients. Best results had been achieved in the 21 women with intrauterine polyps as 24 (57.1%) achieved pregnancy of which 20 patients (47.6%) had live births. The gestation rate in patients with diagnosed polyps concomitant with myoma was (50%) 8 patients out of 16 after polypectomy and myomectomy, 4 of them (25%) had term pregnancy.

The findings of this research are comparable to those of Ghahiry et al.<sup>10</sup>, who found that 13 patients (65%) had pregnancy following hysteroscopic metroplasty, 4 experienced abortion, and 9 had term pregnancy (45 percent). After myomectomy, 25% of women became pregnant (4 out of 16 patients). And 62% of

patients with abnormal uterine bleeding were improved.

In current study after hysteroscopic metroplasty for uterine septum 12 patients of 22 achieved pregnancy (54.5%), 2/22 had abortion and 10/22 had term delivery (45.5%). While 12 patients of 22 (54.5%) improved completely from associated symptoms (AUB, dysmenorrhea and/or hypomenorrhea). These results, regarding pregnancy rate, are similar to those of a research done by Wang et al.<sup>9</sup> in which pregnancy rate was (58%) (18 of 31 patients) underwent hysteroscopic resection of uterine septum), live births rate in the same study was (55%).

In a study done to evaluate the reproductive outcome after hysteroscopic septoplasty through analysis of medical records of 28 women with a history of infertility underwent hysteroscopic resection for uterine septum, which was performed in those patients. After hysteroscopic metroplasty for uterine septum, 64% of women get pregnant, yielding a rate of live births more than 48%; and 19% of patients had spontaneous abortions.<sup>16</sup> Although these results are near that of current study, but miscarriage rate was higher in that study than that of current study.

In Our study we followed 36 primary infertile women with submucous uterine fibroids, twenty of the women who had hysteroscopic myomectomy had a single fibroid discovered intra-operatively, 15 of type 0 and 5 type one and the remaining 16 were found to have both fibroids and polyps. 18 of the 36 women (50%) achieved pregnancies; 10 of these women had live births while 8 patients aborted.

Although vaginal birth is possible after hysteroscopic myomectomy, and uterine rupture has never been documented, obstetric treatment should be very cautious. 17 All women with full-term pregnancies who were delivered via caesarean section were included in our study.

The existence of extra infertility issues has a negative impact on postoperative reproductive outcomes. In their retrospective study, Fernandes et al.<sup>16</sup> found that when the myoma was the sole obvious cause, the pregnancy rate was 41.6 percent, compared to 26.3 percent with one factor and 6.3 percent with two or more additional causes. The inclusion of additional infertility factors might explain the poor pregnancy rate found in our series in the present prospective investigation (50 percent).

Endometrial polyps ranging in size from 0.5 to 3 cm were found in 42 of the women in our research. Twenty-six of the patients had multiple polyps (16 patients had two polyps, 6 had three polyps and 4 patients had more than three polyps). During hysteroscopy, all polyps were removed.

In our research, polypectomy provided the greatest obstetrical outcome, proving that tiny intrauterine lesions like polyps that cause implantation failure had superior outcomes following polypectomy.<sup>18,19</sup>

In our study, the majority of patients with polyp pathology and irregular uterine hemorrhage were treated after hysteroscopy polypectomy; similarly,



endometrial polyp is the most common hysteroscopic finding in patients with abnormal uterine hemorrhage who respond well to this treatment, as mentioned in Lasmar's research.<sup>20</sup>

As regards reproductive outcome 24 women out of 42 got pregnant, of those women 20 gave live birth (47.6%) this is similar to a study where the pregnancy rate after hysteroscopic polypectomy was about 70%.<sup>10</sup>

Ayas et al.<sup>21</sup> reported in a research done on 83 patients with infertility who underwent hysteroscopic polypectomy pregnancy rate (60.9%) which was near the results which have been achieved in current study.

### CONCLUSION

The data revealed that operational hysteroscopy for uterine septa resection, myomectomy, and polypectomy improves the chances of clinical pregnancy in primary infertile women, however the evidence is not definitive at this time. As a consequence, it is proposed that operational hysteroscopy is a safe and effective surgery for women with intrauterine lesions and a history of infertility, resulting in a greater conception rate.

Conflict of interest : none

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