

Operative hysteroscopy platform at a university teaching hospital: a retrospective study

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Naser Al-Husban¹  and Rana Abu Rokbeh²

Abstract

Objective: This study was performed to investigate the prevalence, indications, effectiveness, outcomes, and complications of operative hysteroscopy in gynecological patients with an emphasis on the need for further training and equipping facilities as performed by consultant gynecologists.

Methods: This was a retrospective descriptive study of operative hysteroscopic procedures from 19 September 2016 to 31 December 2018.

Results: In total, 1919 hysteroscopic procedures were performed [1829 (95.3%) diagnostic and 90 (4.7%) operative hysteroscopies]. The patients' mean age was 42.4 years (range, 20–69 years). The most common operative procedure was hysteroscopic fibroid polypectomy in 31 patients (34.4%), followed by transcervical resection of the endometrium in 23 (25.6%) and endometrial polypectomy in 16 (17.8%). The most common indication was menorrhagia in 57 patients (63.33%), followed by recurrent miscarriages in 9 (10.00%) and primary infertility in 5 (5.56%). Sixty-six patients (73.33%) were treated under general anesthesia and 24 (26.67%) under spinal anesthesia. Fifteen fibroids (48.4%) were 3 to 4 cm in size and 11 (35.5%) were >4 cm. Eight polyps (50%) were 3 to 4 cm. The mean uterine size and endometrial thickness were 8.9 ± 2.16 weeks and 11.1 ± 3.01 mm, respectively. The mean preoperative hemoglobin level was 10.9 g/dL and the mean estimated blood loss was 65.9 ± 48.7 mL (range, 10–200 mL). Thirty-eight patients (60.3%) with heavy bleeding improved with no need for further medical or surgical intervention. Eleven patients (44%) with reproductive issues conceived or regained their normal menstrual pattern. Two patients (2.2%) had excessive fluid absorption and one (1.1%) had uterine perforation.

Corresponding author:

Naser Al-Husban, Faculty of Medicine, University of Jordan and Jordan University Hospital, PO Box 2194, Amman 11941, Jordan.

Email: Husban48@yahoo.com

¹Faculty of Medicine, University of Jordan, Amman, Jordan

²Jordan University Hospital, Amman, Jordan



Conclusions: Operative hysteroscopy was an effective and safe option in certain uterine pathologies. Specific training in operative hysteroscopy should be promoted to make this type of surgery an integral part of gynecological services in the developing world.

Keywords

Operative hysteroscopy, fibroid polypectomy, polypectomy, resection, septum, infertility, menorrhagia

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Introduction

The modern development of hysteroscopy completely transformed the approach to uterine intracavitary pathologies by moving from blind procedures under general anesthesia to outpatient procedures performed under direct visualization, thus providing new therapeutic and prospective treatment options that should be available to every modern gynecologist.¹ The use of an electric current to treat intrauterine pathologies such as myomas, polyps, and septa was found to be safe for patients who wished to preserve their fertility.² Resectoscopic fibroid polypectomy has several advantages over traditional laparotomy, such as reduced myometrial trauma, a shorter hospitalization period, and a decreased risk of postoperative adhesion formation. The choice of the procedure mostly depends on the intramural extension of the myoma; personal experience and available equipment are also considered in the decision.³ In one study, hysteroscopic polypectomy was a safe surgical treatment that decreased abnormal uterine bleeding in two-thirds of patients with endometrial polyps, with an acceptable level of satisfaction.⁴ Additionally, hysteroscopic endometrial ablation performed with a bipolar loop electrode was as effective as resectoscopy performed with a unipolar loop electrode in terms of menstrual and

psychophysical well-being. Endometrial ablation performed with a bipolar electrode loop was safer but more costly than that performed with a monopolar electrode loop.⁵

Performance of hysteroscopic septum resection in women of reproductive age who have a uterine septum might improve reproductive outcomes. However, no published randomized study has been performed to support the performance of this surgical procedure in these women. Randomized controlled trials are urgently needed.⁶

Hysteroscopic surgery is a new and evolving surgery in Jordan. The present study casts light on this surgical option at a university hospital in Jordan, showing that the procedure was associated with a decreased hospital stay, lower cost, and preservation of the uterus, especially in patients who desire further pregnancies. This study was performed to investigate the prevalence, indications, effectiveness, and complications of this type of surgery and to emphasize the need for further training and equipping facilities.

Methods

This retrospective study was performed at a university tertiary teaching hospital in Amman, Jordan.

Patients

All patients who underwent operative hysteroscopic interventions from September 2016 to December 2018 were included.

Preoperative assessment

All patients underwent a general physical examination and gynecologic examination before surgery. A careful vaginal examination with a speculum and appropriate swabs was performed preoperatively to exclude vulvovaginitis and cervicitis. All patients underwent a transvaginal ultrasound scan, diagnostic hysteroscopy, or both before the operative hysteroscopy. Written informed consent was obtained from the patients after they had been counseled regarding the operative procedure, including its benefits, risks, and potential complications. All operative hysteroscopies at our hospital were performed under general or spinal anesthesia in the main operating room. The patients were anesthetized using similar standardized general or spinal anesthetics as per hospital practice. Spinal anesthesia was not a widely accepted mode of anesthesia; most patients preferred to sleep during surgery. All patients were assessed preoperatively, and all were fasted for 8 hours as per anesthetic requirements. Patients with a hemoglobin (Hb) of less than 10 g/dL and symptomatic for anemia were transfused with compatible blood. No premedications were given. The type of anesthesia was established after approval and with written consent from each patient. All patients received prophylactic antibiotics at induction of anesthesia in the form of 2 g of cefazolin intravenously.

Operative procedures

Most procedures were performed using monopolar hysteroscopic instruments. For the monopolar instruments, we used 3.0-L bags of 1.5% glycine as a distending

medium. Bipolar hysteroscopy with a normal saline distention medium was used only for selected patients because of the higher cost than monopolar hysteroscopy. The cervix was gradually dilated up to 8 mm using Hegar dilators. All patients had a standardized intrauterine pressure of 80 mmHg during surgery using the same automated glycine infusion pump. Hysteroscopic adhesiolysis was performed using cold scissors with an irrigation/suction device. No preoperative cervical or endometrial preparation was performed. We excluded patients with endometrial cancer. All samples were subjected to histopathological examination. All patients were followed up for a minimum of 4 months through outpatient visits.

Parameters evaluated

The patients' characteristics, types of surgery, surgical indications (resection of fibroids or polyps, endometrial resection or ablation, correction of congenital uterine abnormalities, or hysteroscopic adhesiolysis), complications, and clinical outcomes were evaluated. Excessive fluid absorption was detected immediately in the operating room by calculation of the fluid deficit. Plastic bags were placed underneath the patients' buttocks to collect the fluid. Continuous suction was also used. The total fluid volume in the plastic bag and suction container was subtracted from the total volume of used fluid. The result was the fluid deficit. Diagnostic laparoscopy was used in patients suspected of having uterine perforation. The estimated blood loss was calculated by the number and weight of the gauze used and the amount of blood that was suctioned into a container. The study was approved by the institutional review board (IRB) at Jordan University Hospital, number 5/2019 dated 5 March 2019.

Statistical analysis

The statistical analysis was performed with the Data Toolkit in Excel (Microsoft, Redmond, WA, USA) using descriptive analysis. Student's t-test was performed to evaluate the mean preoperative Hb level for patients with menorrhagia. The obtained data were examined using a frequency table and are presented as frequency and percentage, range, and mean and standard deviation.

Results

In total, 1919 hysteroscopic procedures were performed from September 2016 to December 2018 [1829 (95.3%) diagnostic and 90 (4.7%) operative procedures]. The mean age of the patients was 42.4 years, and the mean parity was 3.01. The majority of the patients (n = 58, 64.4%) did not have coexisting medical conditions. Additionally, the majority of the patients (n = 76, 84.4%) had no history of uterine surgery (Table 1).

The most common procedure was hysteroscopic fibroid polypectomy, which was performed in 31 patients (34.4%), followed by transcervical resection of the endometrium in 23 (25.6%) and polypectomy in 16 (17.8%). The most common indication for surgery was menorrhagia, which was present in 57 patients (63.33%), followed by recurrent miscarriages in 9 (10.00%) and

primary infertility in 5 (5.56%) (Tables 2 and 3).

Most of the operative procedures (n = 66, 73.33%) were performed under general anesthesia, and 24 (26.67%) were performed under spinal anesthesia. Moreover, most of the polypectomies (n = 14) and fibroid polypectomies (n = 25) were performed under general anesthesia (Table 2).

Most fibroids were 3 to 4 cm in size (48.4%), while 35.5% were >4 cm. Half of the polyps were 3 to 4 cm. The polyp size was undocumented in five patients (Table 4).

Based on the ultrasound scans, the mean uterine size and endometrial thickness were 8.9 ± 2.16 weeks (range, 6–15 weeks) and 11.1 ± 3.01 mm (range, 4–20 mm), respectively. These data were undocumented in one patient.

The mean preoperative Hb was 10.9 g/dL (range, 5.4–14.8 g/dL). The mean preoperative Hb level among the patients with menorrhagia was 10.77 g/dL. The mean estimated operative blood loss was 65.9 ± 48.7 mL (range, 10–200 mL) (Table 2).

Of 63 patients whose indication for surgery was menorrhagia, 38 (60.3%) improved with no need for further medical or surgical intervention. During the first 2 weeks following their endometrial resection, three patients were not satisfied and declined to evaluate the

Table 1. Patients' demographics.

Demographic feature			
Age, years	42.4 ± 8.8 (20.0–69.0)		
BMI, kg/m²	28.6 ± 5.5 (19.0–43.7)		
Parity	3.01 ± 2.8 (0.0–12.0)		
Nulliparous	25 (27.8)		
Parity of ≤ 3	28 (31.1)		
Parity of > 3	37 (41.1)		
Medical history	None	HTN and/or DM	Other
Coexisting medical diseases	58 (64.4)	18 (20.0)	14 (15.6)

Data are presented as mean \pm standard deviation (range) or n (%).

BMI, body mass index; HTN, hypertension; DM, diabetes mellitus.

Table 2. Operative hysteroscopic procedures, types of anesthesia, and mean operative estimated blood loss.

Operative procedure	Patients	General anesthesia	Spinal anesthesia	Mean estimated blood loss, mL
Fibroid polypectomy	31 (34.4)	25	6	69.6
TCRE	23 (25.6)	10	13	63.8
Endometrial polypectomy	16 (17.8)	14	2	68.9
Septal resection	13 (14.4)	11	2	68.3
Adhesiolysis	7 (7.8)	6	1	57.1

Data are presented as n (%) or n.
TCRE, transcervical resection of the endometrium.

Table 3. Clinical indications for surgery.

Indication	n	(%)
Menorrhagia	57	(63.33)
Recurrent miscarriages	9	(10.00)
Failed in vitro fertilization	2	(2.22)
Primary infertility	5	(5.56)
Secondary infertility	2	(2.22)
Postmenopausal bleeding	3	(3.33)
Secondary amenorrhea	3	(3.33)
Polyp	1	(1.11)
Fibroid	1	(1.11)
Septum and polyp	1	(1.11)
Secondary infertility and menorrhagia	2	(2.22)
Primary infertility and polyp	1	(1.11)
Primary infertility and fibroid	1	(1.11)
Recurrent miscarriage and septum	1	(1.11)
Recurrent miscarriage and adhesions	1	(1.11)

Data are presented as n (%).

Table 4. Size of polyps and fibroids.

	Polyps	Fibroids
Range	1.5–4.0 cm	2.0–11.0 cm
<3 cm	3 (18.8)	5 (16.1)
3–4 cm	8 (50.0)	15 (48.4)
>4 cm	0 (0.0)	11 (35.5)
Undocumented	5 (31.3)	

Data are presented as n (%).

Table 5. Postoperative clinical outcomes for patients with menorrhagia and patients with reproductive issues.

Postoperative outcome	Menorrhagia	Reproductive issues
Improved	38 (60.3)	11 (44.0)
Needs further surgery	10 (15.9)	–
Pending	8 (12.7)	12 (48.0)
Unsatisfied/not improved	7 (11.1)	2 (8.0)

Data are presented as n (%).

result of the resection. They requested to proceed with hysterectomy (Table 5).

Of 25 women whose indication for surgery was to improve their reproductive ability [primary and secondary infertility, secondary amenorrhea, recurrent miscarriages, and failed in vitro fertilization (IVF)], 11 patients (44%) conceived or regained their normal menstrual pattern. Two patients (8%) did not benefit from adhesiolysis. One of them had a severely damaged endometrium with adhesions, although she was given oral estrogen for 30 days postoperatively to enhance endometrial growth. The other patient had no endometrium and a few small pockets of the uterine cavity from a history of uterine rupture during caesarean section and extensive damage following attempts at reconstruction of the uterus. The other patients

were still being followed up for fertility issues (Table 5).

Two patients (2.2%) with fluid absorption and hyponatremia were treated with normal saline infusion and diuretics with no further complications. They went home the second day after surgery. One patient (1.1%) developed uterine perforation after septal resection. Diagnostic laparoscopy showed a very small 0.5-cm hole in the anterior uterine wall. She was managed conservatively and discharged on oral antibiotics. Hysterosalpingography subsequently showed a normal uterine cavity.

Discussion

The mean age of our patients was 42.4 years, and their main indication for surgery was menorrhagia due to uterine fibroids. These results are comparable with those reported by DaCosta et al.⁷

We did not use preoperative cervical preparation and we did not encounter problems because most of our patients were premenopausal. Vaginal discharge was excluded preoperatively. Vulvovaginitis and cervicitis were also excluded by careful examination using a speculum and appropriate swabs. We did not use gonadotropin-releasing hormone (GnRH) analogues therapy before operative hysteroscopy. Moreover, all of our patients were treated under general or spinal anesthesia in the main operating room. Arena et al.⁸ found that patients given GnRH analogues might benefit from the application of misoprostol. They also indicated that the use of misoprostol in postmenopausal patients might not be efficacious. In diagnostic hysteroscopy, the advantage of misoprostol is probably very small.⁸ Al-Fozan et al.⁹ reviewed randomized controlled trials of cervical ripening agents used before operative hysteroscopy in premenopausal and postmenopausal women and found no strong evidence to support their use in cervical ripening.

Half of the polyps and fibroids in the present study were 3 to 4 cm in maximum diameter, and they were resected in a one-stage operation. Slightly more than one-third of the fibroids were >4 cm in maximum diameter. Only two patients had fibroids; one fibroid was 10 × 11 cm and the other was 6 × 8 cm, and both required a two-stage operation. The first stage was terminated because of fluid (glycine) absorption. The mean uterine size and endometrial thickness were 8.9 weeks and 11.1 mm, respectively. We did not use preoperative agents such as ulipristal acetate or dienogest to shrink the size of the fibroids or thin the endometrium because most of the fibroids were small in size. Ferrero et al.¹⁰ found that ulipristal acetate given for 3 months preoperatively increased the possibility of complete resection in high-complexity hysteroscopic fibroid polypectomy. Bizzarri et al.¹¹ found that preoperative triptorelin and letrozole for submucosal fibroids decreased the hysteroscopy time and volume of fluid absorbed during hysteroscopic resection.

In their systematic review, Lagana et al.¹² found that use of dienogest may be an effective and safe treatment for endometrial thinning before operative hysteroscopy; however, this conclusion was based on few reports, and further studies to support its use are still warranted. Kodama et al.¹³ found that administration of dienogest for 2 weeks thinned the endometrium and yielded favorable surgical outcomes similar to those with GnRH agonists and concluded that administration of dienogest may be an effective and convenient treatment before hysteroscopy.

To avoid the use of preoperative endometrial preparatory medications, we timed the endometrial resection and/or ablation in the early follicular phase immediately after the menstrual bleeding had stopped and performed endometrial curettage to thin the endometrium and increase the efficiency

of endometrial resection/ablation for all patients with an endometrial thickness of >5 mm. The mean estimated blood loss for all of the different procedures was <70 mL per procedure (range, 10–200 mL).

Hysteroscopic polypectomy was performed for different indications, including fertility issues and heavy vaginal bleeding. Symptomatic women with small endometrial polyps can be treated safely and efficiently with hysteroscopic excision.¹⁴ Hysteroscopic polypectomy is a safe procedure with a low complication rate and appears to improve fertility and increase pregnancy rates in previously infertile women with no other explanation of their infertility, irrespective of the size or number of the polyps.¹⁵

In our study, women with infertility, recurrent miscarriages, and recurrent IVF failure only underwent operative hysteroscopy for treatment of major intracavitary lesions (polyps, fibroids, or septa). In their systematic review, Bosteel et al.¹⁶ found that the benefit of hysteroscopic removal of submucous fibroids was uncertain with respect to improving the clinical pregnancy rates in women with otherwise unexplained subfertility. The available low-quality evidence suggested that the performance of hysteroscopic polypectomy in women with suspected major uterine cavity abnormalities on ultrasound prior to intrauterine insemination might improve the clinical pregnancy rate compared with simple diagnostic hysteroscopy. They concluded that further research was needed to measure the effectiveness of hysteroscopic treatment of suspected major uterine cavity abnormalities in women with unexplained subfertility or prior to intrauterine insemination, IVF, or intracytoplasmic sperm injection.¹⁶ Moreover, operative hysteroscopy for treatment of intrauterine pathologies did not interfere with later endometrial development in patients undergoing IVF.²

The indications for adhesiolysis include infertility, oligomenorrhea and secondary

amenorrhea, and recurrent miscarriages. Hysteroscopic adhesiolysis is a feasible and effective way to improve fertility in patients with Asherman's syndrome.¹⁷

Indications for septoplasty include recurrent miscarriages, infertility, and an incidentally identified isolated septum. Corroenne et al.¹⁸ recommended hysteroscopic septum incision for patients with primary infertility and patients undergoing assisted reproductive technologies.

We encountered excessive glycine absorption and hyponatremia in two patients (2.2%) and uterine perforation in one patient (1.1%). These were mild complications with no subsequent adverse effects. Bahar et al.¹⁹ reported a complication rate of excessive fluid absorption of 2.8% and 4.1% with monopolar and bipolar technologies, respectively. They also concluded that both technologies were safe and feasible. Use of a fluid-balance form and mandatory reporting system has been shown to reduce the rate of total complications in hysteroscopic surgeries, particularly media-related complications.²⁰ Limitations of the present study include the small sample size and inability to monitor the patients with reproductive issues for a long duration.

With respect to the training experience of our staff, only consultant gynecologists performed the procedures in this study. There were no records of the annual minimum number of hysteroscopies performed per consultant. The learning curve of operative hysteroscopy is long. Junior doctors were involved appropriately in the diagnostic hysteroscopy procedures, but we recommend training them to gain the appropriate skills and practice of operative hysteroscopy and to widely integrate this training into the residents' curriculum throughout the country.

Conclusion

Operative hysteroscopy was an effective and safe option in patients with certain

uterine pathologies. Specific training in operative hysteroscopy should be promoted to make this type of surgery an integral part of gynecological services in the developing world.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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ORCID iD

Naser Al-Husban  <https://orcid.org/0000-0002-5896-9848>

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