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Chapter

Hysteroscopy, the Window into the Uterine Cavity

Shani Naor-Revel, Ruth Goldstone and Ariel Revel

Abstract

Hysteroscopy, is a technique by which we can look into the uterine cavity entering through the cervix and is today the most applied minimally invasive technique in Gynecology. Indications for hysteroscopy include infertility investigation, abnormal uterine bleeding, and evaluation of suspicious sonographic findings. Nowadays we approach the uterus via vaginoscopy with no anesthetic. Once inside the uterus, we remove polyps or stringless IUD and take a biopsy. These procedures are often referred as "see and treat". Operative hysteroscopy under GA or sometimes cervical block, uses larger instruments to resect myomas, cut a septum (metroplasty) or separate intrauterine adhesions (Asherman's). As Glycine is no more used in hysteroscopy it has become quite a safe procedure. Use of disposable scopes will enable this tool to be part of every gynecologic clinic.

Keywords: hysteroscopy, infertility, uterine bleeding, menorrhagia, metrorrhagia, intrauterine device, septate uterus, asherman's uterine adhesion, fibroids, endometrium, polyps, see and treat

1. Introduction

In 1950, doctors could expect medical knowledge to double every 50 years. By 2020, it will take just 73 days. How's a doctor supposed to keep up? [1]. Writing a chapter to a textbook is thus a challenge. Even if we succeed in being up to date by the time this chapter is published it might already be obsolete. The reader should thus read the chapter as an introduction and follow up on the topics read. As carrying out hysteroscopies requires manual training, we hope that the gynecologist reading our chapter will gain theoretical understanding along with his or her training first on a simulator before performing this procedure on real patients. We think that a gynecology resident should perform 100 diagnostic hysteroscopy procedures before attempting an operative one.

2. History of hysteroscopy

"Hysteroscopy" comes from the Greek terms hysteros meaning uterus and scopy meaning to look. Hysteroscopy enabled visualization of a narrow and dark space, which was difficult until the mid-nineteenth century. Endoscopy was invented by Bozzini in 1805. The first successful hysteroscopy however was performed 65 years later by Pantaleoni when he investigated the uterus of a 60-year-old patient complaining of postmenopausal bleeding. Bozzini detected a polyp in the uterus which

Nitze	1877	Magnifying lense
Heineberg	1914	Parallel chanel, continuous flow
Rubin	1925	CO2 insufflation
Mickulicz-Radecki	1927	electrocoagulation
Vulmiere	1952	Fiber optics
Harold Horace Hopkins and Storz	1959	Rod lens optic
Marleschki	1965	contact hysteroscope
Edström and Fernström	1970	Dextran
Hamou	1980	Glycine
Bettochi	1997	Office scope

Table 1.
Milestones in the development of the hysteroscope.

he cauterized with silver nitrate. Bozzini died at 35 years of age from typhoid fever, and his attempts to improve the light conductor ended. **Table 1** mentions some of the pioneers that have contributed to the hysteroscope.

For distending the uterine cavity for operative hysteroscopy normal saline is used nowadays as it is significantly less dangerous than glycine when fluid loss occurs. Hysteroscopy today represents 200 years of significant innovations in instrumentation, new clinical applications for existing instruments, and continual modification of techniques, all aiming at observing, diagnosing, and treating pathologic conditions of the uterine cavity.

3. Indications

Indications for diagnostic hysteroscopy include many conditions where knowledge about the endometrial cavity is relevant to patient care but the scope of this chapter has not been able to go into depth for every indication. In **Table 2** we list the most common indications for the procedure as well as which tools are required and how long we recommend for such a procedure. This may help the team communicate with each other and referring physicians and the patients, where should the procedure be scheduled and how long it should take and which equipment is required for the procedure.

3.1 Menstrual cycle bleeding

Bleeding at menstruation (menorrhagia) or in between them (metrorrhagia). Postmenopausal bleeding should include a blind biopsy. Patients with bleeding under hormonal replacement therapy should be examined. A frequent referral are patients on continuous Tamoxifen therapy [2]. Bleeding under medical therapy requires a pathological sampling to exclude malignancy. Pipelle ® sampling has 100% sensitivity and specificity to detect malignant cells [3].

Heavy menstrual bleeding is a significant health problem in pre and perimenopausal women. If no pathology is diagnosed using diagnostic hysteroscopy and biopsy, patients should be counseled about treatment which could be hormonal and non-hormonal. As medical therapy is not always successful, Endometrial ablation may be an alternative to hysterectomy that preserves the uterus. Many techniques have been developed to ablate the endometrium. First-generation techniques require visualization of the uterus with a hysteroscope during the procedure.

		Inpatient/ outpatient	Additional Instruments needed	Estimated procedure time (minutes)
10.1	Menorrhagia/ Metrorrhagia/ bleeding under medical therapy	Out	Pipelle ®	3
10.2	Products of conception	In	Grasper/loop	10–30
10.3	Failed clinics attempt to remove IUD/parts	Out	Grasper	5
10.4	abnormal/thick/echoic endometrium by sonography	Out	Pipelle ®	3
10.5	Asherman's	In	Needle tip	10–50
10.6	Fibroid/ metroplasty	In	Loop	5–50
10.7	Primary/secondary infertility and assessing tubal patency	Out	Bubbles sometimes Pipelle ®	5
10.8	Habitual abortions	Out	Pipelle ®	3
10.9	Niche	In	Loop	5–15

Table 2.
Inpatient or outpatient indications for hysteroscopy, device and time needed to complete the procedure.

Second- and third-generation techniques are quicker than previous approaches because they do not require hysteroscopic visualization during the procedure. Decision as to visual or blind procedure is based on the skills of the surgeon and on the size of the uterus. Results and patient satisfaction appear to be similar [4].

3.2 Postpartum or post miscarriage/induced abortion bleeding

Postpartum bleeding raises a suspicion of placental remains. There also may be bleeding due to retained products of conception following an abortion either spontaneous or induced for medical reasons.

3.3 IUD related

Common referral to hysteroscopy is to remove an IUD. In cases where the strings are not apparent referral to hysteroscopy is preferable to the patient than attempting blind instrument IUD extraction.

3.4 Suspected malignancy by sonography

Often the indication is sonographic findings such as suspicion of submucosal uterine fibroids, adenomyosis, endometrial cancer. It should be stressed that following removal of a polyp and diagnosis of malignancy it is obligatory to plan hysterectomy even if the rest of the cavity seemed normal in hysteroscopy. In an Israeli study, residual complex atypical hyperplasia (CAH) or endometrial cancer (EC) was present in 89% of the hysterectomy specimens, mostly (55.6%) as multifocal lesions [5].

3.5 Asherman's

Hysteroscopy is currently considered the gold standard diagnostic and therapeutic approach for patients with intrauterine adhesions [6]. An integrated approach,

including preoperative, intraoperative, and postoperative therapeutic measures, however, are warranted owing to the complexity of the syndrome.

3.6 Fibroid, septate uterus

Hysteroscopic removal of endometrial polyps suspected on ultrasound in women prior to IUI and IVF may improve the clinical pregnancy rate compared to simple diagnostic hysteroscopy [6].

3.7 Primary/secondary infertility; assessing tubal patency

Hysteroscopy should be part of evaluation of primary and secondary infertility [6]. The performer should investigate and describe the uterine shape to exclude a septate uterus or other Mullerian abnormalities of the uterus, the endometrium to exclude intrauterine synechia (adhesions, Asherman's) and atrophy. Moreover an attempt to pass bubbles via the tubal ostia determines tubal patency [7].

3.8 Habitual abortions/recurrent pregnancy loss (RPL)

When a woman has 3 or more consecutive spontaneous abortions we recommend evaluation which includes a diagnostic procedure to evaluate the uterine cavity. Office hysteroscopy, is the easiest and most informative tool to investigate possible intrauterine abnormalities such as septate uterus or intrauterine adhesions or a polyp in patients with RPL or recurrent implantation failure (RIF).

3.9 Niche

Control examination of the uterine cavity after operations on the uterus such as cesarean to see the niche, curettage to evaluate whether there are remains, Asherman's to evaluate the reappearance of adhesions. Following metroplasty for septate uterus it is good practice to evaluate the cavity by hysteroscopy to confirm if postoperatively the uterine cavity is fit for pregnancy. In some cases, a reoperation is required to complete cutting an extensive septum. Also, following myomectomy it is recommended to repeat hysteroscopy to judge whether there are any remnants of the myoma and that no postoperative adhesions have formed.

4. The hysteroscopy team

The hysteroscopy clinic enables patients to undergo the procedure in the office setting. Patients can continue their day plans without need to cancel pleasure activities or work. The team involves administrative, nursing and the physician. It is quite important for the team to work in a concerted way so that the patient arrives at the correct time and the correct equipment is ready for the procedure.

4.1 The administrative assistant

An experienced secretary is an important player for a well-orchestrated team to work coherently. When a patient calls in for an appointment, you should transfer the call to a dedicated secretary and follow a planned call questionnaire. The most important question is asking about the date of the patient's last menstrual period. In premenopausal women, hysteroscopy should be performed between days 7–11 following the beginning of the menstrual period. This achieves

a certainty about our patient not being pregnant and the lining of the uterus is thin, in order to see a good view of the uterus. The patient is advised to eat before coming to the clinic to reduce the complication of a low blood sugar or weakness after the procedure.

In case of doubt the patient is required to carry out βhCG in the blood before coming the clinic. if this was not performed, a urinary pregnancy test to ensure βhCG is negative. Moreover, it is easier to introduce the scope during menstruation as the cervix is slightly relaxed.

4.2 Nursing

Dedicated and professional nursing is an integral part of hysteroscopy. We find it quite efficient to have three nurses working with the physician hysteroscopist in the diagnostic and in the see and treat hysteroscopy clinic. One nurse sits with the patient and explains to her the procedure and prepares her for the signing of the informed consent with the physician and to offer the patient oral analgesia before the procedure.

The second nurse will be assisting the physician during the procedure making sure that the equipment is sterile, connecting the light cable and the normal saline to the scope as well as handing over surgical tools such as grasper or scissors to perform a 'see and treat' procedure and to ensure the wellbeing of the patient. The patient will be seated and covered by the nurse and at the end of the procedure the nurse will ensure that the patient safely descends from the gynecological chair and is able to go and get dressed on her own.

The third nurse oversees sterilization of the hysteroscope optics and sheaths.

It is recommended for a busy clinic to have quite a few both diagnostic and 'see and treat' scopes. We usually schedule a dozen patients per clinic morning, sterilization must thus be carried out in parallel to performing the procedures so that unprepared equipment is not the bottleneck of the clinic. It is recommended that the hysteroscopy clinic nurse attends courses given to physicians or to nurses about hysteroscopy, its indications, contraindications and how the procedures are performed. Teaching a new nurse should be done by an experienced nurse to ensure that safety and efficacy are carried out. Only after such training should a new nurse assist a hysteroscopy clinic. In the UK, a nurse hysteroscopist performs diagnostic procedures [8]. In Israel and to the best of our knowledge in mainland Europe and North America however, only physicians are licensed to carry out invasive procedures on live patients.

Before signing the informed consent, the nurse briefs the patient on the hysteroscopic procedure. Main points explained are the following:

- The hysteroscope is inserted through the vagina and cervix into the uterus. It is very fine and ordinarily a speculum is not used.

- Liquid solution is passed through the hysteroscope throughout the procedure, to expand the uterus and to clear away any blood or mucus.

- The physician will gently insert the hysteroscope which has a light source and can also introduce small tools through a side port. This will enable her to have also a treatment such as removing a polyp or an intrauterine device.

- The nurse explains to the patient that she must read the consent form before sitting with the doctor and any questions regarding the consent form she will be able to receive an explanation before the procedure from the doctor.

4.3 The Gynecologic surgeon

A hysteroscopist is usually a certified gynecologic surgeon. There is mounting evidence in the surgical literature to support the use of skilled labs outside of the operating room for resident training and indeed simulation is the key point for an appropriate surgical learning [9]. It is necessary to improve the quality of the simulators by enhancing or introducing tactile feedback [10].

The physician must carry out three main duties prior to beginning hysteroscopy.

Firstly, review the patient's medical, gynecological, and obstetrical history in general and the reason for referral to the procedure.

Secondly, explain the indication to the patient and thus discuss expectations. For example, if it is to evaluate the endometrial cavity prior to embryo transfer, or to remove an IUD. Another example is suspicion of postpartum residual placental tissue where it should be clear that we will need to schedule an operative procedure as the amount of tissue to be removed exceeds possibility by see and treat equipment.

Thirdly the physician is responsible to rule out an ongoing pregnancy. In case of any suspicion, the patient performs a urinary or blood hCG.

It is imperative that the doctor detail and explain the very rare complications of a procedure prior to starting surgery. The physician should make sure the patient understands that there are rare complications in less than 1% of cases. Anesthesia if used, has rare complications. Intrauterine infection is a contraindication for hysteroscopy. Perforation of the uterus can occur and should be diagnosed immediately by the gynecologist. In such complication the patient will be evaluated to rule out possible damage to her bowel, blood vessel or bladder. Intrauterine adhesions may occur following operative surgery, especially for large lesion such as a myomectomy. With the use of normal saline as distending medium there are no adverse reaction to the distention media as was seen sometimes with Glycine or Dextran. After reviewing such these rare complications, the physician and patient are now ready to sign an informed consent form.

5. The equipment

Equipment that is needed to perform diagnostic hysteroscopy includes the fibreoptic scope, a light cable, and the camera. The camera is connected to a screen. It is recommended to have a camera and a printer to capture and then insert pictures into your operative report. Through an operating channel mechanical tools can be inserted to carry out a 'see and treat' procedure in an outpatient setting [11]. Moreover, the advent of new technologies is further changing the approach of outpatient hysteroscopic surgery. Some procedures that in the past required cervical dilatation to introduce the resectoscope can currently be perfomed using a thin hysteroscope [12].

For all purposes we use a 1.9 (2.8 with sheath) millimeter rigid hysteroscope. For the see and treat the diameter is 4.2 millimeter with the scope of 2.9 millimeter. We find those scopes are well tolerated even by nulliparous or postmenopausal patients.

5.1 Distension of the uterine cavity

Currently we use normal saline for all our hysteroscopic procedures. The use of Glycine is dangerous as it may cause hyponatremia [13]. For the diagnostic procedure the one- or three-liter bag of normal saline flows using gravity is used. It is however easier to use a balloon handpump as sometimes the patient has blood clots in the uterine cavity that need to be flushed out so the gynecologist can see the endometrial cavity.

5.2 Single use scopes

Clinics commonly perform hysteroscopy with multiple use equipment. Recently single use hysteroscopes have been developed (Neoscope or Lina operascope). This may be a suitable option at a gynecologist office where few procedures are performed.

5.3 Hysteroscopy tissue removal systems

Hysteroscopic tissue removal systems (Truclear®, Myosure® or IBS®) may offer an advantage in successful removal of pathology and shorten total operation time.

6. Hysteroscopic method

For purpose of clarity, we will describe how to perform outpatient and inpatient procedures, separately.

6.1 Outpatient hysteroscopy

In order to overcome the sensation of pain caused by speculum and tennaculum among patients undergoing office hysteroscopy the vaginoscopy approach (no touch) was first proposed by Bettocchi [14]. The method uses no insertion of speculum nor any instruments to grasp the uterine cervix. The performer uses vocal analgesia. This means that you keep talking to your patient while performing the procedure and not necessarily showing her the instruments that you use. The patient is encouraged to look at the screen and be part of the procedure. In a randomized trial, oral analgesia was shown to reduce pain [15].

The patient is covered in lithotomy position with her legs comfortably in stirrups. There is no need for scrubbing nor washing. Following digital gentle separation of the major labia and gently inserting the tip of the hysteroscope, the performers eyes are then reverted to the screen while filling the vagina with normal saline.

At this point the cervix should be located. Usually, the uterine cervix will be found in the posterior part of the vagina, you then direct the scope to the opening of the cervix and gently land on it with your scope in order to enter. The rigid hysteroscope needs to gently enter into the cervical canal. The scope has a 30 degree angle and therefore while going through the cervical canal the opening of the canal should be seen at 6 o'clock and gently slide along the cervical canal until the inner os of the uterine cavity is observed. In a retroverted uterus this is the opposite, the hands should be reversed and therefore the opening of the cervix will be seen at 12 o'clock. When the uterus is very introverted you could use your hand to put a little suprapubic pressure on the uterus in order to straighten it. You can use one hand at this step in order to enter the uterus and if needed ask a nurse to apply the suprapubic pressure or even the patient herself. The entry to the uterine cavity should be performed very slowly and carefully watching in order to prevent pain and in order to avoid the possibility of entering forcefully and causing a perforation. Throughout the procedure the patient should be relaxed. The physician should perform all actions slowly using the left hand to hold the camera in a fixed position while the scope with a 30 degree angle is moved along the longitudinal axis, observing the right wall then the anterior wall, then the left wall and then the posterior wall. All these should be done by rotating the attachment of the light cable to the hysteroscope, Taking pictures is recommended.

The whole procedure is performed very slowly., retracting the scope looking on the exit at the lower anterior wall of the uterus. This is especially relevant in patients

who had a previous cesarean section, in order to observe if there is a niche. Looking at the cervical canal can give some information about the possibility of a polyp. The instrument is then removed from the vagina. The whole procedure should take no longer than one minute.

6.2 See and treat

Performance of diagnostic and operative procedures for gynecological conditions in the consultation room setting is becoming increasingly commonplace to reduce risks of general anesthetic, decrease healthcare costs and increase convenience for both patient and gynecologist. Diagnostic hysteroscopy is performed using the required instrument (e.g. scissors or grasper) on standby inside the working canal. Intrauterine contraceptive device (IUD) removal or its fragments is a common referral. Use of small diameter hysteroscopes and resectoscopes allow these procedures to be performed as a single stage "see-and-treat" hysteroscopy in the comfort and safety of an office-based setting.

6.3 Operative

Hysteroscopic surgery has become the standard of care to treat benign intrauterine disease in pre-menopausal and even postmenopausal women. The various hysteroscopic procedures have been shown as safe and highly effective to treat lesions such as submucous myomas, endometrial polyps, uterine septa and intracavitary adhesions.

Operative hysteroscopy is performed in the OR and thus offers advantages and disadvantages. Advantages include the possibility to remove large pathologies from the uterine wall. The operative hysteroscope is inserted following dilatation of the uterine cervix to hegar dilator 10-10.5 under general anesthesia.

There are 3 parts to the operative procedure. First the dilatation of the cervix. This might turn out to be the risky part and indeed most complications occur at this step [6]. The second part deals with the pathology, whether it be using the loop to resect a polyp or type 0 submucosal fibroid [pedunculated fibroids without any intramural extension]. It is more difficult to remove a type 1 [submucosal with minor intramural] fibroid. Type 2 fibroids [mostly intramural, the angle with the endometrium is>90°] should not be removed by hysteroscopic surgery.

7. Analgesia

With new hysteroscopes, it is possible not only to examine the cervical canal and uterine cavity but also to perform biopsies or treat benign diseases in a relatively short time, without any premedication for anesthesia. This is because the sensory innervation of the uterus mainly regards the myometrium, while the endometrium and the fibrous tissue of septa and synechiae are almost insensative [16]. Preventing pain is very important.The pain is caused by distending the uterus and mostly in the cervical canal.

7.1 Analgetics

The use of rectal indomethacin, ropivacaine or levobupicavaine diluted in the saline distension medium, the use of multimodal local anesthesia as well as the use of premedication by means of diclofenac potassium or tramadol are all effective methods to reduce pain. There is a lack of consensus on the choice of analgesia for

outpatient hysteroscopy, with a recent meta-analysis and systematic review suggesting oral nonsteroidal anti-inflammatory drugs and transcutaneous electrical nerve stimulation (TENS) for pain relief [17].

7.2 Preparation of the cervix with vaginal misoprostol

Giving low-dose (25 mcg) Misoprostol before the procedure may soften the cervix sufficiently to allow an easier and more successful test. This medication has been tested before intrauterine procedures including hysteroscopy and, in some patients, it has been shown to be beneficial. Cervical priming facilitated hysteroscopy by dilating the cervix, allowing for easier entry and reducing procedural time. Administration of a cervical preparation, however, increased the risk of adverse effects, namely genital tract bleeding, abdominal pain/cramping and gastrointestinal disturbance [18].

7.3 Distraction techniques

Non-pharmacological options of pain relief at outpatient hysteroscopy include music, hypnosis, adjusting the temperature and pressure of distension medium, stretching of the uterus with a full bladder and electricity via TENS. What we usually do is to have a cheerful conversation with the patient, and we suggest controlled breathing in order to relax the body. It is helpful to suggest to the patient to watch the screen as we explain what we see. Since this chapter is written during the covid-19 pandemic we do not allow the partner to join the patient. Somewhat surprisingly we are under the impression that this has resulted in reducing patient stress.

7.4 Virtual reality

Virtual reality (VR) was suggested as a distraction technique for non-pharmacological pain relief. It is a computer-generated representation of an immersive environment viewed through a headset. VR is effective in reducing pain and anxiety during outpatient hysteroscopy [19].

8. Contraindications

Hysteroscopy is contraindicated in patients with Pelvic infection, Pregnancy, Cervical cancer or Heavy uterine bleeding. If the contraindications to hysteroscopy are observed, complications should be rare.

9. The hysteroscopy reports

The medical report represents one of the most critical steps not only from a legal, medical point of view but also for the patient and other health professionals. It should first include the description of the instruments used: hysteroscope, optics, distension medium, and any mechanical or energy tools. Subsequently, the technique used for access to the cervical canal should be reported, plus the morphology of the cervical canal and the uterine cavity should be carefully described. We report the visualization of both the tubal Ostia and whether they appear patent by passing bubbles. Findings such as polyps, fibroids, adhesions, or a septum should be described in detail. This includes location, size, vascularization, and severity. At the end of the report, your patient should receive

recommendations. If surgery is required it should be stated and a referral for surgery added. In patients undergoing infertility treatment it should be added when the exam is normal that the uterus appears to be compatible for pregnancy. This will indicate to the patient and the infertility team that it is recommended to proceed with IVF or other methods used.

Before discharge, all information written in the letter should be explained to the patient and questions should be answered in detail so that the patient has all the information required for further treatment.

10. Complications

Morbidity and even death have been reported after hysteroscopic interventions [20, 21].

10.1 Adhesions resulting in defective endometrial receptivity

Hysteroscopic resection of a polyp, fibroid or placental pregnancy products is frequently performed to increase IVF success rates. Moreover, a septate uterus may hinder pregnancy following embryo transfer. Hysteroscopic adhesiolysis is the gold standard intervention to treat intrauterine adhesions.

Nevertheless, intrauterine procedures by themselves may cause defective endometrial receptivity [22].

We thus carry out the procedure with paramount prudence so as not to harm normal endometrium nor cause adhesions. In patients who have children, it is crucial to know before surgery if the patient has completed her family plans. For example, if a patient in her 40's has perimenopausal menorrhagia is undergoing hysteroscopic polypectomy the operation would be carried out in different mode whether she wants to preserve her fertility potential or not. This should be described in her informed consent. Some have claimed that endometrial thickness is narrower following polypectomy. We have looked into this and have found that our pregnancy rates were higher despite a mild postoperative decrease in endometrial thickness [23].

10.2 Perforation of the uterine wall

The most common complication of hysteroscopy is uterine perforation (approximately 1%) which can occur with a blunt instrument (uterine sound, dilator, curette, hysteroscope) or during the use of an energy source such as electrosurgery (i.e., inappropriate use of electrodes), with a possible injury of the surrounding organs (bladder, bowel, vessel) resulting in catastrophic consequences. An alternative to the utilization of a thermal energy source during hysteroscopic surgery is the use of mechanical energy such as scissors or intrauterine morcellator (IUM) to treat benign pathologies such as polyps, myomas, and retained products of conception.

10.3 Infection

The prevalence of infections following in-office hysteroscopy is low (0.06%) [24]. routine antibiotic prophylaxis is thus unnecessary before hysteroscopy. Patients should be counseled that if they have fever following an hysteroscopic procedure they should contact your office or out of hours go to the gynecology emergency room.

10.4 Bleeding

In most patients, we performed the procedure on the last days of the menstrual cycle therefore bleeding is still present before and after hysteroscopy. The patient should be informed that mild bleeding is normal after the procedure nevertheless if severe bleeding ensues or continues the patient should contact the clinic or out of hours go to the emergency room to exclude a serious complication from the hysteroscopic procedure. In diagnostic hysteroscopy we perform a procedure using the new vaginoscopic approach, therefore in most cases there is no bleeding at all from the procedure itself. In inpatient hysteroscopy. anesthesia we use the tenaculum and Hagars to dilate the cervix, therefore bleeding results mostly from the surgical intervention. Also following the removal of fibroids or polyps some bleeding is expected, although this should stop within a few hours following the procedure. In some cases removing a large fibroid leaves a large area of exposed blood vessels and attempts should be made during the procedure to obtain hemostasis using coagulation. If bleeding continues the physician may introduce an intrauterine Foley catheter and inflate it, which should be removed an hour later. In most cases, this stops the bleeding and patient is discharged home only after evaluation that there is no substantial bleeding after surgery.

11. Cost

In Israel, most procedures are performed in the HMO setting and therefore it is free for our patients. According to the Israeli ministry of health price list the reimbursement for a diagnostic hysteroscopy is 606 NIS whereas, for a surgical procedure the reimbursement is 1,104 NIS.

In USA, the cost of a hysteroscopy ranges from $750-$3,500. The cost depends on the extent of the procedure. For instance, a diagnostic-only procedure is much less than one involving surgery. The cost may be higher for a more extensive procedure which includes surgery in the hospital and general anaesthesia. Costs for these extensive procedures can be up to $7,000. Some US health insurance carriers will cover a hysteroscopy, at least partially.

In an Italian paper [25], total hospital costs for polypectomy with all systems were significantly less expensive in an office setting compared with same-day surgery in the hospital setting ($p = .0001$).

12. Conclusions

Hysteroscopy is an essential part of the gynecologist's toolbox. Nowadays, hysteroscopy is the gold standard for the diagnosis and treatment of intrauterine pathologies as it represents a safe and minimally invasive procedure that allows the visualization of the entire uterine cavity. It is an inexpensive however valuable method. Cervical preparation before examination with vaginal misoprostol reduces pain during outpatient hysteroscopy and can be offered particularly to nulliparous or postmenopausal patients. Hysteroscopy requires certain skills and experience and is not exempt from complications, especially in unexperienced hands. The report should describe the method used to perform the procedure and then the relevant findings. This includes the shape of uterine cavity, the endometrium, and the right and left ostia. In infertile patients, describe whether bubbles travel through the fallopian tube openings. Gynecologist should be familiar with this tool for better evaluation and treatment of their patients.

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Conflict of interest

The authors declare no conflict of interest.

Notes/thanks/other declarations

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