The role of diagnostic hysteroscopy in modern gynaecological practice

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New advances in hysteroscopic visualisation of the uterine cavity have significantly increased the accuracy of diagnosing intrauterine pathology and created new possibilities for hysteroscopic surgery. An overview of the equipment, indications, contraindications, technique, and complications of diagnostic hysteroscopy is presented. Diagnostic hysteroscopy can be safely and effectively performed as an outpatient procedure under local anaesthesia or even without any anaesthesia. Hysteroscopy should replace most dilatation and curettage procedures. The necessary skills can be easily acquired by any practitioner with appropriate training.

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Introduction

Examination of the uterine cavity with a telescope dates back to the 19th century.[1] However, it was not until the 1950s that real interest in hysteroscopy began. With refinements in equipment and advances in technology, hysteroscopy has become a simple, easy, and effective way to inspect the uterine cavity. The clarity and diagnostic accuracy achieved is remarkable. This technique should become part of the repertoire of every modern gynaecologist. Extensive operative hysteroscopic techniques have also developed in the past decade. However, these procedures are more difficult and are associated with much higher morbidity and should only be performed by those who have undergone specific training.

Equipment

There are two types of hysteroscope—flexible and rigid.[2] Most outpatient diagnostic hysteroscopies are performed with 3 to 4 mm diameter rigid telescopes with a Hopkins rod lens optical system or with similar diameter flexible scopes. The flexible telescope has a mobile fibreoptic tip which can be manipulated within the uterine cavity for better appraisal of intrauterine pathology, while causing less discomfort to the patient than occurs with the rigid scope. This is very useful, enabling hysteroscopy to be performed in the office without anaesthesia. However, it is not widely used because it is much more expensive, the field of view is often limited, and remarkably good results can be achieved with modern rigid scopes and angled objective lenses.

The viewing angle of the telescope can be direct or oblique. An oblique viewing telescope, usually 25° to 30°, is preferred because of the larger field of view and the possibility for viewing around obstructions. An outer sheath is used for the introduction of distending medium. Additional wider diameter sheaths may be used for the introduction of operative instruments or provision of an outflow tract for distending fluid.

Light is usually provided by an intense xenon cold light source which is connected via fibreoptic cable to the telescope. A high resolution video camera and television system are attached to the eyepiece of the telescope. The learning of eye/hand coordination, which is essential for this operative procedure, is facilitated by the use of a video camera. A high quality video recorder is useful for providing a permanent record of the findings. Complete equipment costs between HK$100 000 and HK$250 000.

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Distending medium

For optimum visualisation of the uterine cavity at hysteroscopy, a distending medium is required because normally the uterine walls are opposed. Many clinicians use carbon dioxide (CO_2) to distend the uterus for diagnostic purposes.[2] It is less messy than fluid and provides clear visualisation. A special instrument for safe insufflation of CO_2 is essential. A low flow of CO_2 can either be delivered from a specially designed insufflator or a small cartridge in the handle of the hysteroscope. Insufflators for laparoscopy or other types of endoscopy must not be used as the flow rate and pressure are too high and there is a substantial risk of gas embolism.[3] The flow rate for hysteroscopy should not exceed 100 ml/min and the pressure should be less than 150 mm Hg.

Normal saline (NS), 5% dextrose (D5), 10% dextrose (D10), and 32% dextran (Hyskon, Pharmacia AS, Hillerød, Denmark) have all been used as distending media. The first three are cheap, easily available, and wash out blood from the uterine cavity more efficiently than does CO_2. Ten percent dextrose seems to give a superior result as it is less miscible with blood, has medium viscosity, and gives a clear view. Normal saline is being increasingly used for outpatient hysteroscopy, especially when a small amount of uterine bleeding is present. Since NS contains electrolytes, it cannot be used for electrocautery procedures. Hyskon is a clear but highly viscous fluid with good optical qualities and is not readily miscible with blood. However, occasional anaphylactic reactions have been reported. Instruments also need to be cleaned thoroughly after use.

Training

Adequate training under the direct supervision of experienced hysteroscopists is mandatory before embarking on the procedure. Attendance at hysteroscopy workshops to gain practical experience and regular subsequent assistance at sessions with a qualified hysteroscopist is highly recommended.

Indications

Hysteroscopy is most commonly performed for the investigation of abnormal uterine bleeding and infertility, and in combination with endometrial biopsy is more accurate than dilatation and curettage (D&C) in diagnosis. The specificity of both techniques is 100%, but the sensitivity of hysteroscopy (98%) is greater than that of D&C (65%).[4] Common lesions missed by blind D&C are submucous fibroids, endometrial polyps, and adenomyosis. Hysteroscopy is the most sensitive method for detecting uterine cavity abnormalities in patients with postmenopausal bleeding.[5] Intrauterine causes of amenorrhoea such as Ashermann's syndrome may also be diagnosed hysteroscopically.[6] Hysterosalpingogram may initially suggest an abnormality which can subsequently be confirmed and treated by hysteroscopy. Since submucous fibroids and uterine septa can be identified and treated by this technique, hysteroscopy should also be considered as part of the investigation for all patients complaining of infertility or recurrent abortion. A lost intrauterine contraceptive device (IUCD) can usually be located and removed by hysteroscopy, even when the device is partially embedded in the uterine wall.[7] Common indications for diagnostic hysteroscopy are shown in Table 1.

Table 1. Common indications for diagnostic hysteroscopy

Premenopausal bleeding	– Menorrhagia
	– Prolonged bleeding
	– Intermenstrual/ postcoital bleeding
	– Postpregnancy or postabortion
Amenorrhoea/oligomenorrhoea	
Postmenopausal bleeding	
Abnormal hysterosalpingogram	
Infertility	
Recurrent abortion	
Lost intrauterine device	

Contraindications

There are very few contraindications to hysteroscopy. Pregnancy is one contraindication and a pregnancy test of the patient's urine before the procedure is wise, if there is any doubt about the possibility of pregnancy.[8] Postabortal or postpartum bleeding may indicate the need for a hysteroscopic examination, to exclude retained products of gestation.

Active uterine infection, salpingitis, and pelvic tuberculosis preclude hysteroscopy. Upper and lower genital tract infections should be treated before the procedure is undertaken. Menstruation and heavy vaginal bleeding make it difficult for the uterine cavity to be adequately assessed, although it is not absolutely

contraindicated. The use of free-flowing distending fluid such as NS improves visibility.

Technique

Good counselling and an explanation of the procedure to the patient are essential. Patients may be anxious about a technique being performed without anaesthesia. In the proliferative phase of the cycle there is no risk of pregnancy and the endometrium is thinner. Premedication with an oral prostaglandin inhibitor such as mefenamic acid a few hours beforehand may prevent uterine cramps during the procedure.[9] The patient should preferably empty her bladder first. A preliminary bimanual examination is carried out to determine the uterine axis and a cervical smear should be taken if appropriate. The woman's last menstrual period should be noted, as pregnancy is one of the few contraindications to hysteroscopy. All equipment should be checked before each session.

Hysteroscopy is performed with the patient in the dorsal lithotomy position. A proper medical couch with adjustable stirrups and the facility to independently raise and lower the head and feet is invaluable. The cervix is exposed with a bivalve speculum with unilateral articulation to allow removal of the speculum after the hysteroscope is inserted. The cervix is then cleansed with mild antiseptic.

Anaesthesia is usually not required unless the cervix is stenosed or an operative procedure is to be done. A paracervical block or intracervical injection of 1% lignocaine into the anterior and posterior cervix is usually adequate. The anterior lip of the cervix is picked up with Volsellum forceps and the assembled hysteroscope is gently introduced into the endocervical canal under direct vision. Cervical dilation is usually not necessary and may generate bleeding which impairs visibility. Pretreatment with oestrogen in postmenopausal women has been reported to facilitate insertion of the telescope.[10] Vaginal prostaglandin analogues, laminaria tents, and mifepristone to soften the cervix have also been used.[11,12] If cervical dilation is contemplated, a paracervical block should be used.

It is essential to keep the tip of the bevel of the telescope in the centre of the endocervical canal to prevent any trauma to the friable endocervical mucosa, when a fore-oblique viewing telescope is used. The dark "hole" of the endocervical canal should be kept at the lower part of the visual field rather than in the centre, as the telescope is advanced under direct vision.

After entering the uterine cavity, all areas should be inspected systematically for any macroscopic lesions such as polyps, submucosal myoma, synechiae, septa, endometritis, or endometrial malignancy. With greater experience, subtle changes of the endometrial surfaces, glands, and vasculature can be noted and various types of hyperplasia distinguished. Both tubal ostia should be inspected by moving the telescope to one side and rotating it slowly. Periostial contraction can usually be identified in normal uterine cavities. When CO_2 is used to distend the uterus, the fundus may often appear saddle-shaped—this should not be mistaken for a uterine septum. The telescope is then slowly withdrawn and the endocervical canal examined for any abnormalities. The whole procedure usually takes only five to ten minutes and the patient should feel minimal discomfort.

After removal of the hysteroscope, an endometrial biopsy can be taken with a Novak cannula attached to a syringe. The endometrial tissue obtained should be sent for histology. Directed biopsy of a suspected lesion can also be performed by introducing biopsy forceps through an operating sheath. However, the slightly larger sheath may cause discomfort for some women and the biopsy obtained is tiny. Most moderate or large polyps require removal under general anaesthesia or effective paracervical block.

Complications

Complications associated with diagnostic hysteroscopy should be rare if the procedure is performed with appropriate equipment and by an experienced surgeon.[13]

General anaesthesia

Anaesthetic risk for patients undergoing general anaesthesia (GA) is always present. Therefore, patients should be well prepared and warned of the risks before GA is given. Performing diagnostic hysteroscopy under local anaesthesia or without anaesthesia should be considered.

Vasovagal attack

This may be caused by distension of the vagina, cervix, or uterine cavity. The patient may feel faint, hot, and sweaty. Pallor, bradycardia, and hypotension may be present. This condition is usually mild and self-limiting, but it can be exacerbated by anxiety. The patient should be kept in a head-down position and oxygen may be given by face mask. Very occasionally, atropine (0.3 mg intramuscularly) may be required. This complication becomes much less common with increased operator experience.

Allergic and anaphylactic reactions
Rarely, the patient may have an anaphylactic reaction to lignocaine or dextran and develop a skin rash and acute hypotension. Adrenaline (0.5 ml at 1:1000 dilution subcutaneously) can be life-saving and should always be available to the surgeon.

Uterine perforation
Perforation of the uterus is rare, but can occur at insertion and at the fundus, even in the conscious patient. It can almost be completely prevented by gentle introduction and manipulation of the hysteroscope under direct vision and by taking care in dilating the cervix.

Postoperative pelvic infection
Introduction of the telescope and distending medium into the uterine cavity can predispose to infection, especially in women with a history of previous pelvic infection. Fluid distending media are associated with a slightly higher likelihood of infection than are gas media. Prophylactic antibiotics should be commenced preoperatively for patients with previous pelvic inflammatory disease or other risk factors. Patients with active pelvic infection should not undergo hysteroscopy.

Gas embolism
Carbon dioxide embolism is rare and only associated with the use of older or inappropriate insufflation equipment.

Shoulder tip pain
Irritation of the diaphragm by CO_2 gas can occur, especially at high flow rates. However, it usually subsides quickly and rarely becomes a problem. Patients should be warned that this may occur.

In a series of 300 consecutive outpatient diagnostic hysteroscopies performed by one of the authors using CO_2 as distending medium, nine patients (3%) developed mild vasovagal attack requiring no specific treatment.[9] Five patients (1.7%) developed postoperative shoulder tip pain. Two patients experienced severe pain (0.7%). The procedure was unsuccessful in 16 women due to cervical stenosis or pain. No serious complications such as perforation of the uterus, gas embolism, or pelvic infection were observed.

Discussion

Diagnostic hysteroscopy appears to be more accurate than traditional methods in diagnosing intrauterine pathology. The technique may be learned with relative ease and it should become part of the armamentarium of every gynaecologist.

In the past, most hysteroscopies were performed with 6 to 10 mm rigid telescopes following cervical dilation under GA. However, due to refinements in instrumentation and technique, diagnostic hysteroscopy can now be safely performed as an office procedure with or without local anaesthesia. Minor problems are initially common, but should decrease with experience, and with the development of trouble-shooting skills. Serious complications are very rare.

Most women appreciate the opportunity to watch the procedure on the television monitor and being given a clear explanation of the images on the screen. Provision of an information sheet beforehand is invaluable.

High quality training is essential for those learning hysteroscopy. This may be enhanced by workshops with "hands on" exposure and time spent assisting an experienced hysteroscopist. Initially, performing hysteroscopy under GA will help the clinician develop the basic technique before progression to outpatient procedures using local anaesthesia.

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