
REVIEW

Sonohysterography : An Evaluation of the Uterine Cavity

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Until recently, investigation of the uterine cavity was dependent upon various paraclinical investigation such as hysterosalpingography (HSG), more rarely CT scanning and magnetic resonance imaging, and dilatation and curettage, all of which have their drawbacks, risks, or deficiencies.^(1,2) Transvaginal sonography (TVS) has completely transformed the diagnostic approach of the uterine cavity. Because of the proximity of the probe to the organs being explored, the images obtained are of high resolution.^(1,3) In certain physiological and nonphysiological situation, intracavitary fluid discharges (fluid retention) distend the uterine cavity and improve sonographic contrast.⁽⁴⁾ Distension can also be obtained artificially by instilling a solution into the cavity inducing a veritable sonographic hysterothography (Sonohysterography, SH) for evaluating the uterine cavity and describing intracavitary abnormalities.⁽⁵⁻⁷⁾ Sonohysterography was described in 1984 by Richman et al,⁽⁸⁾ who used transabdominal technique for determining tubal patency. The development of transvaginal transducers has made it possible to refine this technique as a result of improved depiction of the endometrial cavity. Sonohysterography increases the diagnostic sensitivity and specificity of transvaginal ultrasound potentially decreases the number of invasive

procedures, while helping direct appropriate management in cases requiring tissue diagnosis.⁽⁹⁾ Indications for sonohysterography include both clinical and sonographic findings. Clinical indications include abnormal vaginal bleeding, in case of menometrorrhagia in women of child-bearing age or postmenopausal bleeding, or unexplained infertility. Sonographic findings indications include a thickening of the endometrial interface that is out of phase with the patient's menstrual history, the presence of a uterine leiomyoma of indeterminate location, or a poorly defined endometrium.⁽⁹⁾

Timing of the examination

The timing of sonohysterography is dictated by the clinical situation. In the infertile patient, the procedure is usually performed within the first 10 days of the menstrual cycle, similar to the timing of hysterosalpingography. This timing is used to minimize the possibility of disrupting an early intrauterine pregnancy and many of the pathologic conditions are best examined with the background of a periovulatory endometrium. However, for women with irregular cycles, such timing may not be feasible. In these patients, the procedure can be performed after negative result of a pregnancy test is obtained. For patient with suspected polyps,

sonohysterography is best performed during the proliferative phase of the menstrual cycle, since the thin endometrial interface does not further distort the endometrial cavity. For women with suspected leiomyomas, the timing of the examination is subject to discussion. Leiomyomas are often hypoechogenic relative to the myometrium. This may be better assessed in the secretory phase because the thickened, echogenic endometrial lining provides an excellent interface for their detection.

Description of the technique

No special preparation of the patient before the procedure is required. Although there is a theoretical risk of infection, no immediate or delayed infection to date is noted, and prophylactic antibiotics are not used in uncomplicated cases. Because an existing infection could possibly be exacerbated, the examination is deferred in women with active pelvic inflammatory disease. Women with chronic pelvic inflammatory disease or a history of mitral valve prolapse or other cardiac disorders are given prophylactic antibiotics ; similar to the management of such patients before hysterosalpingography. Sedatives or analgesics are not needed during

the procedure as there is no significant pain or discomfort. Nonsteroidal anti-inflammatory drugs can be used for occasional cramping.

First, a baseline transvaginal sonographic examination is performed. (Fig. 1) This examination demonstrates the sonographic characteristics of the endometrium as well as its thickness, the presence of leiomyomas and any associated ovarian abnormality. It also serves to exclude a patient with an unsuspected intrauterine pregnancy. Following the baseline examination, the transvaginal probe is removed and a sterile speculum is inserted. The cervix is cleaned with antiseptic solution, and a catheter is introduced into the uterine cavity to the level of the uterine fundus. The choice of catheter is dictated by clinical situation. For most women, a 5-F paediatric feeding tube will suffice. This catheter is easily inserted, even in the postmenopausal patient, and has the added advantage of low cost. The other catheters which may also be used are hysterosalpingography catheters or insemination catheters or polyethylene catheter. After the catheter is in place, the speculum is removed and sonographic probe is applied. The probe can either be transabdominal⁽¹⁰⁾ or transvaginal.^(7,9,11) The position of the catheter in the endometrial cavity is ascertained before instillation of the saline is commenced. The catheter is connected to a syringe containing 50 ml of sterile saline. Sterile saline is then injected into the catheter under continuous sonographic visualization, distention is continued until all of the uterine cavity is clearly observed. To provide high quality imaging the amount approximately 5-30 ml is required. The average time to perform sonohysterography is 10-15 minutes.

Vaginal spotting of blood is not an infrequent finding. The patient is asked to contact the physician should frank bleeding, increasing pelvic pain and fever occur. For women who experience

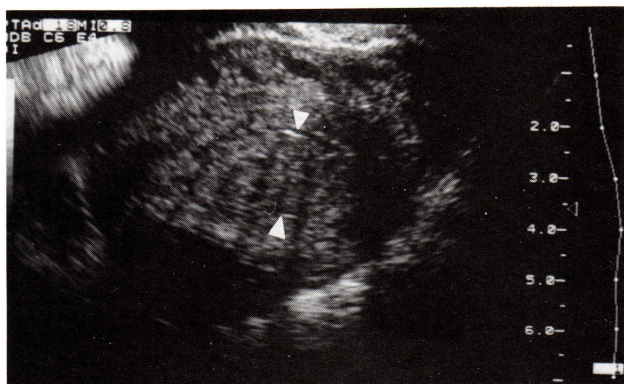


Fig. 1. Conventional transvaginal sonography demonstrated an thickened endometrial interface (arrow) in a patient who presented with abnormal vaginal bleeding.

uterine cramping, nonsteroidal anti-inflammatory drugs can be used.

Sonohysterography is especially valuable for depicting intraluminal, endometrial, or submucosal lesion. In the normal finding, The uterine cavity is symmetrically distended. No masses distorting the cavity or within cavity are seen. The endometrium appears symmetrical, with a single-layer thickness being half the expected double-layer thickness for the phase of the menstrual cycle at the time of the procedure. In the abnormal uterine cavity, the anechogenic interface provided by the saline allows an improved determination of the site of abnormality that was inferred from a thickened or distorted endometrial interface seen at conventional transvaginal sonography (Fig. 2). Abnormal lesion which could be identified by sonohysterography are uterine adhesions, uterine polyps, uterine leiomyomas, uterine septum and endometrial hyperplasia or atrophy.^(7,9)

Limitations of the technique

Limitations of sonohysterography may be encountered in certain clinical situations. In women with cervical stenosis, it may be difficult to introduce the catheter through the endocervical canal.

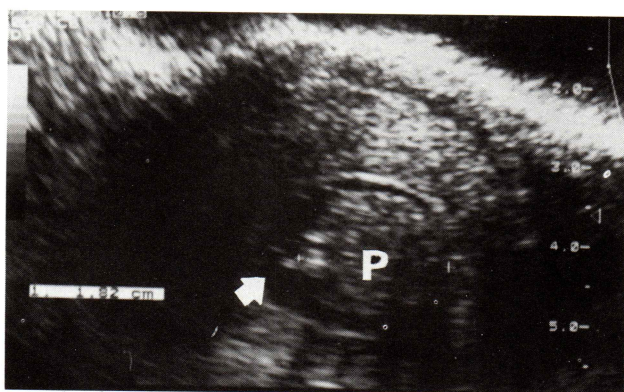


Fig. 2. In the same patient, sonohysterography demonstrated an intraluminal mass surrounded by a small amount of fluid (arrow). This finding is consistent with an endometrial polyp (P).

Occasionally, dilatation of the cervix may be required. inadequate distention of the uterine cavity is another problem that is common in women with uterine adhesions or large leiomyomas. The latter may partially obliterate the uterine cavity. Sonohysterography is of limited use for assessment of tubal patency. It is difficult to follow saline tract which coursing into the tubal ostia with gray-scale images. Study has suggested that colour Doppler sonography with contrast agents may help identify the flow within the fallopian tubes.⁽¹²⁾

A further theoretical risk resides in the possibility of retrograde seeding cancer cells via the fallopian tubes in patients with possible endometrial neoplasm. However, the slow, gradual instillation of saline solution and the low intrauterine pressures induces by small quantities of instilled fluid limit this theoretical risk. In addition, this risk does not appear greater than that involved in hysterosalpingography and the survival of patients with endometrial carcinoma is the same of women who have undergone hysterosalpingography and those who have not.⁽¹³⁾

Sonohysterography represents a new technique for the investigation of the uterine cavity. It is minimally invasive, simple, safe, relatively easy to perform and well tolerated by the patient. It has the potential of altering the management of large numbers of patients with suspected endometrial abnormalities and those being evaluated for infertility. Sonohysterography complements conventional transvaginal sonography and supersedes hysterosalpingography for investigation of the uterine cavity.

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