Thai Journal of Obstetrics and Gynaecology
December 1997, Vol. 9, pp. 299-303

GYNAECOLOGY

Sonohysterography in the Diagnosis of Abnormal Uterine Bleeding : a Preliminary Report

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ABSTRACT

Objective The purpose of this study was to evaluate the value of sonohysterography in diagnosis in patients with abnormal uterine bleeding.

Design Prospective descriptive study.

Setting Department of Obstetrics and Gynaecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University.

Subjects Twenty-five patients with abnormal uterine bleeding and transvaginal sonography suggested an abnormal endometrial echo. Intervention Sonohysterography was performed on all patients, using saline instilled through an endocervically placed catheter. The histologic or pathologic finding was evaluated after surgical procedures and compared with sonohysterography results.

Results Twenty-one of 25 sonohysterography demonstrated intrauterine abnormalities (13 endometrial polyps, 8 submucous myomas). The pathologic finding demonstrated 20 intrauterine pathologic cases (12 endometrial polyps, 8 submucous myomas). Sonohysterography had 100% sensitivity, 80% specificity, 95% positive predictive value, 100% negative predictive value, and 96% accuracy.

Conclusion Sonohysterography is a highly sensitive, specific, and accurate screening procedure for the evaluation of uterine cavitary in abnormal uterine bleeding and may be more cost effective than traditional methods of evaluation.

Key words : abnormal uterine bleeding, sonohysterography, transvaginal sonography.

Abnormal uterine bleeding is frequently caused by pathologic processes that involve the endometrium and the myometrium. Transvaginal sonography (TVS) has completely transformed the diagnostic approach to the uterine mass and endometrial abnormalities.[1,2] Despite the effec-

tiveness of the technique, but the exact location relative to the uterine cavity and the nature of the lesion are often unclear. To better evaluate the endometrium, saline solution infusion sonohysterography (SHG) was described in 1993.[3] Saline introduced during SHG distends the uterine cavity and provides an anechoic contrast medium. This permit delineation of the endometrial lining and distinction between endometrial, submucous, and mural lesion.[4] This technique was also found to be beneficial for evaluation of patient with abnormal uterine bleeding and endometrial thickening.[5-8]

We therefore sought to assess the value of SHG in the detection of intracavitary abnormalities in patients with abnormal uterine bleeding.

Materials and Methods

The study was performed at the Department of Obstetrics and Gynaecology, Ramathibodi Hospital, Mahidol University between January 1996 and March 1997. SHG was performed in 25 women (aged 29-49 years ; mean 38.4 ± 6.58 years) who presented with abnormal uterine bleeding. None of the women were postmenopausal. These women were initially referred for TVS. In all cases, TVS suggested the possibility of an endometrial or myometrial abnormality, and SHG was recommended for further evaluation. In women with regular menstrual cycles, SHG was performed during the midfollicular phase, after cessation of menses. In women with irregular bleeding, the examination was performed soon after cessation of bleeding. SHG was never performed during the secretory phase. The endometrial echo was considered abnormal in the following situation : (a) diffuse thickening relative to the phase of the menstrual cycle (> 8 mm in the follicular phase or after cessation of bleeding in women with irregular bleeding), (b) focal or bulbous thickening or disruption of the endometrial echo, or (c) focal or diffuse heterogenicity of the endometrial texture.

All SHGs were performed by a single investigator (AC). The first investigation consisted of conventional transvaginal sonography using an ATL Ultramark 9 (Advanced Technology Laboratories, Bothel, WA), which in addition to the examination of the uterine adnexa, volume, and contours, also enabled investigation of myometrial structure and endometrial thickness. With the patient in the lithotomy position, a speculum was inserted into the vagina, and the cervix was cleansed with antiseptic solution. A 6-F balloon-bearing catheter was flushed free of air with sterile saline and then placed into the uterine cavity. The balloon was inflated with sterile saline. The speculum was then removed and the covered vaginal ultrasound probe was inserted. The catheter was connected to syringe containing 50ml of isotonic saline solution. Saline solution (approximately 10-40 mL) was instilled into the uterine cavity under continuous observation with TVS. The myometrium, endometrium, and uterine cavity were evaluated for any abnormalities with use of gray-scale imaging. The study was recorded on videotape and hard-copy film.

An endometrial polyp was diagnosed if a pedunculated or (less commonly) sessile polypoid mass was identified within the endometrial cavity with an echotexture that was hyperechoic compared with that of the normal myometrium. Endometrial polyps may or may not have small cystic spaces within them. Submucous myomas were distinguished from endometrial polyps by means of their relatively hypoechoic echotexture with sound attenuation in some cases. An endometrial polyp is entirely within the endometrial cavity, while a submucous myoma is deep to the endometrial lining and may project more or less

into the cavity. A submucous myoma may distort the outline of the endometrial cavity, or it may project almost entirely into the endometrial cavity and be considered an intracavitary myoma. In each case, the diagnosis was made prospectively in the SHG report and then compared with the pathologic or surgical finding. We reviewed the SHG results correlated with the surgical and pathologic finding. After treatment, all patients were followed up to assess clinical outcome.

Results

SHG was successfully completed in all cases. The examination required neither preparation nor anesthesia. A period of 10 minutes was sufficient for full investigation of the uterine cavity. The amount of instilled saline varied from 10 ml to 40 ml, depending on the uterine size, contrast quality, vaginal fluid refuse, and patient comfort. There were no complications. In the 25 patients, SHG demonstrated that 13 were endometrial polyps, 8 were submucous myomas, and 4 were negative finding cases. The pathologic specimens were received by curettage with or without hysteroscopy or myomectomy or hysterecotmy. Of the 25 pathologic specimens found that 12 were endometrial polyps, 8 were submucous myomas, and 5 were unremarkable.

The result of SHG compared to the pathologic diagnosis show sensitivity 100%, specificity 80%, positive predictive value 95%, negative predictive value 100%, and accuracy 96% (Table 1).

Table 1. Result of sonohysterography (SHG) finding in relation to pathologic diagnosis

Result of SHG	Result of pathologic diagnosis		
	No	Abnormal	Normal
Abnormal	21	20	1
Normal	4	0	4
Total	25	20	5

Sensitivity 100%, Specificity 80%, Positive predictive value 95%,
Negative predictive value 100%, Accuracy 96%.

Discussion

In patients with abnormal uterine bleeding part of the evaluation process in the past has included invasive procedures such as endometrial biopsy or curettage. Ultrasonography was introduced as a noninvasive test. Transvaginal sonography has completely transformed the diagnostic approach to the uterine cavity. Because of the proximity of the probe to organs being explored, and thus obtain high resolution images.[9] Our studies indicate that with the addition of saline solution infusion sonohysterography, a more specific diagnosis can be obtained. SHG was described in 1984 by Richman et al, who had used it with transabdominal technique for determining tubal patency.[10] The development of transvaginal transducer has made it possible to refine this technique as a result of their improved depiction of the endometrial cavity. The technique of SHG, which increases the diagnostic sensitivity

and specificity of transvaginal ultrasound has the potential to aids the clinician in the management of abnormal uterine bleeding in a primary care obstetric-gynecologic practice.[6]

Our study shows that SHG had the high sensitivity and high specificity in the diagnosis in patients with abnormal uterine bleeding. By clearly delineating the type and location of an endometrial abnormality, such as a polyp, SHG helps in selection of the appropriate surgical approach.[11] A focal abnormality, such as a polyp or submucous myoma, requires hysteroscopic resection, while a diffuse endometrial thickening, such as endometrial hyperplasia, may be sampled reliably with a dilation and curettage. When endometrial thickening is focal, results of the endometrial biopsy may be false-negative, but when the physician is directed by SHG to a known site of abnormality, the sample is more likely to be obtained from the pathologic area. The use of SHG had an important influence on the evaluation and treatment of patients with abnormal bleeding and submucous myoma. The endometrial cavity is often difficult to delineate in the presence of submucous myoma. SHG can help localize a leiomyoma as submucous, intramural, or a combination of these.[12] In our experience, all submucous myoma cases were diagnosed by SHG and confirmed with pathologic diagnosis. The size and location of submucous myoma had been defined clearly.

In this study a comparison of hysteroscopy with SHG was not done. Widrich et al.[13] compared saline solution infusion sonography with office hysteroscopy and concluded that there was no difference in the procedures in detecting endometrial polyps, myomas, synechiae, hyperplasia, endometrial cancer, or normal uterine cavities.

In conclusion, the use of SHG augments the capability of transvaginal sonography to elucidate the cause of abnormal uterine bleeding. SHG is a highly sensitive, specific, and accurate screening tool for the evaluation of uterine cavitary defects associated with abnormal uterine bleeding. It is a simple, safe, and accurate examination, and its value is currently being assessed. Finally, with increased training and experience with transvaginal sonography, gynecologists will find SHG a simple technique for the investigation of intrauterine pathology.

References

1. Smith P, Bakos O, Heimer G, Ulmsten U. Transvaginal ultrasound for identifying endometrial abnormality. Acta Obstet Gynecol Scand 1991 ; 70 : 591-4.
2. Dodson MG. Use of transvaginal ultrasound in diagnosing the etiology of menometrorrhagia. J Reprod Med 1994 ; 39 : 362-72.
3. Parsons AD, Lense JJ. Sonohysterography for endometrial abnormalities : preliminary results. J Clin Ultrasound 1993 ; 21 : 87-95.
4. Fukada M, Shimizu T, Fukuda K, Yomura W, Shimizu S. Transvaginal hysterosonography for differential diagnosis between submucous and intramural myoma. Gynecol Obstet Invest 1993 ; 35 : 2236-9.
5. Goldstein SR, Zeltser I, Horan CK, Snyder JR, Schwartz LB. Ultrasonography-based triage for perimenopausal patients with abnormal uterine bleeding. Am J Obstet Gynecol 1997 ; 177 : 102-8.
6. Laughead MK, Stones LM. Clinical utility of saline solution infusion sonohysterography in a primary care obstetric-gynecologic practice. Am J Obstet Gynecol 1997 ; 176 : 1313-6.
7. Lerner JP, Timor-Tritsch IE, Monteagudo A. Use of transvaginal sonography in the evaluation of endometrial hyperplasia and carcinoma. Obstet Gynecol Surv 1996 ; 51 : 718-25.
8. Dubinsky TJ, Parvey HR, Gormay G, Maklad N. Transvaginal hysterosonography in the evaluation of small endoluminal masses. J Ultrasound Med 1995 ; 14 : 1-6.

9. Shipley CF, Simmons CL, Nelson GH. Comparison of transvaginal sonography with endometrial biopsy in asymptomatic postmenopausal women. J Ultrasound Med 1994 ; 13 : 99-104.
10. Richman TS, Viscomi GN, de Cherney A, Polan ML, Alcebo LO. Fallopian tubal patency assessed by ultrasound following fluid injection. Radiology 1984 ; 152 : 507-10.
11. Cohen JR, Luseman D, Sagi J, Yovel I, Wolman I, David MP. Sonohysterography for distinguishing endometrial thickening from endometrial polyps in postmenopausal bleeding. Ultrasound Obstet Gynecol 1994 ; 4 : 227-30.
12. Lev-Toaff AS, Toaff ME, Liu JB, Merton DA, Goldberg BB. Value of sonohysterography in the diagnosis and management of abnormal uterine bleeding. Radiology 1996 ; 201 : 179-84.
13. Widrich T, Bradley LD, Mitchinson AR, Collins RL. Comparison of saline infusion sonography with office hysteroscopy for the evaluation of the endometrium. Am J Obstet Gynecol 1996 ; 174 : 1327-34.