

Fluid Augmented Contrast Sonohysterography.

- A New Approach in the Evaluation of Intra Uterine condition

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Summary : Fluid augmented contrast Sonohysterography (CSHG) performed by instilling a small amount of fluid in the uterine cavity by using an intrauterine insemination catheter in 180 cases of suspected endometrial pathology echoenhance the TVS picture. Excellent clear picture of the space occupying lesion, endometrial thickness, contour and echotexture has been obtained with simultaneous observation of myometrium. Intrauterine pathology can be diagnosed with high degree of accuracy. It also enables to identify and segregate subjects having organic lesion from pure functional condition. CSHG had a sensitivity of 95.45%, specificity of 98.24%, a positive predictive value of 96.92% and negative predictive value of 97.39%. In comparison, plain TVS before fluid instillation has a sensitivity of 13.63%, and specificity of 35.08%, positive predictive value 10.84% and negative predictive value 41.23%. We found that the therapeutic approach can be planned in the same sitting and routine use of diagnostic D&C and hysteroscopy can be avoided in a substantial number of cases.

Introduction

The study of uterine cavity is an important step in the evaluation of subjects presenting with unscheduled uterine bleeding, infertility and repeated foetal wastage. The diagnostic techniques commonly employed are D&C, hysterosalpingography, hysteroscopy, and pelvic sonography best performed by transvaginal probe (TVS). While all the procedures are invasive, pelvic sonography is a single noninvasive technique increasingly being used in recent times to diagnose a number of clinical conditions (Rajan 1989, Das et al 1995a, 1995b, Das & Mitra 1995).

A high resolution transvaginal probe offers an amazingly sharp clear picture of uterus. However, confusion regarding the exact diagnosis of intra uterine pathology still remains particularly as the patient approaches her menopause. The hormone dependent endometrium, a 'sonomarker' is altered the myometrium, endometrium and any space occupying lesion becomes isoechoic, depicting ill-defined interfaces to offer a poor quality

picture. It is often difficult, to differentiate between endometrial polyp, endometrial hyperplasia and submucous fibroma or intramural fibroid, whether it distorts the endometrial cavity or not.

However, we observe that a small amount of fluid when naturally present in a postmenopausal atrophic uterus, tremendously echoenhances the picture to discern even a thin strip of endometrium and underlying myometrium with excellent clarity. Taking a cue from this observation, we artificially instilled a small amount of sterile saline in the uterine cavity to augment the TVS picture in 180 cases of clinically suspected intrauterine pathology, displaying thick echogenic endometrium.

Subsequently hysteroscopy and endometrial tissue sampling were done on the same patient to compare prospectively the earlier findings obtained by simple TVS and contrast sonohysterography (CSHG) after fluid instillation. The aim of this study was to determine a reliable simple noninvasive method to detect endometrial

pathology and thus reduce unnecessary surgery.

Technique :

All the subjects were clinically evaluated by detailed history taking, physical examinations and routine investigations. This procedure was first combined with simple pelvic scan performed by 5 MHz transvaginal probe before any exogenous hormone was administered. Subsequently a bivalve speculum was used to expose the cervical os; a soft intra-uterine insemination catheter was threaded through the cervical os upto the fundus after taking usual aseptic care. The speculum was then removed carefully without dislodging the catheter and the vaginal probe reinserted. About 10-15 cc of sterile saline mixed up with weak betadine solution was instilled through a preflushed catheter taking care to avoid air while watching the USG monitor. The uterus was scanned from cervical canal to the fundus in its short axis and after rotating the probe through 90 degree again from cornu to cornu in its long axis. In this way we recreated three dimensional anatomy of the uterus, taking care not to miss any portion of the uterine cavity containing focal lesion. The amount of fluid instilled varied between 10 to 30 cc depending upon the image produced in the ultrasound screen. The findings were video documented and all data stored in the computer were finally analyzed to assess the efficacy of this simple procedure.

Observation and Discussion :

From April '95 to December '96, we studied a total 180 cases that included 148 subjects of unscheduled vaginal bleeding, 24 cases of infertility, and eight cases of habitual abortions. (Table I)

Of the total 180 cases, studied by fluid augmented CSHG, 29 were diagnosed as uterine fibroids, including three intramural and 26 submucous fibroma of different sizes. 12 of them were pedunculated and 13 sessile with variable base embedded in the myometrium, and one displaying multiple fibroids distorting the uterine cavity. Thirty seven

cases were identified as endometrial polyp in some form or other. Out of 25 cases of infertility one displayed small submucous fibroma and an endometrial polyp in other. (Table II.)

Table I
Distribution of 180 cases studied by CSHG

	Fibroid	End. Polyp	Normal	Total
AUB	27 (18.2%)	36 (24.3%)	85 (57.4%)	148 (100%)
Infertility	1 (4.16%)	1 (4.16%)	22 (91.66%)	24 (100%)
Hab. Aborn.	1 (12.5%)	0	7 (87.5%)	8 (100%)
Total	29 (15.76%)	37 (21.73%)	114 (62.5%)	180 (100%)

Table II
Space occupying Lesions and intramural Fibroids correctly diagnosed by simple TVS, CSHG and Hysteroscopy

Uterine Pathology	Plain TVS	CSHG	Hysteroscopy by IUI catch
1. Fibroids (N29)			
A. Submucous (N26)			
a) Pedunculated (N12)	2	12	12
b) Sessile (N14)	5	13	14
B. Intramural (N3)	2	3	0
2. Endometrial Polyp (N37)			
	0	35	37
Total (N66)	9	63	63

When the patients were put to subsequent hysteroscopic examination, the organic lesions diagnosed by CSHG, were confirmed in all, identifying their existence, location and size, barring three cases of intramural fibromas and 2 endometrial polyps. One small fibroma of 10mm dia. in the myometrium, not diagnosed earlier by plane TVS, became apparent only after fluid augmentation and was not identified by hysteroscopy either but confirmed later

in hysterectomy specimen. We found that CSHG echo enhances the USG picture to offer simultaneous excellent observation of endometrium and myometrium. Thus, small intramural myomas become apparent, submucous myomas having variable base embedded into the myometrium can be diagnosed confidently. (Fig 1, 2 & 3).

Of the 117 cases diagnosed by CSHG as normal, three displayed organic lesion on hysteroscopy a small submucous fibroid in one and endometrial polyps in two. Here, we experienced difficulty to distend the uterine cavity adequately in all the three due to patulous cervical os. It is interesting to note that when CSHG was repeated distending the uterine cavity using 8 French Foley catheter, the organic lesions became evident in all (Table III).

Table III

Distribution of cases displaying no organic lesions by simple TVS, CSHG and Hysteroscopy.

Uterine Pathology	Plain TVS	CSHG by IUI Cath	Hysteroscopy
Normal	40	112	114
Suspected Endometrial pathology	74	2	0
Total	114	114	114

Hundred and twelve out of the remaining 114 subjects displayed no organic lesion although some form of focal or generalized endometrial thickening was evident and was confirmed by subsequent hysteroscopy findings. Two of them however, gave an impression of small polyp but proved to be only focal endometrial hyperplasia confirmed by histopathological report.

Fluid augmented CSHG therefore, detected organic lesion in 63 of 66 patients including 28 of 29 fibroids and 35 of 37 endometrial polyps. Thus CSHG had a sensitivity of 95.45% and specificity of 98.24% and a positive predictive

value of 96.92% and negative predictive value 97.39%. Hysteroscopy diagnosed all 63 subjects displaying endometrial pathology barring three intramural fibroids, thus hysteroscopy had a sensitivity of 100% for intrauterine



Fig 1. Submucous Fibroid Polyp arising from the anterior wall of uterus just above Internal Os

pathology and 95.45% when intramural fibroids were included.



Fig 2. Endometrial Polyp displaying Pedicle in CSHG

Barring seven of 26 submucous fibroids and 2 of 3 intramural fibromas, no other organic lesions were diagnosed accurately by plain TVS before fluid instillation. Those seven cases were accurately diagnosed as significant amount of blood was naturally present in the



Fig 3. Pedunculated Fibroid Polyp arising from the Fundus.

uterine cavity during pelvic scan.

However, we observed that subjects displaying an irregular, thick and mixed echogenic endometrium (>10 mm) were commonly associated with the presence of organic lesion; but plain TVS could not identify exact pathology, differentiate organic lesion from focal or generalized endometrial hyperplasia, and outline uterine cavity accurately. Forty patients displayed endometrium having well defined central cavity line and none of them detected organic lesion in subsequent hysteroscopy. Once organic lesion is excluded, we are now trying to explore if any significant correlation can be established between endometrial thickness, echotexture and contour with endometrial histopathology in cases of functional abnormal uterine bleeding.

Therefore, plain TVS has a sensitivity of 13.63%, specificity of 35.08%, positive predictive value 10.84% and negative predictive value 41.23%. In other words when results with plain TVS (before fluid instillation) were compared with fluid augmented CSHG and subsequently with hysteroscopic finding, 86.36% cases of organic lesion were misdiagnosed as regards accurate existence and location of space occupying lesions were concerned; but the rate of misdiagnosis came down to less than 5% when

the test is repeated after fluid instillation (CSHG) with IUI catheter. But when the tests were repeated with a foley catheter, all cases were correctly diagnosed.

CSHG performed by instilling small amount of sterile fluid in the uterine cavity by using IUI insemination catheter therefore clearly augments the TVS picture of the space occupying lesions. Excellent clear picture has been obtained demonstrating the myometrium, intra-uterine space occupying lesion, endometrial thickness, contour, and echotexture. Endometrial polyps can be differentiated confidently from submucous fibroma. Depending upon its size, extent, number, age and parity we planned the subsequent therapeutic approach like wire loop resection, excision by hysteroscopy guided scissor or endometrial curettage and tissue sampling for biopsy, hysterectomy, or even medical treatment with hormone or danazole. Histopathology revealed benign endometrial condition in all including three placental polyps.

Advantages and Limitations :

CSHG is simple, safe, well tolerated by the patients, cost effective and does not involve anaesthesia related hazards. However, risk of infection is real and a meticulous aseptic precaution is needed. In this series, all patients received single dose of inj. gentamycin 80 mg IM after the procedure. No evidence of pelvic infection was evident. About 25% patients experienced some mild abdominal cramps or discomfort during fluid instillation but the pain subsided within few minutes. Three patients however, required antispasmodic therapy.

Hundred forty four patients (80%) could accommodate significant amount of fluid in the uterine cavity without discomfort while in the remaining 36 patients, uterine cavity could not be distended appreciably due to the fluid rapidly draining out through the patulous cervical os and owing to some inherent myometrial resistance. We observed

however, that only a thin film of fluid can appreciably outline a submucous fibroma but not a slender endometrial polyp. We resorted to the use of foley catheter in 15 cases where IUI catheter was not effective but we found the procedure more expensive and more time consuming for routine use.

Conclusion :

The results of this study provide support for plain TVS as a screening test, while fluid augmented CSHG accurately identifies the endometrial pathology. It is a simple, safe and quick office procedure, well accepted by our patients. An immense wealth of informaion regarding intra-uterine

pathology and surrounding endometrium and myometrium can be obtained by the clinician himself sitting in his office by spending extra 3 to 5 minutes.

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