

Transvaginal Sonohysterographic Evaluation of Intrauterine Adhesions

Bruno Salle, MD, Pascal Gaucherand, MD, Pierre de Saint Hilaire, MD, Rene Charles Rudigoz, MD

Department of Gynaecology, Obstetrics, Infertility and Ultrasound, Hôpital de la Croix Rousse, 93 Grande Rue de la Croix Rousse, Lyon 69004, France

Received 14 October 1997; accepted 14 October 1998

ABSTRACT: *Purpose.* We assessed the role of preoperative sonohysterography in the diagnosis of intrauterine synechiae.

Methods. Nineteen patients with a suspected diagnosis of intrauterine adhesion underwent hysterosalpingography, transvaginal sonography, and sonohysterography performed in the consultation room. The patients were then treated by hysteroscopy under laparoscopic or ultrasound guidance.

Results. Transvaginal sonography showed an abnormal uterine cavity in only 10 cases. The sensitivities of sonohysterography and hysterosalpingography in the diagnosis of intrauterine adhesions were both 100%. Sonohysterography showed complete correlation with hysterosalpingography.

Conclusions. We recommend routine sonohysterography after transvaginal sonography in cases of suspected intrauterine synechiae. © 1999 John Wiley & Sons, Inc. *J Clin Ultrasound* 27:131–134, 1999.

Keywords: synechia; transvaginal ultrasonography; transvaginal sonohysterography; hysteroscopy

Intrauterine synechiae rarely occur spontaneously.¹ Asherman's syndrome may be suspected in women who experience significantly decreased menstrual flow or secondary amenorrhea after postpartum dilatation and curettage. The traditional method used to demonstrate intrauterine adhesions (IUAs) is hysterosalpingography (HSG). However, hysteroscopy (HS) has become the diagnostic method of choice and also enables treatment of IUAs.² In 1 study, hysteroscopic treatment of IUAs resulted in pregnancy and live birth in 61% of women.²

Since 1993, we have used sonohysterography

(SHG), which combines transvaginal sonography (TVUS) with intrauterine injection of isotonic saline solution. We retrospectively reviewed the role of SHG in the diagnosis of IUAs. All patients underwent HSG, TVUS, SHG, and then hysteroscopic treatment of the IUA.

PATIENTS AND METHODS

Nineteen patients with a history of repeated miscarriages or secondary amenorrhea were referred to our department for investigation of suspected IUAs in 1997. All patients were confirmed to be ovulatory by measurement of serum luteinizing hormone, follicle-stimulating hormone, estradiol, and progesterone. All 19 patients first underwent HSG (Figure 1). IUAs were classified according to the American Fertility Society classification system³ as stage I, mild; stage II, moderate; or stage III, severe. Complete IUAs were excluded because in such a case neither HSG nor SHG is informative.

Each patient then underwent conventional B-mode TVUS carried out in the luteal phase of the menstrual cycle. TVUS gives more information about the uterine cavity during the luteal phase, especially when congenital or acquired pathologic conditions are suspected. All TVUS and SHG procedures were performed with an Ultramark 9 (Advanced Technology Laboratories, Bothell, WA) or Sonoline AC (Siemens, Erlangen, Germany) ultrasound scanner using a 5-MHz endovaginal probe. All the TVUS examinations were performed by the same operator, who was unaware of the HSG results. The pelvic sonographic examination routinely included assessment of the position, size, and structure of the uterus. A diagnosis

Correspondence to: B. Salle

© 1999 John Wiley & Sons, Inc.

CCC 0091-2751/99/030131-04

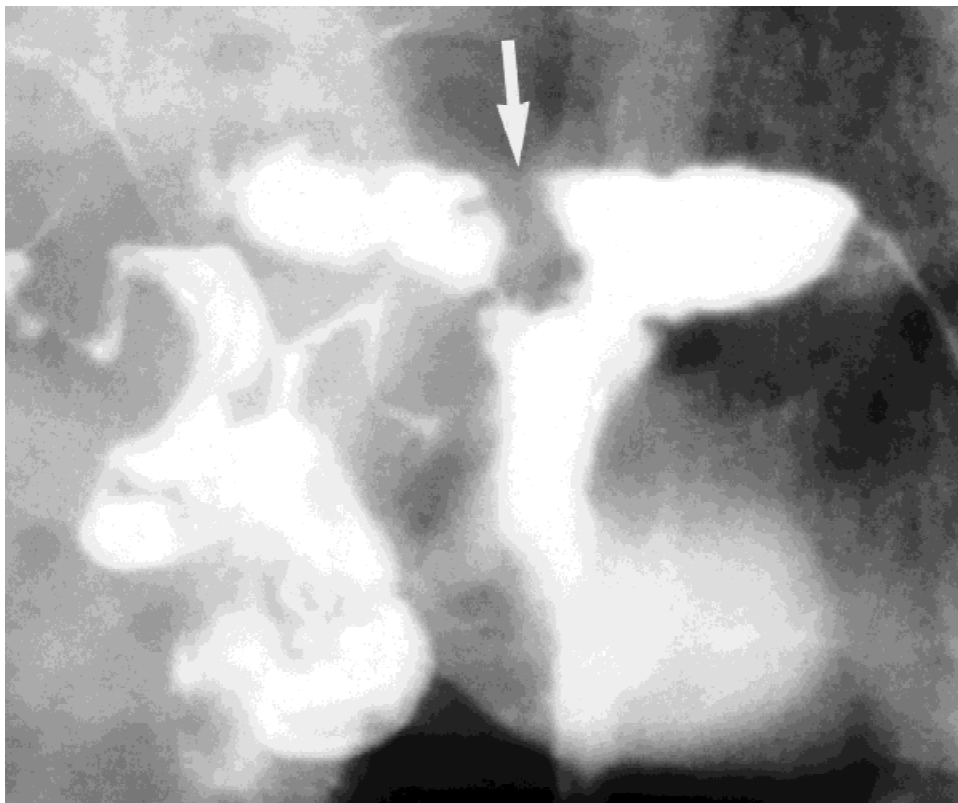


FIGURE 1. Hysterosalpingogram shows intrauterine adhesion (arrow).

of IUA was made if the thickness of the endometrium was less than 2 mm, which is unusual in the luteal phase; if the uterine cavity was asymmetric on a transverse scan; or if an echogenic area was seen inside the uterine cavity.

After conventional TVUS images were obtained, SHG was performed (Figure 2). Fluid was instilled in the uterine cavity to induce distention, thus considerably improving sonographic contrast. The procedure was carried out in the consultation room and required a gynecologic examination table. The uterine cervix was exposed with a speculum and disinfected with iodine solution. A syringe containing 50 ml of isotonic saline solution was attached to a polyethylene catheter (18.5 cm long; 1.6 mm external diameter; 1.1 mm internal diameter; CCD Laboratories, Paris, France), which was introduced into the cervix. The catheter had no balloon. The speculum was then withdrawn and the endovaginal probe introduced into the vagina. Transverse and sagittal images were recorded during injection of the saline solution. An IUA was suspected if an echogenic area between the anterior and posterior walls was demonstrated on a transverse image of the liquid-filled uterine cavity. The IUA was classified as stage I, II, or III, according to the American Fertility Society classification system.

Thereafter, HS was performed by the method of March et al⁴ with the patient under general anesthesia. Isotonic saline solution was used as a distention medium. Synechiae were cut using pointed scissors. The procedure was monitored by either abdominal sonography⁵ or laparoscopy. An intrauterine device was implanted for 15 days, and prophylactic antibiotics were administered. Patients were treated with estrogen only if the surgery had been particularly extensive. Evaluation of the success of the surgical procedure was performed 45 days after surgery by repeat TVUS, SHG, and HS using the techniques described above.

RESULTS

Results are summarized in Table 1. All 19 patients had IUAs on HSG and SHG. TVUS showed an abnormality of the uterus in 10 cases: a hypoplastic uterine cavity with an endometrial thickness of 3 mm in 1 patient and an echogenic area in the other 9 patients. The sensitivities of HSG and SHG in the diagnosis of IUA were both 100%, whereas the sensitivity of TVUS was only 52%. There was complete correlation between HSG and SHG. In all cases, full distention of the cavity dur-

SONOHYSTEROGRAPHY OF UTERINE ADHESIONS

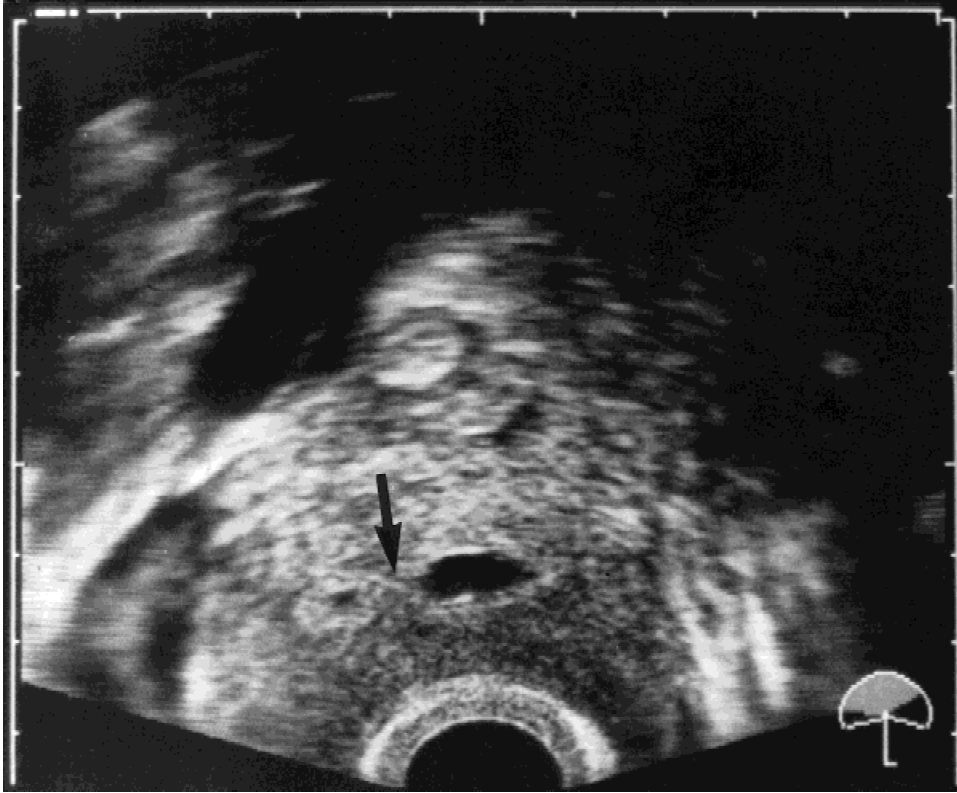


FIGURE 2. Same patient as in Figure 1. Sonohysterogram shows 2 asymmetric cavities in the uterus. The arrow points to the adhesion.

ing SHG was impeded by tethering of the walls by thin or thick bands or synechiae. However, no failure of the SHG procedure occurred because there were no complete IUAs.

The therapeutic results were checked 45 days after surgery. In all cases, the entire cavity could be examined by SHG; and in all cases, the surgery was considered to be successful. There was com-

TABLE 1
Findings in 19 Patients with Intrauterine Adhesions

Patient	Obstetric History	Location of IUA on HSG	TVUS Findings	SHG Findings	Post-treatment HS Findings	Post-treatment SHG Findings
1	Miscarriages	Isthmus	Hyperechoic focus	Adhesion	Normal	Normal
2	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
3	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
4	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
5	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
6	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
7	Miscarriages	Isthmus	Hyperechoic focus	Adhesion	Normal	Normal
8	Miscarriages	Corpus	Hyperechoic focus	Adhesion	Normal	Normal
9	Miscarriages	Corpus	Hyperechoic focus	Adhesion	Normal	Normal
10	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
11	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
12	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
13	Miscarriages	Corpus	Hyperechoic focus	Adhesion	Normal	Normal
14	Induced abortion	Corpus	Endometrium 3 mm thick	Adhesion	Normal	Normal
15	Miscarriages	Fundus	Hyperechoic focus	Adhesion	Normal	Normal
16	Miscarriages	Corpus	Hyperechoic focus	Adhesion	Normal	Normal
17	Miscarriages	Corpus	Hyperechoic focus	Adhesion	Normal	Normal
18	Miscarriages	Corpus	Normal	Adhesion	Normal	Normal
19	Induced abortion	Corpus	Hyperechoic focus	Adhesion	Normal	Normal

Abbreviations: HSG, hysterosalpingography; TVUS, transvaginal sonography; SHG, sonohysterography; HS, hysteroscopy.

plete correlation between postsurgical SHG and HS.

DISCUSSION

On TVUS, an echogenic area in the endometrial cavity or an asymmetric thickness of the endometrium on a transverse scan of the uterus is highly suggestive of the presence of an IUA.⁷ Schlaff and Hurst¹ have shown that TVUS may have a prognostic value in Asherman's syndrome. Patients with an endometrium thinner than 2 mm in the luteal phase did not benefit from surgery, and the authors recommended that treatment be avoided if the endometrium is vestigial. However, sonography has not played a significant role in the diagnosis of intrauterine synechiae.

Our results indicate that SHG may become a powerful tool to define the uterine cavity's anatomy and to diagnose congenital and acquired pathologic conditions. Although our series is small, we have previously reported our experience with SHG in 104 cases of endometrial abnormalities.⁸ In that study, SHG enabled clear visualization of IUAs. With injection of a contrast agent, TVUS can be carried out independently of the follicular or luteal phase, and the procedure takes only a few minutes. Among the failures that we encountered were 2 cases of IUA in which the adhesion completely obstructed the uterine cavity. Injection of contrast medium or solution is not possible in cases of complete IUA. Those cases were not included in the present study. In 1993, Parsons and Lense⁹ also reported an SHG failure because of complete IUA. With this exception, they concluded that there is perfect correlation between SHG and HS in staging IUAs (according to the American Fertility Society criteria).

SHG can be performed easily in cases of partial IUA. Twenty to 30 ml of saline solution is enough for the procedure,¹⁰ although an increase in injection pressure may sometimes be necessary. Excess liquid escapes naturally from the cervix. Confirmation of total surgical resection of the adhesions is important before a new pregnancy can be allowed. Many teams use HS to verify this, but SHG enables complete investigation of the cavity after surgery and is less invasive.¹¹

Our experience with SHG may change our

strategy for the diagnosis of Asherman's syndrome. With SHG, it is possible to perform a complete ultrasound examination of the uterine structure including the uterine cavity and muscles. The ease and simplicity of diagnosis have led us to routinely perform SHG after TVUS in cases of repeated spontaneous miscarriages or suspected uterine abnormality. We believe that SHG is now the method of choice for the diagnosis of acquired abnormalities of the uterus.

REFERENCES

- Schlaff WD, Hurst BS. Preoperative sonographic measurement of endometrial pattern predicts outcome of surgical repair in patients with severe Asherman's syndrome. *Fertil Steril* 1995;63:410.
- Valle RF, Sciarra JJ. Intrauterine adhesions: hysteroscopic diagnosis, classification, and reproductive outcome. *Am J Obstet Gynecol* 1988;158:1459.
- The American Fertility Society. The American Fertility Society classifications of adnexal adhesions, distal tubal occlusion, tubal occlusion secondary to tubal ligation, tubal pregnancies, müllerian anomalies and intrauterine adhesions. *Fertil Steril* 1988;49:944.
- March CM, Israel R, March AD. Hysteroscopic management of intrauterine adhesions. *Am J Obstet Gynecol* 1978;130:653.
- Fraser IS, Song JY, Jansen RPS, et al. Hysteroscopic lysis of intrauterine adhesions under ultrasound guidance. *Gynaecological Endoscopy* 1995;4:35.
- Schenker JG. Etiology and therapeutic approach to synechia uteri. *Eur J Obstet Gynecol Reprod Biol* 1996;65:109.
- Confino E, Friberg J, Giglia RV, et al. Sonographic imaging of uterine adhesions. *Obstet Gynecol* 1985;66:596.
- Rudigoz RC, Salle B, Piacenza JM, et al. Hysterosonographic study of the uterine cavity [in French]. *Journal de Gynecologie, Obstetrique et Biologie de la Reproduction* 1995;24:697.
- Parsons AK, Lense JJ. Sonohysterography for endometrial abnormalities: preliminary results. *J Clin Ultrasound* 1993;21:87.
- Gaucherand P, Piacenza JM, Salle B, et al. Sonohysterography of the uterine cavity: preliminary investigations. *J Clin Ultrasound* 1995;23:339.
- Salle B, Sergeant P, Gaucherand P, et al. Transvaginal hysterosonographic evaluation of septate uteri: a preliminary report. *Hum Reprod* 1996;11:1004.