

# Experience with Instillagel<sup>®</sup> for hysterosonography and analgesia in a complex contraception clinic: a QIPP initiative

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## Abstract

**Background** A significant number of women are referred with bleeding problems related to the use of hormonal contraception, for advice on management of heavy periods or following difficulty with intrauterine device insertion. The authors describe their experience with Instillagel<sup>®</sup> as the contrast medium for hysterosonography in a one-stop clinic for complex contraception referrals. They also comment on its analgesic properties for cervical and uterine instrumentation.

**Methods** The authors reviewed 275 referrals seen over a 6-month period in consultant-delivered clinics provided by a contraception service that serves a single county (population 500 000). They describe the simple technique they use for hysterosonography with Instillagel.

**Results** The authors found Instillagel useful as a contrast medium for sonographic assessment of the endometrial cavity. Additionally, presence of gel in the endometrial cavity, with a time interval between insertion of gel and uterine instrumentation, appears to result in analgesia and relaxation of the uterus. There was a very low incidence of difficulties in a group of patients who had previously experienced significant problems with uterine instrumentation.

**Conclusions** Hysterosonography is an efficacious, simple and inexpensive technique for assessment of the endometrial cavity. It has many potential applications in contraceptive care. An additional benefit appeared to be that once gel was instilled in the cavity for 10–15 minutes it facilitated instrumentation of the uterus.

## Introduction

Imaging has a well-established role in the assessment of problems arising in contraception care. In our service, we have clinics for a range of non-routine problems such as deep or non-palpable implants, failed intrauterine device (IUD) fittings or removals, lost IUD threads, pain associated with the presence of an IUD,

## Key Message Points

- ▶ Hysterosonography is an efficacious, simple and inexpensive technique for assessment of the endometrial cavity. It has many potential applications in contraceptive care.
- ▶ An additional benefit of hysterosonography appears to be that once gel has been instilled in the endometrial cavity for 10–15 minutes it facilitates instrumentation of the uterus.

bleeding problems associated with hormonal contraception and heavy menstrual bleeding. All National Health Services (NHS) need to consider the Quality, Innovation, Productivity and Prevention (QIPP) approach to modernisation. Here we describe a technique that we believe amply fulfils the criteria of that approach.

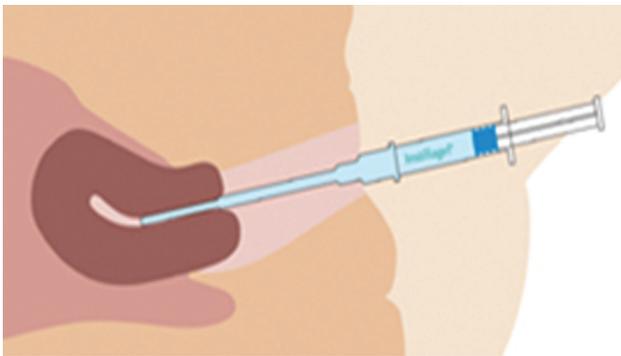
The National Institute for Health and Clinical Excellence advocates ultrasound as the first-line diagnostic tool for identifying structural abnormalities in women with heavy menstrual bleeding.<sup>1</sup> Hysterosonography takes imaging a step further, by providing much more accurate assessment of possible endometrial pathology.<sup>2–6</sup> Traditionally this has been by saline infusion sonohysterography combining transvaginal ultrasonography with simultaneous infusion of sterile saline into the endometrial cavity. The saline acts as a contrast medium that distends the cavity, allowing display of its contours and contents.

Gel hysterosonography was first described in 2007, purely for imaging the endometrial cavity. It was concluded to be a simple technique with minimal inconvenience for the patient, and an attractive alternative to saline infusion.<sup>7</sup> However, in addition to imaging, many of our patients are likely to require uterine instrumentation. There are therefore potential additional benefits to the use of gel in this circumstance, in that it may act as a local anaesthetic for the endocervical canal and uterine cavity. We describe the method and an evaluation of

**Table 1** Complex contraception referrals during the period June to November 2010 (n = 275 patients)

Problem	Patients (n)	
Bleeding	76	49 referred with bleeding while using hormonal contraception, or for IUS fitting for heavy bleeding 27 complained of unacceptable bleeding with copper IUD or levonorgestrel IUS
Pelvic pain	29	15 had an IUD <i>in situ</i>
Lost IUD threads	60	
Unsuccessful IUD fitting	48	
Malposition of IUD	7	IUD fitted elsewhere and threads visible, but the referrer had concern about IUD position
Request for IUD but uncertain suitability	3	These women had been advised at some time that they had a 'bicornuate' uterus
Complex medical problems	20	
Learning disability	3	A patient group vulnerable to exploitation and wanting menstrual suppression
Follow up for abnormal scan	5	Complex ovarian cysts had been noted at assessment at local pregnancy advisory service
Removal of deep or non-palpable implant	21	5 had already had removal attempted unsuccessfully elsewhere
Request for Gynefix® frameless IUD	3	Patients with a history of recurrent IUD expulsion or discomfort with current IUD

IUD, intrauterine device; IUS intrauterine system.



**Figure 1** Instillation set up with quill inserted well into the cervical os. Figure reproduced courtesy of CliniMed Ltd at <http://www.clinimed.co.uk/urology-contenance-care/products/instillaquill.aspx>.

its application over a 6-month period in the setting of a one-stop clinic for complex contraception referrals.

## Methods

We reviewed consecutive formal referrals seen at clinics for complex contraception problems during the 6-month period from June to November 2010 (Table 1). Drop-in appointments, self-referrals and emergency IUD insertions were not included, although such patients were also seen during these sessions.

In women aged under 30 years, ultrasound was not generally used to look for uterine causes of bleeding problems, but was used where they had pain or where referral had followed a failed IUD fitting. We also scanned women with suspected uterine malformation who were requesting an IUD. Endometrial biopsy by aspiration was performed in women aged over 40 years with intermenstrual bleeding or women over 35 years with risk factors for endometrial pathology. Each referred appointment was scheduled for 30 minutes.

Where uterine imaging was indicated, we introduced Instillagel® (CliniMed Ltd, High Wycombe, UK)

through the cervix immediately before the ultrasound scan. Unlike saline, the gel does not require insertion of a balloon catheter to occlude the cervix as it tends to remain in the cavity following instillation, allowing time for the imaging.

Instillagel is a sterile gel solution. Each 100 g contains lidocaine hydrochloride 2 g, chlorhexidine gluconate solution (antiseptic) 0.25 g and small amounts of methyl hydroxybenzoate (E218) and propyl hydroxybenzoate (E216) as preservatives. The gel vehicle consists of hydroxyethylcellulose, propylene glycol and purified water. There are 230 mg lidocaine in an 11 ml syringe and 125.4 mg in a 6 ml syringe. The maximum dose of lidocaine that should be administered by tissue infiltration is 200 mg, but the Summary of Product Characteristics describes doses of up to 800 mg instilled into the urethra producing low circulating levels that are below the level of toxicity.<sup>8</sup>

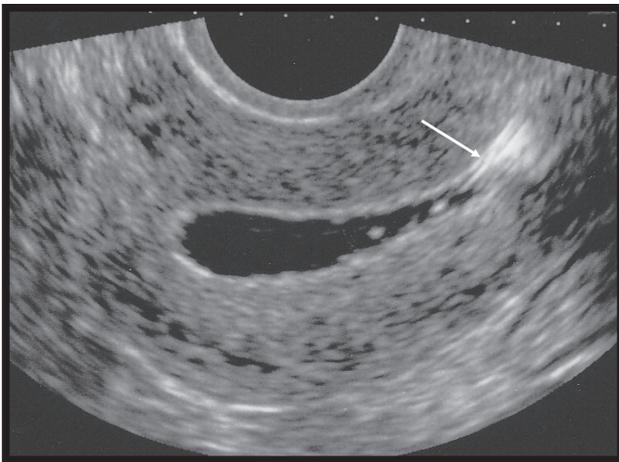
Where required we also used Scandonest® (Septodont Ltd, Maidstone, UK), containing mepivacaine 3%, for infiltration of the cervix for attachment of a tenaculum and intracervical block. The maximum dose of mepivacaine without epinephrine that should be administered by infiltration is 400 mg.<sup>9</sup> A 2.2 ml cartridge for use with a dental syringe contains 66 mg of mepivacaine. In our practice we use a single 11 ml syringe of Instillagel topically to the cervix, cervical canal and uterine cavity and a maximum of three cartridges (198 mg) of 3% mepivacaine.

## Technique

We use Instillaquill® (CliniMed Ltd) as demonstrated in Figure 1, aiming to distend the endometrial cavity with gel. The gel can be applied by introduction of the quill through the external os, either during bimanual examination or during speculum examination. When the external os is narrow, holding the quill firmly over the opening and applying slight pressure to expel the gel will usually dilate it to enable insertion of the quill. If not, then stabilising the anterior lip of the cervix and inserting an

Os Finder (Cory Bros, Shenley, UK) or small dilator permits introduction of the quill. The sensitivity of the cervix varies between patients. Where appropriate, we inject up to 1 ml Scandonest into the anterior cervical lip prior to fixation of the tenaculum. If anaesthesia is required for cervical dilatation then two further cartridges may be injected at the 3 and 9 o'clock paracervical positions, injecting to the full depth of the needle.

When gel distends the uterine cavity it typically causes some initial cramping and this is explained to patients before starting. In women with a normal cavity, minimal gel is required (2–3 ml). A larger bolus distending a small uterine cavity can quickly produce significant cramping. This is avoided by slow instillation and by asking the woman to say if and when they notice any cramping. At this point sufficient gel is usually present to fill and outline the cavity (Figure 2).



**Figure 2** Longitudinal view of a normal endometrial cavity outlined with gel. One end of an intrauterine system stem is demonstrated in the lower pole of the uterus (arrowed).

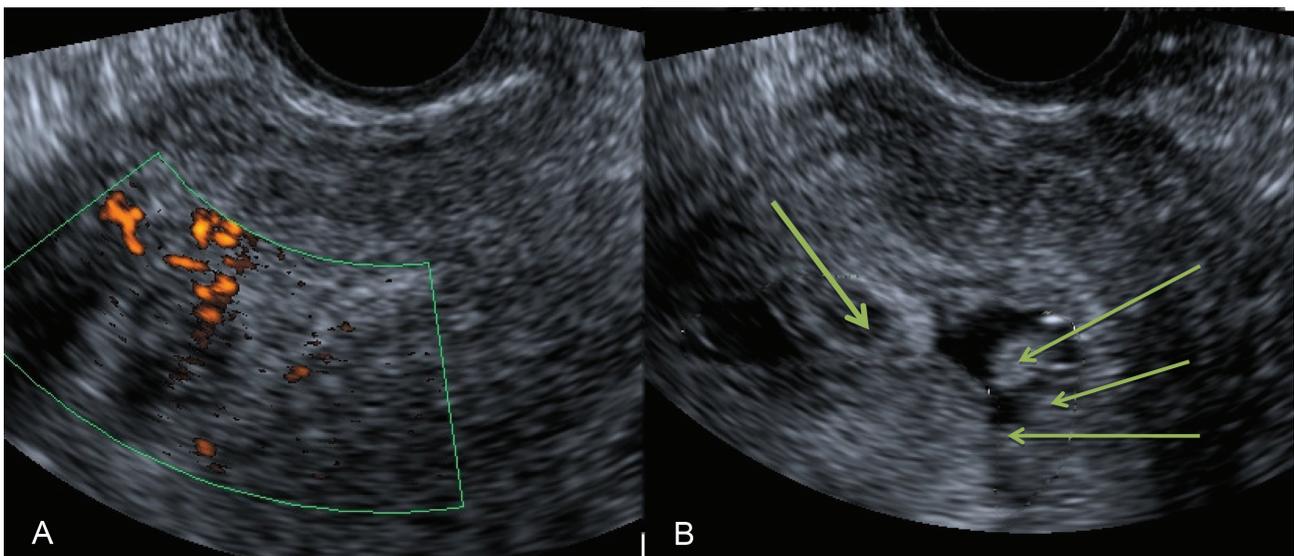
## Results

The primary reasons for referral are detailed in Table 1. Several women were referred with more than one problem. The age of referrals ranged from 15 to 61 years. Several postmenopausal women (including a 61-year-old woman) were referred for location and removal of an IUD with lost threads. Some perimenopausal women were referred with abnormal bleeding. The presumed reason for referral to our service rather than to general gynaecology was that they had an IUD *in situ* that was thought to be relevant to the bleeding. A significant number of women did not require contraception but were referred for intrauterine system (IUS) fitting for heavy periods.

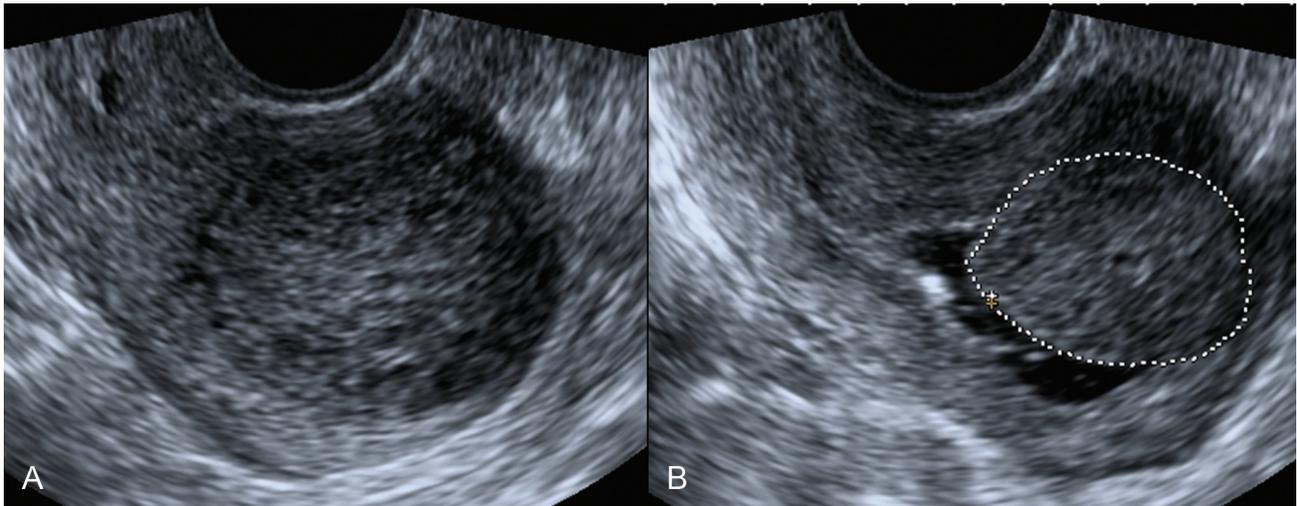
### Abnormal/problem bleeding

Gel hysterosonography was used in 62 referrals and was successful in outlining the endometrial cavity in over 90% of these cases. Comparison of endometrial images pre-gel and post-gel showed that assessment was much clearer with gel outlining the cavity (Figures 3–5). There were six cases with polyps and in four cases it was impossible to differentiate between endometrial thickening and a polyp using ultrasound alone. However the distinction was clear with gel *in situ* (Figure 3).

Submucous fibroids were demonstrated in 18 women. Among four women with a history of IUS expulsion, the gel outlined a Type 0 (pedunculated) submucous fibroid in two cases and Type 2 (>50% intramural) submucous fibroids in the other two women. The latter two women wanted to try another IUS, but were made aware of alternative treatments options such as hysteroscopic resection or fibroid embolisation in the event that use of an IUS was not satisfactory. Some of the other women with submucous fibroids also wanted to try the IUS and were advised of the higher chances



**Figure 3** (A) Transvaginal scan showing indistinct thickened endometrium. Flow demonstrated within the endometrium is abnormal and suggests pathology. (B) Same patient after instillation of gel outlining polyps (arrowed) within the endometrial cavity (outlined).



**Figure 4** (A) A 32-year-old nulliparous woman referred for levonorgestrel intrauterine system insertion for heavy bleeding. Six months earlier she had undergone hysteroscopic fibroid resection, which had not improved her menorrhagia. (B) Gel hysterasonography demonstrated a Type 2 submucous fibroid (outlined), partly filling the endometrial cavity but with >50% of the fibroid in the myometrium involving almost the full thickness of the uterine wall.



**Figure 5** The intrauterine system (IUS) shows up less well than copper devices but can be located by the shadow cast by the levonorgestrel reservoir. Transverse view of the uterine fundus. The intercervical distance can be determined accurately with gel outlining the cavity; here the distance is the same as the width of the arms of a Mirena® IUS (callipers). The acoustic shadow cast by the IUS stem is visible (arrow).

of expulsion and failure to control bleeding, and of alternative treatments. The youngest patient in whom we found uterine pathology accounting for abnormal bleeding was a 32-year-old woman with a large Type 2 submucous fibroid (Figure 4).

No significant pathology was present in the endometrial biopsies performed. On discussion with histopathology colleagues there is no evidence that the gel

interferes with histological assessment, although it is sometimes necessary to pass the endometrial sampler two or three times to empty gel before obtaining a satisfactory tissue sample. A 54-year-old woman referred for recurrence of bleeding after 4 years' amenorrhoea with an IUS was found to have a frank cervical carcinoma.

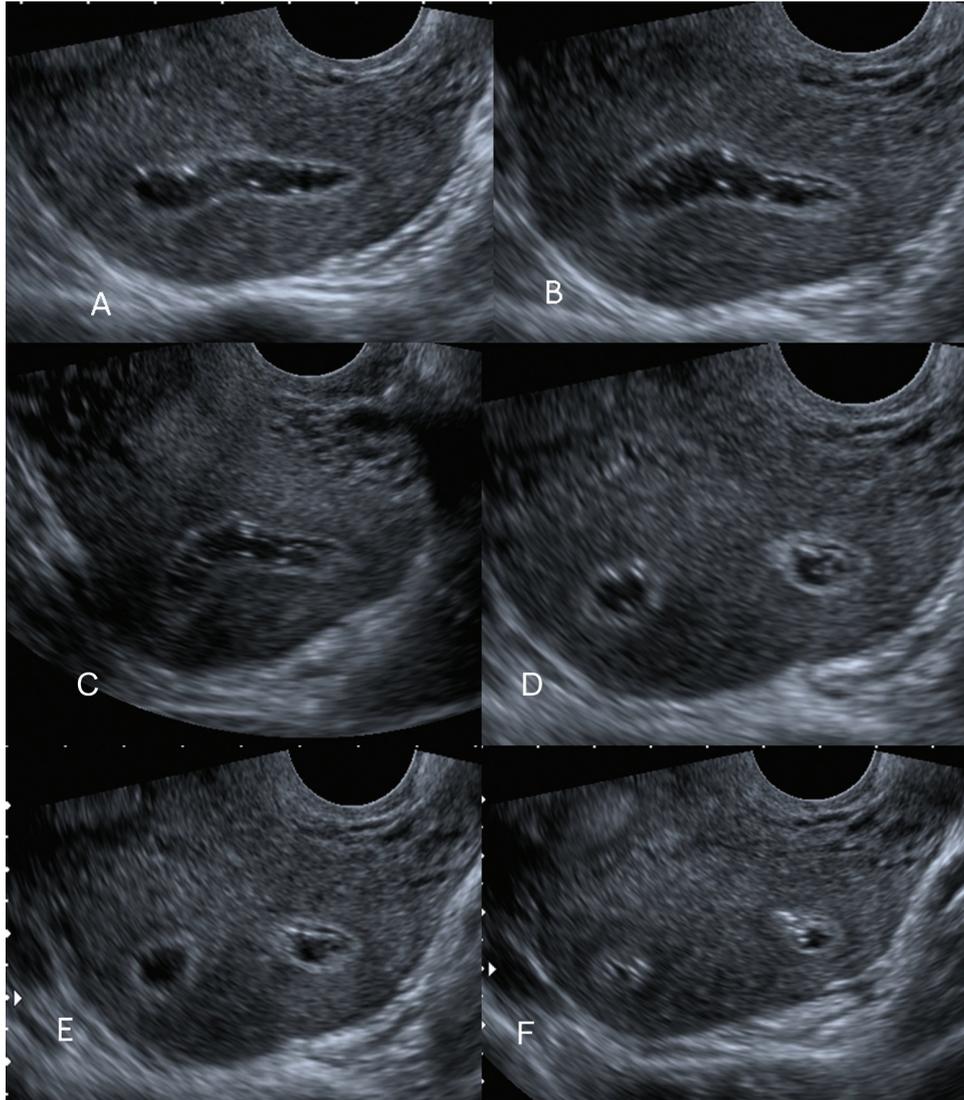
#### Previous failed IUD fitting

A total of 47/49 women referred following a failed IUD fitting were successfully fitted with an IUD at the one-stop appointment. Referrals included patients who had a history of vasovagal syncope at a previous attempted IUD fitting. None of these women had any recurrence of this event with IUD fitting using the technique described.

Referrals for assessment of suitability for an IUD included three women thought to have a uterine malformation, a woman who had previously undergone endometrial ablation and two women with a past history of uterine perforation at the time of IUD fitting. All but one of these women (in whom a uterus didelphys was confirmed) was fitted with a device at their appointment.

#### 'Lost' threads

The device was readily demonstrated in the uterus in 59/60 referrals. In the remaining case, extrauterine location of the device was subsequently confirmed by X-ray. Where there was no indication for removing or changing the device, women were advised to leave it in place. In all but one case where removal or replacement was appropriate, retrieval was performed. Instruments used for these retrievals included fine curved Spencer Wells, Zeppelin or Hartmann (crocodile) forceps or Emmett's thread retriever. Gel was inserted prior to ultrasound localisation and many women commented that the retrieval was quicker and less painful than previous attempts at removal.



**Figure 6** Transverse sections moving cranially from mid-cavity level (A) to the uterine fundus (F) showing a bicornuate cavity.

### Pelvic pain

Among cases with pain with an IUD *in situ*, the presence of the IUD may have influenced referral to a clinic for contraception problems rather than to a general gynaecology clinic. In some cases the pain was associated with the timing of IUD insertion and in others there was no obvious relationship. In all cases a pregnancy test was performed prior to the procedure.

Following instillation of gel it is possible to measure the intercornual distance and assess the position of an object within the cavity with great clarity (Figure 5). A woman referred at 4 months postpartum who was fully breastfeeding had had two framed IUDs fitted postnatally, but both were removed within days of fitting because the pain had not settled. This woman had used a framed T-380 device for 8 years prior to pregnancy and had been very satisfied with it. Gel hysterosonography demonstrated an intercornual distance of just 14 mm, considerably less than the 28 mm width of a standard IUD, the reduced uterine size

presumably being due to her lactation-induced estrogen deficiency. A Flexi-T+380® IUD (Williams Medical Supplies Ltd, Rhymney, UK) was fitted following the scan. The patient experienced minimal discomfort with fitting and has continued with the device without recurrence of the pain.

### Uterine malformation

Of three women referred for evaluation of a possible bicornuate uterus, instillation of the gel clarified that one had a normal endometrial cavity and another had a uterus didelphys. Introduction of gel in this patient demonstrated filling of the uterus on one side only. Careful re-examination with repositioning revealed a second cervix. The third patient did have a subseptate uterus, with a bicornuate pattern to the upper third of the cavity (Figure 6), but there was 5 cm of single midline cavity below, which was sufficient for a levonorgestrel IUS to be fitted. In view of uterine malformation being classed as UKMEC 3,<sup>10</sup> with the

possibility of expulsion of the IUS, the option of taking a progestogen-only pill as well was discussed.

There were two cases during the 6-month period in which outpatient hysteroscopy was necessary. In one case attempted removal of an IUD from a 12 cm cavity distorted by multiple fibroids had failed at the one-stop clinic, but the device was successfully retrieved under direct vision at hysteroscopy. The second case had had two previous failed attempts at IUD fitting before referral and insertion had also been abandoned at the one-stop clinic as attempts appeared to be following a false passage. Insertion was also unsuccessful at the time of outpatient hysteroscopy.

### Discussion

The technique of gel hysterosonography is minimally invasive, easily learnt and requires no equipment beyond that used at a contraception clinic that already provides ultrasound. Most published research has focused on saline contrast, which has been shown to be less painful, less expensive and equal in diagnostic accuracy for uterine cavity evaluation when compared with outpatient hysteroscopy.<sup>2,3</sup> Three studies have compared gel with saline contrast sonography and concluded that it is a suitable alternative.<sup>11-13</sup> Compared with saline, the local anaesthetic gel was associated with less pain<sup>11</sup> and fewer failures,<sup>13</sup> supporting our impression that gel also enhanced the success and acceptability of uterine instrumentation. Also compared with saline, gel has some useful physical properties. Its viscosity is higher, resulting in less seepage and more stable filling of the uterine cavity, obviating the cost of a balloon catheter. Because of its higher viscosity and the smaller instillation volume required, tubal spillage is less likely to occur. The retention of gel within the cavity may permit absorption of local anaesthetic across the endometrium. However, although there is a perceived beneficial effect of the gel on pain during subsequent intrauterine procedures, the degree of benefit still requires evaluation in a randomised trial.

There is no clear guidance on the maximum doses of Instillagel and Scandonest when used simultaneously as topical and infiltrated agents, respectively. In our experience much of the gel drains away and hence the actual dose of lidocaine absorbed is likely to be significantly less than the total 230 mg in an 11 ml syringe. Where a cervical block was also required, the maximum dose of mepivacaine was 198 mg. To date no patient has reported unwanted effects or shown signs of local anaesthetic toxicity.

An important limitation of standard sonographic diagnosis is that the endometrial cavity is a virtual space. Intracavitary pathology may be suspected where the endometrium appears thick, but may not be reliably demonstrated with transvaginal imaging alone. A lower thickness would be expected in the immediate postmenstrual phase, but there are practical limitations

in asking women to return for repeat imaging timed to their cycle. We found that gel contrast enhanced the ability to distinguish intrauterine polyps from endometrium throughout the cycle.

A significant number of women did not require contraception but were referred for consideration of a levonorgestrel IUS for menstrual control, either because their general practitioner considered that fitting might be difficult or because of a failed attempt at fitting. In some cases investigation to determine the cause of bleeding and to exclude endometrial pathology had not been considered. Gel hysterosonography, with biopsy where indicated, fulfils this requirement.<sup>11-13</sup> Among cases with prior investigation, it often provided additional information that informed the decision about treatment.

Under the QIPP initiative, NHS commissioners and providers are required to look at ways of improving the quality and productivity of services by innovative means. The introduction of gel hysterosonography in our service has allowed us to provide an accessible and acceptable one-stop diagnostic and management service in the community. Its use has increased the scope of our clinical delivery and increased efficiency. Without this service it is likely that many women requesting an IUD for contraception or an IUS for menstrual control would have been regarded as unsuitable for these treatment options, often resulting in the use of more invasive or less cost-effective approaches to their management.

**Competing interests** None.

**Provenance and peer review** Not commissioned; externally peer reviewed.

### References

- 1 National Institute for Women's and Children's Health Commissioned by the National Institute for Health and Clinical Excellence. *Heavy Menstrual Bleeding Clinical Guideline 4.5.3*. London, UK: RCOG Press, 2007.
- 2 de Kroon CD, Jansen FW, Louwé LA, *et al*. Technology assessment of saline contrast hysterosonography. *Am J Obstet Gynecol* 2003;188:945-949.
- 3 de Kroon CD, de Bock GH, Dieben SW, *et al*. Saline contrast hysterosonography in abnormal uterine bleeding: a systematic review and meta-analysis. *BJOG* 2003;110:938-947.
- 4 Dijkhuizen FP, De Vries LD, Mol BW, *et al*. Comparison of transvaginal sonography and saline infusion sonography for the detection of intracavitary abnormalities in premenopausal women. *Ultrasound Obstet Gynecol* 2000;15:372-376.
- 5 Widrich T, Bradley LD, Mitchinson AR, *et al*. Comparison of saline infusion sonography with office hysteroscopy for the evaluation of the endometrium. *Am J Obstet Gynecol* 1996;174:1327-1334.
- 6 Timmerman D, Deprest J, Bourne T, *et al*. A randomized trial on the use of ultrasonography or office hysteroscopy for endometrial assessment in postmenopausal patients with breast cancer who were treated with tamoxifen. *Am J Obstet Gynecol* 1998;179:62-70.

- 7 **Exalto N, Stappers C, van Raamsdonk LA, et al.** Gel instillation sonohysterography: first experience with a new technique. *Fertil Steril* 2007;87:152–155.
- 8 **CliniMed Ltd.** Summary of Product Characteristics: Instillagel®. 2010. <http://www.clinimed.co.uk/Portals/10/docs/instillagel-spc.pdf> [accessed 24 May 2011].
- 9 **British Medical Association and The Royal Pharmaceutical Society of Great Britain.** *British National Formulary*, Volume 60. London, UK: Pharmaceutical Press, 2010;781–785.
- 10 **Faculty of Sexual and Reproductive Healthcare.** *UK Medical Eligibility Criteria for Contraceptive Use (UKMEC 2009)*. 2009. <http://www.fsrh.org/pdfs/UKMEC2009.pdf> [accessed 24 May 2011].
- 11 **Van den Bosch T, Betsas G, Van Schoubroeck D, et al.** Gel infusion sonography in the evaluation of the uterine cavity. *Ultrasound Obstet Gynecol* 2009;34:711–714.
- 12 **Bij de Vaate AJ, Brölmann HA, van der Slikke JW, et al.** Gel instillation sonohysterography (GIS) and saline contrast sonohysterography (SCSH): comparison of two diagnostic techniques. *Ultrasound Obstet Gynecol* 2010;35:486–489.
- 13 **Werbrouck E, Veldman J, Luts J, et al.** Detection of endometrial pathology using saline infusion sonography versus gel instillation sonography: a prospective cohort study. *Fertil Steril* 2011;95:285–288.