1000 Office-Based Hysteroscopies Prior to In Vitro Fertilization: Feasibility and Findings

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ABSTRACT

Background and Objectives: Hysteroscopy offers diagnostic accuracy and the ability to treat uterine pathology, but practitioners may be reluctant to perform it without a high index of suspicion because it traditionally requires an operating room. This study reviews the findings and feasibility of office-based diagnostic and operative hysteroscopy in an unselected in vitro fertilization (IVF) population to evaluate whether first-line hysteroscopy should be recommended.

Methods: One thousand consecutive infertile patients scheduled for in vitro fertilization underwent office hysteroscopy. A rigid 20-degree 5-mm hysteroscope, with an operative channel for grasping forceps, scissors, or coaxial bipolar electrode was used. Operative findings, complications, and patient tolerance were noted.

Results: Sixty-two percent of patients had a normal uterine cavity. Thirty-two percent had endometrial polyps. Other pathology included submucous fibroids (3%), intrauterine adhesions (3%), polypoid endometrium (0.9%), septum (0.5%) retained products of conception (0.3%), and bicornuate uterus (0.3%). The pathology was treated in all patients without complication.

Conclusions: When hysteroscopy is routinely performed prior to in vitro fertilization, a significant percentage of patients have uterine pathology that may impair the success of fertility treatment. Patient tolerance, safety, and the feasibility of simultaneous operative correction make office hysteroscopy an ideal procedure.

Key Words: Reproductive surgery, Hysteroscopy, In vitro fertilization, Endometrial polyps.

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INTRODUCTION

In 2000, 99 639 assisted reproductive technology cycles were undertaken in the United States alone.[1] With the increasing utilization of intracytoplasmic sperm injection and preimplantation genetic diagnosis along with the increasing success of in vitro fertilization (IVF) per cycle, more couples will turn to IVF to assist with conception. Optimizing the first cycle is of paramount importance given the high cost and time investment. Evaluation of the uterine cavity prior to IVF has been commonly performed by hysterosalpingography (HSG), despite its inherent diagnostic limitations, use of radiation, and challenging scheduling requirements at some institutions. Recently, sonohysterography (SHG) has been used by many IVF programs as a more practical procedure to evaluate the uterine cavity in an office setting. However, hysteroscopy is generally accepted as the gold standard in diagnosis and, more importantly, allows for treatment of pathology at the same time. Practitioners may be reluctant to perform hysteroscopy as an initial test without a high degree of suspicion for pathology because it has traditionally required anesthesia in an operating room setting. The advent of smaller diameter instruments makes office-based operative hysteroscopy an ideal first-line procedure and can efficiently treat infertile patients with uterine abnormalities in the same setting, thus facilitating a rapid transition from diagnosis to treatment and subsequent pregnancy.

The objective of this study was to review office-based diagnostic and operative hysteroscopic findings and treatment in a large, unselected, IVF patient population to evaluate whether first-line hysteroscopy should be recommended to these patients.

METHODS

One thousand consecutive infertile patients scheduled for IVF underwent routine office hysteroscopy between January 1998 and March 2003 by the senior author with the assistance of a resident or fellow. All hysteroscopies were performed using a rigid 20-degree 5-mm hysteroscope with an operative channel for the use of grasping forceps, scissors, or coaxial bipolar electrode. Instruments were placed through the operative channel when

needed for treatment of pathology after the diagnostic portion had been completed. Typically, less than 1 liter of normal saline was used as the distention media for procedures, except myomectomies, which occasionally required larger volumes. For these longer cases, fluid balance was monitored by ancillary staff throughout the procedure. Diagnostic findings, operative outcomes, complications, and patient tolerance during the procedure were noted.

The coaxial bipolar electrode surgical system (Versapoint, Gynecare, Sommersville, NJ) was used for myomectomies. Power settings were from 60 W (desiccation) to 130 W (cutting). Typically, hysteroscopies were performed during the oral contraceptive phase prior to controlled ovarian hyperstimulation for IVF. Patients received oral premedication with diazepam, intramuscular analgesia with meperidine, and a paracervical block with 1% lidocaine until the last year of the study when an alternative regimen of diazepam, oral acetaminophen with hydrocodone, intramuscular ketorolac, and a paracervical block with 1% lidocaine was used. Eleven patients requested conscious sedation with intravenous fentanyl and midazolam in place of the above regimen.

To minimize potential complications and to perform a complete infertility evaluation, all patients had a transvaginal ultrasound performed in the office prior to the procedure to screen for uterine pathology, including uterine anomalies and intramural or subserosal fibroids, as well as to assess uterine position. Those patients with an anteverted uterus had a full bladder at the time of hysteroscopy to facilitate placement of the hysteroscope. Patients with known uterine fibroids greater than 1.5 cm in size were excluded from the study because they were treated in the operating room setting.

Each patient signed the appropriate informed consent for the treatment received. Institutional review board approval was obtained for review of patient charts and clinic records.

RESULTS

Table 1 lists the findings, both normal and pathologic, of the 1000 office hysteroscopies performed. Eleven patients had more than one abnormality. All procedures were performed without complications. Treatment of adhesions and removal of polyps and submucous fibroids were undertaken and completed in all patients. Division of

septi was performed in patients with a known single fundus confirmed by laparoscopy at a prior time. No procedures were aborted secondary to patient intolerance.

DISCUSSION

The basic infertility workup has traditionally included a hysterosalpingogram to evaluate both the uterine cavity and tubal patency. Although this test is fairly simple to perform, it does not allow for simultaneous correction of presumed uterine pathology. Additionally, previous studies have shown that HSG may miss from 30% to 40% of uterine abnormalities.[2-4] Given the high false-negative rate, the low positive predictive value,[5] and the inability to treat abnormal findings concurrent with diagnosis, HSG has significant limitations when evaluating the endometrial cavity.

Sonohysterography has been proposed as a better diagnostic test of the uterine cavity. However, it also suffers from a sensitivity and specificity inferior to that of hysteroscopy in most studies.[6] Additionally, it does not allow for correction of presumed pathology. Despite these drawbacks, many IVF clinics use SHG rather than hysteroscopy for cavity evaluation. Perhaps because hysteroscopy has traditionally required general anesthesia in an operating room setting, physicians do not consider hysteroscopy as a first-line test. Additionally, distention media are typically hypotonic and electrolyte-free for operative work and thus require careful surveillance of fluid status to minimize complications of hyponatremia and fluid overload. These requirements have made many practitioners reluctant to perform operative hysteroscopy.

Table 1.
Findings of 1000 Office Hysteroscopies Prior to IVF

Findings	Cases
Normal Findings	618 (62%)
Endometrial Polyps	323 (32%)
Submucous Fibroids	27 (3%)
Intrauterine Adhesions	25 (3%)
Polypoid Endometrium	9 (0.9%)
Septum	5 (0.5%)
Bicornuate uterus	3 (0.3%)
Retained Products of conception	3 (0.3%)

However, hysteroscopes that require minimal cervical dilation and yet still allow for an operative channel are available. Patient tolerance of hysteroscopes up to 5 mm allows for their use in an office setting where anesthesia is not required. Additionally, office-based hysteroscopy is no more costly than HSG at many institutions. At our medical center, the institutional and professional fees for performing and reading a hysterosalpingogram are 30% higher than the cost of an office hysteroscopy. Although SHG may offer a cost reduction, for the many patients in whom pathology is found or suspected, a hysteroscopy is then indicated adding expense, delay, and inconvenience. Furthermore, if HSG or SHG misses pathology, the cost of a first-line hysteroscopy that would have detected and treated such pathology pales in comparison to the expense of a failed IVF cycle.

When evaluating a patient prior to IVF, examination of the uterine cavity should be performed in the most accurate manner. It has been reported that up to 50% of infertile patients[6-8] have uterine abnormalities, including fibroids, polyps, intrauterine adhesions, and uterine malformations. This is in agreement with our current study that found 38% of IVF patients undergoing routine hysteroscopy had uterine pathology. The high incidence of endometrial polyps in our patient population may be related to multiple factors. Prior therapy with gonadotropins exposes patients to higher levels of estrogen. These elevated estrogen levels may predispose women to the development of endometrial polyps. In the context of IVF, lower pregnancy rates have been reported in the presence of uterine cavity abnormalities,[9-11] and their correction has been associated with improved pregnancy rates.[8] Because pathology is present in 40% to 50% of infertile patients, as mentioned previously, practitioners should be more inclined to recommend hysteroscopy as part of a basic IVF workup because it allows for simultaneous operative management.

Outpatient hysteroscopy has been shown to be easily performed with excellent surgical results in previous studies. Nagele et al[12] and Vercellini et al[13] found comparable success rates of 98% for performing the procedure. We were able to perform all diagnostic and operative procedures undertaken in the office setting. The initial office transvaginal ultrasound allowed us to exclude patients with large fibroids (greater than 1.5 cm) or major uterine malformations (requiring concurrent laparoscopic surgery) from the study and to perform their surgery in the operating room instead. Additionally, by using a 5-mm hysteroscope with a 5 F operative channel, all of the desired instruments for operative correction can be used. Grasping forceps allow for targeted removal of polyps with the ability to retain a clean specimen for pathologic confirmation. Scissors can be introduced for adhesions and septi. The coaxial bipolar electrode with a choice of differing tips allows for detailed uterine work, especially in removing submucous fibroids. By using the cutting mode primarily, and the desiccation mode when specific blood vessels are encountered, preservation of the delicate endometrium can occur while minimizing the risk of postoperative adhesions.[14] Patient tolerance of the electrosurgical equipment was excellent, confirming what Fernandez et al,[15] Bettochi et al,[16] and Guida et al[17] found in their studies on outpatient hysteroscopy.

Office-based operative hysteroscopy has also been found to be extremely safe. In our study, no complications occurred, and no patients needed extended monitoring or laboratory studies for fluid overload. Typical complications associated with hysteroscopy may be procedure-related, media-related, or postprocedure related.[18] Procedure-related complications, such as uterine perforation, cervical laceration, and damage to tissues including bowel, bladder, and vagina, can be minimized by performing an ultrasound prior to the procedure, revealing the subtle tortuosity and dimensions of the cervical and endometrial canal. Asking the patient to have a full bladder also helps to straighten the cervico-uterine canal to facilitate entry in patients with an anteverted uterus. For the rare patient with a difficult entry, concurrent ultrasound guidance can be invaluable. Our clinic has an ultrasound machine located in the procedure room and readily available.

Using saline as the distention medium also serves to minimize (and often to eliminate) medium-related complications. Hyponatremia and cerebral edema are more of a concern when using hypotonic, electrolyte-free media, such as glycine or sorbitol. But as several authors[14,18] point out, fluid overload, pulmonary edema, and congestive heart failure can still occur if an excessive volume of saline is used, especially if patients have underlying medical conditions predisposing them to fluid-related complications. Air embolism is also a potential complication that must be considered. By avoiding the Trendelenburg position, excessive fluid pressure, prolonged operative times, a dilated cervix without instruments sealing air entry, and by purging the tubing of air, the risk of embolism is minimal.[18]

Postprocedure complications like endometritis can be reduced or eliminated by pre- and posttreatment with antibiotics, as we do in our clinic, and by avoiding operating on patients with active vaginal infections.

Additional benefits of operative hysteroscopy have also been proposed. Cervical dilatation may facilitate embryo transfer and the introduction of insemination catheters. McManus et al[19] found this to be the case if cervical dilatation was performed on average 31 days before embryo transfer. However, in a previous study at our institution, operative hysteroscopy in the cycle prior to embryo transfer did not alter the percentage of transfers that changed from difficult to easy although it was associated with a higher pregnancy rate. The increase in pregnancy rates was attributed to the removal of endometrial polyps or polypoid endometrium at the time of hysteroscopy and thus improving implantation in this population at risk.[8] Takahashi et al[20] has also suggested that irrigation of the cavity with saline may have a beneficial effect on implantation and pregnancy rates in patients with tubal or uterine causes of infertility. Regardless of whether these adjunctive benefits are confirmed by further study, office-based operative hysteroscopy still holds value as the gold standard of diagnostic procedures for uterine cavity abnormalities with the ease, safety, and efficiency of simultaneous therapeutic correction of abnormalities.

CONCLUSION

In an infertile population where hysteroscopy is performed routinely prior to IVF, a significant percentage of patients are found to have uterine pathology. Endometrial polyps are found most frequently, with smaller numbers of fibroids, adhesions, retained products of conception, and septi. These abnormalities may impair the success of future treatment cycles, and removal of the pathology is recommended. Patient tolerance and the feasibility of operative management, simultaneous with diagnosis, make office-based operative hysteroscopy an ideal first-line procedure with minimal risk to the patient.

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