Ambulatory hysteroscopy

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Key content
• Routine diagnostic hysteroscopy under general anaesthesia is an anachronism.
• Evidence-based RCOG guidance should be followed to ensure best practice in outpatient hysteroscopy.
• The role of hysteroscopy in the diagnostic work-up of abnormal bleeding and reproduction remains unclear and further research is required to elucidate where it can be used most cost-effectively.

Learning objectives
• A ‘no touch’ vaginoscopic technique should be employed routinely as this approach reduces pain during diagnostic rigid outpatient hysteroscopy and facilitates operative procedures by improving manipulation of miniature endoscopic equipment.
• A contemporary outpatient hysteroscopy service should be able to provide surgical treatments for uterine polyps, small fibroids, lost coils, minor uterine anomalies, menstrual disorders and permanent contraception.

Ethical issues
• Can we justify subjecting women, especially those with significant medical co-morbidities, to the risks and inconvenience of general anaesthesia for hysteroscopic procedures?

Keywords: hysteroscopy / one-stop / outpatients / ‘see and treat’

Introduction

Direct visualisation of the vagina, cervix and uterine cavity with the aid of an endoscope does not just facilitate diagnosis of disease, but also provides therapeutic possibilities, either directly (‘hysteroscopic surgery’) or indirectly (directing ‘blind procedures’ including global endometrial ablation). Such interventions were traditionally the domain of hospital day-case wards with procedures performed under general anaesthesia. This is no longer the case. The advent of small diameter modern hysteroscopes (≤5.5 mm), allied with the miniature 5–7 Fr ancillary instruments (mechanical instruments: scissors; graspers; biopsy cups; bipolar electrodes, e.g. Versapoint™ [Gynecare, Ethicon Inc., Menlo Park, CA, USA]; morcellators: TRUCLEAR™[Smith & Nephew Inc., Andover, MA, USA], MyoSure® [Hologic, Marlborough, MA, USA]; and female sterilisation systems: Essure® [Conceptus Inc., Mountain View, CA, USA]) has led the paradigm shift of surgical interventions being undertaken in an ‘inpatient’ general anaesthetic setting to an ‘outpatient’ environment with recourse to local anaesthesia if necessary. Thus, the modern gynaecologist is not restricted to efficient outpatient diagnosis using hysteroscopy, transvaginal ultrasound and endometrial biopsy, but can institute minimally invasive therapeutic interventions in an equally proficient manner. As a result, the philosophy of efficient, safe and convenient ‘see and treat’, ‘one stop’ gynaecology in an ambulatory setting – the patient ‘ambulates’ in and ‘ambulates’ out – has come of age.

We will discuss in this article the advances in outpatient hysteroscopy, taking account of the evidence to support interventions and recent best practice guidance.

Conducting outpatient hysteroscopy

A joint British Society for Gynaecological Endoscopy/ Royal College of Obstetricians and Gynaecologists (BSGE/RCOG) Green-top guideline addressing best practice in outpatient hysteroscopy has been recently published. The aim of the guideline is to provide clinicians with up-to-date, evidence-based information regarding outpatient hysteroscopy, with particular reference to minimising pain and optimising women’s experience. Thus, by standardising best practice and identifying areas where evidence is lacking, we can hope to optimise both current and future patient experience. Box 1 summarises the key recommendations for best practice in outpatient hysteroscopy and Box 2 summarises the key points of ‘no touch’ vaginoscopic hysteroscopy which should be the default technique in an outpatient environment.
Indications for diagnostic outpatient hysteroscopy

The main indications for diagnostic hysteroscopy are shown in Box 3. The place of outpatient hysteroscopy (OPH) as a third-line test after transvaginal ultrasound (TVU) and endometrial biopsy in the diagnostic work-up of women with postmenopausal bleeding (PMB) is relatively well defined. However, for the most part, whereas there are synergies between the available tests, there is also some crossover in the information provided. For example, the place of OPH relative to TVU, endometrial biopsy and saline infusion sonography in heavy menstrual bleeding (HMB) and non-menstrual bleeding is unclear. By contrast with a PMB population, women with HMB do not have a ‘normal’ endometrial thickness and the risk of endometrial cancer or atypia is low. Thus, the utility of routine TVU, endometrial biopsy and OPH is questionable and this is borne out in the management algorithm produced by the National Institute for Health and Clinical Excellence (NICE). However, women with HMB can have endometrial hyperplasia, submucous fibroids of various grades and sizes, uterine polyps, uterine anomalies including uterine fibroids and adenomyosis and benign adnexal masses. Non-diagnosis of these pathologies prevents implementation of the many effective medical and surgical treatments for HMB and is therefore likely to result in prolonged suffering, reduced health-related quality of life and absenteeism from work with costs to the economy. Current research involving decision analytical modelling hopes to provide us with some answers as to which testing strategies are the most cost-effective in HMB.

Before leaving diagnostic indications, it is worth considering the wider place of OPH in the management of...
Box 3. Indications for diagnostic outpatient hysteroscopy

Abnormal uterine bleeding
- Postmenopausal bleeding with an endometrial thickness >4 mm or irregular endometrium on TVU or a non-diagnostic endometrial biopsy or on tamoxifen
- Recurrent postmenopausal bleeding

- Unscheduled/intermenstrual bleeding with an abnormal endometrium on TVU or refractory to medical treatment
- Heavy menstrual bleeding with fibroids or an abnormal endometrium on TVU or refractory to medical treatment
- Postpartum bleeding with suspected chronic retained products of conception or arteriovenous malformation on TVU

Reproductive problems
- Subfertility associated with an abnormal ultrasound or hysterosalpingogram
- Late miscarriage/preterm labour

Other
- Glandular abnormalities on cervical smear
- Identification (and retrieval) of lost intrauterine devices
- Incidental finding of an abnormal uterine cavity on TVU (mass, fluid etc.)

Operative hysterectomy

Polyps
The removal of uterine polyps appears to confer benefit in terms of resolving symptoms and obtaining tissue for histological examination. Technological advances in imaging have resulted in better image quality, portability and accessibility, improving the detection rate of focal uterine pathologies. Improvements in hysteroscopy design and ancillary instrumentation coupled with enhanced visualisation, due to improvements in fibre optics and digital imaging, have enabled polyps to be removed under direct hysteroscopic vision in an outpatient setting. Mechanical instruments designed to pass down 5 and 7 Fr operating channels have been used successfully, but their utility is affected by their size and relative fragility. In the late 1990s the development of bipolar intrauterine electrosurgical systems (e.g. Versapoint® bipolar electrosurgical system) facilitated rapid resection of focal uterine lesions in a saline conducting medium. It soon became clear that these rapid and versatile electrosurgical approaches offered a wider repertoire of office treatments including treatment for fibroids, adhesions and uterine anomalies in addition to endometrial polyps and have superseded mechanical approaches (Figure 1).

Procedures within the uterus can be fibrous or glandular, pedunculated or sessile, single or multiple and vary in size from small with minimal uterine cavity distortion to large, filling the whole cavity. Location within the cavity can be a challenge especially fundally (due to difficulty accessing the base) or isthmically (due to restrictions of movement) sited lesions. Miniature hysteroscopic morcellators, which require a specific hysteroscope with an offset eyepiece, are the latest technologies to be introduced, e.g. TRUCLEAR® (Figure 2) and MyoSure®. They can be used in the outpatient setting to simultaneously remove and retrieve polyps and submucous fibroids and appear to be especially useful in removing larger, fundally sited and multiple pathologies. Concerns over inability to establish histopathological diagnoses from morcellated specimens appear to be unfounded. The techniques available for outpatient uterine polypectomy are summarised in Table 1.

The current literature on these outpatient hysteroscopic techniques has demonstrated safety and feasibility, but evidence of effectiveness, patient acceptability and cost-effectiveness is lacking. A multicentre randomised controlled trial (RCT) has randomised more than 500 women either to outpatient with or without local anaesthesia treatment or to day-case removal under general anaesthesia to compare effectiveness, cost-effectiveness and acceptability between

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treatment settings. These patients, as well as 400 non-randomised additional women who expressed a definite preference for treatment setting, will also allow effectiveness and acceptability of treatments to be compared according to type of abnormal bleeding, menopausal status and treatment technique. In time, therefore, we should have more idea as to how best to treat uterine polyps and whom we should treat.

Fibroids

Submucous fibroids are commonly found in association with menstrual and reproductive problems. Can we remove them hysteroscopically both safely and in entirety or do we offer repeat treatments? Do we need to prepare the endometrium with associated cost and morbidity? Do we need to remove the ‘whole’ fibroid or just ‘normalise’ the contour of the uterine cavity (allowing any residual fibroid to spontaneously extrude) reducing risk of inadvertent uterine perforation and visceral injury? Appropriate diagnostic work-up and consideration of patient views are key to choosing how best to approach the management of uterine fibroids.

The removal of most intracavity fibroids requires general anaesthetic and often larger diameter hysteroscopes with their associated advantages of better visualisation with improved illumination and efficient continuous flow systems as well as easier removal of treated fibroid tissue. However, it is not uncommon for failed removal of polyps under general anaesthetic by curettage to be subsequently removed in the outpatient setting by excising these misdiagnosed grade 0 fibroids using bipolar electrosurgery. Smaller, sessile fibroids can also be ablated in the office setting. Even if, for most submucous fibroids, larger diameter resectoscopes are optimal, outpatient hysteroscopic assessment is key; it allows an assessment of treatment setting and need for endometrial preparation, based upon the size, vascularity, number and location of myomas, to be assessed. The role of preliminary incision of the ‘capsule’ of mucosa overlying the submucous fibroid precipitating expulsion of the fibroid into the uterine cavity (e.g. changing a grade 1 to a grade 0 submucous fibroid, thereby ‘preparing’ the fibroid for subsequent resection under general anaesthesia, is unclear.

Adhesions, septae and hypoplastic uteri

Hysteroscopic adhesiolysis can be achieved with scissors or Versapoint™ diathermy in an outpatient setting where scar tissue is filmy and cavity distortion minimal. However, published data are lacking for the safety and feasibility of plastic operations on the uterus in an outpatient, local anaesthetic setting.

Endometrial ablation

The development of ‘second-generation’ miniature, semi-automated ablative technologies has allowed the concept of outpatient local anaesthetic endometrial ablation to be progressed. In the few centres able to offer both treatment environments, outpatient local anaesthetic ablation is as popular as traditional day-case general anaesthetic settings. Several observational studies have addressed the feasibility of outpatient local anaesthetic ablation for various technologies: HydroThermAblator System® (Boston Scientific Corp., Natick, MA, USA), “Thermachoice® Endometrial Ablation (TEA; Gynecare Inc., Somerville, NJ, USA), Thermablate
Table 1. Techniques for outpatient hysteroscopic polypectomy

<table>
<thead>
<tr>
<th>Technique and instruments</th>
<th>Removal</th>
<th>Retrieval</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind</td>
<td>Mechanical (ring polyp forceps/curette)</td>
<td>Blind avulsion</td>
<td>Simultaneous Cheap: does not require sophisticated instrumentation; suitable for large, pedunculated, fundal lesions</td>
</tr>
<tr>
<td>Hybrid</td>
<td>Hysteroscopic forceps + ring polyp forceps or curette</td>
<td>Hysteroscopic avulsion</td>
<td>Blind location Useful for removing large, fibrous polyps and where there is a narrow internal cervical os</td>
</tr>
<tr>
<td>Hybrid</td>
<td>Hysteroscopic scissors + ring polyp forceps or curette</td>
<td>Hysteroscopic excision</td>
<td>Blind location Useful for where there is a narrow internal cervical os</td>
</tr>
<tr>
<td>Hybrid</td>
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<td>Hysteroscopic</td>
<td>Hysteroscopic forceps or polyp snare</td>
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<td>Hysteroscopic bipolar electrosurgery + forceps or polyp snare</td>
<td>Hysteroscopic excision</td>
<td>Hysteroscopic retrieval Quick, avoids LA, allows vaginoscopic approach. Rapid, bloodless and suitable for fibrous as well as glandular, vascular lesions</td>
</tr>
<tr>
<td>Hysteroscopic</td>
<td>Hysteroscopic polyp snare ± monopolar current</td>
<td>Hysteroscopic avulsion/ excision</td>
<td>Simultaneous hysteroscopic retrieval Avoids LA, allows vaginoscopic approach. Suitable for fibrous as well as glandular lesions</td>
</tr>
<tr>
<td>Hysteroscopic</td>
<td>Hysteroscopic morcellator</td>
<td>Hysteroscopic morcellation</td>
<td>Simultaneous hysteroscopic retrieval Avoids LA, allows vaginoscopic approach. Suitable for all types of polyp including fundal large fibrous and pedunculated polyp and multiple lesions</td>
</tr>
</tbody>
</table>

LA = local anaesthesia
The choice of approach depends in part upon the availability of equipment but also is dictated by the size, number, type and location of the focal pathology.
EAS (Idoman Ltd, Dublin, Ireland), NovaSure® bipolar system (RFA) (Hologic, Marlborough, MA, USA). There are also some RCTs comparing outpatient local anaesthetic ablation with day-case inpatient general anaesthetic settings: TEA and Microwave Endometrial Ablation (MEA) system (Microsulis Medical Ltd, Hampshire, UK). For the first time an RCT has been conducted and published directly comparing two of the leading second generation ablative technologies in this ‘novel’ outpatient local anaesthetic setting. The ‘COAT’ trial showed that both thermal balloon ablation using the TEA and radiofrequency impedance-controlled endometrial ablation using the RFA system were safe, acceptable and effective in this setting. The RFA procedure was significantly quicker, but no conclusive differences in pain or acceptability were identified between technologies. Rates of amenorrhoea were higher with RFA at all time points post-surgery compared with TEA, but these differences only reached statistical significance at 12 months in favour of RFA. There were no differences in health-related quality of life between treatment modalities but it was significantly improved following both treatments. Only one woman in each treatment arm had undergone a hysterectomy at 12 months.

Whereas the majority of women undergoing the outpatient ablation would recommend it to a woman with a similar problem (82%), 13% of women found the procedure unacceptable. We need to define more clearly the women most likely to have a positive and effective outpatient experience. In addition to selecting the ‘right’ patients, we need also to concentrate our efforts on reducing procedure-related pain by manipulating analgesic, anaesthetic (topical, intracervical and delayed paracervical blocks) and sedative regimens. The use of intramyometrial injection of local anaesthesia under direct hysteroscopic guidance in the outpatient setting has been recently advocated, the so-called ‘focal–local’.

**Hysteroscopic sterilisation**

Outpatient hysteroscopic sterilisation offers women long-term, non-hormonal, effective, irreversible contraception without the need for surgical incisions or anaesthesia, thereby avoiding the small but significant risks of day-case, laparoscopic surgery. Although it has long been recognised that the transcervical route to occluding the tubal ostia offers many potential advantages, it is only relatively recently that a technique has become established in clinical practice. The Essure® permanent birth control system is now widely used across Europe, North America and Australasia with more than 500,000 procedures being performed (Figure 3). The procedure involves placing a micro-insert, consisting of a stainless steel inner coil with polyester fibres and a super-elastic nitinol outer anchoring coil, into the intramyometrial portion of each fallopian tube. This is done via a fine delivery catheter which is passed down the 5 Fr operating channel of a 30° 5–5.5 mm continuous flow rigid hysteroscope. The procedure can be performed in the majority of women vaginoscopically using normal saline distension, without local anaesthesia and is completed in 5–10 minutes. The majority of women are discharged home within 1 hour. Occlusion of the narrow tubal lumen takes up to 3 months as the polyester fibres cause an inflammatory reaction with tissue ingrowth into the micro-insert and subsequent blockage of the fallopian tube. Confirmatory radiology is scheduled at 3 months to confirm the adequacy of sterilisation; satisfactory device placement is checked by abdominal X-ray or transvaginal ultrasound scan in the 85% of procedures considered straightforward, and the remainder undergo more invasive hysterosalpingogram to confirm tubal occlusion. In the last decade since its introduction, the feasibility, as well as the qualitative and economic benefits, of hysteroscopic sterilisation using the Essure® system have been widely demonstrated. Women must be informed to continue using additional contraception until the results of radiological testing are available.

Successful bilateral device placement rates vary but are consistently >90% and in many centres >95% for techniques. No pregnancies have been reported from the

![Figure 3. The Essure® (Conceptus Inc., Mountain View, CA, USA) hysteroscopic sterilisation system: Hand piece, delivery system (a) and micro-insert (b). All images reproduced with permission from Conceptus Inc.](image-url)
original pivotal trial of Essure® and the effectiveness of the Essure® system is reported to be better than laparoscopic sterilisation with 5-year success rate of 99.7% from the literature supported by data from commercial use (748 pregnancies reported/497 305 kits distributed worldwide; 99.9%) although the latter is likely to be an underestimate. Longer term data pertaining to cumulative pregnancy rates and complications are needed for the Essure® technology to allow a fair comparison against laparoscopic approaches.

Conclusions

Outpatient hysteroscopy confers many advantages over day-case procedures including safety, efficiency, convenience, and cost-effectiveness. In the UK in 2010, a total of 71 130 diagnostic hysteroscopies were performed under general anaesthetic, representing 70% of all diagnostic hysteroscopies. This anachronistic 7:3 ratio needs addressing urgently with investment in ambulatory infrastructure and training, and change in mentality of practising clinicians. An 80% outpatient target for all diagnostic hysteroscopies performed as primary procedures should become mandatory and a 90% target is readily achievable with the correct referral pathways and infrastructures in place. As evidence supporting outpatient intervention accumulates, it is likely that funding of health services will incentivise best practice and drive necessary changes in service delivery. In addition to simple diagnostic procedures, there is mounting evidence to support the use of outpatient therapeutic procedures, namely removal of focal uterine anomalies, LNG-IUS insertion and retrieval, endometrial ablation, and female sterilisation. Further publications from major trials in this field are expected to energise the expansion of ambulatory hysteroscopic services, which appear to be underdeveloped in most UK units. The recent RCOG report examining the future delivery of obstetrics and gynaecology recommended devolving some traditional aspects of gynaecological practice to a community-based setting. Those hospitals with established or developing ambulatory diagnostic and therapeutic hysteroscopy services will be in a position to engage and collaborate with local Primary Care Trusts (PCTs) for optimising gynaecological service delivery. By contrast, those hospitals neglecting such services will become vulnerable to losing substantial parts of their traditional gynaecological patient referral base. Evidence, economics and politics demonstrate that now is the time to engage in outpatient ‘see and treat’ hysteroscopy.

Disclosure of interests

N.A.M. Cooper: none declared. T. J. Clark is a consultant to Conceptus. He received an honoraria from Hologic and Ethicon for clinician training which has been paid into a charitable account to fund research. He has also received an honoraria for lecturing from Nordic Pharma. He has received trial funding from Hologic and is currently a member of their European Advisory Board. He has received funding for travel and accommodation at national and international conferences from Ethicon, Hologic and Conceptus. He receives research funding from the Department of Health and is an HTA Programme Elected West-Midlands member.

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