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TECHNIQUES AND INSTRUMENTATION

Constructing a protocol for the evaluation of residents' competency with office hysteroscopy

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Abstract There is an increasing need for clinician self-evaluation. The need becomes bigger when it comes to assess residents in operative procedures; office hysteroscopy in its current form is one of the best examples to teach and to assess them. We propose a simple protocol for the evaluation of residents in office hysteroscopy that can be used as a platform for future improvement. This will improve their learning experience and ensure that they do not miss any steps of the procedure. As each task is outlined on the evaluation checklist, it is easier to objectively demonstrate the strengths and deficiencies of each one with respect to the given procedure. This can be the basis for application of extra attention and highlights the areas in which each individual needs to improve. The advantage of recording parameters, such as duration of the procedure and pain scores, is that they can serve as tools that demonstrate acquisition of experience and of confidence.

Keywords Office hysteroscopy · Training · Residents' training · Education · Protocol

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Introduction

Ambulatory procedures are currently a significant part of the obstetrician/gynecologist's diagnostic and therapeutic armamentarium [1]. In this context, hysteroscopy has gained considerable popularity among clinicians, replacing traditional approaches in many cases. Its advantage lies in the capacity for the direct visual assessment of the cervical canal and uterine cavity and, depending on the case, the possibility for surgical intervention at the time of diagnosis ("see and treat" technique) [2]. Advantages offered by instrumentation, refinement of the technique and adequate training, have led to the development of office hysteroscopy employing the "no-touch" (or vaginoscopic) approach; no cervical dilatation or any kind of anesthesia/analgesia is needed [2]. Its chief importance stems from the fact that the patient is awake and a minimal intervention can solve the problem at the time of diagnosis without generating marked discomfort or

complications. The latter are reported as extremely rare [3]. There are reports pointing out that the anxiety of an outpatient treatment can affect tolerance of the procedure. However, this is counterbalanced by the reduction of waiting time and number of clinic visits as well as results in *n* overall increased patient satisfaction [4]. However, it is imperative that a physician perform this type of advanced hysteroscopy only after demonstrating competency in the accredited setting with standardized assessment instruments [1].

Training of young physicians in new modalities remains a crucial step in optimizing health care services. This process encompasses the provision of adequate levels of knowledge and skills, without simultaneously placing the patients' health at risk. A major issue in postgraduate medical education is that trainees are often deemed competent to act as primary surgeons based on self or supervisors' global assessments and case logs which lack the appropriate validity and reliability [5, 6]. Therefore, the challenge still exists for development and testing of more robust methods for documenting the residents' competency to perform a procedure in a highly accurate manner.

The construction of protocols/algorithms of the competency of a trainee is essential for both himself/herself and the tutors. Such methods have been developed, but they largely remain as research tools and have yet to be widely accepted and applied to current surgical practice. The technical skills required for endoscopic surgery differ from open surgery due to the lack of perception of depth, tactile feedback, and the necessary hand–eye coordination when operating by looking at a TV screen [7]. These skills are even more imperative for outpatient endoscopic surgery where the patient is awake and surgical accuracy and efficiency are of major significance for minimization of patient discomfort.

The objective of this article is to describe the construction of a protocol for the evaluation of residents in performing outpatient office hysteroscopy.

Skills assessment scales

In general, there are three types of skills assessment tools currently used: (a) rating scales for the assessment of generic skills (Global Rating Scale, Objective Structured Assessment of Surgical Skills, Global Operative Assessment of Laparoscopic Skills, etc.): they aim to evaluate generic technical abilities, not necessarily linked to a specific procedure; (b) procedure (task)-specific skills assessment (procedure-specific checklist, error scoring system, observational clinical human reliability analysis, etc.): they are characterized by a breakdown of a procedure into tasks (task analysis), though the type of scoring may differ; and (c) a combination of generic and procedure-specific assessment tools [8].

The concept of objective structured assessment of surgical skills was first pioneered by Reznick et al. to assess general surgery residents [9]. In hysteroscopy, various examples have been reported [10–12]. Now, more than ever, it is common sense—and there is also a pressing need—for trainees to be assessed as concerns their technical skills in an objective way targeted to the procedure under assessment. With regard to minimally invasive surgical skills, there is an increasing shift to training outside the operating room by using models and simulators. Surgeons can improve their performance by repeated practice, feedback, and learning without concerns of causing any harm [13]. Different tools have been applied to evaluate either overall operative performance, as for example, the Contrasting Group Method [14] and the Global Rating Scale of operating performance [9] or to assess specific procedures, such as the Vaginal Surgical Skills Index [15] and laparoscopic, open abdominal, and hysteroscopic procedures [10, 16].

Outpatient hysteroscopy setting and procedure

Since 2005, we have developed an outpatient hysteroscopy service in a specialized treatment clinic, which is adequately equipped and staffed. We provide a “see and treat” service when this is deemed appropriate and after the patient's full counseling regarding the procedure. Our standard technique is the vaginoscopic approach with insertion of the hysteroscope through the cervical canal and into the uterine cavity without the need for a vaginal speculum, cervical manipulation, or local anesthesia. This technique has been described by Bettochi et al. [2, 4].

We use a rigid single-flow mini-hysteroscope with a final diameter of 3.4 mm with an oval profile to match the shape of the cervical canal (Bettocchi Office Hysteroscope; Karl Storz GmbH & Co., Tuttlingen, Germany). The scope is based on a rigid rod lens system with a diameter of 2 mm and a 30° view and armed with an incorporated 5-Fr. working channel. Only mechanical instruments are used, including sharp scissors and crocodile grasping forceps (Karl Storz GmbH & Co.). A 250-W xenon light source is used to offer a high performance in optimal visualization and image quality.

We use normal saline (N/S 0.9 %) as the distension medium instilled from a 1,000/3,000-ml bag wrapped in a pressure bag connected to a manometer and pumped to 120–140 mmHg. For tissue biopsy, we use the grasp technique, as it is safer and easier for inexperienced surgeons to remove lesions and provide the pathologist with the necessary amount of tissue for histologic examination [17].

Detailed patient counseling takes place before the procedure with regard to the technique itself, the feeling of the uterine distension, and potential adverse effects. Patients are reassured that the procedure will stop as soon as the patient feels dizziness or the pain becomes intolerable.

Basal blood pressure and heart rate are monitored before and after the procedure by an attending staff nurse. Apart from a bimanual vaginal examination performed prior to hysteroscopy, no other preoperative investigations are needed. Intrauterine lesions, such as polyps, fibroids, and synechiae, and simple targeted endometrial biopsies are removed at the time of diagnosis, provided that their diameter and location permit. Our criteria for removal in the outpatient setting are polyps less than 1 cm, G0 submucosal fibroids (completely within the uterine cavity), small uterine septae, and endometrial biopsies. Larger polyps, G1 and G2 submucosal fibroids, and extensive intrauterine synechiae are scheduled for hysteroscopic resection under general anesthesia. During an operative procedure, there is continuous monitoring of the fluid deficit.

Exclusion criteria for the procedure are acute pelvic inflammatory disease, severe active vaginal bleeding, positive pregnancy test, cardiovascular disease (active or history, concerning arrhythmias and ischemia), and suspicion of uterine malignancy.

Failure of the procedure is defined as the following:

(a) When no diagnosis can be made due to poor visualization
(b) Failed access into the cavity
(c) Or patient discomfort of “5” or more on the visual analog score

Training before evaluation

Trainees undergoing a rotation in the outpatient treatment clinic have to attend four theoretical training sessions organized by specialists in operative hysteroscopy, who run outpatient treatment clinics on a regular basis. The curriculum of these sessions includes:

(a) A comprehensive theoretical program of the principles of diagnostic and operative hysteroscopy, instrumentation, complications, equipment troubleshooting, and electrosurgery principles in minimal access surgery.
(b) Video demonstration of diagnostic and operative hysteroscopic procedures is covered in the third session.
(c) In the fourth session, the trainee has the opportunity to practice the resection of endometrium, polyps, and submucosal fibroids in a hysteroscopic simulator.

Upon completion of the four sessions, each trainee participates in a minimum of five outpatient hysteroscopic procedures performed by trainers. Ideally, all trainees should have had prior experience in operative hysteroscopy under general anesthetic. We suggest differentiating groups of trainees based on existing experience in performing hysteroscopy: the first group: inexperienced and the second group: experienced trainees. We also take into account the ESGE classification of the hysteroscopy complexity [18].

Evaluation tool

The tool is constructed as a checklist with the aim of assessing four dimensions (Table 1):

(a) Preoperative communication
(b) Technical procedure including the steps to establish a diagnosis (clear visualization) and effectiveness of eventually necessary therapeutic steps
(c) Interpretation of the findings and information of the patient
(d) Tolerability for the patient

Appropriate patient counseling and consent, documentation, equipment assembly, and the different steps of each procedure are marked on a “0–1–2” scale. Mark “0” relates to a task incorrectly performed or not performed at all, mark “1” to a task where help is needed, and mark “2” to a task performed correctly and independently. The operative technique (resection of lesion or biopsy) is rated on a “0” to “2” scale to allow more flexibility for the assessment of the trainee.

Each trainee is further assessed as to his ability to interpret findings and effectively communicate these to the patient as well as the need for the trainer's contribution to the safe completion of the procedure. The duration of the procedure is recorded and measured from the time of the insertion of the hysteroscope into the vagina until termination of the flow of the distension medium.

To assess the patient's tolerance of the procedure, we use a visual analog score with a 0–10 scale (Table 2). Score “0” suggests no discomfort at all and score “10” suggests the worst pain the patient reports ever having experienced. Patients are asked to rate the pain score during the procedure and 15 min after the end of the procedure. Intraoperatively, if the pain score is 5 or more, the procedure is discontinued. The intra- and postoperative pain scores are recorded in the trainee's evaluation form.

Evaluation procedure

The supervising trainer in the clinic performs all markings. Post-procedure discussion of the trainee's performance is undertaken to provide feedback and areas where improvement is needed. A higher score indicates a better performance. Success rate is defined as an overall score of 18/24 points or more. Trainees are deemed competent to perform a

Table 1 Task score list for performing office hysteroscopy

Task scores		0: not done or incorrect	1: needs help	2: done independently
1	Proper consultation of the patient on procedure, risks, and benefits, before and after	0	1	2
2	Exact knowledge of instruments/system and fitting	0	1	2
3	Discovery and identification of the external cervical os	0	1	2
4	Entrance into the cervical canal/rotation of the scope by 90°	0	1	2
5	Passage through the canal/appearance of the canal has to be at 6 and 12 o′clock positions (ante- or retroverted uterus)	0	1	2
6	Inspection of the intrauterine cavity/rotation of the body of the scope by 90° (right and left) for the examination of the tubal ostia	0	1	2
7	Pulling back of the scope at the level of the internal cervical os to obtain a panoramic view of the uterus	0	1	2
8	Recognition and/or selection of appropriate findings to operate (synechiaes, polyps, fibroids, uterine septum)	0	1	2
9	Operative technique/grasp technique/biopsy/polyp removal	0	1	2
10	Complications: recognition/treatment	0	1	2
11	Patients' compliance[a]	0	1	2
12	Pain scores[b]	0 (above 5)	1 (4–6)	2 (below 5)
Total:		0	12	24

[a] Refers to patient's general acceptance of the procedure and cooperation with the clinician/performer

[b] Refers to pain scores during (a) and 15 min after (b) the procedure. If it has to be discontinued, scoring falls to 0. The mean pain score is calculated as follows: $\text{mean PS} = [2(\text{a}) + (\text{b})]/3$

certain procedure when they have successfully completed ten assessments. With increasing experience, we expect that trainees will demonstrate improvement of their performance among cases of similar complexity. For those who consistently fail to improve their score, we recommend that they observe additional procedures in the outpatient clinic, performing more frequently under general anesthetic and carrying out further practice in using the hysteroscopic simulator.

Discussion

We propose a protocol of training in office hysteroscopy, which we believe to be advantageous for both trainees and trainers. It can be used as a platform with all the tasks that need to be performed by the trainee during outpatient hysteroscopy, necessitating that the trainee focus on all the relevant surgical steps. This improves the learning experience and ensures that the trainee does not miss any steps of the procedure. Furthermore, as each task is outlined on the evaluation checklist, it is easier to objectively demonstrate the strengths and deficiencies of the trainee with respect to the given procedure. This can be the basis for application of extra attention and highlights the areas in which each individual needs to improve. The advantage of recording parameters, such as duration of the procedure and pain scores, is that they can serve as tools that demonstrate acquisition of experience and of confidence.

For the trainer, these structural assessments help to gain an overview of the overall performance of each trainee, indicate areas of concern, and aid the feedback process. This is all the more important in busy departments with large numbers of residents/inexperienced surgeons [19].

The protocol has certain limitations. First, the fact that both trainers and trainees work in the same institution can bias the assessment and thus reduce its validity [10, 20]; unfortunately, in most departments, the organization of blinded assessments, and especially in an outpatient setting, is difficult. Second, the nature itself of an outpatient setting is a difficult environment for trainees to develop their surgical skills: anxiety that the patient might not tolerate the procedure due to unnecessary movements or inadvertent

Table 2 Pain classification and action taken

Pain score	0–1	2–4	5–7	8–10
Evaluation	No discomfort	Discomfort similar to menstrual pain (tolerable)	Moderate pain similar to heavy menstrual pain requiring drugs	Severe pain
Action	Continuation	Continuation, searching for autonomous nervous system symptoms	Discontinuation of the procedure	Discontinuation of the procedure

tissue damage can result in the trainer's lower threshold for intervening and taking over the procedure [20]: to overcome this, we have included participants who had some experience in operative hysteroscopy under general anesthetic. Third, we have not as yet validated this protocol, but we aim to do so 6 months after introducing it; in parallel, we are planning to obtain feedback from trainees as to whether they believe that this improves their training and learning experience.

Conclusion

The need for standardized assessment of residents in ambulatory procedures is obvious; office hysteroscopy in its current form is one of the best examples to teach and to assess the trainees [21]. We propose a simple protocol to assess residents' efficacy and competency. It provides a platform on the basis of which both trainees and supervisors can work together with the aim of transforming residents into safe and skilled primary surgeons. A subsequent step should include its testing in terms of validity and reliability.

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