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Hysteroscopic polypectomy in an office setting: specimen quality assessment for histopathological evaluation

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ABSTRACT

Objective: Polypectomy under hysteroscopic guidance is the treatment of choice for most endometrial polyps, but mechanical or electrical effects at the time of surgery may result in artifactual displacement of tissue with obvious resultant diagnostic problems. The purpose of this study was to record qualitative and quantitative histopathological artifacts and to assess differences between artifacts found in specimens obtained by different surgical polypectomy techniques.
Study design: During the period from November 2012 to March 2013, 90 retrospective consecutive polyp histopathological slides and their reports were identified for this study. Initially reported slides were reviewed blind by two histopathologists, who were not provided with any surgical details. The issued reports and those of the reviewing pathologists were then compared.
Results: Of the 90 reviewed polyp slides, there was complete agreement on the initial issued report in all cases.
Conclusions: Removal of endometrial polyps in an office setting using mechanical instruments, bipolar electrode or a hysteroscopic morcellator provides adequate tissue for histological diagnosis, and there is no difference between these three techniques for adequacy of histological examination, despite the effects of thermal injury or tissue fragmentation.

Introduction

Endometrial polyps are among the commonest causes of abnormal uterine bleeding (AUB) in both premenopausal and postmenopausal women [1,2]. Polypectomy under hysteroscopic guidance is the treatment of choice for most endometrial polyps, since it is well established that blind curettage may miss small polyps and other structural abnormalities [3,4]. Moreover, thanks to technological improvements producing narrow diameter hysteroscopes, operative hysteroscopic polypectomy can be easily performed in an outpatient setting with minimal discomfort [5,6]. Instruments used to remove a polyp through the hysteroscope include grasping forceps, microscissors, bipolar electrosurgical probe, electrosurgical loop (i.e., mini-resectoscope), and morcellator [7–9].

Recently, after being approved by the FDA in July 2012, a small hysteroscopic morcellator (HM), including a 2.9 mm blade for removal of polyps through a 5.6-mm continuous-flow hysteroscope, has become available. The HM has been already proven to be safe and efficacious in performing polypectomy [10], but the effects of such a new technique on the histopathological assessment of specimens have not yet been investigated. Since mechanical effects at the time of surgery or routine processing of pathology specimens may result in artifactual displacement of tissue with obvious resultant diagnostic problems, we believe that pathologists should be aware of these modalities and their effects on normal and neoplastic tissue. We therefore carried out a current retrospective histopathological review of polyp specimens to record qualitative and quantitative artifacts and to assess the differences between histological artifacts found in specimens obtained by different surgical polypectomy techniques.

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Materials and methods

Details and types of surgical procedures were obtained from the electronic medical records from November 2012 to March 2013. Retrospective evaluation of data from 90 consecutive hysteroscopic polypectomies in an office setting was performed according to the type of instruments used: grasping forceps/micro-scissors (Karl Storz, Tuttlingen, Germany); bipolar electrosurgical probes (Versapoint Bipolar Electrosurgical System; Gynecare, Ethicon Inc., NJ, USA); and HM (Truclear-5.0; Smith & Nephew, Andover, USA).

The hematoxylin and eosin-stained tissue samples of each case were reviewed simultaneously on a double-headed microscope (Leica, Wetzlar, Germany) by two expert pathologists (F.Z. and M.G.) who were blind to the surgical technique used. For the purpose of analysis, "adequacy" was defined as the percentage of biopsy specimens from which the two pathologists could make the diagnosis and "agreement/accuracy" as the percentage of reports confirmed by the second pair of pathologists.

Consensus for the following features of polyps was documented: characteristic diagnostic signs of stroma fibrous thick-walled stromal blood vessels; glandular architectural abnormality (often as dilated glands with unusual shapes and focal crowding); epithelial metaplasias; proliferative activity of glands; stag horn glands and stromal condensation around glands; parallel arrangement of the endometrial glands' long axis to the surface epithelium (PGE); fragmentation and cautery artifact.

Hysteroscopic polypectomy

All interventions were performed without the use of single-tooth tenaculum forceps for grasping the cervix, vaginal disinfection, or local or general anesthesia, in an office setting. A 5 mm diameter continuous-flow hysteroscope with oval profile and a 30° fore-oblique telescope and a 5 Fr. operating channel (Office Continuous Flow Operative Hysteroscopy "size 5", Karl Storz, Tuttlingen, Germany) was used, with 5 Fr. mechanical or electric instruments. Distension of the uterine cavity was obtained with saline solution (NaCl 0.9%), using an electronic suction-irrigating pump (Endomat, Karl Storz, Tuttlingen, Germany). A stable intrauterine pressure of approximately 40 mmHg was obtained by setting the flow rate on 300–350 ml/min, the negative pressure suction on 0.2 bar and the pressure of irrigation at 100/120 mmHg.

When polyp size was less than 10 mm, polypectomy was performed by using 5 Fr. mechanical instruments (sharp scissors and/or crocodile forceps). The technique consisted of grasping the polyp's base with open jaws, thereby closing and gently pushing them toward the uterine fundus. The procedure was repeated several times until detachment of the polyp from its implantation in the myometrium. When polyp size was between 20 and 10 mm, polypectomy was performed using either bipolar electrode or HM.

The bipolar Versapoint Twizzle electrode (Gynecare, Ethicon, Somerville, NJ, USA) was used, connected by a flexible cable to a generator that was automatically set to vapour cut (VC3-50). Polyps were sliced from the free edge to the base into two/three fragments, large enough to be pulled out through the uterine cavity using 5 Fr. grasping forceps with teeth. To remove the entire base of the polyp without going too deep into the myometrium, in some cases the Twizzle electrode was bent by 25–30°, enough to obtain a kind of hook electrode.

Polyp morcellation was achieved by using a 5.6 mm hysteroscopic HM (TRUCLEAR-5.0, Smith & Nephew, Andover, USA) composed of a 2.9-mm blade, consisting of a rigid inner tube with cutting edges, which rotates within an outer tube. Before beginning the procedure, to reduce the scope diameter the outer sheath was removed, and the blade was secured to a reusable hand piece. The hand piece has two ports: one connected through a canister to a suction source to aspirate removed tissue; the other to a motor control unit. The window-lock procedure was performed to lock the window when the surgeon is not morcellating. This prevents continuous suction of the distending medium when the inner tube is not activated, to avoid cavity collapse. Tissue is then captured in the cutting window as the inner tube rotates at 1200–1500 rpm and cuts it into small fragments.

A suction-irrigating unit (Endomat, Karl Storz®, GmbH, Germany) was used to provide a positive pressure of 100/120 mmHg and a continuous flow control of 300–350 ml/min, and to apply to the inner tube a suction pressure 250–300 mmHg.

Statistical analysis

All data were analyzed with Prism software (GraphPad Software Inc., San Diego, CA, USA), and were expressed as mean ± SD. The Shapiro–Wilks assessment was used to evaluate whether values had a Gaussian distribution, in order to choose between parametric and non-parametric statistical tests. Comparisons of proportions and means between groups were done by using the χ^2 test and independent *t*-test, respectively. Statistical significance was set at $P < .05$.

Results

Slides from 90 cases (46 menopausal and 44 fertile cycling women) of endometrial polyps were retrieved from the archives for histopathological review (Table 1). The groups (Mechanical, Bipolar and HM) were homogeneous with respect to procedure prevalence and patients' characteristics, but differed only in terms of the dimensions of the polyps. Those collected by using grasping forceps/micro-scissors had the lowest dimensions, significantly lower ($P < 0.001$) than those in the Bipolar and HM groups (Table 1).

With respect to the quality of histopathological specimens, all were judged as adequate, interpretable and representative for polyp, and the percentage of agreements between pathologists was 100% in the diagnosis of endometrial polyp. All our reviewed samples were found to be adequate and representative for detailed histological examination and no malignant or hyperplastic polyp had been neglected.

In detail, no significant differences were identified between samples collected from the Mechanical (Fig. 1a and b) and HM (Fig. 1e–i) groups, and on examination under low power, in all HM group specimens no admixture of fragments of endometrial polyp and margin artifacts was observed (Fig. 1e–i). In samples collected by morcellation, morphological features commonly found in polyps, various epithelial metaplasias, glandular architectural abnormality, and thick-walled stromal blood vessels were well present with little chance of missing relevant pathology (Fig. 1e–i). The metaplastic squamous or atrophic epithelium was always present and intact even if morcellated tissues may contain admixtures of small

Table 1
Clinical and anthropometric details of enrolled women (in menopause: 46 patients; cycling women: 44). Data are reported as mean ± SD, when not indicated.

	Mechanical group	Bipolar group	HM group
Menopause women (*n*; %)	16 (32.6)	16 (32.6)	14 (29.4)
Age (years)	58.2 ± 5.1	60.3 ± 4.8	59.4 ± 2.9
BMI	27.9 ± 4.2	28.6 ± 5.3	26.6 ± 4.5
Parity	1.6 ± 0.2	1.5 ± 0.3	1.6 ± 0.4
Cycling women (*n*; %)	15 (34.1)	15 (34.1)	14 (31.8)
Age (years)	40.3 ± 3.9	41.7 ± 4.3	42.3 ± 4.9
BMI	24.8 ± 2.7	26.6 ± 4.2	27.1 ± 4.3
Parity	1.4 ± 0.2	1.5 ± 0.3	1.4 ± 0.4
Polyp dimension (cm)	1.2 ± 0.3*	2.6 ± 0.8	2.8 ± 0.9

* $P < 0.05$ compared to Bipolar and HM groups.