Diagnosis and Management of Endometrial Polyps: A Critical Review of the Literature

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ABSTRACT

This review article summarizes the salient literature on the diagnosis and management of endometrial polyps. Electronic resources including Medline, PubMed, CINAHL, The Cochrane Library (including the Cochrane Database of Systematic Reviews), Current Contents, and EMBASE were searched with the MeSH terms including all subheadings and keywords endometrial polyps, abnormal uterine bleeding, polypectomy, polyp management, polyp and diagnosis, and polyp and malignancy. There is a paucity of level I evidence in the literature on the diagnosis and management of this common gynecologic disease. Noninvasive investigations such as transvaginal ultrasonography, with or without the use of 3-dimensional ultrasonography and contrast techniques remain the mainstay of first-line investigation. Hysteroscopic resection is the most effective management for endometrial polyps and allows histologic assessment, whereas blind biopsy or curettage has low diagnostic accuracy and should not be performed. This article will review the cause, epidemiology, clinical presentation, diagnostic investigations, and management of endometrial polyps. Journal of Minimally Invasive Gynecology (2011) 18, 569–581 Crown Copyright © 2011 Published by Elsevier Inc. on behalf of AAGL. All rights reserved.

Keywords: Endometrial polyps; Abnormal uterine bleeding; Polypectomy; Hysteroscopic polypectomy; Infertility; Malignancy

Methods

This review was produced by searching electronic resources including Medline (1950–2010), EMBASE (1980–2010), PubMed, CINAHL, The Cochrane Library (including the Cochrane Database of Systematic Reviews), Current Contents, as well as manual searching of bibliographies of known primary research and review articles. These were searched with the MeSH terms including all subheadings and keywords endometrial polyps, abnormal uterine bleeding, polypectomy, polyp management, polyp and diagnosis and polyp and malignancy, as well as nonspecific keywords such as uterine diseases, polyps, and intrauterine were used to include a broad range of clinical studies and relevant publications.

A total of 330 articles were identified, with 265 provisionally included manuscripts retrieved, reviewed, and abstracted by team members, and with review and discussion of content
and relevance to the review. Most were Canadian Task Force Classification II uncontrolled case series, with a considerably smaller number of Canadian Task Force Classification I randomized controlled trials. Final decisions regarding inclusion or exclusion were made on the basis of the methodologic quality, which involved relevant features of population, intervention, and outcome.

Cause

Endometrial polyps are a localized endometrial intrauterine overgrowth that may be single or multiple, measuring from a few millimeters to centimeters, and may be sessile or pedunculated [1]. Endometrial polyps consist of endometrial glands, stroma, and blood vessels [2], with most polyps arising from the fundal region and extending toward the internal os. Occasionally they project through the external cervical os and can be seen in the vagina. Risk factors for the development of endometrial polyps include age, hypertension, obesity, and tamoxifen use [3–5].

Microscopically, endometrial polyps are typically a mixture of dense fibrous tissue (stroma), large and thick walled vascular channels, and glandular spaces of varying shapes and size, covered by a surface epithelium. Recent work describes the parallel arrangement of the endometrial glands long axis to the surface epithelium as a histologic feature of endometrial polyps. This feature, found in 80% of premenopausal women, was significantly less common in postmenopausal women (42%) (p = .001) and did not occur at all in any of the 56 normal control subjects, suggesting that, when present, this is an important additional histologic feature for diagnosis [1].

The exact cause of polyps is unknown, and their heterogeneity makes identification of a single causative factor unlikely. Genetic factors may be contributory to the development of endometrial polyps, with reports identifying clusters of anomalies in chromosomes 6 and 12, which may alter the proliferative process, resulting in endometrial overgrowth and polyp formation [6]. Women with various intrauterine diseases (polyps, leiomyomata, adenomyosis) demonstrate alterations in endometrial levels of matrix metalloproteinases and cytokines compared with control subjects [7]. It is not yet known whether these changes produce the pathologic processes or are a result of their development. These same biochemical mediators are implicated in the role of intrauterine disease causing fertility impairment. The preponderance of polyps in the postmenopausal group may be partly explained by an increase in a proliferation-regulating protein, p63, in this group. This protein is also a marker of reserve cells of the basalis layer, from which polyps are believed to arise [8].

Estrogen and progesterone regulate the balance of proliferation and apoptosis in normal endometrium, although conflict exists over the roles of hormonal receptors in the pathophysiology of endometrial polyps. It appears that both estrogen and progesterone contribute to the elongation of endometrial glands, stromal tissues, and spiral arteries that give the characteristic polypoid appearance to these growths [9]. In postmenopausal women, estrogen receptors are more prevalent in polyps than in normal endometrium [10], with more limited evidence showing progesterone receptors may contribute to polyp development in some women [11].

There are conflicting reports of increased estrogen and progesterone receptor concentration in the glandular epithelium of polyps but not in the stroma when compared with normal endometrium [12] and other work showing no difference in the concentration of receptors in any area [13]. It is possible that the timing in the cycle may be contributory, with endometrial staining demonstrating that estrogen receptors are more prevalent during the secretory than the proliferative phase [14]. Regardless of the hormonal receptor status, functional similarities between endometrial polyps and normal endometrium occur, with polyps undergoing similar cyclic surface changes to those seen in normal endometrium [15].

Epidemiology and Clinical Presentation

The reported prevalence of endometrial polyps varies widely and ranges from 7.8% to 34.9%, depending on the definition of a polyp, diagnostic method used, and the population studied [16–19]. The prevalence of polyps appears to increase with age, and it is reported that more postmenopausal (11.8%) than premenopausal women (5.8%) are affected (p < .01). The association with menopause may be a selection bias, given that postmenopausal women with any vaginal bleeding are more likely to be investigated [17]. There are conflicting reports of menopause being an important etiologic factor, and this is an area for future research [17, 19–23]. The incidence of endometrial polyps is unknown with several prospective studies demonstrating endometrial polyps in symptom-free women [24–27].

For both premenopausal and postmenopausal women with an endometrial polyp, abnormal vaginal bleeding occurs in approximately 68% of cases and is the most common presenting symptom for women with this disease [28]. Overall, 64% to 88% of premenopausal women with endometrial polyps have symptoms [28], most commonly presenting with menorrhagia, irregular menses, postcoital bleeding, or intermenstrual bleeding. Endometrial polyps account for 39% of all abnormal vaginal bleeding in premenopausal women [29], with this bleeding believed to be due to stromal congestion within the polyp leading to venous stasis and apical necrosis [9].

Although bleeding is a common presentation, women with a polyp may remain symptom free and present with this incidental finding on imaging for other indications [30]. It is important to note that symptoms do not correlate with polyp number, diameter, and site [31]. In the postmenopausal period, 56% of women with an endometrial polyp present with symptoms such as postmenopausal bleeding [28, 31]. Polyps account for only 21% to 28% of all causes.
of postmenopausal bleeding [21,28,29]. The presence of a polyp does not always cause symptoms, with a class II study of 686 women aged 20 to 74 years reporting that abnormal uterine bleeding is significantly less frequent (p = .015) among women with polyps compared with those without [17]. Such data indicate that most postmenopausal women with polyps are symptom free, and abnormal bleeding is not commonly associated with polyps in premenopausal women.

In premenopausal women, endometrial polyps are associated with infertility, although the causal relationship remains uncertain [32]. Hypotheses include mechanical obstruction hindering ostium function and affecting sperm migration [33], or biochemical effects of polyps on implantation or embryo development. The latter reflects the finding of increased levels of metalloproteinases and cytokines such as interferon-gamma found in polyps when compared with normal uterine tissue [7]. Women treated with gonadotropins for infertility are exposed to a higher level of estrogen, which predisposes them to development of endometrial polyps [34]. The incidence of polyps occurring in infertile women is widely variable, ranging between 3.8% to 38.5% of women with primary infertility, 1.8% to 17% of women with secondary infertility, and 1.9% to 24% of infertile women when combined [32,35–37]. The specific subpopulation and the diagnostic voracity are factors that may lead to this wide variation.

Women using tamoxifen are at specific risk for development of polyps, with class II studies reporting up to 30% to 60% prevalence in this particular group [22,38–40]. Premenopausal women using the combined oral contraceptives may be at reduced risk for development of polyps, with a large population study showing the overall prevalence of polyps in premenopausal women to be 5.8%, whereas users of combined oral contraceptives had a prevalence of 2.1% [17]. Other risk factors that may predispose to endometrial polyps include hypertension and obesity [22]. Increased levels of estrone is the likely mechanism in obese women, although the link with hypertension may be a confounder of obesity, rather than a direct correlation to the causation of polyps.

Cervical polyps are associated with endometrial polyps in 24% to 27% of cases [23,41,42]. The frequency of the association increases with the presence of abnormal bleeding and advancing age (p < .001), with up to 56.8% of postmenopausal women presenting with vaginal bleeding having both diseases [42]. Women who have atypical glandular cells demonstrated on Pap smear may be diagnosed with an endometrial polyp in 3.4% to 5% of cases [30,43].

**Tendency to Malignancy**

Most endometrial polyps are benign; however they may become hyperplastic, with malignant transformation developing in 0% to 12.9% of polyps in case series reported to date [3,19,44–48]. A recent meta-analysis has reviewed malignant risk in detail, and the reader is directed to this for further information, with important findings in this area included here [49]. The most salient fact from this review is that the risk of malignancy found in endometrial polyps is highest in postmenopausal women with symptoms. The reported incidence of carcinoma confined to endometrial polyps varies between 0% to 4.8%, depending on the population studied and the diagnostic methods used [16]. Although the risk of malignancy is low in premenopausal women [50], it has been significantly correlated with increasing age and menopausal status (p = .03); polyps with a size greater than 1.5 cm (p < .001) [45]; and hypertension and tamoxifen use [4]. In a class II-3 study, the incidence of endometrial hyperplasia and malignancy was similar and clinically relevant in patients with symptoms (3.2%) and symptom-free patients (3.9%), suggesting that polyps should be removed whenever identified [47]. The use of ultrasonography may aid in the diagnosis of neoplastic change within endometrial polyps, with sensitivity of 67% to 100% and specificity of 71% to 89% [51,52]. The variation in range is dependent on the endometrial thickness used as the requirement for further investigation by more invasive methods. The data are limited in this area, and the differentiation of endometrium from endometrial polyps sonographically with regard to possible neoplastic change is a confounding factor.

**Natural History**

The spontaneous regression rates of incidentally detected endometrial polyps at 1 year is estimated in one study to be 27% [27]. In this class II-1 study, the size of polyps at diagnosis correlated with their likelihood of persistence at 12 months follow-up. Polyps with a mean length of 15.1 mm were significantly less likely to have spontaneously regressed at follow-up compared with polyps that had a mean length of 10.7 mm (mean difference 4.4, 95% confidence interval [CI] 0.2–8.6, p = .04) [27], suggesting that smaller polyps are more likely to regress spontaneously. A separate prospective study also demonstrated that smaller polyps <1 cm were more likely to regress spontaneously, whereas those >1 cm were more likely to persist and cause abnormal uterine bleeding, although the difference was not significant (p = .16) [53]. Polyp regression may be associated with isolated episodes of menorrhagia associated with cramping followed by resumption of normal menstruation possibly related to the passage of endometrial polyps [53].

**Diagnosis**

**Imaging**

**Transvaginal Ultrasonography**

On transvaginal ultrasonography (TVUS), an endometrial polyp typically appears as a hyperechoic lesion with regular contours within the uterine lumen, outlining the
endometrial walls on which it rests, surrounded by a thin hyperechoic halo [26]. Cystic spaces corresponding to dilated glands filled with proteinaceous fluid may be seen within the polyp [54] or the polyp may appear as a nonspecific endometrial thickening or focal mass within the endometrial cavity [55]. Such sonographic findings are not specific to polyps, and other endometrial abnormalities such as submucosal fibroids may have the same features [56]. To aid in the diagnosis of an endometrial polyp, TVUS is best performed in premenopausal women before day 10 of the cycle when the endometrium is at its thinnest to minimize the risk of false-positive and -negative findings [57].

Table 1 compares the diagnostic accuracy of various imaging techniques for endometrial polyps. TVUS has reported sensitivity of 19% to 96%, specificity of 53% to 100%, positive predictive value (PPV) of 75% to 100%, and negative predictive value (NPV) of 87% to 97%, when compared with hysteroscopy with guided biopsy. A paucity of level I evidence may explain this wide range of data, as well as studies describing a small number of patients. Within some of these studies the pathologic condition is heterogeneous, with some combining both endometrial polyps and submucosal fibroids as a diagnostic group, making exact figures difficult to extract. In a single large prospective study evaluating the causes of menorrhagia, the reported sensitivity, specificity, PPV, and NPV of TVUS for the diagnosis of endometrial polyps were 86%, 94%, 91%, and 90%, respectively [61].

There are limited data to support color-flow or power Doppler aiding in the differentiation of hyperplasia and malignancy in polyps [51,79,80]. A class II-2 study demonstrated specificity and NPV of 95% and 94% respectively in the diagnosis of endometrial polyps with the addition of color-flow Doppler scanning to TVUS to identify a single feeding vessel [81], whereas others demonstrated adding color-flow Doppler scanning to have low specificity for endometrial cancer [51], with no difference in the histologic condition of polyps on the basis of their resistive index, pulsatility index, or size [82].

The use of power Doppler sonography seems more promising [79,83,84]. This technique offers some advantages over conventional color-flow Doppler sonography that makes it a better technique for depicting vascular networks. There is level II evidence demonstrating that the addition of power Doppler sonography with identification of a single vessel pattern improves diagnostic sensitivity to 89% and specificity to 87% for an endometrial polyp [83], in comparison to the multivessel or scattered vessel pattern seen in malignant lesions or endometrial hyperplasia [79]. This benefit was seen in the diagnosis of endometrial polyps in symptomatic patients, whereas sensitivity in women with symptoms remained largely unchanged from gray-scale TVUS alone [83]. At this time, sonographic examination either with or without color-flow or power Doppler sonography is not a substitute for pathologic evaluation after surgical removal.

**Saline Infusion Sonography**

The use of saline infusion sonography (SIS) or sonohysterography (SHG) increases sonographic contrast of the endometrial cavity, enabling delineation of the size, location and other features of an endometrial polyp. With SIS, polyps appear as echogenic, smooth, intracavitary masses with either broad bases or thin stalks outlined by fluid [55]. This technique may outline small endometrial polyps missed on gray-scale TVUS and is likely improve diagnostic accuracy [60,85–89]. In a prospective comparative study, the use of saline solution as a contrast agent significantly enhanced the sensitivity and specificity compared with TVUS alone, because it detected small lesions that were missed by noncontrast sonography [60]. Differentiating endometrial polyps from submucosal fibroids can be difficult, but examination of lesion echotexture and identification of overlying echogenic endometrium are useful features to distinguish the two [90].

When compared with hysteroscopy by use of guided biopsy for the identification of different endometrial diseases, SIS has sensitivity of 58% to 100%, specificity of 35% to 100%, PPV of 70% to 100%, and NPV of 83% to 100% [37,56,59,60,62]. A number of prospective comparative studies have reported no significant difference between SIS and diagnostic hysteroscopy in diagnosing endometrial polyps [60,86,91].

When compared with hysteroscopy, SIS has the advantage of assessing both the uterine cavity and other uterine and pelvic structures and visualizing potential myometrial and adnexal abnormalities [91]. Previous work reports SIS to be less painful than diagnostic hysteroscopy in the outpatient setting [92], although these studies were not performed with the smaller-diameter hysteroscope in common use today, with both techniques requiring the cervix to be traversed and uterine distension to occur [93]. Disadvantages of SIS include an inability to determine final endometrial disease [56], a longer learning curve compared with noncontrast TVUS [87], and patient discomfort caused by fluid leakage or pain with the use of a balloon catheter [94]. Gel instillation sonohysterography may be an alternative solution to this issue, although limited data are currently available on this technique [94].

**Three-dimensional TVUS and Three-dimensional SIS**

Three-dimensional ultrasonography (3-D US) is a noninvasive imaging technique with the ability to generate multiplanar reconstructed images through the uterus and its external contours. One of the most useful scan planes obtained with the 3-D US is the coronal view which is usually not obtained by two-dimensional (2-D) ultrasound because of the limited mobility of the transvaginal transducer [95]. Coronal views allow more accurate visualization between the endometrium and myometrium at the fundus and cornual angles [96], providing superior diagnostic accuracy in detecting endometrial polyps compared to 2-D TVUS. A class
<table>
<thead>
<tr>
<th>Method [references]</th>
<th>Total number of patients included in studies</th>
<th>Sensitivity Median (range)</th>
<th>Specificity Median (range)</th>
<th>PPV Median (range)</th>
<th>NPV Median (range)</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Future development</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVUS [18,58–64]</td>
<td>1807</td>
<td>91% (19%–100%)</td>
<td>90% (53%–100%)</td>
<td>86% (70%–100%)</td>
<td>90% (87%–97%)</td>
<td>Readily available</td>
<td>Not specific for endometrial polyp</td>
<td>Complementary use of power and color-flow Doppler may aid in diagnosis</td>
</tr>
<tr>
<td>3-Dimensional TVUS</td>
<td>3873</td>
<td>100% (100%)</td>
<td>85% (71%–99%)</td>
<td>94% (89%–99%)</td>
<td>100% (100%)</td>
<td>Noninvasive and safe</td>
<td>Expensive and may not be readily available</td>
<td>Requires further evaluation in methodologically sound studies</td>
</tr>
<tr>
<td>SIS [37,56,58,59,62, 64–70]</td>
<td>1354</td>
<td>95% (58%–100%)</td>
<td>92% (35%–100%)</td>
<td>95% (70%–100%)</td>
<td>94% (83%–100%)</td>
<td>Evaluates all surfaces of uterus and adnexae</td>
<td>Does not allow histologic diagnosis</td>
<td>Gel instillation may lessen patient discomfort</td>
</tr>
<tr>
<td>3 Dimensional SIS</td>
<td>173</td>
<td>94% (92%–95%)</td>
<td>94% (88%–99%)</td>
<td>99% (97%–100%)</td>
<td>97% (97%)</td>
<td>Accuracy comparable to hysteroscopy</td>
<td>Reported accuracy comparable to hysteroscopy</td>
<td>Further studies with larger number of patients are required</td>
</tr>
<tr>
<td>Blind biopsy [62,73,74]</td>
<td>1411</td>
<td>10% (8%–46%)</td>
<td>100% (100%)</td>
<td>66% (31%–100%)</td>
<td>33% (7%–58%)</td>
<td>Evaluates all surfaces of uterus</td>
<td>Allows a histologic diagnosis if tissue actually sampled</td>
<td>Has no role in diagnosis of polyps when used alone</td>
</tr>
<tr>
<td>Diagnostic hysteroscopy [18,60,62,72,75–77]</td>
<td>5261</td>
<td>90% (58%–99%)</td>
<td>93% (87%–100%)</td>
<td>96% (21%–100%)</td>
<td>93% (66%–99%)</td>
<td>Higher accuracy than other imaging modalities</td>
<td>Higher skill requirement than TVUS</td>
<td>Newer instruments allow outpatient operative hysteroscopy with reduced cost and same clinical outcomes</td>
</tr>
<tr>
<td>Flexible hysteroscopy [78]</td>
<td>661</td>
<td>74%</td>
<td>91%</td>
<td>—</td>
<td>—</td>
<td>Better tolerated than rigid hysteroscopy</td>
<td>Inferior images to rigid hysteroscopy</td>
<td>Newer instruments with video chips allow better quality images</td>
</tr>
<tr>
<td>Hysterosalpingography [37]</td>
<td>286</td>
<td>98%</td>
<td>35%</td>
<td>70%</td>
<td>92%</td>
<td>Provides information on tubal patency</td>
<td>Exposure to radiation and contrast material</td>
<td>Has no role as primary imaging for endometrial polyps</td>
</tr>
</tbody>
</table>
II-2 study of 3850 consecutive 3-D US cases reported sensitivity of 100%, specificity of 99%, PPV of 99% and NPV of 100% in diagnosing endometrial polyps when compared to hysteroscopy with biopsy [35]. These figures need to be interpreted with caution because only those with a suspected polyp on 3-D US subsequently underwent hysteroscopy and therefore do not include those women with endometrial polyps who had negative 3-D US result. On reviewing these data, there is no capacity to provide NPV in this study. Smaller studies with this technique have reported more modest figures of 100% for sensitivity, 71% for specificity, 89% for PPV, and 100% for NPV [64].

Adding saline solution contrast into the endometrial cavity to perform 3-D SIS may provide additional information in the diagnosis of endometrial polyps, because it combines the advantages of TVUS and SIS. However, studies report only slightly higher specificity (88% to 99%) and PPV (97% to 100%) for endometrial polyps than those of 3-D US, with sensitivity of 92% to 95% and NPV of 97% [64,97]. Given these data, the greater expense of 3-D sonography and its less-frequent availability, 2-D US with intrauterine contrast should be preferred as an effective and reliable noninvasive method to diagnose polyps.

**Histologic Diagnosis**

**Blind Biopsy**

Blind dilation and curettage is inaccurate in diagnosing endometrial polyps and should not be used as a diagnostic method [98]. Despite specificity and PPV of 100%, its use is limited by its low sensitivity of 8% to 46% and NPV of 7% to 58% when compared with hysteroscopy and guided biopsy [62,73,74]. Use of an endometrial sampler or a curette can miss pedunculated polyps and fragmentation of sessile polyps may make histologic diagnosis difficult [99]. In postmenopausal women, this is particularly the case for polyps, which tend to be broader based with an uneven surface caused by small translucent cysts covered by atrophic endometrium [99].

**Hysteroscopy with Guided Biopsy**

Hysteroscopy with guided biopsy is the gold standard in the diagnosis of endometrial polyps [72]. The main advantage of hysteroscopy is the ability to visualize and remove polyps concurrently. Diagnostic hysteroscopy alone allows only subjective assessment of the size, location, and physical properties of the lesion, with reported sensitivity of 58% to 99%, specificity of 87% to 100%, PPV of 21% to 100%, and NPV of 66% to 99% when compared with hysteroscopy with guided biopsy [18,60,62,75,76,97]. Despite the increasing popularity of office hysteroscopy, most routine diagnostic hysteroscopies are still performed in an operating theater and require anesthesia and hospitalization [56,100]. This may be explained by the requirement of a high level of expertise to perform hysteroscopy in an ambulatory or office setting, especially if operative hysteroscopy is required concurrently. The evidence favors outpatient hysteroscopy for diagnosis, with 2 large-scale studies reporting success rates of 92% to 96% in this setting, with no difference between premenopausal and postmenopausal women [21,76], and a class I study reporting less expense and greater patient preference for an outpatient procedure [101]. The addition of polypectomy for small polyps is possible, and technological improvements and greater surgeon skill should see increased uptake of outpatient procedures in the future.

Flexible hysteroscopy causes less pain for patients and allows an easier passage through the cervical canal when compared with rigid hysteroscopy [102,103], making it more suited for outpatient procedures. It is reported to have lower sensitivity of 74% for the diagnosis of endometrial polyps when compared with rigid hysteroscopy [77,78]. This may be explained by the lower quality image obtained through the fiberoptic bundle that carries both light and the images, although newer flexible hysteroscopy with video chips rather than the old fiberoptic image bundle allows an improved image quality [103]. Expense, delicacy of the instrument with easy breakage, and more limited operative instrumentation are disadvantages of flexible hysteroscopes compared with rigid hysteroscopes.

With continuing technological improvements producing narrow diameter hysteroscopes, operative hysteroscopy can be readily performed in an outpatient setting [104]. A large-scale class II study reported 4863 consecutive operative outpatient hysteroscopies including 2306 for endometrial polyps, in which most small endometrial polyps were removed with minimal discomfort [104]. Polyps larger than the diameter of the internal cervical os may be best removed with the patient under general anesthesia given the increased patient discomfort and longer operating time.

Choice of distension medium is important when considering patient comfort and improved diagnostic accuracy. Normal saline solution causes significantly less shoulder tip and lower abdominal pain compared with carbon dioxide [105], allowing clear, reliable imaging for accurate diagnosis [106] and is widely used in the outpatient setting [21,34,104,107]. Although some patients may not require analgesia or anesthesia for office hysteroscopy, the use of paracervical block or intrauterine anesthetics, particularly if operative hysteroscopy is performed subsequently, may be helpful [108].

Complication rates at hysteroscopy are low, with a large-scale class II-1 study reporting an overall complication rate of 0.28% in 13 600 hysteroscopic procedures; the rate for operative removal of an endometrial polyp in this study is 0.4% [109]. Approximately half of the complications were entry related, whereas the remainder were related to the surgeon’s experience and type of procedure. Overall, hysteroscopic polypectomy has half the risk of complication when compared with hysteroscopic myomectomy or endometrial ablation and 1/10th the risk for complication compared with hysteroscopic synchienolysis [109].
Other Diagnostic Tests

Hysterosalpingography may define endometrial polyps as pedunculated, nonspecific filling defects within the endometrial cavity, with high sensitivity (98%) but low specificity (34.6%) compared with hysteroscopy [37]. It can be used in infertile women to assess tubal patency, but, with disadvantages including use of ionizing radiation, iodinated contrast materials, and patient discomfort, routine use of hysterosalpingography for diagnosis of an endometrial polyp cannot be recommended.

Endometrial polyps can be identified on magnetic resonance imaging as low signal intensity intracavitary masses surrounded by high signal intensity fluid and endometrium by T2-weighted magnetic resonance imaging. Very high cost and limited availability, with limited advantages over sonography, preclude this technique from routine use. Computed tomography scanning has a limited role because of its cost, radiation exposure, and low sensitivity of 53% for endometrial thickness when compared with TVUS, even with contrast enhancement [110]. Virtual hysterosalpingography with 64-slice computed tomography scanning to assess the uterine cavity has been described [111–113], although limited data are currently available, and it should not be considered outside of a research protocol at this time.

Management

For women with endometrial polyps, management is dependent on symptoms, risk of malignancy, fertility issues, and operator skills. Management options will be considered under the headings of conservative nonsurgical, conservative surgical, and radical surgical approaches. Table 2 summarizes the management strategies for endometrial polyps.

Conservative Nonsurgical Management

Having diagnosed endometrial polyps, their removal either in the office or with the patient under general anesthesia is considered a low-risk but not a no-risk procedure and the risk/benefit ratio must be discussed with the patient. In two class II-2 studies, it was found that polyps ≤10 mm have a 27% chance of spontaneous regression over 12 months and a low chance of malignancy [27,53], indicating that symptom-free women with polyps ≤10 mm in size could be managed conservatively.

Medical treatments may have some role in the management of endometrial polyps and GnRH agonists are reported to give short-term symptomatic relief for endometrial polyps; but symptom recurrence is common with treatment cessation [125]. Although GnRH agonists could be used as an adjunctive treatment before hysteroscopic resection [125], this must be considered against the costs and side effects of this medication and the comparative benefit from simple alternate extirpative treatments without the use of these medications.

In a class II study of 3 different hormone replacement therapy types (2.5 mg with conjugated estrogen 0.625 mg and medroxyprogesterone 2.5 mg; estradiol 2 mg and norethisterone 1 mg; tibolone 2.5 mg), the progestin with the highest antiestrogenic activity (tibolone) is suggested to reduce the development of endometrial polyps. Follow-up hysteroscopic examination at 36 months after treatment reported few polyps in any group (range 0–3), and the clinical superiority of any of these medications must be considered in a circumspect manner until class I studies are undertaken. Importantly, the balance between disease suppression and other side effects of these medications must be considered [126].

A randomized trial of LNG-IUS compared with observation indicates that reduced endometrial thickness through progesterogenic suppression may be a factor in reducing polyp development. In the 4.5-year period of the study, 8 new polyps were reported in the observation group compared with 3 in the LNG-IUS group (p = 0.16). In this intention to treat study, the 3 polyps in the LNG-IUS group occurred in 1 woman who did not have the LNG-IUS inserted and the remaining 2 in women who had it removed at 1 year because of side effects. Although these figures are encouraging, the use of LNG-IUS for the treatment of polyps should be currently limited to research protocols [127].

Conservative Surgical Management

Blind dilation and curettage has been the standard management option for abnormal uterine bleeding and suspected endometrial disease for many years and is still common practice, with a survey from the United Kingdom in 2002 reporting that 2% of gynecologists used blind dilation and curettage for the management of endometrial polyps, and 51% were performing blind curettage after hysteroscopy for the removal of polyps [100]. Evidence suggests that this practice is ineffective and has a significant complication rate (1:100 perforation rate and 1:200 infection rate) associated with its use. A class II study reports complete removal of endometrial polyps by dilation and curettage alone in 8/51 patients (4%), whereas the addition of polyp forceps increases complete extraction to 21/51 patients (41%). These class II-2 and II-3 studies indicate that the endometrial disease is removed less than 50% of the time, and in many cases removal is incomplete [73,74,128–130]. Given the low complication rate associated with hysteroscopic removal and its widespread availability, safety, and ability to be performed in an outpatient setting [76,105,109,131,132], blind dilation and curettage should be relegated to history and replaced by direct visualization and targeted disease removal.

TVUS-guided polypectomy has been suggested as a possible improvement on the blind technique; however, after an early feasibility study, there has been little further enthusiasm for this technique [133]. The mean operating time for the procedure was 8 minutes (95% CI, 5.9–10.4) and was successful in 32/37 (86.5%) cases (95% CI, 75.5–97.5). In the failed cases, unsatisfactory imaging and failure to grasp the polyp were the causes. Two patients (5.4%) bled from the tenaculum insertion site, necessitating a suture for hemostasis.
Hysteroscopic Resection

Hysteroscopy and polypectomy is an effective, safe method of diagnosing and treating an endometrial polyp that allows expeditious recovery, return to normal activities, and short hospital or office stay [114,115,119]. A variety of methods are practiced to remove polyps at hysteroscopy, and Table 2 summarizes these techniques and their relative advantages and disadvantages.

The type of instruments used for polyp removal is dependent on availability, expense, and surgical experience, as well as the size and location of the lesion. Large and sessile polyps are best removed with a hysteroscope fitted with an electrosurgical loop (resectoscopic), whereas small and pedunculated polyps may be removed with either scissors or small polyp forceps in an operating hysteroscope under direct vision [114]. In a class II-2 study with 240 women with endometrial polyps, resectoscopic polypectomy took significantly longer to perform (p < .05) and carried a higher risk of complications than hysteroscopic polypectomy with other instruments, such as microscissors, grasping forceps, and electric probe. This was likely due to the larger polyp size and greater cervical dilation required for this technique. There was no recurrence of polyps in the resectoscopic group, whereas the use of grasping forceps was associated with a 15% recurrence rate [114].

Other instruments include the bipolar Versapoint (Gynecare, Sommerville, NJ) system with less cervical dilation compared with the operating hysteroscope and the use of saline solution rather than glycine, potentiating a decreased risk of hyponatraemia and its sequelae [28,122]. The hysteroscopic morcellator removes polyp chips as it resects, allowing continuous vision, a short operating time, and less movement of instruments through the cervix with decreased potential for cervical laceration and fluid loss [120,121]. These techniques may be limited by availability and cost, and there is no evidence that they significantly alter clinical outcome at this time. Randomized, comparative studies with standard electrosurgical resection are recommended.

Radical Surgical Options

Hysterectomy is the definitive treatment for endometrial polyps. Although this guarantees no recurrence and no potential for malignancy, its invasive nature, risk of surgical morbidity, cost, and implication for future fertility are factors that require careful consideration and discussion with

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Comparison of polyp management</th>
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<tr>
<td>Management</td>
<td>Advantages</td>
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<tr>
<td>Dilatation and curettage or Hysteroscopy followed by blind grasping forceps/curettage [74,114]</td>
<td>Readily available</td>
</tr>
<tr>
<td>Hysteroscopic polypectomy [102,104,109,114–119]</td>
<td>Accurate, complete resection of polyp Early recovery, return to normal activities Minimal hospitalization Low risk of complication (0.38%) Associated with good reproductive outcome</td>
</tr>
<tr>
<td>Hysteroscopy and polyp morcellation [120,121]</td>
<td>Easy to use No glycine for distension Time saving Short learning curve</td>
</tr>
<tr>
<td>Hysteroscopy and bipolar removal of polyp [28,122] Hysterectomy [123,124]</td>
<td>Easy to use No glycine for distension</td>
</tr>
<tr>
<td>Medical [125]</td>
<td>Noninvasive</td>
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the patient [124]. There are no class I studies comparing hysterectomy with conservative treatments for polyps; however, a pragmatic approach with the less-invasive treatment seems appropriate in the absence of such evidence.

Clinical Outcomes

Clinical outcomes after treatment of endometrial polyps are generally good. In a randomized clinical trial of 150 women with an endometrial polyp allocated to hysteroscopic removal or observation, there was no difference identified in the volume of menstrual loss between the groups, although the symptoms, such as intermenstrual bleeding, were significantly improved by removal at follow-up (residual symptoms following polyp removal 7/75 vs conservative 28/75; p = .001) [134]. Other studies report the symptomatic improvement to be very good, with abnormal uterine bleeding resolved after hysteroscopic polypectomy in 75% to 100% of cases [135,136].

Adhesion risk is low after polypectomy, because the myometrium is not incised and the endometrium has an excellent regenerative capacity [137]. A class I study with 90 women reports no adhesions after hysteroscopic polypectomy, and routine antiadhesion treatments are unlikely to be of benefit in this group of patients [116].

In a class II-3 retrospective study, recurrence of polyps after 9 years of follow-up after hysteroscopic polypectomy was reported in 5 of 240 patients (3.7%), requiring repeat hysteroscopic removal in 3 (1.7%) and subsequent hysterectomy in 2 (0.8%) [114]. This is in contrast to a class II-3 study that reports recurrence of symptoms after polypectomy of 60% by survival curve analysis; however, only 2/78 (2.5%) women were identified to have recurrent polyps, with many other diseases present in the remaining patients including abnormal uterine bleeding [138]. This indicates that although recurrence of polyps is low, the presenting symptoms leading to surgical removal are not always related to the presence of the polyp. It is therefore important to differentiate recurrence of disease with recurrence of symptoms, and discussion of this fact with the patient before intervention is required.

Most of the data for polypectomy in subfertile patients suggests that removal improves fertility, with reported pregnancy rates varying between 43% to 80% [114,139,140]. Both spontaneous pregnancy rates and those associated with assisted reproductive technology are reported to be increased after polypectomy. In a class I study, polypectomy before intrauterine insemination significantly increased subsequent pregnancy success (relative risk 2.1; 95% CI 1.5-2.9, p < .001). The rate of pregnancy in the study group was 51%, and of these, 65% had a spontaneous conception before the first intrauterine insemination, whereas all pregnancies in the control group were obtained during the fertility treatment [141].

There is conflict surrounding the size of polyp needed to be removed to achieve an improvement in assisted reproductive technology, with data suggesting that removal of polyps <2 cm has no impact on the outcome of fertility treatment [142-144]. In contrast, a class II-2 study suggested that restoration of fertility was not dependent on the size of lesion removed (139) and a class II-3 study reported no significant difference in the reproductive outcome for patients with polyps ≤2.5 cm or >2.5 cm [114].

Conclusion

Endometrial polyps are a common gynecologic disease that increases with age and are rarely associated with malignancy. Polyps may not be responsible for abnormal uterine bleeding symptoms in premenopausal women when they are found, although, when diagnosed, removal seems prudent to exclude this as a simple causative factor. Noninvasive techniques such as gray-scale TVUS are a reliable modality for diagnosis, with diagnostic improvement by use of contrast techniques. In clinical practice, the choice of diagnostic method for endometrial polyps is dependent on the condition of the patient, the facilities available, comparative costs, and the physician’s experience with these modalities.

For management, hysteroscopic resection is safe and effective and allows histologic assessment. Blind techniques should be avoided when visual techniques are available for excision. Conservative treatment is a viable option pending patient preference and risk factors. For patients with infertility and the presence of polyps, removal of disease is likely to be helpful to subsequent pregnancy. Conservative treatments for benign lesions should be favored over radical options.

References


92. O’Connell LP, Fries MH, Zerlingue E, Brehm W. Triage of abnormal postmenopausal bleeding: a comparison of endometrial biopsy and


