Original Article

Assessment of Long- and Short-Term Outcomes of Hysteroscopic Polypectomy in Patients with Uterine Polyps

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Abstract

Background: Polyps are a common diagnosis in women of different ages. They can cause a variety of symptoms from bleeding to infertility and can even be the progenitor for malignancies.

Materials and Methods: This was a retrospective cohort study conducted in Isfahan. A total of 1004 patients were included in this study. After hysteroscopic polypectomy, patients had their information regarding the complications and recurrence recorded.

Results: Symptoms improved in 639 (63.8%). Recurrence of polyps was seen in 143 (14.2%) patients. A total of 170 had a successful pregnancy, with 110 of them spontaneous. Using scissors had lower recurrence compared to graspers. Eight cases had complications during the treatment, two of which were major.

Conclusion: Hysteroscopic polypectomy is the treatment of choice for uterine polyps. We show hysteroscopic polypectomy to have a high success rate and a low complications rate, with polypectomies done using scissors to have lower risk of complications or recurrence compared to graspers.

Keywords: Abnormal uterine bleeding, hysteroscopy, polyps, post-operative complications, recurrence

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Introduction

Uterine polyps (UPs) are abnormal growths of the endometrial glands containing blood vessels and endometrial stroma. They vary in size and in rare cases can even fill the uterine cavity.[1] These growths are usually asymptomatic; however, they can be a cause of abnormal uterine bleeding (AUB) and even infertility.[2,3] While the exact prevalence rate of UPs is unknown, about 1–8% of women have had a history of UPs, with older women being in higher risk of developing these growths.[4] Several molecular mechanisms have been proposed to play a role in the development of endometrial polyps, such as monoclonal endometrial hyperplasia,[5,6] over-expression of endometrial aromatase, and gene mutations.[7,8]

About 80% of UP cases are asymptomatic and are incidentally found in sonographic imaging performed for other reasons. AUB is the most common symptom. While the exact prevalence varies according to the criteria used to define a polyp, the diagnostic test used, and the type of population studied, AUB is most definitely more common in patients with UPs.[9] About 11–45% of patients trying for *in vitro* fertilization (IVF) have been diagnosed with UPs,[10] and it is a common finding in patients with recurrent implantation failure (RIF).[11]

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These polyps are usually benign; however, about 2.7% of UP cases end up malignant, with post-menopausal women being at a higher risk of malignancy (4.93%) compared to pre-menopausal women (1.12%).[12]

UPs are usually diagnosed with transvaginal ultrasonography (TVUS), saline infusion sonography (SIS), or hysteroscopy.[13] Their treatment is dependent on the symptoms, risk of malignancy, and infertility in patients.[1] Hysteroscopic polypectomy is the optimal treatment for polyps needing conservative surgery. It is an easy-to-perform, effective, low-cost, and minimally invasive method. Hysteroscopic polypectomy has a success rate of over 75% and thus has become the method of choice for treating patients.[14] Hysteroscopic polypectomy is effective in treating infertility caused by UPs.[15-17] Recurrence rates reported for hysteroscopic polypectomy differ. Some studies have shown hysteroscopic polypectomy to have a recurrence rate of 10–15%,[15,18] while others have reported rates of up to 43.6%.[19,20] It appears to be an effective treatment with most patients reporting an improvement of symptoms following a polypectomy,[21] although persistence or recurrence of AUB in pre-menopausal women appear to be relatively high.[21,22] It is clear that since the exact prevalence of improvement or recurrence after polypectomy is not known, more studies should be done in this regard. Hysteroscopic polypectomy, just like any other surgical technique, has its own risks and side effects, but the overall incidence of complications is 0.95%.[23] The most frequently reported complications are hemorrhage, uterine perforation, and cervical laceration.[24,25]

According to various results of hysteroscopic polypectomy, we decided to assess improvement of symptoms, pregnancy rates following polypectomy, polyp recurrence rates with scissors, polyp recurrence rates with graspers, complications of polypectomy, rate of hysterectomy following polypectomy, and the incidence of cancer in the polyps.

Materials and Methods

This is a retrospective cohort study performed from May 2016 to February 2020 in an educational and medical center in Isfahan and was approved by the ethics committee of Isfahan Medical University of Sciences (IR.ARI.MUI.REC.1401.139). The target population was women having underwent hysteroscopic polypectomy. The inclusion criteria included any woman with an ultrasonographic diagnosis of UPs alongside either a history of AUB or a history of infertility or with a polyp larger than 1.5 cm or having more than one polyp. Both pre- and post-menopausal women meeting the criteria were included. Patients having a pathologic diagnosis of UPs instead of an ultrasonographic one were also included in this study. The exclusion criteria included any patient having underwent dilation and curettage for UPs or failure to report polyps in pathology or the patient being unaware of the return of symptoms in the first 2 years following the polypectomy. Assuming a recurrence rate of 15% and a confidence interval of 95%,[26] our sample size was calculated to be 1110. We enrolled 1110 patients in this study. A total of 56 patients did not return after 2 years, 30 did not consent to the study, and 20 patients had unrelated surgeries, making them ineligible for follow-up. In the end, 1004 patients were included in this study. Among the pre-menopausal patients, 218 (21.7%) participants were referred from infertility clinics, and another 512 (50.9%) were referred due to their symptoms. Other patients (274) were menopausal and were referred due to AUB and TVUS demonstrating their polyps, or their polyps were an incidental finding in their TVUS.

Characteristic baseline information of the subjects, instruments used during surgery (scissors or graspers), their clinical history, laboratory data, and any complications during or after surgery were extracted from the medical records of participants. During 2 years from the time of hysteroscopy, the patients were followed up with history taking. They also underwent TVUS if they exhibited further symptoms. They were also asked about whether they had undergone hysterectomy and the reason for it. The patients were also asked about whether they had become pregnant and if it was spontaneous pregnancy or they used some kind of assisted reproductive technology (ART).

In most cases, hysteroscopy was performed in the follicular phase of the menstrual cycle and under general anesthesia. We performed diagnostic and operative hysteroscopy with a standard rigid hysteroscope. We also removed the UPs with micro-scissors or grasping forceps and continued the polypectomy until we reached a normal panoramic view of the uterus. Then an endometrial biopsy sample was taken to rule out the other causes. We used 0.9% normal saline to distend the uterine cavity and measured the amount of fluid deficit in order to prevent volume overload.

Statistical analysis was done using SPSS version 25 (SPSS Inc., Chicago, IL, USA). Quantitative data were analyzed using Chi-square tests and quantitative data using independent sample T-test. The significance level was defined as P value < 0.05.

Results

Our patients underwent a 2-year follow-up in terms of symptom improvement, pregnancy rates, polyp recurrence rate, the rate of hysteroscopy complications, hysterectomy rate after polypectomy, and polyp cancer rate. The average age was 36.37 ± 5.57 and 52.61 ± 5.60 in pre- and post-menopausal patients, respectively. Most of the patients had a complaint of AUB, which was seen in 658 (65.5%). In the pre-menopausal group, 218 (21.7%) had a complaint of infertility. Hysteroscopic polypectomies were performed with micro-scissors through the operative hysteroscope in 612 (60.9%) of the patients, and 392 (39.1%) of the polypectomies were done by graspers. Out of 730 pre-menopausal patients, 218 (29.8%) were referred with a chief complaint of infertility and 170 (77.9%) had a successful pregnancy following polypectomy [Table 1].

Overall, patients reported over 60% improvement rate of the symptoms. In our study, 143 (14.2%) suffered from

a recurrence of polyps, with 96 (9.5%) of them being pre-menopause and 47 (4.7%) of them being menopausal. We found scissors to have an overall lower rate of recurrence compared to graspers, with 9.8% and 17.8% of recurrence rate, respectively (*P* value < .05) [Table 2].

There were complications in 8 (0.79%) patients. Cervical laceration was seen in 2 (0.2%), uterine false track in 4 (0.39%), and uterine perforation in 2 (0.2%). In our study, 86 (13%) of our patients had undergone hysterectomy due to unresolved symptoms, with 38 (5.8%) of them being pre-menopause and 48 (7.35%) being menopausal, with this difference being statistically significant (*P*-value < .001). Six of the polyps were also cancerous, with four of them being in the post-menopause group. However, these numbers and the number of surgical complications were too low to be analyzed correctly [Table 3].

Discussion

Hysteroscopy provides a simple, safe, and effective tool to diagnose intra-uterine abnormalities and lesions. Considering how UPs are common, hysteroscopic surgery has become an important procedure in patients with polyps. In this study, we reported the short- and long-term outcomes of 1004 participants who had undergone hysteroscopic polypectomy. The mean age of all 1004 participants was 41.53 (19–73), with 36.37 ± 5.57 and 52.61 ± 5.60 in pre- and post-menopausal patients, respectively. The most common complaint was AUB seen in 658 (65.5%), followed by infertility in 218 (21.7%). Overall, 150 (14.9%) of the patients did not report any improvement following the polypectomy. We found the recurrence rate of symptomatic polyps to be 14.2%. We found that patient age or surgical techniques used did not affect the rate of improvement. In our study, 170 (77.9%) of those with a complaint of infertility had at least one successful pregnancy following polypectomy and 110 (15%) of the pre-menopausal patients reported at least one spontaneous pregnancy. Our results showed that the recurrence rate is lower in patients who have underwent polypectomy using scissors (9.8%) compared to graspers (17.8%) (*P* value < 0.05). We also showed hysteroscopic polypectomy to have a very low complication rate. In this study, we only found eight cases with surgical complications, with only two of them being major complications. Fortunately, bowel or bladder injury did not happen in any of the participants following uterine perforation. However, 86 (8.6%) of the

Table 1: Baseline and clinical characteristics of the patients

	Pre-menopause, *n*=730	Post-menopause, *n*=274	Total, *n*=1004	*P*
Age, years average (±SD)	36.37 (± 5.57)	52.61 (± 5.60)	41.53 (± 9.40)	N/S
Reason for polypectomy, *n* (%)				
Abnormal uterine bleeding	460 (63%)	198 (72.2%)	658 (65.5%)	0.325
Infertility	218 (29.8%)	-----	218 (21.7%)	
Size or number of polyps	52 (7.1%)	76 (27.7%)	128 (12.7%)	
Symptom improvement, *n* (%)				
No improvement	106 (14.6%)	44 (16.1%)	150 (14.9%)	0.092
Improved symptoms	624 (85.4%)	230 (83.9%)	854 (85.1%)	
Polypectomy approach, *n* (%)				
Graspers	269 (36.8%)	123 (44.8%)	392 (39.1%)	0.019
Scissors	461 (63.2%)	151 (54.2%)	612 (60.9%)	
Pregnancy following polypectomy, *n* (%)				
Spontaneous pregnancy	110 (15%)	-----	110 (10.9%)	N/S
IVF	18 (2.4%)		18 (1.7%)	
IUI	12 (1.6%)		12 (1.1%)	
Drugs	30 (4.1%)	-----	30 (2.9%)	

Table 2: Recurrence and improvement rate in the patients regarding their demographic features and the techniques used

	Recurrence			Improvement of symptoms		
	No recurrence	Recurrence	*P*	Improvement seen	No improvement	*P*
Age						
Years average (±SD)	41.51 (±9.61)	41.69 (±8.03)	0.810	41.63 (±10.04)	41.36 (±8.16)	0.643
Menopause, *n* (%)						
Post-menopause	233 (85%)	41 (15%)	0.762	230 (83.9%)	44 (16.1%)	0.092
Pre-menopause	628 (86%)	102 (14%)		624 (85.4%)	106 (14.6%)	
Polypectomy approach, *n* (%)						
Scissors	552 (90.2%)	60 (9.8%)	0.03	186 (67.9%)	88 (30.8%)	0.096
Graspers	322 (82.1%)	70 (17.8%)		322 (61.9%)	198 (38.1%)	

Table 3: Hysterectomy complications and histological characteristics of the polyps

	Pre-menopause $n=730$	Post-menopause $n=274$	*P*
Complications of polypectomy, *n* (%)			
Laceration	1 (0.13%)	1 (0.73%)	0.514
False track	3 (0.41%)	1 (0.73%)	
Uterine perforation	1 (0.13%)	1 (0.36%)	
Hysterectomy due to no improvement, *n* (%)	38 (5.2%)	48 (17.5%)	<0.001
Cancerous polyps, *n* (%)	2 (0.26%)	4 (1.45%)	N/S

patients had to undergo a hysterectomy to treat unresolved symptoms. Hysterectomy rates were significantly higher in post-menopausal women (*P* value < 0.001). In this study, most of the complications were due to cervical stenosis and the lack of preparation of the cervix before surgery, so preparation of the cervix, especially by prostaglandins, is recommended before surgery. Sangchai *et al*.[18] demonstrated that polyp recurrence was not observed when using a resectoscope compared to scissors and grasper, so we suggest using a resectoscope in future studies to investigate the rate of recurrence, especially in patients with no desire to preserve their fertility.

Most of the women who did not show improvement following a hysteroscopic polypectomy and had recurrent symptoms, had higher BMI, and were later found to have been suffering from adenomyosis. Adenomyosis has been known to be a cause for AUB,[27] and while there is a clear link between adenomyosis and UP, its pathogenic role in developing UP is not yet clear,[28] indicating that hysteroscopic polypectomy could be effectively used as treatment for both groups. Hysteroscopic polypectomy seems to have a lower recurrence rate compared to other techniques used to treat uterine polyps such as dilation and curettage, which has been reported to have recurrence rates of up to 25%.[29,30]

All our cases had complete fertility workup done, and the only abnormality suspected was endometrial polyps on transvaginal ultrasound scan. Stamatellos[31] *et al*. report a spontaneous pregnancy rate of 61.4% following hysteroscopic polypectomy and Pereira *et al.* reported a pregnancy rate of 48.5%,[32] both of which are similar to what we found in our study (50.4%), while other studies show results similar to ours.[16,33,34] The difference in findings between the studies could be explained by the change in demographics and the population studied. Polypectomies are shown to undo anatomical distortions caused by the UPs in the uterine cavity and to improve the chance of embryo implantation and successful pregnancies.[35] Studies have also shown that polypectomies increase the mid secretory concentration of implantation factors such as IGFBP-1, TNFa, and osteopontin[36] and simultaneously decrease inflammatory markers such as Nf-Kb.[37] Both the anatomical and biochemical changes due to polypectomies help increase the chance of a successful pregnancy. So, hysteroscopic polypectomy of UPs appeared to improve fertility and increase pregnancy rates in previous infertile women with no other reason to explain their infertility, irrespective of the size or number of polyps. Hysterectomy rates in our study were higher than those of previous studies.[18] Patients with a larger uterus, adenomyosis, or higher BMI or those who were not interested in medical or further conservative treatment for the recurrence of polyps were more likely to undergo hysterectomy. We also found older patients to be more likely to undergo hysterectomies, which is likely due to a higher chance of malignancy in older patients.[38] The recurrence rates reported in our study have also been confirmed in other studies like Paradiso *et al.*, who reported a recurrence rate of 13.3%,[20] and Raz, who reported a recurrence rate of 15%.[26] However, other clinical trials reported a recurrence rate of up to 19.1%.[39] While higher recurrence rates have been reported,[40] most of the published studies show recurrence rates of 13–17%, which are in line with our findings. In our study, the recurrence rate was marginally higher in menopausal women compared to pre-menopause women, but we found no statistical significance between the two groups.

We found graspers to have a higher recurrence rate than scissors. Our results correlate with Preutthipan *et al.*, who reported graspers to have the highest recurrence rate.[18] Other studies have also reported the recurrence rate of graspers to be higher than that of scissors, up to 15%.[41] Reports of the recurrence rate for scissors being lower than what we found in this study are also found.[42] Some studies have reported conflicting results however; for example, one study done by Ceci *et al.* found the recurrence rate to be similar in different techniques and not significantly different[43] and another by García found no difference in the method used.[44] Overall, we found graspers to be the technique with the highest recurrence rate. Considering how graspers could leave some residue of the abnormal growth, it is no surprise that scissors are more effective in polypectomies. Our results are in line with the scientific consensus at large.

We suggest more studies be done on recurrence rate of different kinds of polyps such as pedunculated compared to sessile or cervical polyps or the precise techniques used for their excision, such as cold scissors versus different kinds of graspers, to help clinicians make better and more educated choices. Patients' symptoms before polypectomy could also be expanded upon. We suggest more studies with more extensive analyses of different symptoms and differentiation between said symptoms be done in this regard.

Conclusion

In the end, we have found hysteroscopic polypectomy to be effective with a rather low recurrence rate in the patients. It is

a low-cost, easily accessible approach that may be performed in out-patient clinics. It has been demonstrated to be successful in treating infertility. We suggest more polypectomies be done using scissors as they appear to have a lower recurrence rate and a comparable success rate in improving patient symptoms.

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Conflicts of interest

There are no conflicts of interest.

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