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Original Article

# Role of endometrial sampling in cases with asymptomatic cervical polyps

Adnan Budak[a], Ahkam Göksel Kanmaz[b,*]

[a] Department of Obstetrics and Gynecology, Izmir Provincial Health Directorate, Izmir, 35210, Turkey
[b] Department of Obstetrics and Gynecology, Tepecik Training and Research Hospital Izmir, 35170, Turkey

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ABSTRACT

Cervical polyps are benign neoplasms of the cervix and frequently asymptomatic; however, they may cause intermenstrual, postcoital, and postmenopausal bleeding. The excision of cervical polyps and necessity of endometrial sampling is remain controversial.

The objective of our study was to determine the association between cervical polyps and smear and endometrial pathologies.

221 patients were included in the study and all patients data reviewed retrospectively. All patients were divided into two groups; 1. Premenopausal, 2. Postmenopausal. The groups were compared in terms of demographic information, histopathological results and polyp number and size. Also endometrial sampling results were divided; 1. premalignant-malignant group 2. benign group.

There was a statistically significant difference between polyp size and premalignant and malignant endometrial pathologies in the postmenopausal patient group ($p = 0.048$ and $p = 0.002$). The cut-off value for polyp length was determined to be 19 mm and that for polyp volume was determined to be 2150 $mm^3$.

The use of Pap smear screening before polypectomy can give information about malignancy potential of asymptomatic cervical polyps. However, if polyps sizes are length of >19 mm and volume of >2300 $mm^3$, especially in postmenopausal females endometrial sampling should be recommended.



## Introduction

Cervical polyps are benign neoplasms of the cervix, originating from the endocervical canal, and are observed in 2%–5% of individuals during the reproductive period [1]. They are usually more prevalent in multiparous patients who are in the fifth decade of their lives [2]. Cervical polyps are frequently asymptomatic; however, they may cause intermenstrual, postcoital, and postmenopausal bleeding, and in rare cases, may enlarge and cause symptoms, such as uterine prolapse [2,3]. Although there is still no consensus on the occurrence of cervical polyps, many reasons, including chronic inflammation, hormonal stimulus, local response to an unknown stimulus, blockage of secretory glands in the cervical os, and genetic factors, have been suggested [4,5]. By definition, a cervical polyp refers to a central fibromuscular stroma covered with glandular or stromal epithelium which is more swollen than the cervical epithelium, frequently due to the abovementioned reasons [5]. MacKenzie et al demonstrated that a very low probability of detecting malignant or dysplastic changes in cervical polyps, especially in premenopausal females at their analysis of 1366 reports of cervical polyps in the 4 year period [6]. Schnatz et al. [7] reported that the pathologic changes that can be detected in patients with cervical polyps are frequently originated from endometrial origin and that the probability of malign transformation associated with primary cervical polyps is very low. Furthermore, the excision of cervical polyps and whether endometrial and endocervical sampling be performed during excision remain controversial. Younis et al. [7] and MacKenzie et al [6] determined in their studies that polypectomy in cases of asymptomatic polyps was not cost-effective and should be recommended for only symptomatic cases. Goldshmid et al. [8] suggested the expectant approach because of the low probability of the occurrence of primary neoplasms in asymptomatic cervical polyp cases. Long et al. [9] suggested polypectomy for even asymptomatic cervical polyp cases, while Neri et al. [10] suggested endocervical sampling in addition to cervical polypectomy. Additionally, Büyükbayrak et al. [11] recommended endometrial sampling in addition to polypectomy, similar to many other studies in the literature [4,7,13].

* Corresponding author.
*E-mail addresses:* drabudak@gmail.com (A. Budak), drgokselkanmaz@gmail.com (A.G. Kanmaz).

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The objective of our study was to retrospectively examine the results of patients with asymptomatic cervical polyps detected during routine gynecological examination at our clinic and to determine the association between cervical polyps and smear and endometrial pathologies.

## Materials and methods

A total of 483 patients who underwent cervical polypectomy between December 2014 and January 2017 at the Tepecik Training and Research Center Gynecology and Obstetrics Department were retrospectively reviewed using the data obtained from the hospital information system. Asymptomatic patients who had no complaints but were detected with cervical polyps during routine gynecological examination and who underwent Pap smear screening and endometrial sampling were included in the study. Patients who had a history of gynecological or non-gynecological cancer, those whose endometrial double wall thickness was >10 mm, those who had suspicious lesions independent from the menopausal state or in the postmenopausal period on routine transvaginal ultrasound prior to polypectomy, those who were pregnant, those who were administered a hormone replacement therapy, and those who used intrauterine device or oral contraceptives were excluded from the study. Finally, 221 patients were included in the study.

All patients included in the study were made polyp excision without using cautery with polyp forceps. All polypectomies made at our outpatient clinic under local anesthesia (if needed sedoanalgesia) by specialist doctors or senior assistants and also all patients included in the study performed endometrial sampling with Pipelle device during the same session. Furthermore, they had undergone fluid-based Pap smear screening at least 1 month postoperatively. The number of polyps was recorded by retrospectively reviewing the operation notes using the hospital information system. Polyp sizes were recorded from the operation note if measured using a ruler and from the pathology report if not measured during the operation.

Patients were divided into two groups, pre- and postmenopausal, depending on their menopausal status. The groups were compared in terms of demographic information, histopathological results, Pap smear screening and endometrial sampling results, and polyp number and size. Endometrial sampling results were divided into two groups to determine their association with polyp size: premalignant-malignant group, which included results requiring operation or resampling, such as malignancy and simple and complex hyperplasia with and without atypia; and benign group, which included results not requiring operation or resampling, such as secretory, proliferative, endometrial polyp and endometritis.

The study was initiated following the approval of the Tepecik Research and Training Hospital Ethics Committee.

### *Statistical analysis*

Statistical analyses were performed using SPSS 22.0 for Windows (SPSS Inc., Chicago, IL, USA), and $p \leq 0.05$ was considered statistically significant. Data distribution was determined using normality tests. One sample *t*-test was used for data with parametric distribution, and the results are presented as the mean ± standard deviation. The Mann–Whitney U test was used for nonparametric data, and the results are presented as the median (minimum–maximum). Categorical variables are presented as percentage and frequency. The Chi-square or Fisher's exact test was used according to the number of patients. The subgroup analysis between endometrial pathologies and polyp sizes was performed using a receiver operating characteristic (ROC) curve, and the cut-off value was determined using the Youden index. Diagnostic test results were calculated with 95% confidence interval (CI) and Medcalc's Free Statistics calculator using the cut-off value.

## Results

A total of 483 patients with cervical polyps who underwent cervical polypectomy at the outpatient clinic of our hospital between December 2014 and January 2017 were retrospectively reviewed. Of these, 221 patients (93 premenopausal and 128 postmenopausal) who had asymptomatic cervical polyps and met the study criteria were included in the study.

Demographic information of the patients is summarized in Table 1. Age and prevalence of hypertension and diabetes were higher in the postmenopausal patient group ($p < 0.001$, $p < 0.001$, and $p < 0.001$, respectively). Furthermore, the rate of comorbidities, including chronic diseases other than hypertension and diabetes (hypothyroidism, hyperthyroidism, asthma, COPD, and atherosclerotic heart disease), was higher in the premenopausal than in the postmenopausal group, but there was no statistically significant difference. There was no statistically significant difference between the menopausal status of patients and number of polyps. Both polyp length and volume were detected significantly higher in the postmenopausal than in the premenopausal patient group ($p = 0.019$ and $p = 0.012$, respectively).

Polyp histopathology, Pap smear, and endometrial sampling results were examined by dividing the patients into two groups according to the menopausal status (Table 2). The endocervical histopathological diagnosis rate of the excised polyps was higher in the premenopausal group, whereas all other polyp histopathologic findings except endocervical histopathology were more frequent in the postmenopausal group, there was no statistically significant difference between the two groups ($p = 0.064$). Atrophy on Pap smear and granulation tissue on histopathology were higher in the postmenopausal than in the premenopausal patient group, whereas the rates of benign and inflammatory changes were higher in the premenopausal than in the postmenopausal patient group. Cervical dysplasia was detected in only one premenopausal

**Table 1**
Demographic information of patients.

| | Premenopausal patient group (93, 42.1%) | Postmenopausal patient group (128, 57.9%) | p value |
|---|---|---|---|
| Age, years | 44 (29–48) | 52 (48–73) | <**0.001** |
| Hypertension | 1 | 30 | <**0.001** |
| Diabetes | – | 15 | <**0.001** |
| Comorbidity | 12 | 3 | 0.060 |
| Polyp length, mm | 10 (2–45) | 12 (2–60) | **0.019** |
| Polyp volume, $mm^3$ | 250 (8–28,500) | 520 (8–31,500) | **0.012** |
| Number of polyps | 1 (1-2) | 1 (1–3) | 0.817 |

**Table 2**
Histopathological results of patients.

| | Premenopausal patient group (93, 42.1%) | Postmenopausal patient group (128, 57.9%) | p value |
|---|---|---|---|
| Polyp histopathology | | | 0.064 |
| Cervical | 23 (24.7%) | 39 (30.4%) | |
| Endocervical | 64 (68.8%) | 74 (57.8%) | |
| Endometrial | 2 (2.1%) | 9 (7%) | |
| Nabothian cyst | 2 (2.1%) | 11 (8.5%) | |
| Adenomyoma | – | 2 (1.5%) | |
| Granulation tissue | 2 (2.1%) | 3 (2.3%) | |
| Pap smear | | | **0.001** |
| Benign | 81 (87.1%) | 101 (78.9%) | |
| Atrophy | – | 18 (14.1%) | |
| ASCUS | 1 (1.1%) | – | |
| Inflammatory changes | 11 (11.8%) | 9 (7%) | |
| Endometrial pathology | | | **<0.001** |
| Benign | 72 (77.4%) | 46 (35.9%) | |
| Atrophic | – | 47 (36.7%) | |
| Endometrial polyp | 15 (16.1%) | 26 (20.3%) | |
| Endometritis | 4 (4.3%) | 1 (0.8%) | |
| Hyperplasia without atypia | 2 (2.15%) | 4 (3.1%) | |
| Hyperplasia with atypia | – | 1(0.8%) | |
| Malignant | – | 3 (2.3%) | |

ASCUS, atypical squamous cells of undetermined significance.

patient, which included atypical squamous cells of undetermined Significance (ASCUS). There was a statistically significant difference between the two groups in terms of Pap smear results ($p = 0.001$). In the evaluation of histopathological results on endometrial curettage, a statistically significant difference was detected between the pre- and postmenopausal patient groups ($p < 0.001$). Regarding the endometrial histopathology results, atrophy and endometrial polyp rates were higher in the postmenopausal than in the premenopausal patient group, whereas those of endometritis and other benign pathologies were higher in the premenopausal than in the postmenopausal patient group. The incidence of endometrial hyperplasia without atypia was higher in the premenopausal than in the postmenopausal patient group, while those of endometrial hyperplasia with atypia and endometrial malignancy were higher in the postmenopausal than in the premenopausal patient group.

Subgroup analysis results for determining the association of menopausal status and polyp size with endometrial pathology are summarized in Table 3. There was no significant difference between polyp size and endometrial pathology in the premenopausal patient group, whereas there was a statistically significant difference between polyp size and premalignant and malignant endometrial pathologies in the postmenopausal patient group ($p = 0.048$ and $p = 0.002$, respectively).

A ROC curve was used to determine the cut-off values of polyp size and volume for predicting the premalignant-malignant endometrial pathologies in the postmenopausal patient group (Fig. 1); the cut-off value for polyp length was determined to be 19 mm and that for polyp volume was determined to be 2150 $mm^3$. Diagnostic tests and area under curve values are summarized in Table 4. In case of polyp length of $\geq$19 mm, premalignant-malignant endometrial pathologies were detected with 70.83% sensitivity, 87.50% specificity, and 98.84% positive predictive value (PPV; $p = 0.002$). Similarly, in case of polyp volume of $\geq$2150 $mm^3$, premalignant-malignant endometrial pathologies were detected with 84.17% sensitivity, 87.50% specificity, and 99.02% PPV ($p < 0.001$).

## Comment

Cervical polyps frequently originate from the endocervical canal [1]. There is no consensus regarding the cause of these lesions, which have a fibroglandular center surrounded with a glandular or stromal epithelium and are more swollen than the surface area that they occupy [3,4]. Cervical polyps; are often asymptomatic, have low primary dysplasia and malignancy rates, and are associated with endometrial polyp and endometrial pathologies [2,6,8,10–12]. In a review by Bucella et al 9 cervical polyps were determined and no malignancy was detected [2]. MacKenzie et al analysis of 1366 reports of cervical polyps in the 4 year period and no malignancy was detected likewise Bucella et al [6]. Goldshmid et al was analyzed 228 cervical polyps in 2011 and they detected CIN in 6 (2.6%) cervical polyps without any malignancy [8]. Neri et al, Büyükbayrak et al and Fauth et al were performed endometrial sampling in addition to polypectomy and they determined endometrial carcinoma rates from 0.1% to 0.4% in postmenopausal cervical polyps [10–12]. As can be seen, there is no consensus in the literature regarding the approach toward patients

**Table 3**
Role of cervical and endocervical polyp sizes in predicting endometrial pathologies.

| | Benign endometrial pathology group | Premalignant-malignant endometrial pathology group | p value |
|---|---|---|---|
| Polyp length, mm | | | |
| Premenopausal | 10 (2–45) | 5 (5) | 0.134 |
| Postmenopausal | 10 (2–60) | 20 (5–30) | 0.048 |
| Polyp volume, mm3 | | | |
| Premenopausal | 250 (8–28,500) | 87.5 (50–125) | 0.238 |
| Postmenopausal | 372 (8–31,500) | 4000 (125–18,000) | 0.002 |

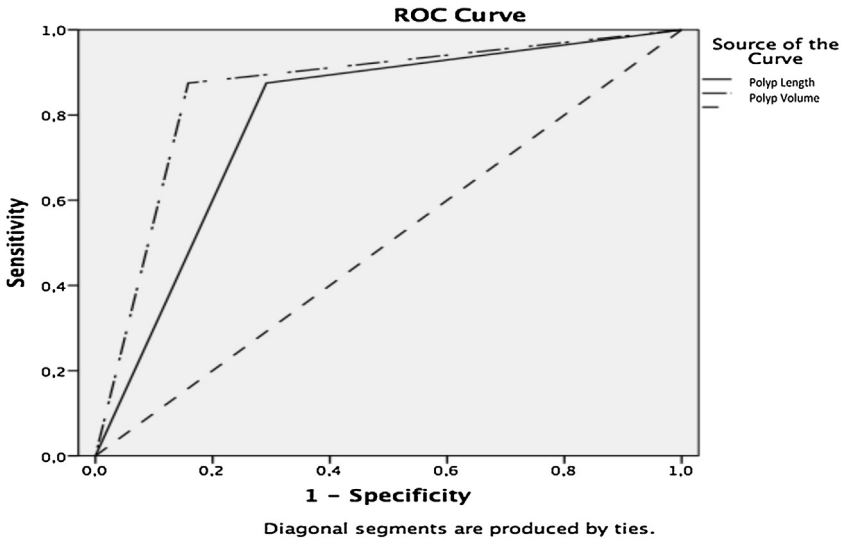


**Fig. 1.** Role of the length of postmenopausal asymptomatic cervical polyps in predicting premalignant-malignant endometrial pathologies.

**Table 4**
Role of postmenopausal asymptomatic cervical polyps in predicting premalignant-malignant endometrial pathologies.

| | Cut-off value | Area under Curve | Sensitivity | Specificity | Positive predictive value | Negative predictive value | p value |
|---|---|---|---|---|---|---|---|
| Polyp length, mm | 19 | 0.792 ± 0.074 | 70.83 (61.8–78.7) | 87.50 (47.3–99.6) | 98.84 (93.12–99.81) | 16.67 (12.1-22.6) | 0.002 |
| Polyp volume, $mm^3$ | 2150 | 0.858 ± 0.071 | 84.17 (76.38–90.19) | 87.50 (47.35–99.68) | 99.02 (94.16–99.84) | 26.92 (18.4–37.52) | <0.001 |

with cervical polyps. Because dysplasia and cancer rates are very low in patients with cervical polyps, some studies have suggested that polypectomy would not be cost-effective in patients with asymptomatic cervical polyps, and that monitoring would be appropriate [6]. However, other reports recommend that excision should be performed regardless of the presence or absence of symptoms, and that endometrial sampling should be included in polypectomy regimen because its results may indicate endometrial pathologies [8,11,12].

In our study, 221 patients with asymptomatic cervical polyps were retrospectively reviewed, and there were no primary malignancies or dysplastic changes on any of the cervical polyp histopathological examinations, which was consistent with the literature [6,8]. The rate of occurrence of dysplasia in cervical polyp cases included in studies that did not distinguish between asymptomatic and symptomatic cases varied between 0.2% and 0.6% [10,12]. The rate of primary malignancy of cervical polyps was 0.1% in two previous studies [12]. In our study, cervical dysplastic changes were detected on Pap smear screening in only one patient (0.4%) in the premenopausal patient group, and this result was lower than the average result found in Turkey and America [14,15]. However, all patients included in the study were asymptomatic and mostly postmenopausal, which may have affected the Pap smear results.

Long et al. [9] examined the association between cervical polyp size and cervical dysplasia but could not detect any statistically significant association. Similarly, in our study, there was no significant association between cervical polyp size and cervical dysplasia (found in only one patient).

Several studies have suggested an association between cervical polyps and endometrial pathologies [11,12,16]. In our study, polyp histopathology results of patients with premalignant-malignant endometrial pathologies were reported as cervical or endocervical polyps. While there was no association between polyp size and endometrial pathology in the premenopausal patient group, there was a statistically significant association between pathological changes and greater polyp length and volume in the postmenopausal patient group. Furthermore, an endometrial premalignant or malignant lesion was detected with 95% CI, 78.7% sensitivity, 99.6% specificity, and 99.81% PPV when the polyp length was ≥19 mm and with 95% CI, 90.19% sensitivity, 99.68% specificity, and 99.81% PPV when the polyp volume was ≥2150 $mm^3$. No similar studies were found in the literature; therefore, our results could not be compared. It is known that genetic (e.g., BRCA 1 and 2 and Lynch syndrome) and hormonal (e.g., estrogen) factors play a role in the etiology of endometrial hyperplasia and malignancy [17]; it has been suggested that similar genetic and hormonal factors may play a role in the etiology of cervical polyps [4,5,11,16]. Thus, it should be noted that endometrial pathologies may exist in the presence of cervical polyps.

To the best of our knowledge, our study is the first in the literature to show the association between endometrial sampling results and cervical polyp size. Due to the strict patient selection criteria of our study, the number of patients that could be included in the study was lesser than those in similar other studies in the literature, but this prevented any possible bias.

In conclusion, while it is recommended to excise symptomatic cervical polyps [15], there is no clarity regarding the excision of asymptomatic cervical polyps and the necessity of simultaneous endometrial sampling. Our results supported the use of Pap smear screening before polypectomy to collect information regarding the malignancy potential of asymptomatic cervical polyps detected during routine gynecological examination. However, considering that cervical polyps are not formed only as a result of pathologies underlying the cervix, we believe that endometrial sampling

would be appropriate in polyps with a length of >19 mm and volume of >2300 $mm^3$, especially in postmenopausal females, even if they are asymptomatic. However, further randomized, controlled, prospective studies are warranted.

## Conflicts of interest

The authors have no conflicts to interest relevant to this article to disclose.

## Contributors' statements

Dr. Budak designed the study, drafted the initial manuscript, made statistical analysis and approved the final manuscript as submitted.

Dr. Kanmaz designed the data collection instruments, and coordinated data collection at hospital information system, critically reviewed the manuscript, and approved the final manuscript as submitted.

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