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Polypectomy Technique and Histopathological Evaluation in Colon Polyps According to Paris Classification

Paris Sınıflamasına Göre Kolon Poliplerinde Polipektomi Tekniği Ve Histopatolojik Değerlendirme

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Polypectomy Technique and Histopathological Evaluation in Colon Polyps According to Paris Classification

ABSTRACT

Objective: Colorectal cancers are in third place in terms of incidence and second in terms of mortality. This study aims to type the polyps detected during colonoscopy according to the Paris classification, perform polypectomy with the appropriate technique, classify them as histopathological, determine the presence of dysplasia, and review the risk status of colorectal cancer.

Material and Method: Our study is a retrospective study presented as a one-year review of 124 patients who were found to have colonic polyps due to colonoscopy, who underwent polypectomy with the appropriate technique, and whose histopathological determination was completed.

Results: The study was conducted between 2021 and 2022 with a total of 124 cases, 37.9% female and 62.1% male. The mean age of the cases was 58.58 ± 14.40 years. The way the polyps were removed was determined according to the polyp size and the Paris classification. Polypectomy was performed with biopsy forceps for <5 mm polyps. For ≥5 mm polyps, polypectomy was performed with a hotsnare after mucosal separation with saline-methylene blue-adrenaline. A piecemeal polypectomy was performed for two very large polyps. The most important factor in determining CRC surveillance and the presence of dysplasia was polyp diameter. The dysplasia rate in polyps removed with biopsy forceps was lower than in the polypectomy group with a hot snare.

Conclusion: Colorectal cancers are multifactorial, the initial architecture is polyps. The increase in the diameter of these polyps rather than the removal techniques was significant in terms of colorectal cancer risk.

Keywords: Colon polyps, colorectal cancers surveillance, presence of dysplasia in colon polyp, polypectomy, polypectomy technique.

ÖZET

Amaç: Kolorektal kanserler görülme sıklığı açısından üçüncü, mortalite açısından ise ikinci sırada yer almaktadır. Bu çalışmada kolonoskopi sırasında tespit edilen poliplerin Paris sınıflamasına göre tiplendirilmesi, uygun teknikle polipektomi yapılması, histopatolojik olarak sınıflandırılması, displazi varlığının belirlenmesi ve kolorektal kanser risk durumunun gözden geçirilmesi amaçlanmaktadır.

Gereç ve Yöntem: Çalışmamız, kolonoskopi sonucu kolonik polip saptanan, uygun teknikle polipektomi yapılan ve histopatolojik incelemesi tamamlanan 124 hastanın bir yıllık incelemesi olarak sunulan retrospektif bir çalışmadır.

Bulgular: Çalışma 2021-2022 yılları arasında %37,9'u kadın, %62,1'i erkek olmak üzere toplam 124 vaka ile gerçekleştirildi. Olguların yaş ortalaması 58,58 ± 14,40 yıldı. Poliplerin çıkarılma şekli polip boyutuna ve Paris sınıflamasına göre belirlendi. <5 mm polipler için biyopsi forsepsi ile polipektomi yapıldı. ≥5 mm'lik poliplerde salin-metilen mavisi-adrenalin ile mukoza ayrımı yapıldıktan sonra sıcak snare ile polipektomi yapıldı. İki adet çok büyük polip için parça parça polipektomi yapıldı. KRK sürveyansının ve displazi varlığının belirlenmesinde en önemli faktör polip çapıydı.

Sonuç: Kolorektal kanserler multifaktöriyeldir, başlangıç mimarisi poliplerdir. Bu poliplerin alınma tekniklerinden ziyade çaplarının artması kolorektal kanser riski açısından anlamlıydı.

Anahtar Sözcükler: Kolon polibinde displazi varlığı, kolon polipleri, kolorektal kanser sürveyansı, polipektomi, polipektomi tekniği.

Introduction

Global Cancer Statistics 2020: GLOBOCAN revealed that there may be more than 1.9 million new colorectal cancer (CRC) cases in 2020, and 935,000 patients may die due to CRC. This assumes that one in every 10 cancer cases may be a CRC patient. In general, CRC ranks third in terms of incidence and second in terms of mortality (1). In CRC screening, colonoscopy is the most appropriate method to detect both cancer and precancerous lesions directly. If there are no pathological findings in the screening colonoscopy of patients aged 50 and over, it is recommended in the guidelines to perform a colonoscopy every 10 years. However, new guidelines recently published recommend that screening colonoscopy should be performed at age 45. The sensitivity of colonoscopy in detecting CRC is >95%, while its sensitivity in detecting advanced adenomas (≥10 mm in diameter) is 88–98% (2). The well-known pathway in CRC oncogenesis is the adenoma-carcinoma sequence. Detection and removal of precursor lesions reduce the incidence and mortality of CRC (3-8). With this study, we aimed to evaluate the effect of classifying precursor lesions according to the Paris classification and removing them with appropriate techniques on the presence of dysplasia and CRC surveillance.

Material and Method

Study design and participants

The hypothesis of our study was to investigate the relationship between polyp type, size, localization, and polyp removal technique in detecting dysplastic changes when polyps are detected in patients undergoing colonoscopy and in predicting changes in screening in terms of CRC surveillance.

Colonic polyps were detected in 124 (21%) of 590 patients who applied to the endoscopy unit of a center in the Eastern Anatolia Region for colonoscopy between January 2021 and January 2022. In this retrospective study, the colonoscopy reports and pathology results of 124 patients with colon polyps were prepared by recording the data from the hospital automation system. In patients with polyps detected in the colonoscopy report, polyp characterization was performed according to the Paris classification, and polyp removal techniques were recorded separately. Patients who underwent pathological evaluation after polypectomy were included in the study. Those whose colonoscopy report was not characterized according to the Paris classification, those whose polypectomy could not be performed for various reasons, and those whose pathological evaluation was not performed were excluded from the study. The study was designed according to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. Since the study concept is retrospective, it was conducted from the hospital database with the permission and consent of the hospital, and no consent was obtained from the patients. A survey was not administered to the patients.

From colonoscopy reports, pedunculated, flat, and sessile polyps (Paris classification Ip, Isp, Is, IIa, IIa/IIc) were characterized. Again, polyps were grouped according to the data in the colonoscopy reports. Polyps smaller than 5 mm and those removed in one go with biopsy forceps were collected in the first group. Those with ≥5 mm polyp (sessile, pedunculated, and flat) and those who underwent polypectomy with a hot snare by injecting 3-4 cc of 1\10000 saline-methylene blue-adrenaline into the base were included in the other group. In our two cases that could not be completely removed with a snare, we detected one with a pedunculated polyp and the other with a sessile polyp. Since the snare could not fully grasp these two polyps, a piecemeal polypectomy was performed and 3-4 cc of 1\10000 saline-methylene blue-adrenaline was injected into the base of the stump. Those who underwent piecemeal polypectomy with a hot snare were included in the last group. These large polyps were treated with polypectomy, close to endoscopic mucosal resection, leaving normal mucosal margins in the surrounding tissue. The obtained polypectomy materials were evaluated by three pathologists with the same experience working in the center's pathology laboratory. Data on the pathological typing of polyps, the presence of dysplasia, and cancer were recorded in the hospital information system. In light of the information recommended in gastroenterology guidelines regarding the use of anticoagulants and antiplatelets, low-dose aspirin use was allowed in patients before and after the colonoscopy procedure. Low molecular weight heparin was administered

to our patients who had to receive anticoagulant treatment in the evening before the procedure. The morning dose was skipped, and the normal dose of low molecular weight heparin treatment was given again in the evening. The Boston bowel preparation scale was used for colonoscopy. While those with BBPS ≥ 6 were included in the study, those with BBPS < 6 were excluded from the study due to a lack of preparation.

Statistical analysis

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program was used for statistical analysis. Descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum, and maximum) were used when evaluating the research data. The suitability of quantitative data for normal distribution was tested with the Shapiro-Wilk test and graphical analysis. The Mann-Whitney U test was used to compare two groups of quantitative variables that were not normally distributed. Kruskal-Wallis test and Dunn-Bonferroni test were used for intergroup comparisons of more than two quantitative variables that were not normally distributed. Fisher-Freeman-Halton exact test was used to compare qualitative data. Statistical significance was accepted as $p<0.05$.

Ethics Statement

This retrospective study was approved by the Ethics Committee of Dicle University Faculty of Medicine (Date: 09.06.2022, Issue: 180). Guidance Recommendations for Medical Practitioners in Biomedical Research Involving Human Subjects have been prepared taking into account the Declaration of Helsinki.

Results

Colon polyps were detected in 124 (21%) of 590 adult patients who applied to the endoscopy unit of a secondary-level state hospital in the Eastern Anatolia Region between January 2021 and January 2022. This study examined a cohort of 124 patients with colon polyps. Of the 124 patients, 37.9% (n=47) were female and 62.1% (n=77) were male. The ages of the patients ranged between 16 and 86, and the average was 58.58±14.40. When the purpose of the colonoscopy of the patients included in the study was examined, 37.1% (n=46) was for screening purposes, 6.5% (n=8) was for iron deficiency anemia (IDA), and 11.3% (n=14) was for abdominal pain (Table I).

Table I. Distributions of descriptive characteristics

		n (%)
Gender	Male	77 (62.1)
	Female	47 (37.9)
Age	*Mean±Sd*	58.58±14.40
	Median (Min-Max)	60 (16-86)
Complaint	For screening purposes	46 (37.1)
	Iron deficiency anemia	8 (6.5)
	Abdominal pain	14 (11.3)
	History of colon polyp	8 (6.5)
	Constipation	5 (4.0)
	Rectal bleeding	14 (11.3)
	Malignancy examination	11 (8.9)
	Others	17 (13.7)
Technical	Hotsnare polypectomy	72 (58.1)
	Biopsy forceps	50 (40.3)
	Piecemeal polypectomy	2 (1.6)

When the cases in which polyps were detected during the colonoscopy procedure were examined according to the polypectomy technique, 58.1% (n=72) were found to have polyps larger than 5 mm. It was observed that 3-4 cc of 1\10000 saline-methylene blue-adrenaline injection was applied to the base of these polyps. 40.3% (n = 50) were diminutive polyps of <5 mm and polypectomy was performed in one go with biopsy forceps. Since 1.6% (n=2) were very large polyps, polypectomy was performed with a mucosal dissection-like hot snare by applying 1/10000 saline-methylene blue-adrenaline to the base after piecemeal polypectomy (Figure I, Table I).

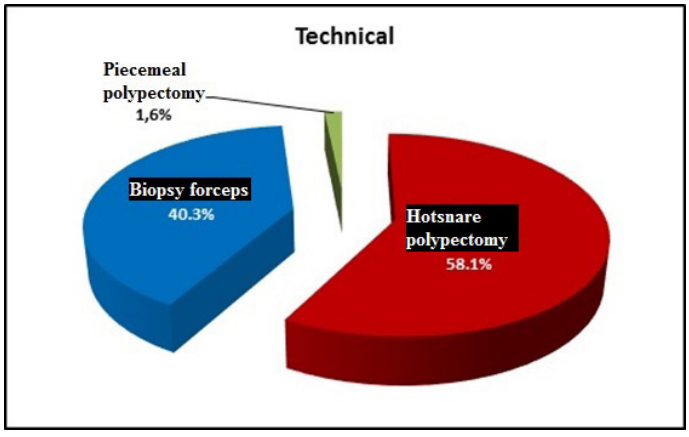

Figure I. Distribution of techniques

It was observed that polyps were detected in the ascending colon in 18.5% (n=23) of the patients who underwent polypectomy. The sizes of the polyps detected in the ascending colon ranged between 4 and 100 mm, and the average value was 15.04±23.76 mm. When ascending colon polyps were examined according to the Paris classification, 4.3% (n=1) were Ip; 73.9% (n=17) were Is; 4.3% (n=1) were IIa; 4.3% (n=1) were Ic; 4.3% (n=1) were Isp; and 8.7% (n=2) were IIa/IIc. When the pathologies of ascending colon polyps were examined, it was seen that 73.9% (n=17) were non-adenomatous polyps, 13% (n=3) were adenomatous polyps, and 13.3% (n=3) were cancer (CA). It was observed that polyps were detected in the transverse colon in 22.6% (n=28) of the patients who underwent polypectomy. The sizes of the polyps detected in the transverse colon varied between 5 and 50 mm, and the average value was 11.21 ± 11.35 mm. When transverse colon polyps were examined according to the Paris classification, 21.4% (n=6) were Ip; 53.6% (n=15) were Is; 10.7% (n=3) were IIa; and 14.3% (n=4) were Isp. When the pathologies of transverse colon polyps were examined, it was seen that 64.5% (n=16) were non-adenomatous polyps, 34.6% (n = 9) were adenomatous polyps, and 3.8% (n=1) were CA. It was observed that polyps were detected in the descending colon in 24.2% (n=30) of the patients who underwent polypectomy. The sizes of the polyps detected in the descending colon ranged between 5 and 80 mm, and the average value was 10.23±13.52 mm. When descending colon polyps were examined according to the Paris classification, 56.7% (n=17) were Is; 3.3% (n=1) were IIa; 36.7% (n=11) were Isp; and 3.3% (n=1) were IIa/IIc.When the pathologies of descending colon polyps were examined, it was seen that 54.8% (n=17) were non-adenomatous polyps, 41.9% (n=13) were adenomatous polyps, and 3.2% (n=1) were CA. It was observed that polyps were detected in the sigmoid colon in 7.3% (n = 9) of the patients who underwent polypectomy. The sizes of the polyps detected in the sigmoid colon varied between 5 and 20 mm, and the average value was 9.77 ± 6.24 mm. When sigmoid colon polyps were examined according to the Paris classification, 11.1% (n=1) were Ip; 33.3% (n=3) were Is; 33.3% (n=3) were IIa; and 22.2% (n=2) were Isp. When the pathologies of sigmoid colon polyps were examined, it was seen that 66.7% (n=6) were non-adenomatous polyps and 33.3% (n=3) were adenomatous polyps. It was observed that polyps were detected in the rectum in 56.5% (n = 70) of the patients who underwent polypectomy, and polypectomy was performed. The sizes of rectal polyps varied between 3 and 100 mm, and the average value was 16.08 ± 20.73 mm. When rectal polyps were examined according to the Paris classification, 14.3% (n=10) were Ip, 47.1% (n=33) were Is; 5.7% (n=4) were IIa; 24.3% (n=17) were Isp; and 8.6% (n=6) were IIa/IIc. When the pathologies of rectal polyps were examined, it was seen that 59.6% (n=34) were non-adenomatous polyps, 31.6% (n = 18) were adenomatous polyps, and 8.8% (n=5) were CA.

Table II. Adenomatous, dysplasia and cancer distributions

		n (%)
Adenomatous Polyp	none	76 (61.3)
	present	48 (38.7)
	VA	2 (4.2)
	TVA	4 (8.3)
	TA	42 (87.5)
Dysplasia	none	74 (59.7)
	present	50 (40.3)
	LG	47 (94.0)
	HG	3 (6.0)
CA	none	113 (91.1)
	present	11 (8.9)
	Adenocarcinoma	11 (100.0)

VA: Villous adenoma, TVA: Tubulovillous adenoma TA: Tubular adenoma, LG: Low grade, HG: High grade, CA: Cancer

Adenomatous polyps were detected in 38.7% (n=48) of the patients included in the study. When the types of adenomatous polyps are examined, 4.2% (n=2) was villous adenoma (VA), 8.3% (n=4) was tubulovillous adenoma (TVA), and 87.5% (n=42) was tubular adenoma (TA) (Table II). The presence of dysplasia was detected in 40.3% (n=50) of the polyps (Figure II). When examined according to dysplasia subtypes, it was seen that 94% (n=47) was low grade (LG) and 6% (n=3) was high grade (HG). CA was detected in 8.9% (n=11) of the cases. All CA types (n=11) were found to be malignant adenocarcinomas (Table II).

Table III. Comparison of descriptive characteristics by techniques

Hotsnare polypectomy		Techniques			p
		Hotsnare polypectomy	Biopsy forceps	Piecemeal polypectomy	
Gender	Male	45 (62.5)	32 (64.0)	0 (0)	[a]0.255
	Female	27 (37.5)	18 (36.0)	2 (100)	
Age	*Mean±Sd*	57.57±14.05	59.30±14.79	77.00±0.00	[b]0.092
	Median (Min-Max)	59 (16-86)	61.5 (19-82)	77 (77-77)	

[a]*Fisher Freeman Halton Test* [b]*Kruskal Wallis Test*

The gender and age of the cases did not show a statistically significant difference according to the polypectomy removal technique (*p>0.05*) (Table III). According to the polypectomy removal technique, the polyp pathologies of the ascending colon, transverse colon, descending colon, sigmoid colon, and rectum did not show a statistically significant difference (*p>0.05*) (Table IV). No significant difference was found between genders in terms of age (*p>0.05*). There was no significant difference between adenomatous and non-adenomatous polyps and gender (*p>0.05*).

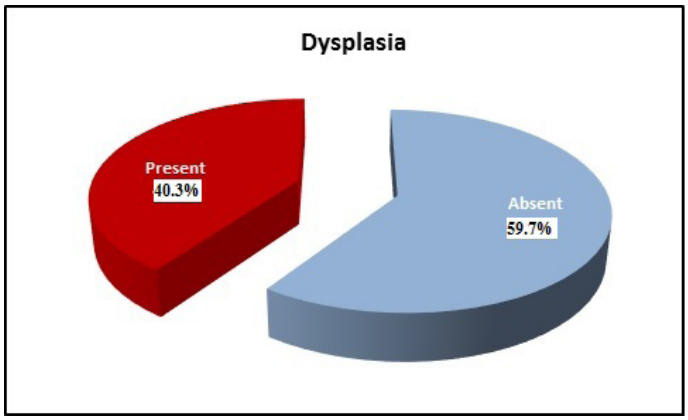

Figure II. Distribution of presence of dysplasia

A statistically significant difference was found between the polypectomy removal technique and the presence of dysplasia (*p=0.001; p<0.01*). It was observed that the dysplasia rate in polyps removed with biopsy forceps was lower than in the hotsnare polypectomy and piecemeal polypectomy groups (Table V). According to the ascending colon polyp pathologies, a statistically significant difference was found between the ascending colon polyp sizes of the cases (*p=0.007; p<0.01*). As a result of pairwise comparisons made to determine the source of the difference, the sizes of cases with malignant neoplasia in their pathology were significantly higher than those with non-adenomatous polyps (*p=0.005; p<0.001*). According to transverse colon, descending colon, and sigmoid colon polyp pathologies, no statistically significant difference was found between the polyp sizes in the same segment of the cases (*p>0.05*). A statistically significant difference was found between rectal polyp sizes according to rectal polyp pathologies (*p=0.002; p<0.01*). As a result of pairwise comparisons made to determine the source of the difference, the sizes of cases with malignant neoplasia pathology were significantly higher than those of non-adenomatous polyps (*p=0.004; p<0.01*).

Table IV. Comparison of pathologies by techniques

Pathological localizations Hotsnare polypectomy		Techniques			p
		Hotsnare polypectomy	Biopsy forceps	Piecemeal polypectomy	
Ascending Colon	Non-adenomatous Polyp	6 (60.0)	11 (84.6)	0 (0)	[a]0.150
	Adenomatous Polyp	3 (30.0)	0 (0)	0 (0)	
	Malignant Neoplasia	1 (10.0)	2 (15.4)	0 (0)	
Transverse Colon	Non-adenomatous Polyp	14 (73.7)	2 (33.3)	0 (0)	[a]0.119
	Adenomatous Polyp	4 (21.1)	4 (66.7)	1 (100)	
	Malignant Neoplasia	1 (5.3)	0 (0)	0 (0)	
Descending Colon	Non-adenomatous Polyp	11 (57.9)	6 (54.5)	0 (0)	[a]0.483
	Adenomatous Polyp	8 (42.1)	4 (36.4)	1 (100)	
	Malignant Neoplasia	0 (0)	1 (9.1)	0 (0)	
Sigmoid Colon	Non-adenomatous Polyp	3 (50.0)	3 (100)	0 (0)	[a]0.464
	Adenomatous Polyp	3 (50.0)	0 (0)	0 (0)	
Rectum	Non-adenomatous Polyp	20 (51.3)	14 (77.8)	0 (0)	[a]0.058
	Adenomatous Polyp	16 (41.0)	2 (11.1)	0 (0)	
	Malignant Neoplasia	3 (7.7)	2 (11.1)	0 (0)	

[a]*Fisher Freeman Halton Test*

Table V. Comparison of presence of dysplasia by techniques

Hotsnare polypectomy (n=75)		Techniques			*p*
		Hotsnare polypectomy	Biopsy forceps	Piecemeal polypectomy	
Dysplasia	none	35 (48.6)	39 (78.0)	0 (0)	[a]***0.001****
	present	37 (51.4)	11 (22.0)	2 (100)	

[a]*Fisher Freeman Halton Test*
***p<0,01*

Discussion

The 2010 World Health Organization (WHO) reported conventional adenomas (tubular, tubulovillous, and villous adenomas) and serrated polyps (SPs) (hyperplastic polyps [HPs], sessile serrated adenoma/polyps [SSA/Ps], and conventional serrated adenomas [TSA]) as precursors of CRC (9). The association of serrated polyps, SSA/Ps, and TSA with cancer has been discussed in many studies. For this reason, conventional adenomas and serrated polyps detected in screening colonoscopies should be removed en bloc with appropriate technique by an experienced team and examined in the pathology laboratory (10-15). Although evidence for the malignant potential of serrated polyps has not been directly demonstrated, cross-sectional studies show that dysplastic changes and malignant transformation may occur in serrated polyps (16). It is estimated that 3-22% of CRCs arise from serrated polyps (16). If the pedunculated, sessile, and flat polyps detected in our study were all <5 mm, a polypectomy was performed with biopsy forceps. Polypectomy was performed with a hot snare after mucosal removal with 3-4cc 1/10000 saline-methylene blue-adrenaline at the base of ≥ 5 mm pedunculated, sessile, and flat polyps. These polypectomy materials were sent to the pathology laboratory and examined. Again, polyps that could not be detected directly with a snare were removed by piecemeal polypectomy. After the mucosal separation process was performed with 3-4cc 1/10000 saline-methylene blue-adrenaline at the base of the stump, a mucosal resection-like polypectomy was performed, and large polyps were removed. Considering the findings of our study, there was no significant relationship between the polypectomy removal technique and the presence of dysplasia. However, it was observed that as the diameter of the polyp increased, the likelihood of dysplasia and malignancy increased. This situation we found in our study is similar to previously published articles.

Three large cohort studies in the United States found that at 10-year follow-up of patients who underwent initial screening colonoscopy, patients with advanced adenomas or large serrated polyps were more likely to develop CRC than patients without polyps (17-19). Considering the characteristics of adenomas (size, number, villous character, and presence of dysplasia), a higher risk of CRC is predicted. In contrast, the risk of CRC is lower in patients with immature adenomas, 1 or 2 SPs <10 mm. However, as the number of polyps increased, the possibility of CRC increased (17-19). Serrated polyps without atypical cells were previously called HPs. It was believed that such polyps did not have cancer potential. In 1990, Longacre et al. (20) reported serrated polyps. Torlakovic et al. (21, 22) stated that SPs should be examined as typical and atypical. They suggested that HPs have SSAs, a subtype that includes atypia. However, some studies did not approve the term adenoma, accepting that these lesions were not as oncogenic as adenomatous polyps. In the latest 2010 WHO classification, the term SSA/Ps, which includes both adenoma and polyp grades, was used (23, 24). Thus, SSA/Ps has a place in the classification among serrated polyp types in its new and standardized form. This transition has not been fully adopted, as it is widely accepted that there is no risk of developing cancer. According to the WHO classification, serrated polyps in the colorectum are generally reported as HP, TSA, and SSA/P (24). When evaluated in light of these data, every lesion seen during the endoscopy procedure should be removed by polypectomy. Similar to the literature, dysplasia was mostly detected in adenomatous polyps in our cases. We detected dysplasia in non-adenomatous polyps in two of our patients. Randomized clinical trials and the European polyp surveillance study (EPoS) recommend that patients with 1 or 2 <10 mm low-grade dysplasia and tubular adenomas should have screening colonoscopy every 5 or 10 years (25). Although surveillance recommendations in guidelines for CRC risk in conventional adenomas vary little, awareness of surveillance for CRC risk in serrated

polyps is just emerging. The view that SP\As are a different precursor lesion and a separate group for CRC has been revealed in studies with increasing evidence (26). However, SP\As remain largely unknown regarding CRC risk. SP\As, although there is limited evidence of their malignant potential, size is an important determinant. It has been determined that cases with SP\A ≥10 mm are more likely to turn into synchronous or metachronous CRCs than cases without polyps or cases with SP\A <10 mm (13, 27, 28).

We accept that every polyp/adenoma may be a precursor lesion for CRC and should be removed. Keeping this in mind, the most common polyp/adenoma group we detected were diminutive polyps with a diameter of ≤ 5 mm. Approximately 60% of polyps detected in screening colonoscopies are polyps with a diameter of ≤5 mm. The association of these diminutive polyps with CRC is low, but cannot be neglected (29, 30). In contrast, Burgess et al. (31) showed that this dimension is also important for SSA/P. The odds ratio (OR) for cytological dysplasia for every 10 mm increase in lesion size is 1.90 (32). SSA/P cytological dysplasia (SSA/P-D), presence of 0-Is according to the Paris Classification (OR=3.1); also having Kudo pitting pattern III, IV, or V (OR=3.98); and depending on increasing age (OR=1.69/decade) (32). In the literature, CRC is reported to occur in three different ways. These are the chromosomal loss of stability pathways from adenoma to carcinoma (50-70%); the other is the most mutated "Lynch syndrome" pathway (3-5%); and it consists of a serrated path (30-35%). As we mentioned above, WHO grouped serrated polyps under three headings: HP, SSA/P, and TSA. The last two types of polyps are strongly associated with the development of CRCs. HPs are less likely to become malignant than TSAs. Both HP and SSA/Ps appear morphologically similar. SSA/P is also difficult to detect (32).

Resection of premalignant serrated lesions by professionals and experienced individuals reduces the development of CRC. One of the biggest problems of inexperienced people is the inability to obtain en-bloc lesions and the difficulty of providing CRC surveillance. Unlike adenomas, not all serrated lesions are associated with CRC (33). However, when all studies are evaluated, it shows that the relationship of serrated polyps with CRC cannot be ignored. Erichsen, Rune, et al. (32) showed that patients with a history of SSA/P had an increased risk of CRC compared to patients without polyps. Although SSA/Ps have similar sizes to adenomatous polyps, the increased risk of CRC may be even higher than that of adenomatous polyps. The risk of CRC was found to be particularly high for SSA/Ps with dysplasia. A history of TSA was also associated with an increased risk of CRC, whereas patients with a history of HP had a lower risk of CRC. The estimated CRC risk after 10 years is 4.4% for SSA/P-D patients and 4.5% for TSA patients. This is the first study to quantify CRC risks for subtypes of serrated polyps with good precision (32).

As a result, in our study, increased polyp diameter and the presence of dysplasia pose a risk for CRC. This is an issue in which our study overlaps with the literature. We also found that dysplasia can be found not only in adenomatous types of polyps but also in non-adenomatous polyps. Therefore, all polyps must be removed en bloc during the colonoscopy procedure. In our study, we could not obtain sufficient information to perform CRC surveillance according to the Paris classification of polyps and polypectomy technique. The strength of our study is that, in terms of CRC, we found that, although rare, dysplastic changes may also develop in non-adenomatous polyps. Patients with CP may be overlooked in terms of CRC surveillance. Creating this awareness is very useful. On the other hand, the most important features that limit our study are that the study is retrospective, there are not enough cases, and the patients do not have long-term follow-up in terms of CRC surveillance.

Conclusion

The larger the polyp, the more likely it is to develop dysplasia, if it is adenomatous. Although we do not have enough cases, we observed that dysplasia can also develop in non-adenomatous polyps in two of our cases. According to the Paris Classification, the shape of the polyp or the technique of removing the polyp does not provide sufficient information to the

endoscopist regarding the possibility of detecting CRC and dysplasia.

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