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RESEARCH ARTICLE

Is Age an Independent Risk Factor for Histopathology of Colorectal Polyps? A Retrospective Analysis

Yaş Kolonik Polip Histopatolojisi için Bağımsız Bir Risk Faktörü Müdür? Retrospektif Analiz

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ABSTRACT

Aim: Colorectal cancer and its precursor lesions are quite common in developed countries. Data on the prevalence of lesions located in the right colon have been reported to range from 20.5 to 48.1% depending on the gender and advanced age. Today, many countries are conducting studies for disseminating the screening programmes in order to detect and treat polyps at an early stage. In this paper, we aimed to evaluate the relationship that exists between the patient's age and the polyp localisation with histopathology of colorectal polyp.

Method: In our endoscopy unit, 789 patients underwent colonoscopy in the last two years. Among these, a total of 724 patients who met the criteria were included in the study group. The demography of the patients and histopathological data of the polyps were evaluated.

Results: Of the 724 patients included in the study, 317 had at least one pathology detected by colonoscopy. Of these, 57.4% had polyp, 13.6% had malignancy, 8.2% had diverticula, 6.9% had both diverticula and polyp, 5.4% had ulcerative colitis, 3.8% had Crohn's colitis, 4.1% had anastomotic stricture, and 0.6% had lipoma. The prevalence of precancerous and cancerous polyps was observed to be significantly higher in the left colon localisation and among cases aged 50 and over. No significant difference was noticed between polyp type and polyp localisation.

Conclusion: Age is an independent risk factor for histopathology of colorectal polyps. Therefore, we believe that screening programmes should be disseminated.

Keywords: Colonoscopy, colorectal polyps, risk factor

ÖZ

Amaç: Kolorektal kanser ve öncüleri gelişmiş ülkelerde oldukça yaygındır. Sadece sağ taraftaki lezyonların prevalansı için mevcut literatürdeki tahminler, cinsiyet ve ilerleyen yaşla ilişkili olarak %20,5 ile 48,1 arasında değişmektedir. Günümüzde birçok ülkede, poliplerin erken evrede tespit ve tedavi edilebilmesi amacıyla, tarama programlarının yaygınlığını artırıcı çalışmalar yapılmaktadır. Bizde bu yazımızda, hasta yaş ve polip lokalizasyonunun, kolorektal polip histopatolojisi ile ilişkisini değerlendirmeyi amaçladık.

Yöntem: Kliniğimizde son 24 ayda 789 hastaya kolonoskopi yapıldı. Bu hastalardan kriterlere uyan 724'ü çalışma grubuna dahil edildi. Hastaların klinik ve poliplerin histopatolojik verileri değerlendirildi.

Bulgular: Çalışmaya dahil edilen 724 hastanın 317'sinin kolonoskopisin de patoloji mevcut idi. Bunlardan %57,4'ünde polip, %13,6'sında malignite, %8,2'sinde divertikül, %6,9'unda divertikül ve polip, %5,4'ünde ülseratif kolit, %3,8'inde crohn koliti, %4,1'inde anastomoz darlığı ve %0,6'sında lipom tespit edildi. Sol kolon lokalizasyonunda ve 50 yaş ve üstü olgularda prekanseröz ve kanserli polip prevalansının anlamlı derecede yüksek olduğu gözlendi. Polip tipi ile polip lokalizasyonu arasında anlamlı fark yoktu.

Sonuç: Yaş, kolorektal poliplerin histopatolojisi için bağımsız bir risk faktörüdür. Bu nedenle, tarama programlarının yaygınlaştırılması gerektiğine inanıyoruz.

Anahtar Kelimeler: Kolonoskopi, kolorektal polip, risk faktörü

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Introduction

Colorectal cancer (CRC) has the second highest incidence of digestive system cancers according to the American Cancer Society (ACS).[1] In Turkey, it is the third most common cancer among men and women.[2] CRC and its precursor lesions are quite common in developed countries. Adenoma-carcinoma sequence, which aims to schematise the process of CRC development, is widely accepted.[3] Data on the prevalence of precursor lesions have been reported to range from 20.5 to 48.1% depending on the gender and advanced age.[4]

Studies have shown that age is one of the most important risk factors for developing colorectal adenoma, especially age of ≥65 years is reported to be related with higher prevalence rates for advanced adenomas and CRC.[5] Also, report has it that the left colon polyps and carcinomas detected in colonoscopy have a higher incidence than the right-sided colon.[4,6] Therefore, many countries today have been conducting studies for disseminating the screening programmes in order to detect and treat polyps at an early stage.[7]

Regular screening is therefore recommended for CRC in adults 45 years of age and older with an average-risk by the ACS Guideline (2018).[8] On the other hand, the American Society for Gastrointestinal Endoscopy emphasises that 50 years is the age to begin CRC screening for Caucasians with an average-risk, since the rate of adenoma detection at this age reaches 25% and 15% in men and women, respectively.[9]

In this study, our aim is to evaluate the relationship between the patient's age and the polyp localisation with histopathology of colorectal polyp.

Materials and Methods

The study protocol was approved by the institutional Ethics Committee. A written, informed consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.

The medical records of patients, who underwent colonoscopy in the last two years in the surgical endoscopy unit of our department were evaluated retrospectively. Within this period; a total of 789 colonoscopy procedures had been performed (with the indications of positive faecal occult blood testing, rectal bleeding or hematochezia, regular health examination and constipation), and among them, 724 patients' medical records were evaluated. Of these 724 patients, 317 in whom a colonic pathology was detected were included in the study group.

The following inclusion criteria were used for patient selection: (1) the patients who underwent complete colonoscopy (caecal intubation), and (2) the patients who underwent a polypectomy and/or biopsy. The 65 patients who had (1) incomplete colonoscopy, (2) underwent an endoscopic mucosal resection or endoscopic submucosal resection (not decided and performed in screening, their prior biopsy results were known and colonoscopy was performed in them with a therapeutic purpose), and/or (3) in which polypectomy could not be performed (due to taking anticoagulant drugs, multiple comorbid conditions, etc.) (Since we did not perform polypectomy in the same session due to the risk factors, we did not know the histopathology of those polyps.) were excluded.

The following parameters were analysed for all patients: age, sex, presenting complaint, polyp location, and histological subtype of polyp. Precise characteristics of the colorectal polyps (that is, number, size, form and location) were documented in the colonoscopy reports by endoscopists.

Initially, the patients were classified into three groups according to their age (<40 years old, 40-49 years old, and ≥50 years). After that, colorectal polyps were divided into four groups: The right-sided, left-sided, rectum and multiple lesions. The polyps located proximal to the splenic flexure were considered right-sided (including the caecum, ascending colon and transverse colon), whereas those that were distal to the splenic flexure were considered left-sided (including the descending colon, sigmoid colon and rectum). Histopathological findings and degree of dysplasia (low and high) were also analysed.

Colonoscopy Procedure

Four trained endoscopists carried out the procedures. An Olympus Evis Exera III (CF-H260/CF-Q260) (Olympus, Tokyo, Japan) was used to conduct all investigations.

Sodium Dihydrogen Phosphate (B.T. Enema 210 ml) and Sennozid A+B Ca (X-M diet 150 ml) as a purgative was used for all patients for bowel preparation. Sedoanalgesia was performed by the anaesthesiologist. Polypectomies were performed using standard biopsy forceps (for polyps <5 mm) or polypectomy snares for larger polyps (>5 mm).

Statistical Analysis

The data was analysed using the SPSS statistical software, version 17. Common statistics were applied in order to estimate the significance of the results. Chi-square test, Mann-Whitney nonparametric test and Fischer's exact test were used were necessary. Differences were considered to be significant if $p<0.05$.

Results

At least one pathology was detected by colonoscopy in 317 (43.8%). Of these 317, 57.4% (n=182) had polyp, 13.6% (n=43) had malignancy, 8.2% (n=26) had diverticula, 6.9%

(n=22) had both diverticula and polyp, 5.4% (n=17) had ulcerative colitis, 3.8% (n=12) had Crohn's colitis, 4.1% (n=13) had anastomotic stricture, and 0.6% (n=2) had lipoma.

The characteristics of patients who had polyp are shown in Table 1. Among 182 patients with polyps, 57.7% were male. The mean age of these patients was 60.3±6,26 (37-86) and 85.8% of the patients were ≥50 years of age. The presenting complaints/symptoms were positive faecal occult blood (30.8%), rectal bleeding or hematochezia (14.3%), constipation (8.8%) and regular health examination (46.1%). A maximum of two polys was found in 72% of the patients. Of all polyps, 142 (78.1%) were adenomatous polyps (APs), 31 (17%) were hyperplastic or non-adenomatous polyps and 9 (4.9%) were intra-mucosal carcinoma. The 142 APs comprised 103 (56.8%) tubular adenomas, 26 (14.2%) tubulovillous adenomas and 13 (7.1%) villous adenomas. Among the APs, 49 (26.9%) were noted to have high grade dysplasia (HGD). Of the 182 patients with polyp; 41 (22.5%), 69 (38%), 41 (22.5%) and 31 (17%) polyps were detected in the right colon, the left colon, the rectum and multiple locations, respectively.

85.8% of all the polyps and 79.1% of all the malignancies were detected in cases ≥50 years of age (Table 2). There were significant statistical differences between groups when polyps and malignancy were compared according to age.

When the localisation of polyps by age was evaluated, the polyps in patients under the age of 50 were observed most commonly in the rectum, while those in patients 50 years of age and above were in the left colon (Table 3). Hyperplastic or non-APs were most commonly observed in <50 years of age, while intra-mucosal carcinoma was observed in ≥50 years of age (Table 4). Additionally, polyp type analysis by localisation, hyperplastic or non-adenomatous polyp (s), adenomatous polyp (s) and intra-mucosal carcinoma were most commonly detected in the left colon (Table 5). According to these results, there was a significant difference between the patient's age and polyp (s) localisation and type ($p<0.05$), but there was no difference between polyp type and localisation. Also, proximal rectum was the most common localisation for the rectal polyps.

Table 1. The general characteristics of patients with polyp

Features	n (182)
Gender (n, %)	
Male	111 (57.7)
Female	71 (42.3)
Mean age (year) (range)	60.3±6,26 (37-86)
Age (n, %)	
<40	1 (0.5)
40- 49	25 (13.7)
≥50	156 (85.8)
Presenting complaint (n, %)	
Positive faecal occult blood testing	56 (30.8)
Rectal bleeding or hematochezia	26 (14.3)
Regular health examination	84 (46.1)
Constipation	16 (8.8)
Number of polyp (n, %)	
1- 2	131 (72)
>2	51 (28)
Histopathology of colorectal polyp	
Adenomatous polyps	142 (78.1)
Tubular adenomas (Low dysplasia)	75 (41.4)
Tubular adenomas (High dysplasia)	28 (15.4)
Tubulovillous adenomas (Low dysplasia)	11 (6)
Tubulovillous adenomas (High dysplasia)	15 (8.2)
Villous adenomas (Low dysplasia)	7 (3.8)
Villous adenomas (High dysplasia)	6 (3.3)
Hyperplastic or non-adenomatous polyps	31 (17)
Intra-mucosal carcinoma	9 (4.9)
Polyp localisation	
Right colon	40 (22)
Left colon	70 (38.4)
Rectum	40 (22)
Multiple	32 (17.6)

Discussion

The present study retrospectively analysed the clinical and pathological characteristics of colorectal polyps and the relation between colorectal polyp localisation,

Table 2. Polyp and cancer detection analysis by age

Features	Age <50 n (%)	Age ≥50 n (%)	p value
Polyp (s) (n=182)	26 (14.2)	156 (85.8)	<0.01*
Malignancy (n=43)	9 (20.9)	34 (79.1)	<0.01*

Table 3. Polyp (s) localisation analysis by age

Polyp (s) localisation	Age <50 n (%)	Age ≥50 n (%)	p value
Right colon	4 (17.6)	36 (23)	
Left colon	7 (26.5)	63 (42.2)	<0.01*
Rectum	12 (41.2)	28 (17.6)	
Multiple	3 (14.7)	29 (18.2)	
Total (n)	26	156	

Table 4. Histopathology of colorectal polyp analysis by age

Age, (n)	Polyp type, n (%) Hyperplastic or non-adenomatous, 31 (17)	Adenomatous, 142 (78.1)	Intra-mucosal carcinoma, 9 (4.9)	p value
<50 (26)	20 (64.5)	84 (59.2)	2 (33.3)	<0.01*
≥50 (156)	11 (35.5)	58 (40.8)	6 (66.7)	

Table 5. Histopathology of colorectal polyp analysis by localisation

Polyp localisation, n (%)	Polyp type, n (%) Hyperplastic or non-adenomatous, 31 (17)	Adenomatous, 142 (78.1)	Intra-mucosal carcinoma, 9 (4.9)	p value
Right colon	6 (19.4)	33 (23.2)	1 (11.1)	
Left colon	10 (32.3)	54 (38.1)	6 (66.7)	
Rectum	7 (22.6)	31 (21.8)		
Upper	3 (42.9)	16 (51.6)	2 (22.2)	0.256
Middle	3 (42.9)	9 (29)	2 (100)	
Lower	1 (14.2)	6 (19.4)		
Multiple	8 (25.7)	24 (16.9)	-	

histopathology and patient's age in our patient group.

Advancing age has been reported to be an independent risk factor for the development of colorectal polyps and carcinoma.[5,10] However, publications evaluating the relationship between patient's age, polyp localisation and polyp histopathology are limited. In the present study, it was observed that age of patient with polyp was an independent risk factor for polyp histopathology, but polyp localisation did not have any effect on histopathology.

Current reports have identified that old age, obesity, smoking, alcohol, BMI, diet, physical activity, medication, and/or hormone replacement therapy are independent risk factors with colorectal polyps.[11,12,13] Age is equally an important factor in both men and women. More than 50% of CRC cases are diagnosed after the age of 70 years and only 10% of the cases are detected before the age of 55.[14] Another study with the participants between the age of 20 and 79 showed that the prevalence of colorectal adenoma increased significantly with age.[15] The effect of patient sex on polyp incidence is still controversial, whereas men have a higher risk of developing APs compared to women.[16,17] However, Kaminski et al.[18] reported that almost similar as CRC family history, there is an increased risk in male sex.

In our study, 23% of the patients who underwent colonoscopy were found to have polyp and the risk of polyp increased significantly with age. Median age of the patients with polyps was similar to other studies, in which the mean was 60.3 years.[19] In addition, the majority of the patients with polyps were male.

Determining the histopathological features of the polyps with colonoscopy precisely is quite challenging. This can only be achieved with the removal of the polyp followed by the histopathological examination. APs which includes dysplasia is the most common type detected with colonoscopy. While these polyps can be found in 5-10% of the general population, this rate increases up to 60% in the ninth decade.[20] APs constituted 78.1% of our cases and among them tubular polyps were the most common type (56.8%), compared to other studies.[21]

Risk for developing CRC is associated with histological type and localisation of the polyp. The present study has shown that polyps were more frequently located in the left colon and the rectum (60.5%), a finding that is in agreement with previous studies[22,23] and left sided polyp had more tendency to show HGD and intra-mucosal carcinoma. In a study by Patel et al, it was demonstrated that the prevalence of right-sided lesions increased with advanced aged.[24] Therefore, that study indicates the importance of evaluating the entire colon segments in elderly population. However, complete colonoscopy may not always be achieved in this patient group due to increased risk of complications, poorer bowel preparation and higher incidence of comorbidities.

Study Limitations

This study had several limitations: 1) Study was performed in a single academic centre with limited numbers of sample and 2) It was a retrospective study where the sizes of all adenomas were not found.

Conclusion

Age is an independent risk factor for histopathology of colorectal polyps. We therefore believe that screening programs should be disseminated, the quality of endoscopic interventions should be inspected and improved.

Ethics

Ethics Committee Approval: The study protocol was approved by the institutional Ethics Committee (date: 12.08.2019; number: 618).

Informed Consent: Written informed consent was obtained from the patient for the publication of this report and any accompanying images.

Peer-review: Internally peer reviewed.

Authorship Contributions

Concept: T.A., N.A., Design: T.A., N.A., F.C., Supervision: N.E., M.B.G., M.H., Materials: T.A., N.A., Data Collection and/or Processing: T.A., N.A., Analysis and/or Interpretation: F.C., N.E., M.B.G., M.H., Literature Search: T.A., N.A., Writing: T.A., N.A.

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