

## Çocukluk Çağı Kolorektal Poliplerini Değerlendirmede Rektosigmoidoskopi Yeterli Midir?

### Is Rectosigmoidoscopy Sufficient in the Evaluation of Childhood Colorectal Polyps?

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#### ÖZ

**Giriş:** Gastrointestinal sistem polipleri; mukoza ve submukozadan köken alarak lümeneye doğru çıkıntı yapan, neoplastik ve non neoplastik olabilen, en sık ağrısız rektal kanama ile ortaya çıkan bir lezyondur. Çocukluk çağı polipleri çoğunlukla iyi huyludur ancak malignite gelişimine yol açabileceği akıldadır. Çalışmamızda pediatrik yaşta kolorektal polip şüphesi olan hastalarda tam kolonoskopi yapılma gerekliliğinin vurgulanmayı amaçladık.

**Yöntem:** 6 ay-18 yaş aralığında olan Ocak 2019 ile Şubat 2021 tarihleri arasında kolonoskopi yapılarak polip saptanan çocuk hastalar çalışmaya dahil edildi. Hasta verileri etik kurul onayı alındıktan sonra geriye dönük olarak analiz edildi.

**Bulgular:** Dört yüz hastaya kolonoskopi yapıldı, 58 polip tespit edildi. Hastaların 28'i erkek, 11'i kadındı; ortalama yaş 6,8 idi. En sık görülen şikayet %51.2 ile rektal kanamayı. Tüm hastalara aynı pediatrik gastroenterolog tarafından kolonoskopi yapıldı. Çalışmamızda %28.2 oranında çoklu polip, %46.1 oranında pedinküllü ve %15.3 oranında proksimal rektosigmoid kolon polipleri tespit edildi. Neoplastik adenomatöz poliplerin tamamı rektosigmoid bölgenin proksimaline yerleşmişti ve %75'i çoklu polipti.

**Sonuç:** Kolorektal polipler çocuklarda sağ kolonda yerleşimli polipler nadir de olsa görülebilir, neoplazi ile yakından ilişkili olduğu bilinmelidir. Bu nedenle kolorektal polip düşünülen çocuk hastalarda deneyimli pediatrik gastroenterolog tarafından tam kolonoskopi yapılmalıdır. Böylece polip tespit oranını artıracak ve pediatrik yaşta neoplastik poliplerin gözden kaçmasını önleyecektir.

**Anahtar Kelimeler:** çocuk, gastroenteroloji, kolonoskopi, kolorektal polip

#### ABSTRACT

**Objective:** Gastrointestinal(GI) polyps are mucosal or submucosal lesions protruding into the lumen.They can be neoplastic or non-neoplastic and often present with painless rectal bleeding. This study emphasizes the necessity of complete colonoscopy in pediatric patients with suspected colorectal polyps.

**Method:** This retrospective study, approved by the ethics committee, included pediatric patients (6 months – 18 years) who underwent colonoscopy between January 2019 and February 2021 and were identified with polyps.Patient data were analyzed.

**Results:** Four hundred patients underwent colonoscopy, and 58 polyps were detected. 28 of the patients were male and 11 were female; the average age was 6.8 years. The most common complaint was rectal bleeding with 51.2%. All patients underwent colonoscopy by the same pediatric gastroenterologist. In our study, multiple polyps were detected in 28.2%, pedunculated polyps in 46.1%, and proximal rectosigmoid colon polyps in 15.3%. All neoplastic adenomatous polyps were located proximal to the rectosigmoid region and 75% were multiple polyps.

**Conclusion:** While less common in children, right-sided colorectal polyps can occur and are closely associated with neoplasia. Therefore, in pediatric patients with suspected colorectal polyps, complete colonoscopy by an experienced pediatric gastroenterologist is essential. This increases polyp detection rates and prevents overlooking potentially neoplastic polyps in this age group.

**Keywords:** child, gastroenterology, colonoscopy, colorectal polyp

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## INTRODUCTION

Gastrointestinal (GI) polyps are mucosal or submucosal lesions, classified as neoplastic or proliferative, which protrude into the lumen. They can present as pedunculated or sessile, single or multiple, and are most prevalent in the colorectal region, particularly in children aged 2-6 (1). While non-neoplastic polyps are the most common type, neoplastic polyps deserve attention due to their potential as precursors to pathologies like familial adenomatous polyposis, which carries a high risk of malignancy (3). The primary clinical symptom of GI polyps is painless rectal bleeding, but they may also present with abdominal pain, constipation, diarrhea, polyp or rectal prolapse, and, less frequently, intussusception (2). Iron deficiency anemia is a common finding. This study presents demographic characteristics, laboratory findings, and polyp characteristics in pediatric patients diagnosed through colonoscopy, discussed in the context of current literature. Notably, the recent increase in pediatric gastroenterologists has led to the detection of more proximal and multiple polyps. This highlights the necessity of routine, complete colonoscopic evaluation. Due to the limited data on pediatric colorectal polyp patients undergoing colonoscopy, our study aims to contribute valuable insights to the field.

## MATERIALS AND METHODS

This retrospective study included pediatric patients (aged between 6 months and 18 years) who underwent colonoscopy between January 2019 and February 2021 and were diagnosed with polyps. All colonoscopies were performed by a single pediatric gastroenterology specialist after at least a 12-hour fasting period. Patients were sedated with propofol and midazolam, administered by an anesthesiologist. A total of 58 polyps were detected in 39 of the 400 patients who underwent colonoscopy. We retrospectively analyzed patient demographics, clinical characteristics, laboratory results, colonoscopy findings, and biopsy reports. For comparison, patients were divided into three groups according to their age (2-6 years old, 6-10 years old, and over ten years old). Polyps were also categorized based on diameter and histopathological features. We specifically evaluated the characteristics and localization of neoplastic polyps. Comparisons between groups were made concerning age, gender, polyp size, location, and characteristics. This study was approved by the Health Sciences University Faculty of Medicine, Adana City Training and Research Hospital ethics committee. It is a retrospective study evaluating digital data and patient files.

Ethics committee approval dated 02.06.2021 and numbered 82/1433 was obtained from Health Sciences University Adana City and Training and Research Hospital Medical Research Ethics Committee.

### Statistical Analysis

The conformity of patient age, polyp size, and polyp number variables to a normal distribution was analyzed using analytical methods. Descriptive statistics were calculated for numerical data, including mean, median, standard deviation, and largest and smallest values. For categorical data, descriptive methods such as ratio and percentage were employed. A P-value threshold of less than 0.05 was used to determine statistical significance. SPSS Statistics Ver. 26.0 was used for all statistical analyses and calculations.

## RESULTS

This study investigated the causes of chronic abdominal pain, chronic diarrhea, unexplained growth retardation, rectal bleeding, and treatment-resistant anemia in 400 pediatric patients who underwent colonoscopy. Polyps were detected in 39 patients (58 total). Of these patients, 28 were male and 11 were female, with a mean age of 6.8 years. Consistent with pediatric trends, the 2-6 year age group was most prevalent, representing 47.3% of patients. Patients were divided into three age groups: 2-6 years (47.3%), 6-10 years (21%), and over ten years (26.5%). The most common presenting complaint was rectal bleeding (51.2%), followed by prolapsed rectal mass (23%), diarrhea (10.2%), abdominal pain (5.1%), and hyperpigmented lip lesions (5.1%). 5.1% of patients were asymptomatic. Rectal examination revealed palpable polyps in 17 patients. Laboratory evaluation identified iron deficiency anemia in 17 patients and vitamin B12 deficiency in 10 patients. The majority of polyps (67.2%) were located in the rectosigmoid colon (Figure 1: Rectum-located stalked polyp), with the remaining 32.8% situated proximally to the rectosigmoid region (Figure 2: Colon-located polyp). A single polyp was seen in 71.8% of cases during colonoscopy. Of the 30 multiple polyps detected in 11 patients, 10.2% had two, and 18% had more than two. 73.3% of multiple polyps were sessile, and 68% of solitary polyps were pedunculated, and there was no statistically significant difference between them ( $p = 0.07$ ).



**Figure 1.**

**Figure 1.** Rectal located polyp with peduncle



**Figure 2.**

**Figure 2.** Colon located sessile polyp

The distribution of single and multiple polyps detected during colonoscopy in pediatric patients is shown in figure 3. Regarding the distribution of single and multiple polyps detected during colonoscopy, 54.5% of patients with multiple polyps exhibited polyps proximal to the rectosigmoid colon; all visualized multiple polyps were located within the colon. We classified polyps into four size categories: smaller than 5 mm (18 polyps), 5-10 mm (18 polyps), 11-20 mm (13 polyps), and larger than 20 mm (9 polyps). Polyp size varied by location (Table 1); within the rectosigmoid colon, we detected ten polyps smaller than 5 mm, 13 polyps between 5-10 mm, eight polyps between 10-20 mm, and eight polyps larger than 20 mm. Proximally, we found eight polyps smaller than 5 mm, five polyps between 5-10 mm, five polyps between 10-20 mm, and one polyp larger than 20 mm. The distribution of polyps according to their size is shown in figure 4. A comparison revealed significantly larger diameters for

polyps within the rectosigmoid region. This size difference may make proximal polyps more easily overlooked, potentially due to fewer associated symptoms. Intriguingly, two patients presented with a single polyp within the rectum's first 10 cm and two polyps in the descending and transverse colon. Histopathological analysis revealed the following polyp distribution: 18% juvenile, 35.9% inflammatory, 35.9% hyperplastic, and 10.2% adenomatous (Table 2).

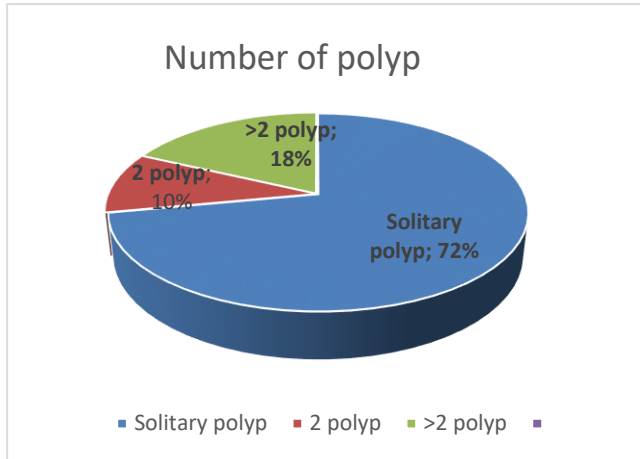


Figure 3. Distribution of single and multiple polyps detected during colonoscopy in pediatric patients

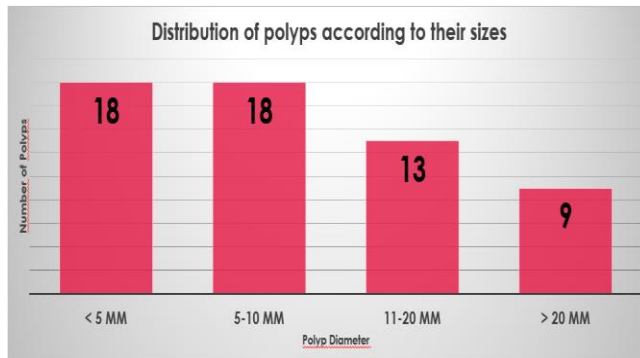


Figure 4. Distribution of polyps by size

Polyp Diameter	< 5mm	5-10 mm	10-20 mm	>20 mm
Number of rectosigmoid polyp	10	13	8	8
Number of colonic polyp	8	5	5	1

Table 2. Characteristics of Patients with Colorectal Polyps and Polyps

Feature	n	%
Gender		
Female	11	28.2
Male	28	71.8
Age		
2-6 year	18	47.3
7-10 year	8	21
>10 year	13	26.5
Application complaint		
Polyp diameter		
< 5mm;	18	31
5-10 mm;	18	31
10- 20 mm;	13	22.4
>20mm;	9	15.6
Number of polyps		
Solitary	28	71.8
Multiple	11	
2 polyp	4	10.2
>2polyp	7	18
Pedunculated polyp	27	46.5
Sessile polyp	31	53.5
Localization		
Distal rectosigmoid	39	67.2
Proximal rectosigmoid	19	32.8
Histopathology		
Juvenile; 18%	10	18
Inflammatory; 35.9%	20	35.9
Hyperplastic; 35.9%	20	35.9
Adenomatous; 10.2%	8	10.2

DISCUSSION

While colorectal polyps are extensively studied in adults, pediatric data remains limited. Studies such as those by Gupta SK. et al. (4), Mougenot JF. et al. (5) and Latt et al. (6) have reported varying polyp prevalence rates in children, initially ranging from 1% to 4%. However, recent years have seen a marked increase in prevalence (up to 12%) with the widespread adoption of full colonoscopy.

This highlights the importance of complete colonoscopic evaluation, as rectosigmoidoscopy alone may underestimate polyp presence, particularly for multiple polyps located proximally to the rectosigmoid colon (2, 3).

The higher occurrence of colorectal polyps in males remains unexplained (3), a trend supported by several pediatric studies (4, 5, 7, 8). Adult studies have established male gender as a risk factor for the development of hyperplastic and adenomatous polyps. The pediatric picture is less definitive. Gupta et al. observed a two-fold higher incidence of juvenile polyps in males (4), while Wang et al. (9) found no significant gender-related difference in polyp prevalence. Our study aligns with the trend of higher polyp detection in males. This observation warrants further investigation to determine, given the male gender represents a risk factor for polyp development in children, and to elucidate the potential mechanisms behind any such association. Currently, the reasons for gender-related differences in pediatric polyp prevalence remain unclear, highlighting the need for comprehensive studies on this topic.

Consistent with the literature, our study found the highest polyp prevalence in the 2-6 year age group. This aligns with previous studies where the mean age of patients with polyps was reported as six years (Mougenot et al.), 5.1 years (Waitayakul et al.), and 5.6 years (Mohammad et al.) (5, 10, 11). The results of our study indicate a mean age of 6.8 years, consistent with the findings reported in prior research.

The most frequent clinical manifestation of colorectal polyps is painless rectal bleeding during defecation. Rectal examination may reveal a mobile, soft mass, which can sometimes prolapse out of the rectum. Additional symptoms include abdominal pain, constipation, diarrhea, and rectal prolapse, potentially resulting from polyp-related obstruction or intussusception. Acute anemia may occur due to significant rectal bleeding from auto-amputation of pedunculated polyps (2). Importantly, extraintestinal symptoms can accompany syndromic diseases, particularly Peutz-Jeghers syndrome (PJS) and familial adenomatous polyposis (FAP) (12). Certain syndromic diseases, such as Peutz-Jeghers syndrome, may present with characteristic mucocutaneous pigmentation around the lips, buccal mucosa, nostrils, eyes, hands, feet, and perianal region. Additionally, macrocephaly, cleft lip or palate, and tumors in various locations can be observed (2). Our findings align with the literature, where rectal bleeding consistently emerges as the predominant symptom associated with colorectal polyps. Studies by Waitayakul et al. (10), Thakkor et al. (7), Mohammad et al. (11), Bo Liu et al. (14), Mougenot et al. (5), and Ulukaya et al. (13) all identify rectal bleeding as the most common complaint. Other studies similarly report lower gastrointestinal bleeding as the primary presenting symptom (4, 15, 16). Consistent with prior studies, our findings identified abdominal pain, diarrhea, chronic constipation, and iron deficiency anemia as additional symptoms associated with colorectal polyps. The most common presentation in our study was rectal bleeding (51.2%), followed by a prolapsed rectal mass (23.6%), diarrhea (10.2%), and, less frequently, abdominal pain. Interestingly, we observed asymptomatic patients: two presented with lip hyperpigmentation, and two had a family history of polyposis syndromes. Laboratory evaluation revealed iron deficiency anemia (43.5%) and vitamin B12 deficiency (25.6%). Hypoalbuminemia was not detected. Importantly, children with extraintestinal symptoms and a family history of polyposis carry a significantly increased risk of malignancy.

The presence of more than five hamartomatous polyps during colonoscopy necessitates thorough investigation and complete colonoscopic evaluation (17).

Rectal examination plays a crucial role in diagnosing colorectal polyps, particularly those situated on the posterior rectal wall in the 6 o'clock position. Studies by Pillai RB et al. (18) and Güveç FT. et al. (16) report high polyp detection rates via rectal examination (20% and 80%, respectively). In our study, 43.5% of polyps were identified on rectal examination within the first 10 cm of the anal canal and rectum, underscoring the importance of this examination in patients presenting with lower gastrointestinal bleeding.

The literature establishes a predominance of solitary, stalked juvenile polyps located within the rectosigmoid colon in pediatric cases. In patients with multiple polyps, approximately 60% are found in the rectosigmoid region (7, 13, 14, 19). The presence of five or more polyps warrants consideration of juvenile polyposis syndrome and Peutz-Jeghers syndrome. While solitary juvenile polyps have a low recurrence risk (4.5%), those with more than five polyps demonstrate an increased risk of 17-37.5% (17).

Studies such as those by Dipasquale V. et al. (15), Waitayakul et al. (10), Mougenot et al. (5), Thakkor et al. (7), and Mohammad et al. (11) support these trends. They report a high incidence of solitary polyps within the left colon or rectum, with a small percentage of patients exhibiting multiple polyps or those located proximal to the splenic flexure. The predominant histological type was juvenile, with infrequent occurrences of inflammatory or hyperplastic polyps and rare adenoma detection. Our findings align with those of Haghi Ashtiani et al. (20), who similarly observed a 6% prevalence of multiple polyps and an 18.8% occurrence of right-sided polyps. However, studies by Latt et al. (6) and Roth et al. (21) present a contrasting picture, with a higher proportion of multiple polyps (53-58%) and a significant percentage (30-60%) located proximal to the sigmoid colon. Rathi C. et al. (22) reported that in the non-polyposis group, 97% of patients exhibited polyps isolated to the left colon. In our study, all colonoscopies were performed by the same pediatric gastroenterologist, revealing a 28.2% prevalence of multiple polyps, a 46.1% occurrence of stalked polyps, and a 15.3% localization within the proximal rectosigmoid colon. Interestingly, while 63.6% of patients with multiple polyps presented with them in the rectosigmoid region, a significant 36.4% exhibited proximal polyp localization. This supports previous studies (6, 23, 24) suggesting a higher-than-expected prevalence of polyps proximal to the rectosigmoid colon. Available data indicate that approximately 40% of pediatric colorectal polyps are located within the rectosigmoid region, with the remainder distributed relatively evenly throughout the proximal colon (2). This distribution underscores the necessity of complete colonoscopic evaluation whenever a polyp is detected in a child, regardless of its initial location. Our findings support the importance of complete colonoscopy in suspected colorectal polyp cases. Notably, while approximately half of the polyps with neoplastic potential were located proximally, a significant observation is that these proximal polyps were frequently hyperplastic, highlighting their risk of future neoplastic transformation. Histopathological classification broadly divides polyps into neoplastic and non-neoplastic groups. Non-neoplastic polyps include inflammatory, hamartomatous (such as juvenile polyps), and hyperplastic types (2).

While solitary adenomas are rare in children, they carry significant long-term malignant potential. Reported rates of adenomatous polyps in the pediatric literature vary:

Waitayakul et al. (10) detected a 5% rate, Mougnot et al. (5) observed adenoma in only one patient, while studies by Gupta et al. (4) and Thakkar et al. (7) reported rates of 0.5% and 11%, respectively. Güveç et al. (16) found a 5.2% prevalence of adenomatous polyps. Particularly, adenomatous polyps are more frequently associated with polyposis syndromes, particularly in children over ten years of age (26). In contrast to these studies, our findings did not reveal a predominance of juvenile polyps. We hypothesize that this difference may be attributed to patients with rectal bleeding preferentially seeking care at pediatric surgery clinics rather than pediatric gastroenterology clinics.

In contrast to the prevailing literature, our study identified three out of four male patients with neoplastic adenomatous polyps within the 2–6-year age group, with only one ten-year-old patient. Interestingly, 50% of patients with neoplastic polyps had a family history of hereditary polyposis syndrome, prompting early screening within their families. Our findings suggest that while age may not be a differentiating factor, the presence of multiple, sessile, and right-sided colonic polyps exhibits a strong association with neoplasia. A crucial task for pediatric gastroenterologists is the timely identification of cancer risk in patients presenting with colorectal polyps.

### CONCLUSION

Pediatric colorectal polyps can present at any age. While juvenile polyps are most prevalent in childhood, a significant proportion (approximately 40%) are located in the rectosigmoid region, with the remainder distributed throughout the proximal colon. Multiple, proximal, and sessile polyps carry an increased risk of neoplastic transformation. Therefore, complete colonoscopic evaluation is essential in children with confirmed or suspected polyps, regardless of location. Colonoscopy is a sensitive diagnostic tool for polyp detection and an effective therapeutic intervention.

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**Conflict of Interest:** None

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**Informed Consent:** Our study is a retrospective study.

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