



ORIGINAL ARTICLE

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Evaluation of the frequency of colon diverticula with lower gastrointestinal system endoscopy

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Abstract

The patients are often elderly, presenting the symptoms, and fully recognizing the disease is difficult. It is sometimes confused with inflammatory bowel disease. Within the scope of this research, we aimed to elucidate the frequency of colon diverticulum in patients who underwent lower gastrointestinal endoscopy in our clinic. Demographic data and its relationship with the patient's height-weight-body mass index will also be evaluated. The medical files of 200 patients aged 18-90 years who underwent lower gastrointestinal system endoscopy in our institution have been retrospectively analyzed. The demographic details, age, gender, and results of endoscopy findings have been investigated with respect to detecting colon diverticulum. The presence of diverticula was observed in 7% of the patients (n=14), external hemorrhoids in 1% (n=2), internal hemorrhoids in 28% (n=56), and polyps in 21.5% (n=43). A statistically significant relationship was observed between the genders of the patients in terms of the presence of polyps (p<0.05). The distribution of clinical findings of the patients according to age and body mass index (BMI) did not reveal any statistically significant relationship. The prevalence of diverticulitis is increasing gradually with the aging population. We believe interval lower gastrointestinal system endoscopy remains a significant tool, especially after an acute attack, particularly after complicated diverticulitis, to rule out malignancy or advanced adenomata at the target site and the rest of the colon.

Keywords: Colon diverticulum, polyp, colon endoscopy, body mass index, elderly

Introduction

Even if diverticulum disease of the colon is asymptomatic, it is accompanied by findings such as abdominal pain and changes in bowel habits. Especially in Western societies, it is often located in the left column. For left colon diverticular disease, the more proximal part of the colon should be investigated. The right colon diverticulum, more common in Asian societies, is a separate entity and does not require investigation or association with the left colon diverticulum [1].

Diverticula formation is located along the regions between mesenteric and antimesenteric tapeworms, is the protrusion of the mucosa into the pericolic fat layer through weak points in the circular muscles, with the effect of increasing intra-colonic pressure, often involving the muscularis mucosa [2].

The disease is generally examined in 3 different clinical categories. Asymptomatic diverticular disease, symptomatic but uncomplicated disease ("painful uncomplicated disease" or "left side appendicitis"), and symptomatic diverticular disease with

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complications. The main symptomatology concentrates on the sigmoid colon muscle mass and the tapeworm [3].

This disease, which is rare under the age of forty, has a frequency of 50% over the age of 80 and has been reported to be between 2–45% in necropsy studies. It is frequently seen in the female gender. In societies with Western-style pulp-free eating habits, the left colon diverticulum has been associated with excessive meat consumption. Approximately 10–25% of people with diverticular disease will encounter diverticulitis throughout their lives [4].

Diverticular disease of the colon is the outward ballooning of the mucosa due to some deficiencies in the muscle layer. In true diverticula, all layers of the intestine, namely the mucosa, muscle layer, and outer membrane, become sacs, whereas in pseudo diverticula, only the mucosa and submucosa become sacs. Most colon diverticula are pseudo diverticula. Although a French surgeon, Lister described outward pockets in the colon as pouches, in the seventeenth century, Fleischman first used the term diverticulum in 1815 [5].

Since it is usually asymptomatic, its incidence is difficult to determine. Additionally, small diverticula may be missed in the autopsy series. It is becoming more common, especially in industrialized Western countries, with the increase in the elderly patient population and the discovery of new diagnostic methods. The disease's onset age is often in the 6th, 7th or 8th decades. While its prevalence is less than 10% in people under 40, it varies between 50% and 66% in patients aged 80 and over [6].

Diverticular disease may be asymptomatic or symptomatic with or without complications. As a complication, patients have diverticulum micro-perforations and accompanying inflammation, leading to peritonitis. Even stricture and fistulization are not uncommon findings. Since patients are often elderly, presenting the symptoms and fully recognizing the disease is difficult. It is sometimes confused with inflammatory bowel disease (IBS) [7].

Within the scope of this research, we aimed to elucidate the frequency of colon diverticulum in patients who underwent lower gastrointestinal endoscopy in our clinic. Demographic data and its relationship with the patient's height-weight-body mass index will also be evaluated.

Material and Methods

The medical files of 200 patients aged 18–90 years who underwent lower gastrointestinal system endoscopy in our institution have been retrospectively analyzed. Patients who underwent lower gastrointestinal endoscopy between August 2023 and November 2023 were included in the study. Patients with indications of iron deficiency anemia, constipation, and abdominal pain were

included in the study. Patients with gastrointestinal hemorrhage, inflammatory bowel disease, inadequate colon cleansing, and patients who could not reach the cecum were excluded from the study. The demographic details, age, gender, and results of endoscopy findings have been investigated with respect to detecting colon diverticulum.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from Adiyaman University Non-invasive Clinical Research Ethics Committee with protocol number 2023/3-8, and informed consent has been obtained from all participants.

Statistical Analysis

Patient data collected within the scope of the study were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) for Windows 26.0 (IBM Corp., Armonk, NY) package program. Frequency and percentage for categorical data and mean and standard deviation for continuous data were given as descriptive values. For comparisons between groups, the “Independent Sample T-test” was used for two groups, and the “Pearson Chi-Square Test” was used to compare categorical variables. The results were considered statistically significant when the p-value was less than 0.05.

Results

Within the scope of the study, 200 patients aged between 17 and 86 were included in the evaluation. The average age of the patients was 53; 40.5% (n=81) were female, and 59.5% (n=119) were male. The presence of diverticula was observed in 7% of the patients (n=14), external hemorrhoids in 1% (n=2), internal hemorrhoids in 28% (n=56), and polyps in 21.5% (n=43) (Table 1).

The distribution of clinical findings of the patients according to their gender is shown in Table 2. When the table was examined, a statistically significant relationship was observed between the genders of the patients in terms of the presence of polyps ($p<0.05$). On the other hand no statistically, significant relationship was found in other clinical findings.

The distribution of clinical findings of the patients according to their age groups is denoted in Table 3. When the table was examined, it was seen that there was no statistically significant relationship in all clinical findings between age groups.

The distribution of clinical findings of the patients according to body mass index (BMI) groups is presented in Table 4. When the table was examined, it was seen that there was no statistically significant relationship between the BMI groups in all clinical findings.

Table 1. Distribution of demographic and clinical findings of the patients

(N=200)	n (%)	Mean±SD	Median (Min-Max)
Age (years)		53±15	55 (17-86)
18-40 years old	46 (23)		
40-65 years old	118 (59)		
65≤ years old	36 (18)		
Gender			
Male	119 (59.5)		
Female	81 (40.5)		
Height (cm)		165±9.8	165 (144-188)
Weight (kg)		74±13.5	74 (38-111)
Waist circumference		95.8±12.7	96 (65-133)
BMI		27.3±4.9	26.8 (15.2-42.3)
<20	10 (5)		
20-25	62 (31)		
25-30	70 (35)		
>30	58 (29)		
Presence of diverticula	14 (7)		
Number of diverticules		4.6±3.6	4 (1-12)
Diverticula localization			
Cecum	1 (10)		
Ascending colon	1 (10)		
Descending colon	3 (30)		
Sigmoid colon	2 (20)		
Transverse colon	3 (30)		
External hemorrhoids	2 (1)		
External hemorrhoid degree			
G1	1 (50)		
G2	1 (50)		
Internal hemorrhoids	56 (28)		
Internal hemorrhoid degree			
G1	32 (57.1)		
G2	20 (35.7)		
G3	4 (7.1)		
Presence of polyps	43 (21.5)		
Number of Polyps		1.8±1.2	1 (1-6)
Polyp localization			
Cecum	1 (2.3)		
Ascending colon	6 (14)		
Descending colon	4 (9.3)		
Rectum	14 (32.6)		
Sigmoid colon	10 (23.3)		
Transverse colon	8 (18.6)		
Polyp size (mm)		11±10.5	8 (3-50)

Table 2. Distribution of clinical findings according to the gender of the patients

	Gender		p value
	Male	Female	
	n (%)	n (%)	
Diverticulum	10 (8.4)	4 (4.9)	0.509
External hemorrhoids	2 (1.7)	0 (0)	0.516
Internal hemorrhoids	37 (31.1)	19 (23.5)	0.308
Polyp	34 (28.6)	9 (11.1)	0.006

Table 3. Distribution of clinical findings according to age groups of patients

	Age			p value
	18-40 years	40-65 years	65≤ years	
	n (%)	n (%)	n (%)	
Diverticulum	1 (2.2)	9 (7.6)	4 (11.1)	0.266
External hemorrhoids	1 (2.2)	1 (0.8)	0 (0)	0.597
Internal hemorrhoids	8 (17.4)	33 (28)	15 (41.7)	0.052
Polyp	5 (10.9)	27 (22.9)	11 (30.6)	0.084

Table 4. Distribution of clinical findings according to patients' BMI groups

	Age				p value
	<20	20-25	25-30	>30	
	n (%)	n (%)	n (%)	n (%)	
Diverticulum	1 (10)	3 (4.8)	3 (4.3)	7 (12.1)	0.300
External hemorrhoids	0 (0)	0 (0)	1 (1.4)	1 (1.7)	0.762
Internal hemorrhoids	1 (10)	19 (30.6)	19 (27.1)	17 (29.3)	0.594
Polyp	1 (10)	12 (19.4)	18 (25.7)	12 (20.7)	0.634

Discussion

Colon diverticula are the most common structural disease of the colon and the 5th most common disease in the gastrointestinal tract (GIS). Prevalence studies indicated that its frequency increases with age. Along with factors such as diet, obesity, smoking, and alcohol, advanced age is one of the most important risk factors [8]. In our study, the presence of diverticula was observed in 7% of the patients (n=14), external hemorrhoids in 1% (n=2), internal hemorrhoids in 28% (n=56), and polyps in 21.5% (n=43). Additionally, a statistically significant relationship was observed between the genders of the patients in terms of the presence of polyps (p<0.05). Clinical examination, barium radiography, colonoscopy, ultrasonography (USG), and computerized tomography (CT) are used to diagnose diverticular disease. CT is also used for staging and to guide treatment. Treatment covers a wide spectrum, from dietary modification to multistage surgery [7].

The most accepted factors regarding the etiology of diverticular disease of the colon are changes in colon wall resistance, colon

motility disorders, and lack of especially fibrous foods in the diet. A low-fiber diet causes the formation of low-volume stools that retain less water and a slowdown in the functioning of the gastrointestinal tract. All these factors increase the intra-colon pressure and make it difficult to excrete the colon contents. Increased intraluminal pressure in the colon has been shown in patients with diverticulosis [8]. In our study, the distribution of clinical findings of the patients according to age and BMI did not reveal any statistically significant relationship.

Physical inactivity, constipation, obesity, smoking, and nonsteroidal anti-inflammatory drug (NSAID) use are also thought to be associated with the risk of developing diverticular disease [9]. Another factor that plays a role in the pathogenesis of diverticular disease is the decrease in the tensile strength of the muscle fibers in the colon wall as age increases [10].

Patients with sigmoid colon diverticulitis complain of left lower quadrant pain and fever. Nausea, vomiting, and changes in bowel habits may also accompany it. It is a difficult disease to diagnose. IBS can be confused with ischemic colitis, inflammatory bowel diseases, and colon cancer. Imaging is essential in making a diagnosis [11].

According to the results of a large retrospective study on the prevention of diverticulitis, the protective effect of a lifestyle with high physical activity and a diet rich in fiber and low in fiber, fat, and red meat was determined. While obesity is evaluated in the same category, excess physical activity has been determined as the main factor that reduces the risk of diverticulitis. These fiber foods should be of plant origin and have insoluble fiber in the stomach and small intestine. These are destroyed by the influence of microflora in the colon. According to recommendations, 20–35 g of fiber is the daily amount that an adult should consume [12].

The treatment approach for uncomplicated diverticulitis disease is to leave the intestine for rest and antibiotic treatment. Antibiotic treatment should have both anaerobic and aerobic spectra. If systemic findings accompany the disease, the patient should be hospitalized, and IV antibiotic treatment should be started. Most patients recover with medical treatment during their first attack. After the first attack, the patient should undergo elective colonoscopy or sigmoidoscopy [13].

However, 6–8 weeks should be kept between treatment and endoscopic examination to eliminate the risk of perforation. When uncomplicated diverticular disease recurs twice or complications develop after attacks, elective surgery should be considered [14,15].

In elderly patients, diverticula cause bleeding originating from the lower GI tract. It often stops spontaneously (70–80%). The mortality risk of diverticular bleeding is low, especially when compared to peptic disease. In treatment, it is necessary to identify the bleeding site along with aggressive resuscitation. Colonoscopy should be performed both for diagnosis and as a treatment approach. Large bowel obstruction is an extremely

important complication, both in terms of mortality and the need for urgent surgical intervention. Surgical treatment should be sought for this disease, generally treated with medical and conservative treatment approaches, when complications occur and cannot be resolved with a medical approach [16, 17].

Cao et al. conducted a meta-analysis of 68 studies, including 13,905 patients with a median age of 58, and cancer was detected in 2.0% and advanced adenoma in 3.8%. Complicated diverticulitis had increased 9.2-fold compared to uncomplicated diverticulitis. Adenomas were detected in 17%. Of those diagnosed with colorectal cancer, 85% were concordant with the site of the diverticulitis on CT, while 15% were incidental findings. They recommended routine colonoscopic follow-up in convenient individuals [18]. Laurie et al. conducted a retrospective analysis to compare colonoscopy versus post-computed tomography for confirmed diverticulitis. Their findings indicated that routine colonoscopy for patients with uncomplicated diverticulitis is not cost-effective for colorectal cancer screening patients over 50 years. They also suggested colon endoscopy for patients with uncomplicated diverticulitis under 50 years and all patients admitted with complicated diverticulitis [19].

Guidelines recommend that a colonoscopy be performed 4–8 weeks following recovery from an episode of diverticulitis in patients who have not had a recent, high-quality colonoscopy, even among those diagnosed via CT scanning [20].

Conclusion

The prevalence of diverticulitis is increasing gradually with the aging population. Computerized tomography is the gold standard in imaging diverticulitis and classification of diverticular disease severity as it carries prognostic and potentially therapeutic significance. Additionally, we believe interval lower gastrointestinal system endoscopy remains a significant tool, especially after an acute attack, particularly after complicated diverticulitis, to rule out malignancy or advanced adenomata at the target site and the rest of the colon.

Consent for Publication

The original article is not under consideration by another publication, and its substance, tables, or figures have not been published previously and will only be published elsewhere.

Data Availability

The data supporting this study's findings are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

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