



# Our results of lower gastrointestinal endoscopy: evaluation of 700 patients

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## ABSTRACT

**Objective:** Although radiological imaging modalities like barium enema and computed tomography provide some clues, endoscopic methods still maintain superiority in assessment and differential diagnosis of large intestinal symptoms and complaints that require biopsy. We aimed to present the results of colonoscopic procedures performed in our general surgery clinic in detail.

**Material and Methods:** Seven hundred patients who presented to Afyon Kocatepe University, Faculty of Medicine, Department of General Surgery Endoscopy Unit between January 2011 and July 2012 with an indication for colonoscopy were retrospectively evaluated.

**Results:** Out of the 700 patients enrolled in the study 356 (50.8%) were male while 344 patients (49.2%) were female. The mean age of the patients was found to be 49 years. Within the group of 700 patients who underwent colonoscopic examinations, the terminal ileum and cecum have been reached on the first attempt in 432 patients (61.7%) and colonoscopic success has been achieved. Results of colonoscopies performed on 700 patients in our clinic revealed malignancy in 42 (6%) patients, and all of these patients were treated surgically in our clinic. Mortality was not observed in this series. Procedure-related bleeding and perforation developed in 6 patients. One patient developed respiratory arrest due to sedation and patient was responsive to resuscitation. The complication rate in our series was 1%.

**Conclusion:** In the study where we revised our own clinical experience, we found that our success rate was lower than the literature, and our complication rate was higher. The main reasons are accepted as our colonoscopy unit's being young and the low patient volume.

**Key Words:** Colonoscopy, surgeon, diagnosis

## INTRODUCTION

Due to advances in fiber optic technology, colonoscopy is used routinely for visual inspection of the colon (1). The main advantages of colonoscopy over radiological techniques are the ability to biopsy a lesion if required for the differential diagnosis, and the ability to being used for therapeutic purposes in cases like polyps and volvulus (2, 3). The purpose of colonoscopy is examination of the entire colon including the cecum. The success of the procedure largely depends on good preparation and the ability of the team. Colonoscopy is being used frequently in routine colon cancer screening. In addition to cancer screening, colonoscopy is used for lower gastrointestinal symptoms (rectal bleeding, change in bowel habits longer than two weeks, bloody mucous discharge, lower abdominal pain and tenesmus feeling). It is performed routinely in other pathologies such as filling defects on barium enema evaluation, unexplained gastrointestinal bleeding, iron deficiency anemia, polypectomy, biopsy, endoscopic treatment of bleeding lesions, removal of foreign bodies, and balloon dilatation or stent implantation for stenosis (4). In this study, we aimed to present the results of colonoscopic procedures performed in a university hospital, general surgery clinics along with the literature.

## MATERIAL AND METHODS

Seven hundred patients who presented to Afyon Kocatepe University, Faculty of Medicine, Department of General Surgery Endoscopy Unit between January 2011 and July 2012 with an indication for colonoscopy were retrospectively evaluated. Written informed consent form was obtained from all patients before the procedure. The procedure was not performed in patients with serious arrhythmia, history of myocardial infarction, poor performance, those in the acute phase of diverticulitis, and those with contraindications to biopsy or polypectomy such as coagulation disorders. In addition, patients who underwent rigid sigmoidoscopy were excluded from the study. Patients were started on fluid diet 48h prior to the process and were given 1:1 diluted, 45 mL of sodium phosphate (Fleet phospho soda) orally, at 22:00 the day before the procedure and at 06:00 on the day of the procedure. Bowel cleansing was completed with a sodium phosphate enema, which was applied in the morning of colonoscopy. One to five mg midazolam was given during the process for sedation and 20-50 mg hyoscine-N-butyl bromide (scopolamine butylbromide) i.v was preferred as a spasmolytic. The investigations were performed by the Fujinon colonoscopy device.

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### Statistical Analysis

Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) version 15.0 was used for analysis. Chi-square independence test was utilized for statistical analysis and p value of <0.05 was considered significant.

### RESULTS

Three hundred fifty-six of 700 patients enrolled in the study (50.8%) were male, while 344 patients (49.2%) were female. The mean age was found as 49 years. The youngest patient who underwent colonoscopy was 27 and the oldest was 88 years old. The mean midazolam dosage used throughout the procedure was 3 mg, and the mean hyoscine-N-butyl bromide (scopolamine butylbromide) dose was 20 mg. The duration of examination was 16 minutes, while in patients with adequate cleaning this was reduced to 10 minutes. The mean duration was 43 minutes in patients who underwent polypectomy. Table 1 depicts colonoscopy indications in detail. The terminal ileum and cecum had been reached at the end of the first examination and colonoscopic success has been achieved in 432 patients (61.7%). The procedure was not successful in 268 patients (38.3%) due to inadequate cleaning, failure to tolerate the procedure, technical problems, or presence of a mass that did not allow the passage of the colonoscope. Colonoscopy was successful at the second attempt in 83% (93 patients) of the 112 patients (16%) with insufficient cleaning, after proper bowel preparation. In the remaining 19 (7%) patients, success has been achieved in the third attempt in 17, and the fourth attempt in 2 patients. In our series, the maximum number of endoscopy attempts was four. The 156 (22%) patients in whom repeat colonoscopy could not be performed due to reasons such as not tolerating the procedure or masses that did not permit the passage of colonoscopy were evaluated by contrast-enhanced computed tomography and barium enema. In our series, a statistically significant relationship was not found between gender and colonoscopic success and evaluated areas ( $p=0.22$ ). Similarly, no significant relationship was found between gender and insufficient bowel cleansing ( $p=0.059$ ). In our series, a polyp was detected in 120 patients, 74 of which were neoplastic polyps, thus these patients underwent polypectomy. The remaining 46 patients had hyperplastic and inflammatory polyps, with non-neoplastic nature and not suitable for polypectomy. In addition, sigmoid detortion was applied in three patients.

The endoscopic findings are summarized in Table 2 according to the predominant diagnosis. Concomitant perianal diseases in patients with major diseases such as ulcerative colitis, Crohn's disease, or malignancy were excluded from classification. The table depicts only patients with isolated perianal signs. The number of patients diagnosed with malignancy by colonoscopy was 42 (6%) out of 700 patients. Thirty-eight of these patients were diagnosed at the first attempt, and 4 at the second attempt. All patients diagnosed with malignancy underwent double-contrast computed tomography for detection of distant metastases and synchronous tumors (six patients in whom the entire colon could not be visualized). All of these patients were treated surgically in our center. In our clinic, the health staff who help to perform colonoscopies do not change, and the surgical residents start to perform these procedures beginning from their second year. In our series, 833 colonoscopies were performed on 700 patients, including

Table 1. Classification of patients according to colonoscopy indications

Colonoscopy indications	Number	Percentage
Lower gastrointestinal symptoms	478	68.2
Filling abnormalities on barium enema	10	1.6
Gastrointestinal bleeding	170	24.2
Operated colon tumor follow-up	42	6
Total	700	100

repeat colonoscopies. Out of the 432 patients with success in the first attempt, the colonoscopy was performed by residents under the supervision of faculty members in 368 (52.5%), and primarily by a faculty member in 64 (9.1%) patients. The procedure was not successful in the first attempt in 268 patients (38.2%), and the number of patients with inadequate bowel cleansing within this group was 198. The second cause of failure was non-compliance in 21 patients. All repeat colonoscopy interventions were made by faculty members and the entire colon was evaluated.

In our series, mortality was not observed in any patient. However, respiratory arrest responsive to resuscitation developed in one patient during withdrawal of the colonoscope. Three patients underwent emergency surgical operation due to perforation. In all 3 patients, the perforation site was at the rectosigmoid junction and repaired with primary suture. All 3 patients developed perforation during the second endoscopy attempts that were carried out by faculty members. Three patients experienced lower gastrointestinal bleeding that was treated conservatively. Bleeding was attributed to polypectomy in 2 patients, and tumor biopsy in 1 patient. The complication rate in our series was 1%.

### DISCUSSION

Nearly 10 years after the design of the first endoscope by Basil Hirschowitz, fiber optic colonoscopy that was developed by Olympus and Machida was used for evaluation of the colon for the first time (5). Currently, colonoscopy is accepted as the gold standard in macroscopic assessment of the colon. In addition, it is used routinely for biopsy or polypectomy, for diagnosis and treatment of gastrointestinal bleeding, for extraction of foreign bodies and decompression of sigmoid volvulus (6). Although the technical details of colonoscopy have been described in detail, there still are negative factors affecting the success of the process such as the endoscopy team, the patient and the used equipment. The concept of colonoscopy success has been characterized as the visualization of the cecum. It is stated in the literature that the rate of accessing the cecum should be around 95% in academic centers (7). Aslinia et al. (8) reported the success rate as 85.5% after evaluation of their colonoscopy results of 6 years. Yilmaz et al. (1) stated their colonoscopic success rate as 78%. In our series, the success rate of 61.7% was well below the rates from other centers. The inadequate bowel cleansing and patient compliance seem to be responsible for the low success rate in our series. Other reasons that play a role in this failure can be summarized as the patient's general status, gender, abdominal adhesions

Colonoscopic diagnosis		Numeric and percentage value	Numeric and percentage value
Normal		241 (34.4)	241 (34.4)
Cancer		42 (6)	42 (6)
Polip		120 (17.1)	120 (17.1)
Diverticulosis		30 (4.2)	30 (4.2)
Colitis	Nonspecific colitis	27 (3.8)	62 (8.8)
	Ulcerative colitis	15 (2.1)	
	Infectious colitis	6 (0.8)	
	Allergic colitis	4 (0.5)	
	Chron's disease	7 (1)	
	Ischemic colitis	3 (0.4)	
Solitary rectal ulcer		5 (0.7)	5 (0.7)
Hemorrhoidal disease	Internal hemorrhoid	64 (9.1)	99 (14.1)
	External hemorrhoid	27 (3.85)	
	Internal and external hemorrhoid	8 (1.14)	
Amebiasis		9 (1.2)	9 (1.2)
Angiodysplasia		4 (0.5)	4 (0.5)
Rectovesical fistula		1 (0.14)	1 (0.14)
Findings secondary to operation	Post-hemorrhoidectomy anal stenosis	3 (0.4)	13 (1.8)
	Anastomotic stricture	5 (0.71)	
	Anastomotic ulcer	4 (0.5)	
	Anastomotic recurrence	1 (0.14)	
Volvulus		3 (0.4)	3 (0.4)
Redundant sigmoid colon		12 (1.71)	12 (1.71)
Rectal prolapse		5 (0.71)	5 (0.71)
Perianal findings	Fissure	40 (5.7)	54 (7.7)
	Fistula	5 (0.71)	
	Abscess	7 (1)	
	Dermatitis	2 (0.28)	
Total			700 (100)

due to previous surgeries, radiation therapy, drugs used for sedation, the feature of the selected device, looping during colonoscopy, colonoscopy device technology, and the collaboration and experience of the team (8).

The most feared pathology among diseases that cause lower gastrointestinal symptoms is colorectal cancer. Mortality rates can be reduced by up to 30% with early diagnosis of colorectal cancer, which ranks second in cancer-related deaths (9, 10). Colonoscopy is still the most trusted diagnostic tool in the screening and diagnosis of colorectal cancer. The studies within our country reported the incidence of colorectal cancer as 3% in Elazığ, and as 14.4% in Bursa (11). In our study, colorectal cancer rate was found as 6% with 42 patients. Thirty-eight of these patients were diagnosed at the first attempt, and four at the second attempt. The differences between studies are thought to arise from differences in socioeconomic status, dietary habits, and colonoscopy indications among regions. In 6 of our patients who were diagnosed with cancer, entire colon screening could not be performed due to reasons related to the mass. It is known that synchronous tumor incidence in colorectal cancer varies between 2% and 8% (12). Therefore, in patients with cancer, the entire colon should be evaluated

by both preoperative imaging and intraoperative methods in order not to overlook a synchronous tumor. In our series, all patients diagnosed with malignancy underwent double-contrast computed tomography for detection of distant metastases and synchronous tumors. All of these patients were treated surgically in our center.

It is assumed that colon cancers develop from neoplastic adenomatous polyps. Therefore, even if a single polyp is detected during the test, it is recommended to view the entire colon and remove the polyp if appropriate. It has been reported that the incidence of colorectal cancer can be reduced by 76 to 90% by this approach (13). Based on a study from our country, the rate of detecting a polyp can be as high as 20.7% (14). In our series, the rate of polyp detection was determined as 17.1% with 120 patients. However, polypectomy was performed only in 74 patients in our series due to neoplastic polyps. In the remaining patients, the most common findings were hyperplastic polyps smaller than 1 cm diameter and inflammatory polyps secondary to inflammatory diseases. Polypectomy was not performed since they were non-neoplastic polyps and not eligible for polypectomy. Bowles et al. (15) detected normal colonoscopic findings in 42.1% of their patients. In ad-

dition, they reported 22.5% polyps, 22% diverticuli, and 13.9% inflammatory disease. In another colonoscopy study including patients over the age of 80 years, they observed 42% diverticuli, 27% polyps and 8% colorectal cancer (16). In our study, normal colonoscopy findings were identified in 34.4%, while 4.2% had diverticulum, 3.1% inflammatory bowel disease, and 0.5% angiodysplasia. Another pathology with unexplained pathophysiology and requiring surgical treatment is solitary rectal ulcer, which is characterized by single or multiple rectal mucosal ulcerations (17). In our series, five patients (0.7%) had solitary rectal ulcer and all patients were treated surgically. The most frequent pathologies among colonoscopy findings are anorectal disorders. Within the group of anorectal diseases, hemorrhoids are most frequently detected. The incidence of hemorrhoids in our country was found to be 17.6% in Erzurum, and 31% in Cyprus. Süleymanlar et al. (18) have observed that this rate can be as high as 58%. In our study, the rate of hemorrhoids was determined as 14.1%.

Although colonoscopy is a safe procedure, it is an invasive procedure with particular complications. Nevertheless, mortality might be observed in rare cases, and mortality and morbidity rates related to colonoscopy have been reported as 0.02% and 0.25%, respectively. The most common complications have been identified as bleeding (0.24%-0.33%) and perforation (0.08%-0.19%). Bleeding usually occurs either from diverticuli or after polypectomy (19). Bleeding that occurs due to the interventions performed during the examination often stop spontaneously. In cases of on-going bleeding, sclerotherapy or cauterization procedures as well as local embolization or surgery may be required (20). In our series, lower gastrointestinal bleeding treated by medical treatment developed in three patients (0.42%): two patients with polypectomy and one patient with tumor biopsy. Perforations usually occur in the rectosigmoid and sigmoid colon (21). A perforation was observed in three of our patients (0.42%). In all 3 patients, the perforation has occurred during the second attempt. Two of these patients had a history of previous major abdominal surgery, and one patient was diagnosed with ulcerative colitis. In all three patients, the perforation was treated with primary suture repair and they were discharged without any other complications. Other common complications were hypoxia, bradycardia, myocardial ischemia, tachycardia, cardio-respiratory changes due to sedation, collapse (22). There were no deaths in our series, however, 1 patient (0.14%) developed respiratory arrest that responded to resuscitation. The total complication rate in our series was 1%.

## CONCLUSION

In the study where we reviewed our own clinical experience, we found that our success rate was lower than the literature, and our complication rate was higher. The main reasons could be recently established colonoscopy unit and the low patient volume. We will re-evaluate our program in light of these results.

**Ethics Committee Approval:** Ethics committee approval was not required, since the study was a retrospective study.

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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