

Types and Patterns of Colorectal Polyps Detected During Colonoscopy

Abstract:

Introduction : Colorectal polyps are abnormal growths of tissue projecting from the mucosa of the large bowel. They may be classified according to their morphology (sessile or pedunculated), histology (hyperplastic, adenoma, etc.), and behavior (benign or malignant). **Aim:** to identify the prevalence, types and patterns of colorectal polyps in a cohort of patients presenting to endoscopy unit at Benha University Hospital during the period of study. **Methods:** A cross-sectional study was conducted on all patients referred to the endoscopy unit of the Hepatology, Gastroenterology and Infectious Diseases Department in Benha University Hospital for colonoscopy, during the period from April 2021 to June 2022. **Results:** The most common site of polyps was sigmoid colon (30.8%), followed by rectal region (15.4%), the studied polyps were neoplastic in 29 patients (55.8%) and non-neoplastic in 23 patients (44.2%). neoplastic group had statistically higher age, higher frequency of smokers and family history of colonic polyp, lower hemoglobin compared to non-neoplastic group. neoplastic group, the most common site was sigmoid colon and distributed all over colon (20.7% for both) followed by cecum (17.2%), While in non-neoplastic group the most common site was sigmoid (43.5%) followed by rectum (26.1%). **Conclusion:** Polyps were identified in 52 patients (13%), they included 33 males and 19 females, and their mean age was 54.73 ± 13.5 years, the studied polyps were neoplastic in 29 patients (55.8%) and non-neoplastic in 23 patients (44.2%).

Keywords: Colorectal polyps, colorectal malignancy, colonoscopy

Introduction

Colorectal polyps are abnormal growths of tissue projecting from the mucosa of the large bowel. They can be found through screening or diagnostic procedure conducted for other reasons such as gastrointestinal bleeding ⁽¹⁾.

They may be classified according to their morphology “sessile or pedunculated”, histology “hyperplastic, adenoma, etc”, and behavior “benign or malignant” ⁽²⁾.

The biggest concern is their ability to progress into carcinoma, through the adenoma-carcinoma sequence ⁽³⁾.

Early detection of colonic polyps can alleviate Colo Rectal Carcinoma (CRC) morbidity trend through early detection of malignancies and the elimination of polyps ⁽⁴⁾.

Adenomatous polyps are histologically categorized into three subtypes: tubular adenoma, tubulovillous adenoma, and villous adenoma. Following detection through colonoscopy, complete removal of neoplastic polyps is essentially important, since it would prevent the development of cancer of CRC ⁽⁵⁾.

Neoplastic polyps are accountable for roughly 5-10% of population over age of 40 and these are important predisposing factor for majority of large bowel carcinoma cases ⁽⁶⁾.

Aim

To identify the prevalence, types and patterns of colorectal polyps in a cohort of patients presenting to endoscopy unit at Benha University Hospital during the period of study.

Patients and methods

This **cross-sectional** study was conducted on all patients referred for first time to the endoscopy unit of the Hepatology, Gastroenterology and Infectious Diseases Department in Benha University Hospital for colonoscopy, during the period from April 2021 to June 2022 after approval of the committee of ethics of scientific research in Benha Faculty of Medicine in Benha University. The study included a total of 400 colonoscopies, all patients included in the study were subjected to informed consent from each patient after explaining the whole study procedures, Full medical history (Basic demographic Data , Symptoms suggesting colonic polyps , Family history of colonic polyps) , Clinical examination , Laboratory investigations (CBC , INR).

Endoscopy Procedure:

Colonoscopy was carried out after bowel preparation with osmotic laxative under midazolam sedation. The procedures was carried out in the left lateral position, The endoscopy was performed by a trained endoscopist in the endoscopy unit, The endoscopic finding included site, size and number of the polyps and multiple biopsies were taken for histopathological assessment. Polyp locations were classified into 6 categories—cecum, ascending colon, transverse colon, descending colon, sigmoid colon, and rectum , polyp sizes were classified as follows: minute (< 5 mm in diameter), small (≥ 5 mm to < 10 mm), and moderate to large (≥ 10 mm).

Gross morphologies were described according to the Paris classification ⁽⁷⁾ : Type 0-I indicates elevated or polypoid forms , 0-Ip Polypoid/pedunculated , 0-Is Polypoid/sessile, broad-based , Type 0-II indicates flat or superficial forms, namely , 0-IIa Flat and elevated , 0-IIb Completely flat , 0-IIc Superficially depressed , These types often consist of mixed forms e.g., type IIa+c = flat and elevated with a central depression , Type 0-III indicates excavated /ulcerated forms, without any further subgrouping.

All lesions were then classified according to Kudo classification of pit patterns with photographic correlation of lesions .All lesions were then classified into 3 types based on Narrow-Band Imaging International Colorectal Endoscopic (NICE) classification, which consists of 3 types .

Histological Assessment:

All samples were collected and stored in formalin container and stained with hematoxylin and eosin, viewed under light microscopy by a pathologist. Histology was classified as neoplastic polyp including tubular adenoma, tubulovillous adenoma, villous adenoma, serrated adenoma, adenocarcinoma, or non-neoplastic polyp includes hyperplastic polyp and inflammatory.

Statistical Analysis:

The collected data was revised, coded, tabulated using Statistical package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter: Descriptive statistics: Mean, Standard deviation (\pm SD), range for

numerical data & Frequency and percentage of non-numerical data. Analytical statistics: Student T Test was used to assess the statistical significance of the difference between two study group means , For the comparison of more than two groups' means, one way analysis of variance (ANOVA) was used , Chi-Square test was used to examine the relationship between two qualitative variables. Fisher's exact test: was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. All reported p values were two-tailed and $p < 0.05$ was considered to be significant.

RESULTS:

A total of 400 colonoscopies were done. Polyps were identified in 52 patients (13%), the majority had a single polyp and most polyps were small in size.

The studied patients included 33 males (63.5%) and 19 females (36.5%), their mean age was 54.73 ± 13.5 years, most cases (30.8%) were employee 23.1% were house wife, 21.2% were workers, 17.3% were retired and 7.7% were farmers. most patients (61.5%) were from rural areas (**table 1**).

As regard History & clinical examination , most patients (65.4%) had bleeding per rectum, 44.2% of patients had abdominal pain, 42.3% had constipation, 30.8% had abdominal distension, 15.4% had fecal straining, 9.6% had fatigue and only one patient had weight loss (**table 2**).

The most common site of polyps was sigmoid colon (30.8%), followed by rectal region (15.4%), ascending and descending colon (11.5% for each), cecum (9.6%), transverse colon (7.7%), in addition 7 patients (13.5%) had multiple polyps in many sites. Most polyps (65.4%) were small in size. Most patients (53.8%) had single polyp, 25% had 2 polyps, 3.8% had 3 polyps, and 9 patients (17.3%) had multiple polyps (**figure1**).

As regarding Paris classification; 34.6% was Ip Polypoid/pedunculated, 38.5% was Is Polypoid/sessile, 17.3% was Iia Flat and elevated and 5 patients (9.6%) had multiple expression of Ip, Is, Iia (**table 3**).

Most of patients 46.2% had NICE grade I, 50% had NICE grade II and 3.8% had NICE grade III. Regarding Kudo classification; 17.3% of patients were I, 34.6% were II, 7.7% were III S, 32.7% were III L, and 7.7% were IV (**figure 2**).

The most common criteria in histopathological examination was Hyperplastic polyp and Tubular adenoma (28.8% for each), followed by Inflammatory polyp in 11.5%, Tubulovillous adenoma in 9.6%, Villous adenoma in 5.8%, Sessile serrated adenoma in 5.8%. In addition 3 patients (5.8%) of patients had multiple polyps with mixed criteria (**table 4**).

The studied polyps were neoplastic in 29 patients (55.8%) and non-neoplastic in 23 patients (44.2%). neoplastic group had statistically higher age, higher frequency of smokers and family history of colonic polyp, lower hemoglobin compared to non-neoplastic group. neoplastic group, the most common site was sigmoid colon and distributed all over colon (20.7% for both) followed by cecum (17.2%), While in non-neoplastic group the most common site was sigmoid (43.5%) followed by rectum (26.1%) (**table 5**).

Discussion

'Polyp' is a term derived from the Greek word polypous, which means 'morbid lump.' Generally, this term describes any mass protruding into the lumen of a hollow vessel, anywhere in the gastro-intestinal, genito-urinary or respiratory tracts. Usually, polyps arise from the mucosal layer of these organs, although some submucosal pathologies may cause mucosal protrusion into the lumen and resemble mucosal polyps. Not all polyps necessarily exhibit neoplastic behavior. ⁽⁸⁾

Colorectal polyps are very common among middle-aged individuals, with a prevalence being as high as up to 30%. The epithelial type (either adenomatous or hyperplastic) represents the most common form of colorectal polyps, followed by non-epithelial (inflammatory and juvenile) polyps ⁽⁹⁾.

Adenomatous polyps are histologically categorized into three subtypes: tubular adenoma, tubulovillous adenoma, and villous adenoma. Following detection through colonoscopy, complete removal of neoplastic polyps. ⁽¹⁰⁾

The neoplastic polyps are of primary importance because they harbor a malignant potential, which represents a stage in the development of colorectal cancer. For this reason, it is essential to identify these polyps at a sufficiently early stage, when a simple office procedure to remove them can stop the development of colorectal cancer and prevent disease and death ⁽¹¹⁾.

Colonoscopy is a non-invasive method of diagnostics and treatment of colon cancer and polyps. Total colonoscopy is a complete evaluation of the colon and rectum mucosa, up to the cecum floor. The deep examination can be useful for detecting the colorectal polyps, subsequent follow-up and early detection of cancer. Studies have confirmed that colonoscopy examination reduces the risk of colorectal cancer up to 60-70% ⁽¹²⁾.

In the study by ⁽¹³⁾ 1852 patients underwent colonoscopy, 503 of them had colorectal polyps. The mean age was 75.4 ± 4.2 years (range, 65–88 years). A total of 253 males represented 50.3% of the sample and 250 females represented 49.7%. Overall, 62.8% of patients were from urban areas, whereas 37.2% were from rural areas.

In the current study, most patients (65.4%) had bleeding per rectum, 44.2% of patients had abdominal pain, 42.3% had constipation, 30.8% had abdominal distension, 15.4% had fecal straining, 9.6% had fatigue and only one patient had weight loss.

In the study by ⁽¹³⁾ Clinical presentations of patients requiring colonoscopy examination were constipation (21.2%), diarrhea (18.7%), abdominal pain/distention (15.7%), rectal bleeding or hematochezia (10.7%), loss of weight (9.3%), anemia (7.2%), positive fecal occult blood (6%), and regular health examination (11.3%).

In the current study, most polyps (65.4%) were small in size. Most patients (53.8%) had single polyp, 25% had 2 polyps, 3.8% had 3 polyps, and 9 patients (17.3%) had multiple polyps. Regarding associated criteria; 3 patients had edema, 2 patients had nodularity, 2 patients had irregular vascular pattern, and 4 patients had diverticula or Fistula.

Our results agreed with Cekodhima et al., ⁽⁹⁾ who yielded a total of 346 polyps (the unit of analyses). The majority of polyps (42.5%) were small (<1 cm); 38.7% were of medium size (1-2 cm) and the rest (18.8%) large (>2 cm).

Regarding Paris classification; 34.6% was Ip Polypoid/pedunculated, 38.5% was Is Polypoid/sessile, 17.3% was IIa Flat and elevated and 5 patients (9.6%) had multiple expression of Ip, Is, IIa.

In agreement to our results ⁽¹³⁾ 74.8% of polyps were 0–I, and sessile type (0–Is) was the most detected type. No significant difference was detected between 0–IIa and 0–IIb for the three different histological features of polyps.

In the current study, the most common criteria in histopathological examination were Hyperplastic polyp and Tubular adenoma (28.8% for each), followed by Inflammatory polyp in 11.5%, Tubulovillous adenoma in 9.6%, Villous adenoma in 5.8%, Sessile serrated adenoma in 5.8%. In addition, 3 patients (5.8%) of patients had multiple polyps with mixed criteria. So the total number of adenomatoid polyps was 29 (55.8%).

Our results were in agreement with previous studies as; Vişovan et al. ⁽¹⁴⁾ who described a predominance of adenomatous polyps over hyperplastic polyps (66 vs. 32%) and Vilela Filho et al. ⁽¹⁵⁾ described a predominance of adenomatous polyps over hyperplastic polyps (58.9 vs. 34.7%).

Most adenomatous polyps convert into colon carcinoma over a 10-year period. The National Polyp Study showed a 76% reduction in CRC incidence and a 53% reduction in mortality in patients that underwent colonoscopic polypectomy ⁽¹⁶⁾ .

In the current study, 46.2% of patients had NICE grade I, 50% had NICE grade II and 3.8% had NICE grade III. Regarding Kudo classification; 17.3% of patients were I, 34.6% were II, 7.7% were III S, 32.7% were III L, and 7.7% were IV.

In the present study, the studied polyps were neoplastic in 29 patients (55.8%) and non-neoplastic in 23 patients (44.2%). Neoplastic group included tubular adenoma (15 patients), villous adenoma (3 patients), tubulovillous adenoma (5 patients), sessile serrated adenoma (3 patients) and another 3 patients with multiple expression of adenomas. Non- neoplastic group included hyperplastic polyp (15 patients), inflammatory polyp (6 patients), hamartomatous polyp (2 patients).

Our results were in agreement with Cekodhima et al., ⁽⁹⁾ who reported that hyperplastic and tubular types accounted for the majority (71.4% and 74.4%) of non-adenomatous and adenomatous polyps respectively.

Conclusion

Our study shows that the incidence of colonic polyp was 13%, the majority had a single polyp, most polyps were small in size. The most common site of polyps was sigmoid colon (30.8%), followed by rectal region (15.4%), the studied polyps were neoplastic in 29 patients (55.8%) and non-neoplastic in 23 patients (44.2%). neoplastic group had statistically higher age, higher frequency of smokers and family history of colonic polyp, lower hemoglobin compared to non-neoplastic group. neoplastic group, the most common site was sigmoid colon and distributed all over colon (20.7% for both) followed by cecum (17.2%), While in non-neoplastic group the most common site was sigmoid (43.5%) followed by rectal (26.1%).

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Author contribution

Authors contributed equally in the study.

Conflicts of interest

No conflicts of interest

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Table 1: Sociodemographic data of the studied patients

		N=52	%
Sex	Male	33	63.5%
	Female	19	36.5%
Age (years)	Mean \pmSD	54.73 \pm 13.50	
	Range	23-85	
Occupation	Retired	9	17.3%
	Farmer	4	7.7%
	Worker	11	21.2%
	House wife	12	23.1%
	Employee	16	30.8%
Residence	Rural	32	61.5%
	Urban	20	38.5%

Table 2: Symptoms in patients of the studied group

	N=52	%
Bleeding per rectum	34	65.4%
Abdominal pain	23	44.2%
Weight loss	1	1.9%
Fatigue	5	9.6%
Constipation	22	42.3%
Abdominal distension	16	30.8%
Fecal straining	8	15.4%

Table 3: Paris classification of the examined polyps

	N=52	%

Paris classification	Ip Polypoid/pedunculated	18	34.6%
	Is Polypoid/sessile	20	38.5%
	IIa Flat and elevated	9	17.3%
	Multiple expression of Ip, Is, IIa	5	9.6%

Table 4: Histopathological examination of polyps of the studied groups

		N=52	%
Histopathological examination	Hyperplastic polyp	15	28.8%
	Inflammatory polyp	6	11.5%
	Tubular adenoma	15	28.8%
	Villous adenoma	3	5.8%
	Tubulovillous adenoma	5	9.6%
	Sessile serrated adenoma	3	5.8%
	Hamartomatous polyp	2	3.8%
	Mixed	3	5.8%

Table 5 : Gross anatomy as regarding to histological examination

		Histopathological examination				Test	P value
		Neoplastic		Non-neoplastic			
		N=29	%	N=23	%		
Site of the polyp	Cecum	5	17.2%	0	0.0%	$X^2=12.4$	0.045*
	Ascending colon	4	13.8%	2	8.7%		
	Transverse colon	2	6.9%	2	8.7%		
	Descending	4	13.8%	2	8.7%		
	Sigmoid colon	6	20.7%	10	43.5%		
	Rectal	2	6.9%	6	26.1%		
	All over colon	6	20.7%	1	4.3%		
Size	Minute	2	6.9%	5	21.7%	$X^2=7.8$	0.09
	Small	18	62.1%	16	69.6%		
	Moderate	2	6.9%	2	8.7%		
	Large	1	3.4%	0	0.0%		

	Variable	6	20.7%	0	0.0%		
Number	Single	16	55.2%	12	52.2%	$X^2=3.4$	0.33
	2 polyps	5	17.2%	8	34.8%		
	3 polyps	1	3.4%	1	4.3%		
	Multiple>10	7	24.1%	2	8.7%		
Associated criteria	Edema	2	6.9%	1	4.3%	$X^2=4.6$	0.11
	Nodularity	0	0.0%	2	8.7%		
	Irregular vascular pattern	0	0.0%	2	8.7%		
	Diverticula or Fistula	4	13.8%	0	0.0%		

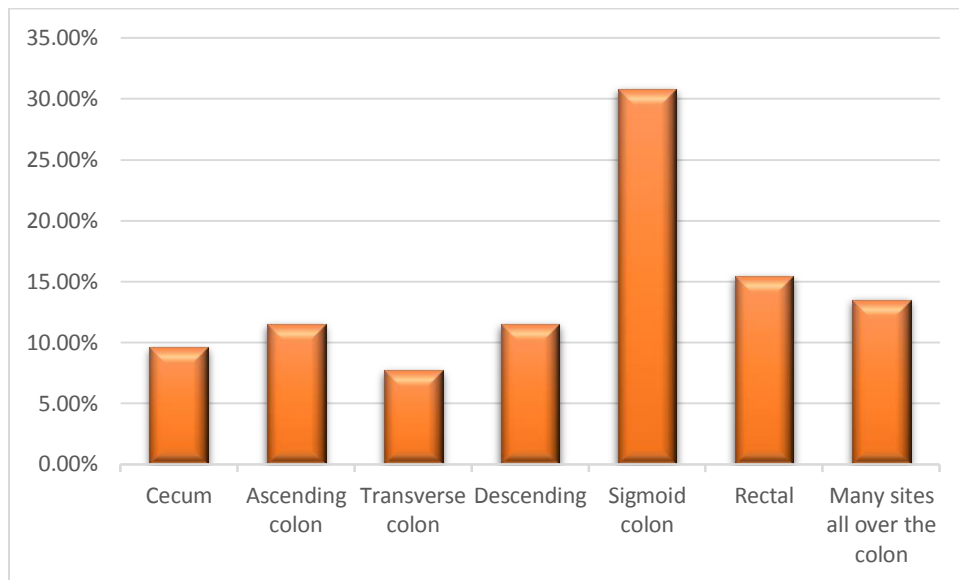


Figure 1: Site of polyps in the studied group

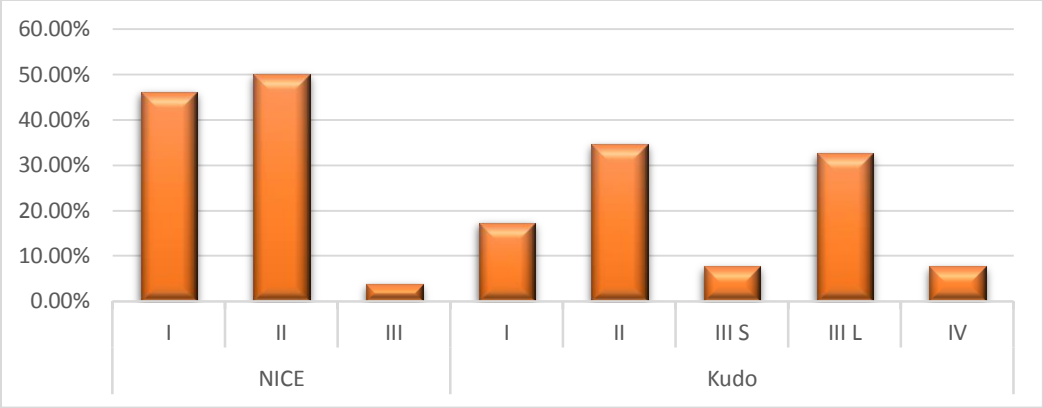


Figure 2: NICE and KUDO classification in the studied patients