

Research Article

HISTOMORPHOLOGICAL ANALYSIS OF DIMINUTIVE AND SMALL POLYPS IN A TERTIARY CARE HOSPITAL

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Received 29th November 2020; Accepted 27th December 2020; Published online 30th January 2021

ABSTRACT

Background: Colorectal cancer is the major cause of morbidity and mortality. Colonoscopy examination is important for colorectal cancer screening effective in detection and removal of polyps and further histopathological examination plays a crucial role in patient management. The purpose of this study is to analyse the histomorphology of diminutive and small polyps detected during colonoscopy. **Method:** The cross sectional descriptive study was conducted at Hospital for Advanced Medicine and Surgery (HAMS). One hundred and thirty three patients underwent colonoscopy polypectomy followed by biopsy for confirmation of the lesion. Data were obtained and statistically analysed. **Result:** Out of 133 polyps, 89 (66.9%) of them were adenomas. 5 (22.7%) of the 81 diminutive polyps and 17 (77.3%) of the 52 small polyps showed advanced histology which was statistically significant (p value <0.0001). **Conclusion:** Polyp size plays an important role in determining the frequency of advanced adenomas as the small polyps has high frequency of showing advanced adenoma in comparison to diminutive polyps.

Keywords: Diminutive, hyperplastic, pedunculated

INTRODUCTION

Precancerous colorectal polyps vary widely in morphology, size and histology. The gross appearance of these Polyps at endoscopy are broadly classified as 'polypoid' and 'non-polypoid'. Polypoid lesions, in general, protrude into the gut lumen and are attached to the mucosa with a pedicle (pedunculated) or with a shorter and broader base (sessile). Non-polypoid lesions, although, erroneously described as 'flat', are actually slightly elevated.¹ Colonoscopy is the primary method for colorectal cancer screening effective in detection and removal of polyps.^{2,3} Majority of the polyps detected during colonoscopy are diminutive (≤ 5 mm) or small polyps (6-9 mm). Multiple studies have shown that the frequency of advanced histology (villous features, high grade dysplasia, or adenocarcinoma) in these polyps is very low.^{4,5} Therefore, histopathological evaluation of these diminutive and small polyps primarily serves the purpose of determining advanced histological features which guide the postpolypectomy surveillance interval recommendations.⁶⁻⁸ So, the aim of this study is to analyze the histomorphology of diminutive and small polyps detected during colonoscopy.

MATERIALS AND METHODS

A hospital based cross sectional descriptive study was conducted in the Department of Pathology at HAMS hospital over a period of one year (December 2019 to November 2020). Out of 2586 biopsies, 133 patients were included in this study. All the patients who underwent colonoscopic polypectomy for polyps <10 mm were enrolled and verbal consent was taken from all patients. Patients with previous history of colon cancer, inflammatory bowel disease, history of polyposis syndrome were excluded from this study. Colonoscopic reports were collected and information about the polyps (location, size and macroscopic features) were gathered. Polyps were distributed in two groups according to the size: diminutive (≤ 5 mm)

polyps and small (6-9 mm) polyps. Colonoscopy procedure was performed by experienced gastroenterologist and gastrointestinal surgeons. After bowel preparation colonoscopy was done. Minimum inspection time from caecal pole to anus was > 6 minutes for maximal pathology detection. The polyps were removed either by biopsy forceps or snare polypectomy with an electrosurgical current. All collected specimen were fixed in 10% formalin and were brought to the pathology department. The samples were further processed through automated histokinette and the slides were stained by hematoxylin and eosin stain which was reported by the pathologist by using World Health Organization classification. We classified the specimens by histological type [neoplastic- (adenomas, serrated adenomas) and non neoplastic (hyperplastic, lymphoid, juvenile and inflammatory polyps)], degree of dysplasia and according to the presence of villous component. In order to evaluate the importance of the villous component in the diagnosis of advanced adenomas amongst adenomas less than 10 mm, we decided to distinguish two types of adenomas: advanced histology adenoma (with substantial villous component and/or high grade dysplasia) and high grade neoplasia (presence of high grade dysplasia and/or intramucosal carcinoma). Statistical analysis and software used: Statistical analysis were performed by using the free trial version of JMP version 15.

RESULTS:

A total of 133 cases were included in the study. The study population consisted of 100 (75.2%) males and 33 (24.8%) females. The age of the patient ranged from 4-97 years with mean age of 55.5 ± 17.2 years. The distribution of the polyps were as follows: 47 right-side colon (35.3%) and 86 left-side colon (64.7%). Twenty-nine polyps (21.8%) were Paris type 0-Ip (protruded, pedunculated) and 104 (78.2%) were Paris type 0-Ia (protruded, sessile). Eighty-one (60.9%) polyps were ≤ 5 mm in size, whereas 52 (39.1%) were between 6-9 mm. The mean size of the polyps was 5.2 ± 2.3 mm. Histopathological examination showed that 89 (66.9%) polyps were adenomas (including three sessile serrated lesion and one traditional serrated adenoma), 5 (3.8%) hyperplastic polyp, 8 (6.0%) lymphoid polyps, 9

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(6.8%) juvenile polyps and 22 (16.5%) inflammatory polyps. Three colonoscopically defined polyps showed apoptotic colopathy, mucosal tag and submucosal lipoma in histopathology, which were excluded from this study. Table 1 shows the location, macroscopy and histopathological features of the polyps based on the size (≤ 5 and 6-9 mm size categories). There was no statistical difference (Fisher exact test: $p = 0.3738$) between the location and size of the polyps. The p value of 0.0376 suggests diminutive polyps were more often sessile than in the small polyps: 68 (84.0%) and 36 (69.2%). Statistical difference (p value < 0.0001) was also observed between the histological features of the two groups. In the diminutive polyp group, there were 5 polyps with advanced histology, all showing villous features. In the small polyp group, there were 17 polyps showing advanced histology of which 13 had villous component of low grade dysplasia and 4 had villous component with high grade dysplasia. None of the diminutive and small polyps were found to have intramucosal carcinoma. Diminutive polyps were less likely to harbor villous features and high-grade dysplasia compared to small polyps (6.2% vs. 32.7%). We compared the group of patients with advanced adenoma and the group without advanced adenomas (Table 2). There was no statistical difference in age (p value 0.59), sex (p value 0.22) and location (p value 0.523) between the advanced and non-advanced adenomas. However, there was a higher proportion of small polyps in the advanced adenomas compared to the non-advanced adenomas (p value 0.0011). Also, there was a statistical difference (p value < 0.0001) between the morphological features of the two groups with more sessile (68.2%) lesions in the advanced adenoma group, compared to the non-advanced group (13.4%).

Table 1.

Location, macroscopic and histologic features of the polyps:			
	≤ 5 mm (n=81)	6-9 mm (n= 52)	P value
Location:			0.3738
Right-side colon	30 (37.0%)	17 (32.7%)	
Left-side colon	51 (63.0%)	35 (67.3%)	
Macroscopic features:			0.0376
Sessile	68 (84.0%)	36 (69.2%)	
Pedunculated	13 (16.0%)	16 (30.8%)	
Histologic features:			0.0116
Adenoma-			
Tubular	40 (49.4%)	23 (44.3%)	
Tubulovillous	5 (6.2%)	14 (26.9%)	
Villous	0	3 (5.8%)	
Sessile serrated	2 (2.5%)	1 (1.9%)	
Traditional serrated	0	1 (1.9%)	
Hyperplastic	5 (6.2%)	0	
Juvenile	1 (1.2%)	8 (15.4%)	
Inflammatory	21 (25.9%)	1 (1.9%)	
Lymphoid	7 (8.6%)	1 (1.9%)	
Adenoma, low grade	47 (100%)	38 (90.5%)	0.0458
Adenoma, high grade	0	4 (9.5%)	

Table 2.

Comparison of patients with advanced adenomas and non advanced adenomas				
	Non-advanced adenomas (n=67)	Advanced adenomas (n=22)		P value
Mean age	60.2 \pm 14.7	58.1 \pm 15.6		0.59
Male sex	51 (76.1%)	20 (90.9%)		0.22
Female sex	16 (23.9%)	2 (9.1%)		
Polyp size:				0.0011
≤ 5 mm	42 (62.7%)	5 (22.7%)		
6-9 mm	25 (37.3%)	17 (77.3%)		
Location:				0.523
Right-side	26 (38.8%)	8 (36.4%)		
Left-side	41 (61.2%)	14 (63.6%)		
Macroscopy:				< 0.0001
Pedunculated	58 (86.6%)	7 (31.8%)		
Sessile	9 (13.4%)	15 (68.2%)		

DISCUSSION

In this study, age range of the patient was from 4-97 years with the mean age of 55.5 \pm 17.2 years, and male to female ratio of 3:1. The mean age and the proportion of male and female patients in this study are similar to the findings in the study done by Makaju R et al⁹, Rangaswamy R et al¹⁰ and Francis J et al¹¹. Our study did not show statistical significance of frequency of advanced adenomas in male than in female (p value 0.22) which was similar to the study done by Chaput et al¹². In contrast, study done by Kim H et al¹³ showed that men were at significantly increased risk of harboring advanced adenomas compared to women comprising 62.1% of cases. Our study showed that 89 (66.9%) polyps were adenomatous polyps (including three sessile serrated lesion and one traditional serrated adenoma) and 44 (33.1%) of them were non-adenomatous polyps (which included hyperplastic, lymphoid, juvenile and inflammatory polyps). This finding correlated with the study of Franklin C et al¹⁴ and Rastogi et al¹⁵. Our study did not find any significant statistical difference (p value 0.523) of the frequency of advanced adenomas on the basis of the location. This finding was similar to the results obtained by Kim et al¹³. In contrast, Olivier et al¹⁶ found a significant association between the initial polyp location and the recurrent one. Of all the advanced adenomas, 68.2% of them were sessile in our study which suggested statistical significance (< 0.0001) when compared with the non-advanced adenomas. Studies done by Olivier et al¹⁶ and William A et al¹⁷ showed similar result. Our study identified that the small polyps (6-9 mm) has strong association with advanced adenoma. Of 81 diminutive polyps and 52 small polyps, advanced adenomas were found in 5 (22.7%) and 17 (77.3%) respectively. Invasive carcinoma was not found in any of these polyps. This suggests that the small polyps have a higher chance of being advanced adenomas in comparison to the diminutive polyps (p value of 0.0011). This showed a strong association between polyp size and advanced histological features. Pickhardt et al¹⁸ also showed that, of the 464 small polyps, 18 (3.9%) had advanced histological features and none had carcinoma. Other studies which showed similar significance were Rex K et al¹⁹, Gupta et al⁵, Franklin et al¹⁴. And, in studies done by Lynn et al⁷, Aldridge et al and Shinya et al²⁰ showed that carcinoma was detected in small polyps but not in diminutive polyps.

CONCLUSION

The size of the polyp is a critical determinant of important histology. In addition, there is very low frequency of advanced adenoma in diminutive polyps, but it is frequent in small polyps.

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