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SHORT COMMUNICATION

Location of colorectal adenomas and serrated polyps in patients under age 50

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Abstract

Background The incidence of colorectal cancer, especially located in distal colorectum, is rising markedly in young patients. Conventional adenomas and serrated polyps have been widely recognized as precursors of colorectal cancer.

Aim To investigate the correlation of polyp feature with polyp location in patients under age 50.

Method Patients under age 50 who had received colonoscopy were included from 2010 to 2018. Clinical data including number, location, size, and histopathology of polyps were collected. Odd ratios and 95% confidence interval of adenomas with their location were calculated.

Result In total, 25,636 patients aged 18–49 were enrolled, among which 4485 patients had polyps, with polyp detection rate of 17.5%. A total of 2484 and 2387 patients had conventional adenomas and serrated polyps, respectively. 76.0% advanced adenomas and 69.5% ≥ 10-mm serrated polyps were located in the distal colorectum. The detection rate of advanced adenomas was higher in patients aged 45–49. Patients with adenomas especially advanced adenomas in the distal colorectum were more likely to have advanced adenoma in the proximal colon.

Conclusion Among patients under age 50, advanced adenomas and ≥ 10-mm serrated polyps were predominantly in the distal colorectum. Advanced adenomas tended to be found in patients aged 45–49. Our results might explain the rising trend of distal colorectal cancer and emphasize the necessity for colonoscopy screening among these populations.

Keywords Conventional adenoma · Serrated polyp · Colorectum · Location · Young patients

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Introduction

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and second leading cause of cancer death worldwide [1]. While the incidence of CRC is decreasing mainly due to endoscopic screening, the incidence among young patients under age 50 is increasing. As to the location distribution, CRC in young patients tended to be located left-sided. Among patients under age 50, tumors were more commonly diagnosed in the distal colorectum compared with those in the proximal colon (65% vs 25%) [2]. Most CRC cases are sporadic and develop slowly over several years through the adenoma-carcinoma sequence [3]. On the other hand, increasing evidence supports that serrated polyp represents another precursor lesion of CRC and contributes to about one-third of CRC cases through an alternative pathway [4, 5]. Given the current knowledge that left-sided CRC is rising among young patients, it is with vital significance to know the association of polyp feature and polyp location among young patients. To extend our knowledge, we focused on polyp location among colonoscopies in patients under age 50 and analyzed the correlation between polyp feature and polyp location.

Methods

Patient selection

Patients under age 50 who had received colonoscopy were searched from a database in the Department of Endoscopy at the Sixth Affiliated Hospital of Sun Yat-sen University from January 2010 to June 2018. This study was approved by the Institutional Review Board of the Sixth Affiliated Hospital of Sun Yat-sen University. We excluded patients who were younger under age 18, had colorectal cancer without polyp, had a diagnosis of familial adenomatous polyposis or inflammatory bowel disease, or underwent colonoscopy after bowel surgery.

Colonoscopic and pathologic report

Reports of colonoscopy and pathology were retrospectively reviewed by two doctors. Information on age and gender of patients, number, location, size, and histopathologic characteristics of polyps were collected. According to the 2010 WHO classification schema, serrated polyps included hyperplastic polyp (HP), sessile serrated adenoma/polyp (SSA/P), and traditional serrated adenoma (TSA). Conventional adenoma included tubular adenoma (TA), tubulovillous adenoma (TVA), and villous adenoma (VA). Serrated polyp was classified by size (< 10 mm; ≥ 10 mm). Advanced conventional adenoma was defined as at least one conventional adenoma of ≥ 10 mm in diameter or with advanced histology features (tubulovillous/villous histological features or high-grade or severe dysplasia). For location, polyps located from the cecum to the splenic flexure were classified as proximal colon; polyps in the descending or sigmoid colon as distal colon; and polyps in the rectum or rectosigmoid junction as rectum, among which the latter two locations were collectively defined as distal colorectum. For both serrated polyps and conventional adenomas, if more than one polyp was diagnosed in an anatomic region, the size of the largest polyp and the histology of the most advanced lesion were used.

Statistical analysis

Data were analyzed using the Statistical Package for Social Science software, version 21.0 (SPSS Inc., Chicago, IL, USA). For all variables, descriptive statistics were conducted, including means and standard deviations for continuous variables, and frequencies for categorical variables. Chi-square or Fisher's exact probability tests were used to calculate the odd ratios (ORs) and 95% confidence interval (CI). The differences with two-sided P value < 0.05 were considered statistically significant.

Results

Clinicopathological information

In total, 25,636 patients aged 18–49 who received colonoscopies were included in this study, among which 21,515 patients had no positive findings. A total of 4485 patients were reported to have polyps, with an average age of 41.0 ± 6.8 years old. A total of 3452 (77.0%) patients had at least a polyp in the distal colorectum. The polyp detection rate was 17.5% in this study. Detection rate of conventional adenomas, advanced adenomas, serrated polyps, and ≥ 10-mm serrated polyps were 9.69%, 2.91%, 9.31%, and 0.50%, respectively. The detection rates of overall polyp, conventional adenoma, advanced adenoma, and serrated polyp were significantly higher in patients at age of 45–49 (as shown in Table 1).

A total of 2484 patients had conventional adenomas, among which 2306 (92.8%) patients had less than 3 conventional adenomas and 649 (26.1%) patients had adenomas ≥ 10 mm. The most common pathologic subtype of adenoma was tubular adenoma (2162 cases, 87.0%) while there were 328 (13.2%) with tubular-villous adenoma and 78 (3.14%) with villous adenoma. Two hundred seventy-three (11.0%) patients had adenoma with high-grade dysplasia. Nine hundred thirty-one (37.5%) patients were in proximal colon, 1752 (70.5%) were in distal colorectum, and 199 (8.01%) patients had adenomas in multi-regions. According to the definition, 747 patients had advanced adenomas, among which 568 (76.0%) were located in the distal colorectum.

Table 1 Detection rate of different polyp subtypes according to age and gender

	No. of patients	Overall polyp	Conventional adenoma		Serrated polyp	
			Overall	Advanced[a]	Overall	≥ 10 mm
All	25,636	4485 (17.5)	2484 (9.69)	747 (2.91)	2387 (9.31)	128 (0.50)
Age (years)						
18–34	9201	797 (8.66)	328 (3.56)	104 (1.13)	512 (5.56)	37 (0.40)
35–44	10,294	1940 (18.9)	1076 (10.5)	315 (3.06)	1016 (9.87)	55 (0.53)
45–49	6141	1748 (28.5)	1080 (17.6)	328 (5.34)	859 (14.0)	36 (0.59)

[a] Advanced conventional adenomas were defined as at least one conventional adenoma of ≥ 10 mm in diameter or with advanced histology (tubulovillous/villous histological features or high-grade or severe dysplasia), otherwise were defined as non-advanced conventional adenomas

Number of patients (percentage) for categorical variables

A total of 2387 patients had serrated polyps, among which 2118 (88.7%) patients had less than 3 serrated polyps and 128 (5.36%) patients had serrated polyp ≥ 10 mm. The most common pathologic subtype of serrated polyp was HP (97.7%) while there were 0.38% patients with SSA/P and 2.05% with TSA. Six hundred fifteen (25.8%) patients had proximal serrated polyp, 1893 (79.3%) had distal colorectal serrated polyp, and 121 (5.07%) had multi-regional serrated polyp. Among those with serrated polyps ≥ 10 mm, 89 (69.5%) were located in the distal colorectum.

Risk of proximal polyps according to the feature of distal colorectal adenoma

Compared with patients without distal colorectal adenomas, patients with distal colorectal adenomas were more likely to have proximal conventional adenomas (OR, 4.05; 95% CI, 3.43–4.77; $P < 0.001$) and serrated polyps (OR, 2.24; 95% CI, 1.77–2.84; $P < 0.001$). Furthermore, we found the association was strong for proximal advanced adenomas (OR, 3.84; 95% CI, 2.75–5.36; $P < 0.001$). Compared with patients without distal colorectal adenomas, patients with distal colorectal advanced adenomas were 7.83 times more likely to have advanced adenoma in the proximal colon (95% CI, 5.23–11.7; $P < 0.001$).

Discussion

CRC diagnosed under 50 years old accounted for about 5% and 10% of colon and rectal cancer in 2010, respectively. The proportion was expected to double by 2030 [6]. Given the rising incidence of CRC in young patients, expert panels suggested screening program should start at age 45 instead of 50 for average-risk population [7, 8].

Adenoma and advanced adenoma detected by screening colonoscopy tended to be located in the distal colon and rectum in previous studies [9, 10]. In our study, the predominant trend of polyps in the distal colorectum was also found, as 77.0% patients had at least a polyp in the distal colorectum. It was noted that both advanced adenomas and ≥ 10-mm serrated polyps were predominantly detected in the distal colorectum.

Imperiale et al. also focused on the status of proximal colon according to distal colorectal finding [11, 12]. They found a relative risk of adenoma in the proximal colon was higher in patients with distal colorectal adenoma as compared with that in patients without adenoma in the distal colorectum, which was in line with our study. These results strongly recommended young patients who had distal adenoma detected but failed to fully examine the proximal colon due to bad bowel preparation or unbearable pain or by a sigmoidoscopy as an initial examination should receive a following complete colonoscopy.

Several limitations of our study need to be noted. First, this was a retrospective analysis in a single center which might have selection bias. Second, because of the evolving nature and lack of consensus regarding the diagnostic criteria of serrated polyps, we were unable to confirm that we had distinguished HPs from SSA/Ps and TSAs; therefore, some serrated polyps might be misdiagnosed or misclassified. However, polyp size has been established as a strong predictor for the likelihood of a polyp progressing into advanced neoplasia, so we preferred to use large serrated polyps in the current analysis.

Conclusion

Among patients under age 50, advanced adenomas and ≥ 10-mm serrated polyps were predominantly in the distal colorectum and advanced adenomas tended to be found in patient aged 45–49, which somehow explained the rising trend of distal colorectal cancer and emphasized the necessity for the colonoscopy screening among these population.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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