

Clinicopathological Analysis Of Serrated Adenomas Of The Colorectum

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Citation

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Abstract

Background: Serrated adenoma is a recently recognized epithelial neoplasm of the colorectum. The aim of this study is to clarify the clinical and morphological features of serrated adenomas.

Methods: Our study comprised of 44 cases of serrated adenoma that were signed-out during the year 1998; these were then divided into three histological groups according to histological features (tubular, tubulovillous or villous). These cases were looked for any synchronous associated histological lesion in the colorectum. The follow-up biopsies were also analyzed for each individual case and were correlated.

Results: The mean age of presentation was 65.1 years with 1.5:1 male to female ratio. The tubular type of serrated adenoma was the predominant type with 34 cases (77%). There were eight cases (18%) of tubulovillous type and two cases (4.5%) of villous type. Majority of the lesions were limited to left colon (34% sigmoid and 41% rectum). On follow-up biopsies 3 cases developed adenocarcinoma, 1 case developed adenoma with high-grade dysplasia, 9 cases had recurrent adenomas and 3 cases had hyperplastic polyps.

Conclusions: Serrated adenomas were mostly limited to the left colon and their clinical behavior correlated with their histological features.

INTRODUCTION

It has been generally understood that hyperplastic polyps of the colorectum are non-neoplastic, benign lesions. However, reports of cases with hyperplastic polyposis complicated by colorectal cancers^{1,2,3,4} and the presence of dysplasia in hyperplastic polyps^{5,6,7} have suggested that these benign lesions are prone to neoplastic transformation.

In 1984, Urbanski et al.⁸ reported a case of colonic adenocarcinoma arising within a polyp of mixed hyperplastic and adenomatous morphology, and they referred to this lesion as a mixed hyperplastic and adenomatous polyp. A similar colonic lesion but with a different nomenclature "mixed hyperplastic and neoplastic polyp" was reported in 1986.⁹ Subsequently, Longacre and Fenoglio-Preiser¹⁰ published a report on 110 colorectal polyps with architecturally hyperplastic but cytologically neoplastic features, and they referred to these lesions as "serrated adenoma." A serrated glandular pattern of adenomatous proliferation was the common characteristic feature of serrated adenoma.

Although the serrated adenoma has become an established

entity in the field of pathology, the clinical and morphological features of these polyps are not very well discussed. The aim of this study is to analyze the demographic, clinical, anatomical and follow-up features of serrated adenoma.

PATIENTS AND METHODS

I reviewed pathology records at my institution from the period between January 1998 and December 1998 and sorted out the list of patients with serrated adenoma. The histologic diagnosis of serrated adenoma was based on the criteria described by Longacre and Fenoglio-Preiser.¹⁰ In brief, histologic confirmation of (1) a serrated glandular pattern simulating hyperplasia, (2) the presence of goblet cell immaturity, (3) upper crypt zone mitosis, and (4) the prominence of nuclei were the criteria for inclusion.¹⁰

The lesions fulfilling the above criteria were included in the investigation. Total 44 cases were found during the one-year period. These patients comprised 4% of 1095 colorectal adenomas found during this period.

RESULTS

There were 27 (61.3%) men and 17 (38.6%) women; their ages at the time of diagnosis ranged from 33 to 85 years, with a mean age of 65.1 years. Synchronous traditional adenoma was found in 39 patients. None of the patients had synchronous invasive colorectal cancer or any family history suggestive of hereditary colorectal cancer syndromes. All 44 patients had a single serrated adenoma. Eleven patients also had synchronous hyperplastic polyp.

Thirty-three (74%) of 44 adenomas were found in the rectosigmoid colon. The exact locations were 3 cases in cecum, 3 cases in ascending colon, one case in hepatic flexure, 2 cases in transverse colon, 2 cases in descending colon, 15 cases in sigmoid colon and 18 cases in rectum. The histologic type of the serrated adenomas was classified into tubular type in 34 (77%) lesions, tubulovillous type in 8 (18%) lesions, and villous type in 2(4.5%) lesions. High-grade dysplasia was found in none of the lesions. The mean specimen size of the 44 cases was 12.5 mm (range 2-15 mm).

Regarding age distribution of these lesions there was one case in fourth decade, 4 cases in fifth decade, 10 cases in sixth decade, 7 cases in seventh decade, 18 cases in eighth decade and 4 cases in ninth decade. Table I shows the anatomical location of the lesion with age and sex distribution.

Figure 1

Table 1: Anatomical location of serrated adenomas with there sex and age distribution.

Anatomical Location	Sex		Age range						Total
	Female	Male	30-39	40-49	50-	60-69	70-	80-89	
Cecum	1	2					2	1	3
Ascending Colon	1	2				1	2		3
Hepatic Flexure	1						1		1
Transverse Colon	1	1			1		1		2
Descendin Colon		2					1	1	2
Sigmoid Colon	6	9		1	5	3	5	1	15
Rectum	7	11	1	3	4	3	6	1	18
Total	17	27	1	4	10	7	18	4	44

Seventeen cases of 44 adenomas had follow-up biopsies at our hospital. Thirteen of them had only one follow-up, three had 2 follow-ups and one had 3 follow-ups. Eight cases developed recurrent tubular adenoma, 1 case tubulovillous adenoma, 1 case tubular adenoma with high-grade dysphasia, 3 cases adenocarcinoma of colon, 3 cases hyperplastic polyp and one case was unremarkable. Two of the 3 cases that developed adenocarcinoma were villous serrated adenoma and 1 case was tubular serrated adenoma. Table II describes the associated lesions and table III compares the three histological types of serrated adenoma with follow-up diagnosis.

Figure 2

Table 2: Summary of histological types of serrated adenoma and other associated lesions.

Anatomical location of serrated adenoma	Serrated Adenoma Types			Total	Associations*	
	Tubular	Tubulovillous	Villous		Hyperplastic polyp	Chronic active inflammation
Cecum	3			3		2
Ascending Colon	3			3	1	
Hepatic Flexure	1			1		
Transverse Colon	1	1		2		
Descendin Colon	2			2		
Sigmoid Colon	14	1		15	4	1
Rectum	11	5	2	18	6	
Total	34	6	2	44	11	3

* Other associated lesions.

Figure 3

Table 3: Follow-up diagnosis on different histological types of serrated adenoma.

Follow-up Diagnosis	Histological Types of Serrated Adenoma			Total
	Tubular	Tubulovillous	Villous	
No Follow-up	23	4		27
Tubular adenoma (TA)	5	3		8
TA with HGD	1			1
TubuloVillous adenoma		1		1
Hyperplastic polyps	3			3
Adenocarcinoma	1			2
Unremarkable Bowel	1			1
Total	34	8	2	44

DISCUSSION

The term “serrated adenoma” was introduced by Fenoglio-Preiser et al.¹¹ in 1988. Although they proposed that this type of adenoma should be regarded as a distinctive pathologic entity, they also reported that serrated adenoma represented from 0.0005% to 0.5% of colorectal adenomas.^{10, 11} In contrast, we found a greater prevalence of neoplasms compatible with the histological criteria of serrated adenoma from our survey. It would therefore seem likely that serrated adenoma is a much more frequent neoplasm occurring in the colorectum than previously recognized. Because of the possibility that high-grade dysplasia developing in serrated adenoma, recognition of this type of adenoma seems to be essential for pathologists and for the investigation of the histopathogenesis of colorectal cancer.

Morphologically, in serrated adenoma at low power one sees a serrated pattern similar to that of traditional hyperplastic polyps. However, on closer scrutiny a serrated adenoma shows a more complicated branching. The cytoplasm may be very eosinophilic. Serrated adenomas tend to have elongated crypts with dilatation of the crypts (greater at the bases).¹² Also present are horizontally oriented crypts running just above the muscularis mucosa often with goblet cells at the base of the crypt. The most dilated crypts tend to have an increased content of goblet cells mucous collecting in the crypts and surface mucosa. Generally, the serrated adenoma appears more villiform or complexly branched than does a traditional hyperplastic polyp.¹² Probably the most discriminating feature is that of the nuclei. The nuclei of

serrated adenomas are considered somewhat between that of a hyperplastic polyp and traditional adenoma (more atypia than a hyperplastic polyp but atypia that falls short of traditional adenomas). In traditional hyperplastic polyps the nuclei are ovoid or round, dark with occasional faint nucleoli, and basally placed with minimal pseudostratification. In the serrated adenoma, the nuclei are larger, ovoid and rounded, with focal elongation and pseudostratification. They can be hyperchromatic with chromatin clumping or nuclear membrane irregularities, or vesicular with "prominent" nucleoli. Torlakovic and Snover¹³ list the following as a way of differentiating serrated adenomas from hyperplastic polyps. Compared to hyperplastic polyps, serrated adenomas will have:

- Dilatation of the crypt that is most prominent at the base.
- Presence of horizontally oriented crypts (just above the muscularis mucosa).

In the literature serrated adenomas are most commonly found in the rectosegmoid colon. Seventy-four percent of the lesions were limited to rectosegmoid in our study. They range in size from 0.2 cm to 7.5 cm, 60% are 0.1 to 0.6 cm in size, and 21% are greater than 1.0 cm in size. Our study also showed comparable results with size range of 0.2 to 1.5 cm and mean size of 12.5 mm. In traditional hyperplastic polyps 93% are smaller than 0.5 cm and only 1 to 4% are larger than 1.0 cm. In one study, twenty four percent of serrated adenomas had foci of traditional adenoma and 10% had foci of intramucosal cancer.¹⁴ It is becoming clearer that many of the lesions in the past that were diagnosed as large hyperplastic polyps are probably serrated adenomas.

As has been previously published,¹⁰ serrated adenomas are distributed throughout the colon, with a predominance in the left side, and they have a predominantly polypoid configuration. Rubio and Rodensjo,¹⁵ however, recently identified serrated adenomas among colorectal neoplasms that were regarded as "flat" according to the criteria of Wolber and Owen,¹⁶ and they subsequently speculated that the flat serrated adenoma may be an independent precursor of colorectal cancer.^{17,18} However none of our cases exhibited flat morphology in this study.

We were not able to identify any clinical features specific to our patients with serrated adenoma. Although cases of innumerable serrated adenomas in the colorectum have been recently recognized and referred to as serrated adenomatous

polyposis,¹⁹ most of our patients either had a single serrated adenoma. Even though genetic alterations of serrated adenoma in relation to hyperplastic mucosa and possible progression to invasive cancer still need to be established, the clinical, endoscopic and histologic features of serrated adenoma suggest that, at present, these neoplasms should be treated in concept in a manner similar to that for traditional colorectal adenoma. In this regard, not only the size but also the presence of villous histological type or high-grade dysplasia may be a clue to the later behavior of the lesion.

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References

1. Matsumoto T, Mizuno M, Shimizu M, Manabe T, Iida M, Fujishima M. Serrated adenoma of the colorectum: colonoscopic and histologic features. *Gastrointest Endosc* 1999;49:736-42.
2. McCann BG. A case of metaplastic polyposis of the colon associated with focal adenomatous change and metachronous adenocarcinomas. *Histopathology* 1988;13:703-5.
3. Bengoechea O, Martinez-Peiuuela JM, Larrinaga B, Valerdi J, Borda F. Hyperplastic polyposis of the colorectum and adeno-carcinoma in a 24-year-old man. *Am J Surg Pathol* 1987;11:323-7.
4. Jorgensen H, Mogensen AM, Svendsen LB. Hyperplastic polyposis of the large bowel. *Scand J Gastroenterol* 1996;31:825-30.
5. Franzin G, Dina R, Zamboni G, Iannucci A, Scarpa A, Novelli P. Hyperplastic (metaplastic) polyps of the colon. *Am J Surg Pathol* 1984;8:687-98.
6. Franzin G, Novelli P. Adenocarcinoma occurring in a hyperplastic (metaplastic) polyp of the colon. *Endoscopy* 1982;14:28-30.
7. Teoh HH, Delahunt B, Isbister WH. Dysplastic and malignant areas in hyperplastic polyps of the large intestine. *Pathology* 1989;21:138-42.
8. Urbanski SJ, Marcon N, Kossakowska AE, Bruce WR. Mixed hyperplastic adenomatous polyps: an underdiagnosed entity. *Am J Surg Pathol* 1984;8:551-6.
9. Gabbers JO, Laissue JA. Mixed hyperplastic and neoplastic polyp of the colon: an immunohistochemical study. *Virchows Arch [A]* 1986;410:189-94.
10. Longacre TA, Fenoglio-Preiser CM. Mixed hyperplastic adenomatous polyps/serrated adenomas: a distinct form of colorectal neoplasia. *Am J Surg Pathol* 1990;14:524-37.
11. Fenoglio-Preiser CM. Adenomas. In: Fenoglio-Preiser CM, Pascal RR, Perzin KH, editors. *Tumors of the intestines*. Washington: Armed Forces Institute of Pathology; 1988. p. 108-12.
12. Ming SC, Goldman H. *Pathology of the Gastrointestinal Tract*. Lippincott, Williams & Wilkins; USA; 2nd edition (February 1998). Pp 820-825.
13. Torlakovic HH, Snover DC. Serrated adenomatous polyposis in human. *Gastroenterology* 1996;10:111-118.
14. Longacre TA, Fenoglio-Preiser CM. Mixed hyperplastic adenomatous polyps/serrated adenoma. A distinct form of colorectal neoplasia. *Am J Surg Pathol* 1990;14:524-537.
15. Rubio CA, Rodensjo M. p53 overexpression in flat

serrated adenomas and tubular adenomas of the colorectal mucosa. *J Cancer Res Clin Oncol* 1995;121:571-6.

16. Wolber RA, Owen DA. Flat adenomas of the colon. *Hum Pathol* 1991;22:70-4.

17. Rubio CA, Rodensjo M. Flat serrated adenomas and flat tubular adenomas of the colorectal mucosa: differences in

the pat tern of cell proliferation. *Jpn J Cancer Res* 1995;86:756-60.

18. Rubio CA, Kato Y, Hirota T, Muto T, Flat serrated adenomas of the colorectal mucosa in Japanese patients. *In Vivo* 1996;10:339-44.

19. Torlakovic E, Snover DC. Serrated adenomatous polyposis in humans. *Gastroenterology* 1996;110:748-755.

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