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CASE REPORT

Serrated adenoma of the stomach: Case report and literature review

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Abstract

Gastric serrated adenomas are histologically characterized by protruding glands with lateral saw tooth-like indentations lined with stratified dysplastic cells containing abundant eosinophilic cytoplasm. Since the first case of gastric serrated adenoma found in 2001, 18 additional cases have been reported. Gastric serrated adenomas have a particular proclivity to progress to invasive carcinoma; 75% or 15 of the 20 cases now in record - including the present one - exhibited invasive carcinoma. The 20th case of gastric serrated adenoma reported here differs from the preceding ones in as much as it evolved in a patient with Lynch syndrome, implying that this adenoma phenotype may develop not only sporadically but also in patients with hereditary traits.

Key words: Gastric; Serrated; Neoplasia; Lynch syndrome

Core tip: Gastric serrated adenomas have a particular proclivity to progress to invasive carcinoma; 75% or 15% of the 20 cases that are now in record - including the present one - exhibited invasive carcinoma.

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INTRODUCTION

Ninety years ago Konjetzny[1] described mucosal polyps in gastric specimens. Six years later Stewart[2] found among 11000 necropsies, 47 gastric polypoid lesions with mucosal aberrations that he called adenomas. Since then, much attention has been centred on gastric adenomas due to their propensity to evolve into invasive carcinoma[3-11].

Throughout the years several classifications of gastric polyps have been proposed[12-15]. Based on the endoscopic appearance, endoscopists have classified gastric polyps (adenomas being a histologic diagnosis) as flat[16] (also called non-polypoid or non-protruding) and polypoid[11] (also called protruding). Non-protruding polyps that appear thinner than the surrounding mucosa are called, depressed lesions[17]. This endoscopic classification was subsequently confirmed at the histological level[18]. Based on the gross appearance, Goldstein *et al*[19] classified gastric polyps into flat topped, villiform, and pedunculated and Ming *et al*[12] into flat and papillary. Based on their histological configuration, gastric polyps were classified by Elster[14] into focal foveolar hyperplasia, hyperplasiogenic polyps, tubular and villous adenomas, and by Appelman[20] into non-neoplastic (focal foveolar hyperplasia and hyperplastic polyps), non-neoplastic possibly

hamartomatous (Peutz-Jehgers-type polyps), and neoplastic adenomas (with or without invasive carcinoma). Nakamura[7] grouped gastric polyps into types I and II (hyperplastic polyps), and types III and IV (adenomas), and Kozuka[10] grouped them into common type (hyperplastic, adenomatous, and carcinomatous polyps), special-type hamartoma (Peutz-Jehgers polyps, juvenile polyps, polyps in Cronkhite-Canada syndrome, and fundic gland cyst polyps), polypoid lesions (inflammatory polyps and polypoid carcinoma), and polyps resulting from a submucosal mass.

In 2001 we reported a novel histologic phenotype of gastric adenoma characterized by protruding glands with lateral saw tooth-like notches due to scalloped epithelial indentations[21]. The serrated elongations were lined with stratified dysplastic cells containing abundant eosinophilic cytoplasm; it was called gastric serrated adenoma since it mimicked other serrated adenomas evolving in the colon[22] the appendix[23], the duodenum[24], the pancreatic duct[25] and the Barretts's esophagus[26]. Remarkably, this adenoma phenotype was not included in any of the aforementioned classifications of gastric polyps[11,18,20-22]. One possible explanation could be that gastric serrated adenomas were classified together with gastric villous adenomas. Another possible explanation could be that this type of lesion is very rare in the stomach. In this context, it should be mentioned that no case of serrated adenoma was recorded in a survey of 67 consecutive gastric adenomas[18], nor in larger series of gastric adenomas in the literature[5,6,10-14].

Subsequently, we reported six additional cases of gastric serrated adenoma[27,28]. More recently, cases with gastric serrated adenomas were reported from such disparate countries as Tunisia[29], Japan[30], Turkey[31] and South Korea[32].

The purpose of the present communication is to report another case of gastric serrated adenoma, this time occurring in a patient with Lynch syndrome, an autosomal dominant genetic condition with an increased risk to develop cancer in various organs, including the stomach.

CASE REPORT

The patient is a 57-year-old male with confirmed *MSH2* mutation Lynch syndrome. His mother was treated for endometrial cancer and an uncle for colorectal cancer. In 1995 the patient was operated for cancer in the right colon. In 2007, a second colon cancer was found at surveillance colonoscopy, this time in the transverse colon. A total colectomy with ileo-rectal anastomosis was performed. In 2009 he was operated for a metastasis in the small bowel. Histology revealed a metastasis from colon cancer.

A gastro-esophagoscopy was done in October 2012, because of protracted gastro-esophageal reflux. Histology showed short Barrett´s esophagus with low-grade dysplasia. During the same séance, a 10 mm in diameter polypoid lesion was detected in the stomach (Figure 1).

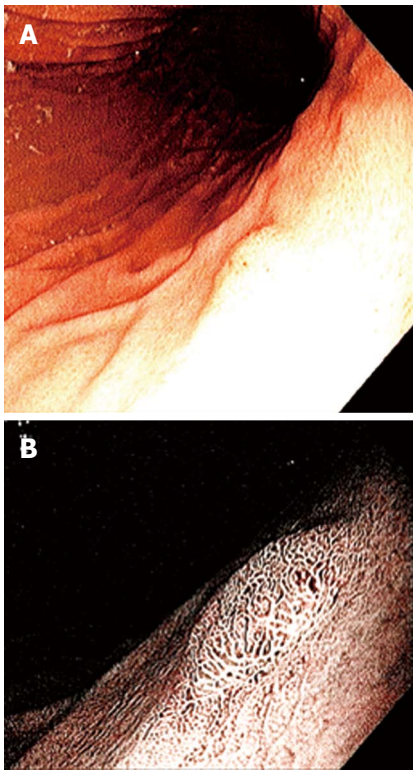

Figure 1 Endoscopic view. A: Gastric polyp; B: Gastric polyp after indigocarmine staining.

The polyp was endoscopically excised. No complications occurred during or after the procedure. The histological examination of the gastric polypoid lesion revealed a serrated adenoma showing protruding glands with lateral saw tooth-like notches due to scalloped epithelial indentations with high-grade dysplasia (Figure 2). In addition, an adenocarcinoma invading the submucosal tissues was demonstrated (Figure 3). The invasive carcinoma component retained the serrated configuration and the cytological features of the adenoma (Figure 4).

DISCUSSION

Despite decreasing incidence, gastric carcinoma continues to be one of the most common cancers world wide[33]. It is generally assumed that the histogenesis of gastric carcinoma of intestinal type follows the atrophic gastritis-intestinal metaplasia-dysplasia-pathway[34]. On the other hand, the histogenesis of gastric carcinomas of diffuse type remains elusive. Thus, the histogenesis in the majority of the gastric carcinomas has not yet being disclosed.

It is known that gastric tubular or villous adenomas may progress to gastric carcinoma of intestinal type[9,10,12,35]. The same fate seems to apply to gastric serrated adenomas, since of the 20 gastric serrated adenomas now in record (including the one reported here), 75% had evolved into invasive carcinoma (Table 1).

Recently, Kwon *et al*[32] reported 9 cases of gastric serrated adenomas. These authors found that MUC5AC expression was present in 66.7% (6/9) of the gastric

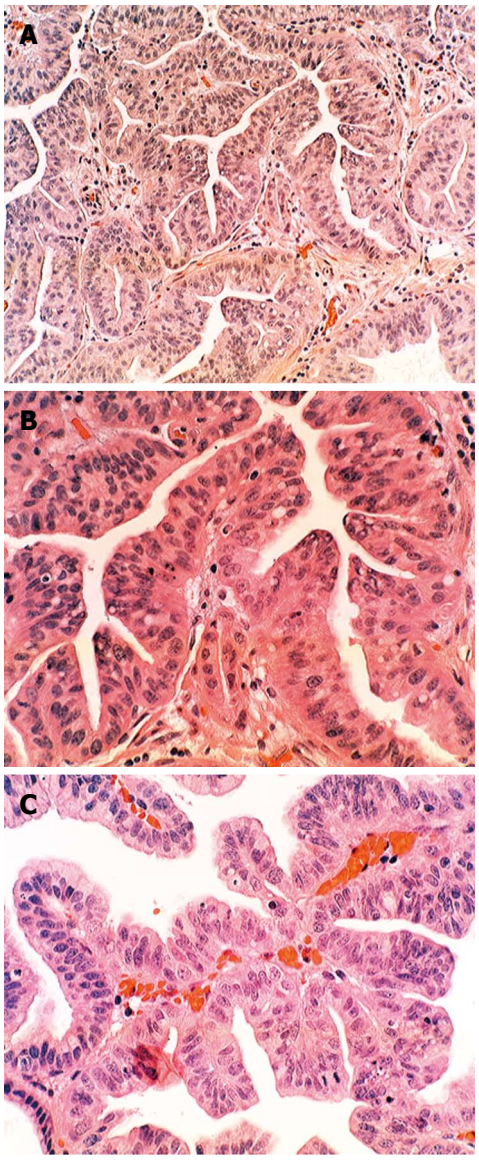

Figure 2 The histological examination of the gastric polypoid lesion revealed a serrated adenoma showing protruding glands with lateral saw tooth-like notches due to scalloped epithelial indentations with high-grade dysplasia. A: Adenoma showing serrated glands lined with high-grade dysplasia [hematoxylin and eosin (HE) × 10]; B: High power view of the adenomatous component showing serrated glands with indentations lined with high-grade dysplasia (HE × 20); C: View of a single elongated gland with saw-tooth-like configuration lined with high-grade dysplasia (HE × 20).

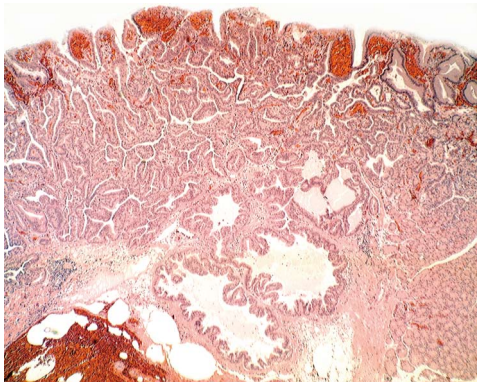

Figure 3 Low-power view of serrated adenoma with invasive carcinoma (hematoxylin and eosin × 10).

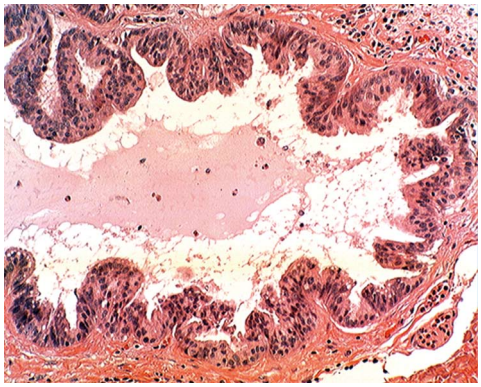

Figure 4 High power view of the invasive component with retained serrated configuration (hematoxylin and eosin × 10).

Table 1 Gastric serrated adenomas case reports

Ref.	Year of publication	No. of cases	No. cases with invasive carcinoma
Rubio *et al*[21]	2001	1	1
Rubio *et al*[27]	2004	5	4
Rubio *et al*[28]	2007	1	1
M'sakni *et al*[29]	2007	1	0
Hasuo *et al*[30]	2009	1	1
Köklü *et al*[31]	2010	1	0
Kwon *et al*[32]	2013	9	7
Rubio *et al*[1]	2013	1	1

[1]Present communication.

serrated adenomas, in 71.4% (5/7) of the serrated adenocarcinomas, and *KRAS* mutations in 33.3% (3/9) of the cases. Kwon *et al*[32] concluded that the high frequencies of malignant transformation and *KRAS* mutations suggested that gastric serrated adenomas might be precursors of gastric mucin-phenotype adenocarcinoma.

Here, we report the first case of serrated adenoma of the stomach in a patient with Lynch syndrome. Lynch syndrome is an autosomal dominant genetic condition which has a high risk of colon cancer as well as other cancers including endometrium, ovary, stomach, small intestine, hepatobiliary tract, upper urinary tract, brain, and skin. The increased risk for these cancers is due to inherited mutations that impair DNA mismatch repair. The occurrence of this case of gastric serrated adenoma in a patient with Lynch syndrome implies that this adenoma phenotype may develop not only sporadically but also in patients with hereditary traits.

Paradoxically, eight out of 20 cases of serrated adenoma of the stomach now in record (including present case) have been reported from a single Institution[21,27,28]. The increased awareness of the existence of these gastric aggressive adenomas may result in more cases being re-

ported from other Institutions in the future.

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