Serrated neoplasia of the stomach: a new entity

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Abstract

Aim—Despite the fact that gastric carcinoma continues to be one of the most common cancers worldwide, only dysplasia in flat mucosa and adenomas have been shown to evolve into invasive carcinoma. The aim of this paper is to report a novel histological phenotype of gastric adenoma with early invasive growth.

Material and results—The patient presented with gastric complaints. A barium examination revealed an ulcerated tumour in the corpus, apparently infiltrating the gastric wall. The endoscopic examination showed a pediculated protruding tumour in the greater curvature. Punch biopsies were reported as invasive adenocarcinoma. Because of the poor condition of the patient, a partial gastrectomy was performed. The histological examination revealed elongated fronds with lateral crenated, saw tooth-like notches as a result of scalloped epithelial indentations. Areas with high grade dysplasia, with carcinoma in situ, and invasive carcinoma at the tip of the adenoma were demonstrated. The pedicle of the protruding neoplasia “emerged” from a non-protruding serrated adenoma.

Conclusions—The protruding serrated neoplasia had apparently evolved from a non-protruding serrated gastric adenoma. This appears to be the first case of gastric serrated neoplasia in the literature.

Keywords: gastric serrated neoplasia; gastric carcinoma; dysplasia; gastric adenoma

Early in 1923, Konjetzny reported the presence of polypoid changes in the gastric mucosa, and five years later Borrmann described different types of gastric polyps. In 1929, Stew art found 47 gastric polypoid lesions with mucosal aberrations—which he called adenomas—among 11 000 necropsies.

Since then, much attention has been centred in the literature around gastric adenomas, and several classifications have been proposed by different authors.

The accepted microscopic structures described for those neoplastic gastric polyps have been either tubular, tubulovillous, or villous. Recently, however, while reporting surgical gastric specimens, we found a protruding neoplastic lesion with the phenotypic characteristic of a serrated adenoma, similar to those reported in the colon. Because a similar case of gastric serrated adenoma has been reported previously in the literature, it was considered of interest to describe its microscopic characteristics in this report.

The patient

The patient was a 78 year old woman. Thirty two years previously, she was treated with pelvic irradiation for a squamous cell carcinoma of the uterine cervix. For the past 10 years she had been treated for diabetes mellitus and hypertension. Two years ago the patient developed a gastric peptic ulcer, which was treated with medication. For the past week she had complained of profuse vomiting, weakness, tiredness, and dizziness. No haematemesis or melena were recorded. The laboratory reported moderate anaemia. A barium x-ray examination of the stomach revealed an ulcerated tumour in the corpus, apparently infiltrating the gastric wall. The subsequent endoscopic examination showed a pediculated polypoid tumour in the greater curvature. Punch biopsies taken from the tumour were reported as invasive adenocarcinoma.

Owing to the poor condition of the patient, the surgeon considered a total gastrectomy too hazardous and, because the tumour was pedunculated (according to the endoscopist), he decided to perform a local excision. The patient had an uneventful postoperative period.

Pathology

The surgical specimen comprised a 10 cm in diameter gastric wall centred by a protruding pediculated polyp, measuring 4 cm in diameter. Part of its luminal border was eroded and covered with fibrin. The preparation was fixed in 4% neutral formalin.

After fixation, a 1 cm thick cross section of the entire preparation (through the largest tumour diameter, including part of the adjacent gastric mucosa) was imbedded in paraffin wax and processed for histology. The remainder of the tumour and the adjacent gastric mucosa in all four lateral directions were sampled in blocks.

Macrosections (6 µm thick) from the large block were cut and stained with haematoxylin and eosin (fig 1) and for Ki67 (MIB1; Dako, Glostrup, Denmark), and p53 (DO-1, sc-126, Santa Cruz, Santa Cruz, California, USA).

The histological examination revealed a protruding neoplastic lesion composed of elongated fronds with lateral crenate, saw tooth-like notches caused by scalloped epithelial indentations (fig 2). The nuclei covering the serrated glands were stratified, either cigar shaped with irregular chromatin deposits, or vesicular shaped carrying a large nucleolus (fig 3A). In other cells, the nucleoli were dark and irregular as a result of nucleolus associated chromatin. Connecting thin chromatin bridges were seen between two or more individual chromocentres and between the irregular chromatin clumps.
along the nuclear membrane and the chromocentres. Mitotic figures were increased. Some glands showed a back to back arrangement, others a gland within glands arrangement, and in one area invasive carcinoma was seen in the luminal aspect of the neoplasm (fig 3B). Other areas showed elongated fronds without indentations. The pedunculated base of the serrated neoplasm showed no invasive growth.

Immunohistochemical staining revealed pronounced Ki63 (MIB1) expression in the serrated protruding adenoma, in addition to the area of invasion. p53 was not expressed. It should be noted that the preparation had been fixed in formalin for two days. The possibility that the relatively long period of fixation led to spurious p53 results cannot be rejected.

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adenoma measuring 2 cm in diameter. The non-protruding lesion showed serrated foveoli with indentations (fig 4) lined by dysplastic cells (fig 5), which exhibited pronounced Ki67 (MIB1) expression (fig 6). The non-protruding serrated adenoma was partly surrounded by gastric mucosa with hyperplastic foveolar epithelium showing serrated indentations. No dysplasia could be demonstrated (fig 7). The hyperplastic foveolar epithelium mimicked hyperplastic colorectal polyps.20

The fundic mucosa surrounding the hyperplastic foveolar epithelium showed occasional intestinal metaplastic cells and dilated gastric glands. The foveoli were normal. No inflammation, atrophy, or dysplastic changes were found.

Discussion
On the grounds of gross appearance, Goldstein and Lewin21 classified gastric adenomas into flat topped, villiform, and pedunculated, and Ming and Goldman18 classified them into flat and papillary. In a recent study,22 we found that 40 of 67 gastric adenomas were non-protruding (not thicker than twice the thickness of the normal gastric mucosa), with the remaining 27 being protruding (having more
Serrated structures were neither reported the occurrence of neoplastic changes in hyperplastic colorectal polyps. Colorectal hyperplastic polyps are characterised by foveolar hyperplasia with serrated indentations without dysplasia. In the light of these observations, it appeared that not only colonic hyperplastic polyps but also gastric serrated hyperplastic polyps may evolve into a neoplastic lesion. Interestingly, Zea-friarte et al reported rare cases of invasive carcinoma in gastric hyperplastic polyps. Gastric hyperplastic polyps differ from hyperplastic colonic polyps because they are devoid of serrated indentations.

Despite its decreasing incidence, gastric carcinoma continues to be one of the most common cancers worldwide. Histological mucosal changes, such as atrophic gastritis and intestinal metaplasia, are believed to predispose to gastric cancer development, and dysplasias of flat mucosa, adenomas, and ectopic gastric glands appear to be genuine precursors of gastric carcinomas of the intestinal type. However, dysplasia in flat mucosa, adenomas, and ectopic gastric glands are rather uncommon lesions. Therefore, any possible alternative pathway to investigate gastric carcinogenesis should deserve careful attention.

Increased awareness of the existence of serrated neoplasia in the stomach may result in similar cases being reported in the future.

This is the first case of serrated neoplasia of the stomach reported in the literature.
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