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Metaplastic bone formation in a hyperplastic polyp of the stomach: a case report.

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Abstract

Metaplastic bony tissue along with hyperplastic mucosal epithelium showing no atypism was detected in biopsy materials from a Yamada type I gastric polyp. The tissue was metaplastic woven bone associated with calcification. Histogenesis of the bone formation is as yet unknown. This is the first reported case of the presence of metaplastic bone accompanied by hyperplastic gastric mucosa so far.

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— Brief Note —

Metaplastic Bone Formation in a Hyperplastic Polyp of the Stomach: A Case Report

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Metaplastic bony tissue along with hyperplastic mucosal epithelium showing no atypism was detected in biopsy materials from a Yamada type I gastric polyp. The tissue was metaplastic woven bone associated with calcification. Histogenesis of the bone formation is as yet unknown. This is the first reported case of the presence of metaplastic bone accompanied by hyperplastic gastric mucosa so far.

Key words : stomach, hyperplastic polyp, metaplastic bone, histopathology

Bone formation in the human stomach has been found, though rarely, among cases of cancer (1-4). However, there has been no report of the presence of bony tissue associated with gastric epithelium showing no atypism so far. We report a case in which bone formation with calcification occurred along with mucosal epithelium in a hyperplastic polyp of the stomach.

Case report

The patient was a 71 year-old male, who complained of poor appetite and fatigue for about one month. Gastrofiberscopy revealed Yamada type I and type IV polyps at the cardiac region of the stomach (Fig. 1). Biopsy materials from the Yamada type IV polyp were necrotic granulation tissue, and mucosal tissue from the Yamada type I polyp showed metaplastic bone formation with calcification along with hyperplastic glandular tissue revealing no atypism (Fig. 2). This bony tissue was metaplastic woven bone, and

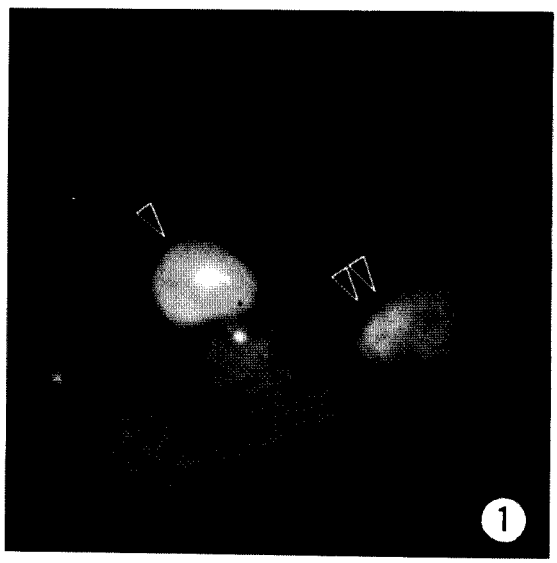

Fig. 1 Endoscopic view of the stomach revealing polyps of Yamada type IV (arrowhead) and type I (double arrowheads).

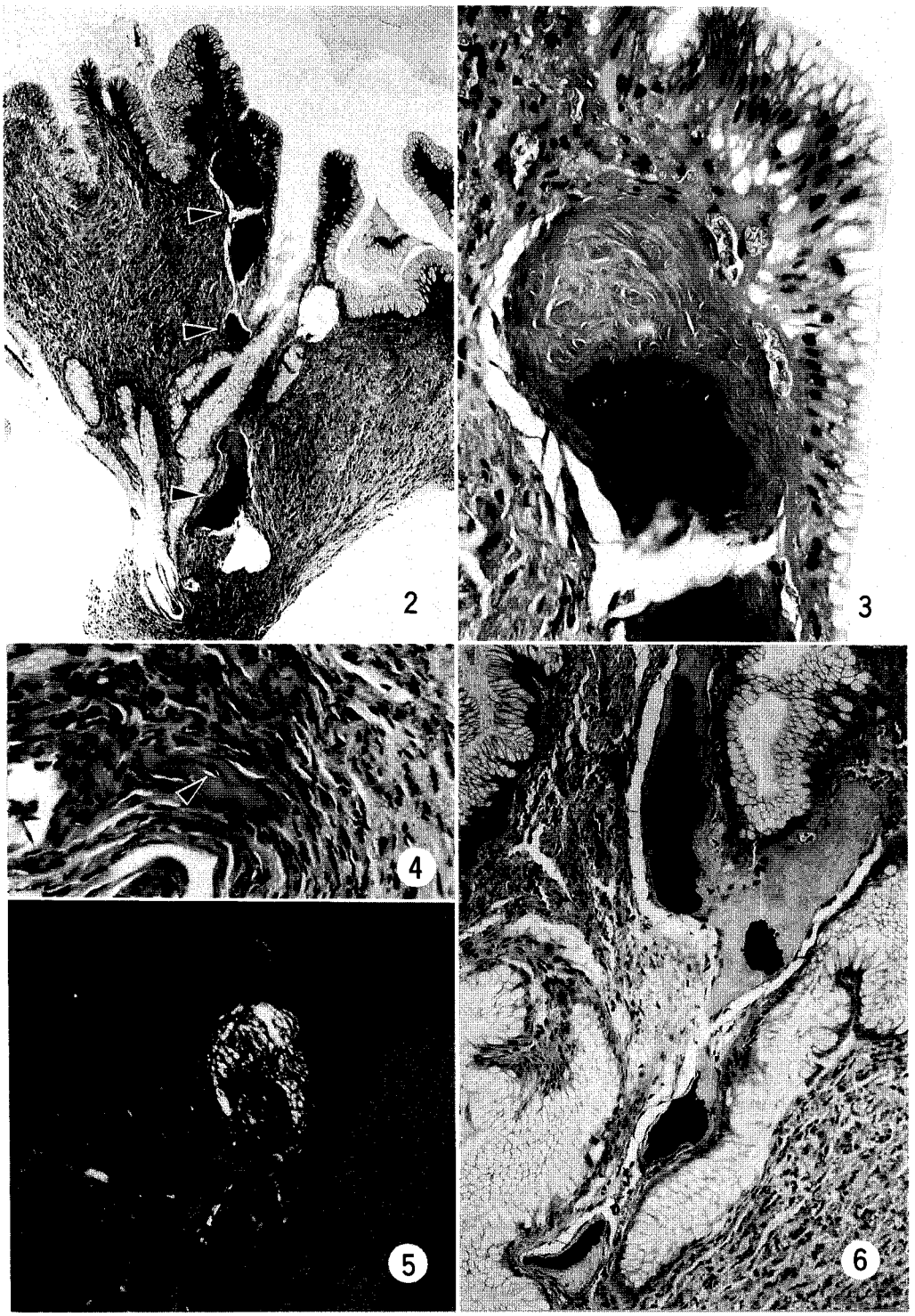
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Fig. 2 Metaplastic bony tissue (arrowheads) associated with calcification along with hyperplastic epithelium obtained from the Yamada type I polyp in Fig. 1. H. E. stain, ×60.

Fig. 3 Higher magnification of metaplastic woven bone. H. E stain, ×350.

Fig. 4 An osteocyte-like cell (arrowhead) embedded in the osteoid tissue. H. E stain, ×140.

Fig. 5 Fragmented short collagen bundles in the metaplastic bone revealed by polarized microscopy. H. E stain, polarized, ×140.

Fig. 6 Strongly positive reaction for calcium deposition in the metaplastic bone. von Kossa's reaction, ×140.

osteoblastic cells were not detected around the bony tissue (Fig. 3). Osteocyte-like flat cells embedded in the osteoid tissue were detected (Fig. 4). The bony tissue was composed of fragmented bundles of collagen fibers, as revealed by polarized microscopy (Fig. 5), and calcium deposition in the central area was demonstrated by von Kossa's reaction (Fig. 6).

The main laboratory data are as follows; *Serum:* total protein 7.2 g/dl (albumin 55.2 %, alpha$_1$-globulin 3.1%, alpha$_2$-globulin 9.7 %, beta-globulin 7.9%, gamma-globulin 24.1 %), total cholesterol 160 mg/dl, gamma-GTP 146 mU, LAP 204 mU, total bilirubin 1.3 mg/dl, (direct 0.6 mg/dl), ALP 239 IU/l, GOT 59 IU/l, GPT 27 IU/l, LDH 59 IU/l, ZTT 10.5, BUN 10.1 mg/dl, uric acid 3.9 mg/dl, creatinine 0.7 mg/dl, Na 140 mEq/l, K 3.9 mEq/l, Cl 100 mEq/l, Ca 8.2 mg/dl (normal range, 8.2-10.8 mg/dl), P 3.1 mg/dl; *Blood cells:* RBC 438 ×10^4/mm^3, WBC 8000/mm^3 (St. 5%, Seg. 32%, Eo. 2%, Ba 0%, Mo. 4%, Lym 57%), Hb 16.8 g/dl, Ht 43%, platelets 22.1 ×10^4/mm^3; *Urine:* n. p. Laboratory data disclosed only a mild degree of liver dysfunction. Serum electrolytes (Na, K, Cl, Ca and P) were within the normal range. The clinical course of the patient has been favorable.

Discussion

Four cases of ossification in stomach cancer, including both primary and metastatic foci, have been reported in the literature (1-4). Papillary and tubular adenocarcinomas were the predominant histological types (1-4). On the other hand, calcification alone has frequently been observed in mucinous type carcinoma (4). Although ossification was experimentally observed in precancerous lesions induced by chemical carcinogens in the remaining stomach following subtotal gastrectomy in rats (5,6), or in the transplanted gastric mucosa of rats (7), no report has been observed on the presence of bony tissue associated with atypical or hyperplastic epithelium in the human stomach so far in the literature. In the present case, bony tissue with calcification was observed along with non-malignant, but hyperplastic epithelium with calcification.

As to the histogenesis of ossifications, the tissue induction theory, in which fibroblastic cells are purported to be activated and differentiate to form metaplastic bone in the stroma under the influence of the cancerous epithelium, is widely accepted (4,6,7). As for the bone formation beneath mucosal epithelium with no atypism, the same woven bone as in the present case was reported in a case of juvenile polyp in the rectum (8). Considering the hamartomatous origin of this kind of polyp, the primitive mesenchyme may play an important role in stromal osteogenesis (8).

It is likely that the resection of the fundic glands, resulting in increased alkalinity, could induce bony tissue as reported previously (5,9), but such an acid deficiency was not likely in the present case. Calcification preceding ossification as seen in the present case has been emphasized in cases of colon cancer (10). In addition, it is of interest that bone formation was exclusively observed just beneath the regenerating epithelium, but not in the originally transplanted gastric mucosa in the abdominal wall in rats (7).

Therefore, not only malignant epithelium, but also regenerating or even hyperplastic epithelium as in the present case could induce stromal osteogenesis under certain special conditions as yet undetermined.

However, as reported previously (3), the total number of stomach cancers associated with calcification is very small, when compared with the frequent occurrence of the disease. This fact is not fully explained yet.

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