

—Report on Experiments and Clinical Cases—

Spurt Bleeding from a Calcificated Gastrointestinal Stromal Tumor in the Stomach

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Abstract

Calcifications within primary gastrointestinal tumors are rare. Gastrointestinal stromal tumor (GIST) is an unusual nonepithelial tumor that develops in the gastrointestinal tract. In this paper we describe a case of spurt bleeding from a calcificated GIST in the stomach successfully treated by partial gastric resection.

A 77-year-old man was admitted for chest discomfort and loss of consciousness. Endoscopic examination revealed spurt bleeding from the top of the submucosal tumor. No other lesions or points of bleeding were found in the stomach. Emergency partial gastrectomy was performed, and the stomach was closed. The cut surface of the tumor had a firm, solid, whitish-gray parenchyma with patchy calcification. Microscopic observation revealed a profusion of spindle-shaped tumor cells with calcification growing from the gastric muscular propria to the submucosa. The cells exhibited low mitotic activity and no prominent signs of nuclear atypia. Immunohistochemical staining of the tumor demonstrated positive reactivity for CD34, KIT, and vimentin, but negative reactivity for α -smooth muscle actin, desmin, and S-100 protein. Tumor cells positive for Mib-1 were rare. The diagnosis of the tumor was established as GIST. (J Nippon Med Sch 2005; 72: 304–307)

Key words: gastrointestinal stromal tumor, stomach, bleeding, gastric resection, calcification

Introduction

Calcifications within primary gastrointestinal tumors are rare. Gastrointestinal stromal tumor (GIST) is an unusual nonepithelial tumor that develops in the gastrointestinal tract.

In this paper we describe a case of spurt bleeding from a calcificated GIST in the stomach successfully treated by partial gastric resection.

Case Report

A 77-year-old man was admitted to Uchida Hospital for chest discomfort and loss of consciousness. During the week before admission, the patient had been taking nonsteroidal anti-inflammatory drugs for the treatment of bilateral knee pain. Initial laboratory tests revealed the following: serum aspartate aminotransferase

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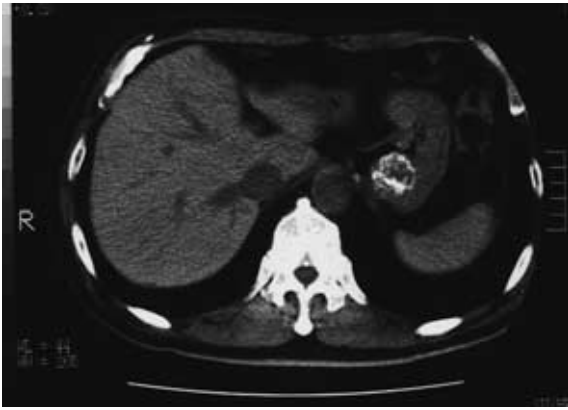


Fig. 1 CT showed a high-density area in the stomach.

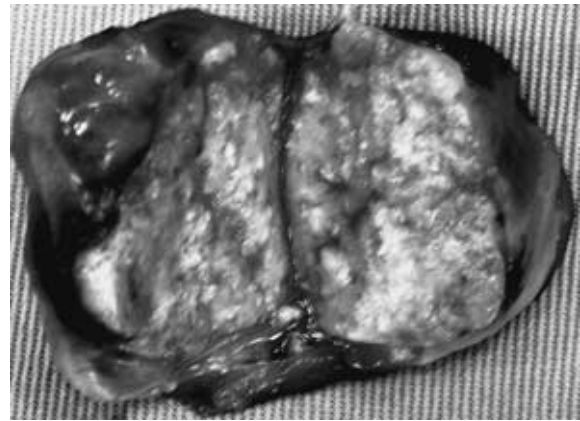


Fig. 3 Macroscopic findings of the resected specimen.

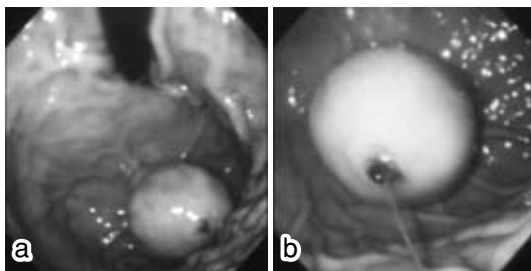


Fig. 2 Endoscopic examination revealed spurt bleeding from the top of the submucosal tumor.

concentration, 34 IU/L (normal, <28 IU/L); serum alanine aminotransferase concentration, 53 IU/L (normal, <33 IU/L); serum lactic dehydrogenase concentration, 350 IU/L (normal, 180 to 460 IU/L); serum gamma glutamic transpeptidase concentration, 32 IU/L (normal, 8 to 39 IU/L); serum C-reactive protein concentration, 0.2 mg/dL (normal, <0.3 mg/dL); white blood cell count, 4,500/ μ L (normal, 4,000 to 8,000/ μ L); red blood cell count, 331×10^4 / μ L (normal, 410 to 550×10^4 / μ L); and serum hemoglobin concentration, 9.1 g/dL (normal, 14 to 18 g/dL). The serum concentration of carcinoembryonic antigen was 1.3 ng/mL (normal, <2.5 ng/mL).

A high-density area in the stomach was detected with computed tomography (CT) (Fig. 1). Endoscopic examination revealed a round submucosal tumor with signs of ulceration and oozing at the upper end (Fig. 2a). No other lesions or points of bleeding were found in the stomach. The patient was promptly treated with a proton

pump inhibitor, but rebleeding began after 3 days. Endoscopic examination revealed spurt bleeding from the top of the submucosal tumor (Fig. 2b). Emergency partial gastrectomy was performed, and the stomach was closed. The resected tumor measured $28 \times 26 \times 26$ mm. The surgical margins of the resection were free of tumorous tissue, and the gastric mucosal aspect showed ulcer formation at the top of the tumor. The cut surface of the tumor had a firm, solid, whitish-gray parenchyma with patchy calcification (Fig. 3). Microscopic observation revealed a profusion of spindle-shaped tumor cells with calcification growing from the gastric muscular propria to the submucosa. The cells exhibited low mitotic activity and no prominent signs of nuclear atypia. Immunohistochemical staining of the tumor demonstrated positive reactivity for CD34, KIT, and vimentin, but negative reactivity for α -smooth muscle actin, desmin, and S-100 protein (Fig. 4). Only occasional tumor cells were positive for Mib-1. The diagnosis of the tumor was established as GIST. The postoperative course was uneventful and the patient was discharged on postoperative day 11. No signs of recurrence have since been detected in follow-up clinical observation.

Discussion

GISTs are rare neoplasms that appear to arise from the muscular layers of hollow organs, most commonly the stomach and small bowel. Their presumed origin from smooth muscle cells has led to

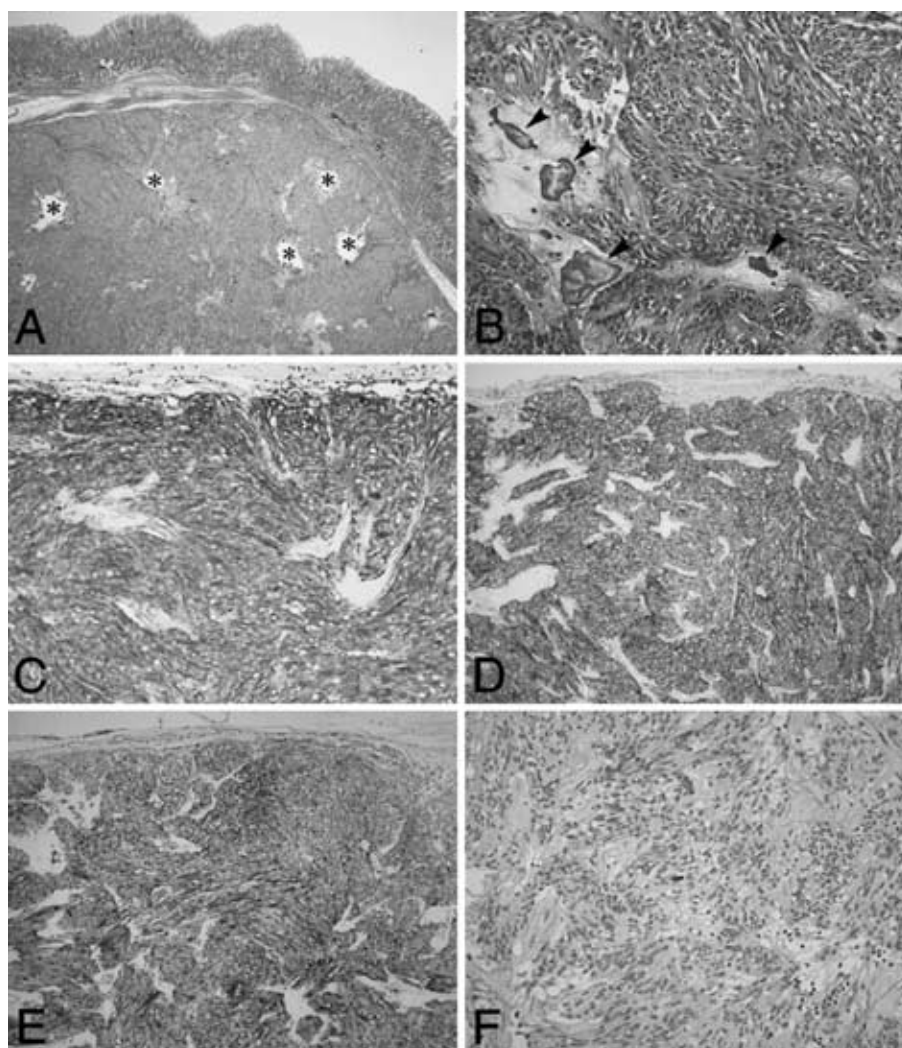


Fig. 4 Low magnification shows a tumor in the submucosa protruding from the gastric muscularis propria (A). Multiple calcified lesions in the tumor produce artificial defects (**asterisks**) of tissue. High magnification shows the spindle shape and pseudoalveolar pattern of the tumor cells (B). No prominent nuclear atypia of tumor cells was found. Calcified lesions (**arrowheads**) are observed in the area of fibrous stroma. Tumor cells are positive for CD34 (C), KIT (D) and vimentin (E). Tumor cells are only occasionally positive for Mib-1 (F).

the use of terms such as “leiomyoma”, “leiomyoblastoma” and “epithelioid leiomyosarcoma”. Unfortunately, the exact origin of these tumors is difficult to determine microscopically. In view of the difficulty in assigning a benign or malignant classification for a disease entity with such a complicated histogenesis, the tumor is now described rather generically as a “gastrointestinal stromal tumor” (GIST)¹. GIST is currently defined as a spindle cell, epithelioid, or occasionally pleomorphic mesenchymal tumor of the gastrointestinal tract which shows expression of KIT (CD117, stem cell factor receptor) on

immunohistochemical studies.

GIST is often discovered incidentally at surgery and should be completely excised. CT and endoscopic examination are increasingly used to detect asymptomatic GISTs in view of their minimal invasiveness. Patients with GIST most commonly present with an abdominal mass or gastrointestinal bleeding as a result of overlying mucosal ulceration and pain. Few, however, exhibit spurt bleeding from the top of the GIST, the symptom we found on the endoscopic examination of our patient. Other symptoms may include anorexia, dysphagia, obstruction, perforation, and fever¹.

The CT features of GISTs include well-defined tumor margins and predominantly homogenous contrast enhancement, with precontrast Hounsfield units of 30 to 35 and postcontrast Hounsfield units of 50 to 60².

Calcifications within primary gastrointestinal tumor are rare, but the appearance is striking and characteristic of several tumor types. The presence of diffuse, punctate calcifications in a gastric mass strongly suggests mucin-producing adenocarcinoma³; calcium salts precipitate with glycoproteins in an alkaline matrix⁴. GISTs may occasionally contain calcification, but usually of a circumscribed and patchy type⁵. The calcification develops mostly in necrotic tissue, probably due to the formation of a precipitate of calcium phosphate via the preferential binding of denatured proteins to phosphate ions⁴.

In conclusion, we encountered a case of spurt bleeding from a calcificated GIST in the stomach successfully treated by partial gastric resection.

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