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Case Report

Gastric Schwannoma

Gastrointestinal mesenchymal tumors are a group of tumors originated from the mesenchymal stem cells of the gastrointestinal tract, consisting of gastrointestinal stromal tumors (GIST), leiomyomas or leiomyosarcomas or schwannomas. Gastric schwannoma is a very rare gastrointestinal mesenchymal tumor, which represents only 0.2% of all gastric tumors and 4% of all benign gastric neoplasms. We report a 24-year-old girl who suffered from an episode of upper gastrointestinal bleeding. The endoscopic examination showed a round submucosal tumor with a central ulceration and bleeding over the high body of the stomach. Surgical resection of the tumor was performed. The pathological examination revealed a picture of spindle cell tumor that was strongly positive for S-100 protein stain, and non-reactive for CD34, CD117, actin, HHF-35, desmin, melan-A and HMB-45, consistent with gastric schwannoma. The literature is reviewed.

Gastrointestinal mesenchymal tumors are a group of tumors originated from the mesenchymal stem cells of the gastrointestinal tract, consisting of gastrointestinal stromal tumors (GIST), leiomyomas or leiomyosarcomas, and schwannomas.[1] According to histological pictures, these tumors present in the spindle shape. They were traditionally considered to be of smooth muscle origin. In the past, these tumors were diagnosed as leiomyoma, leiomysarcoma or leiomyoblastoma. However, different diagnoses have been made recently. The immunohistochemical studies showed that some of these tumors had positive stain for CD117, CD34 and no evidence of smooth muscle differentiation. The histogenetically non-committal term of gastrointestinal stromal tumor (GIST) has been introduced to represent a common tumor type at these sites.[2-4] The existence of schwannoma as a primary gastrointestinal tumor based on the positive S-100 stain had been under serious debates until a series of 25 well-documented cases were presented by Daimaru *et al*.[5] Gastric schwannoma is a very rare gastrointestinal mesenchymal tumor, which represents only 0.2% of all gastric tumors and 4% of all benign gastric neoplasms.[6] When gastrointestinal schwannoma occurs, the most common site is the stomach.[7] We report a case of gastric schwannoma located in the high body of the stomach.

CASE REPORT

A 24-year-old girl, who went to the USA for study 8 years before and had stayed there ever since, felt intermittent upper gastrointestinal upset in the past 1 month. She suffered from a sudden episode of vomitus with fresh blood 1 week before admission to our hospital. At that time, she visited a local medical doctor in the USA. The upper gastrointestinal endoscopic examination revealed a protruding mass with a deep central ulceration. The lesion was covered with fresh blood clots in the gastric high body. Gastric malignancy was highly suspected.

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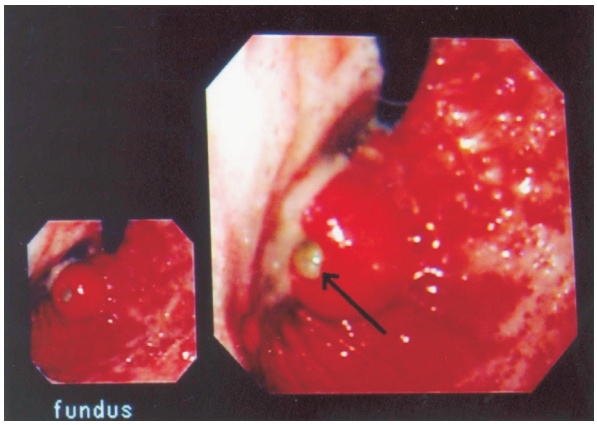

Fig. 1. Endoscopic findings of the tumor. The arrow indicates a round tumor with central ulceration.

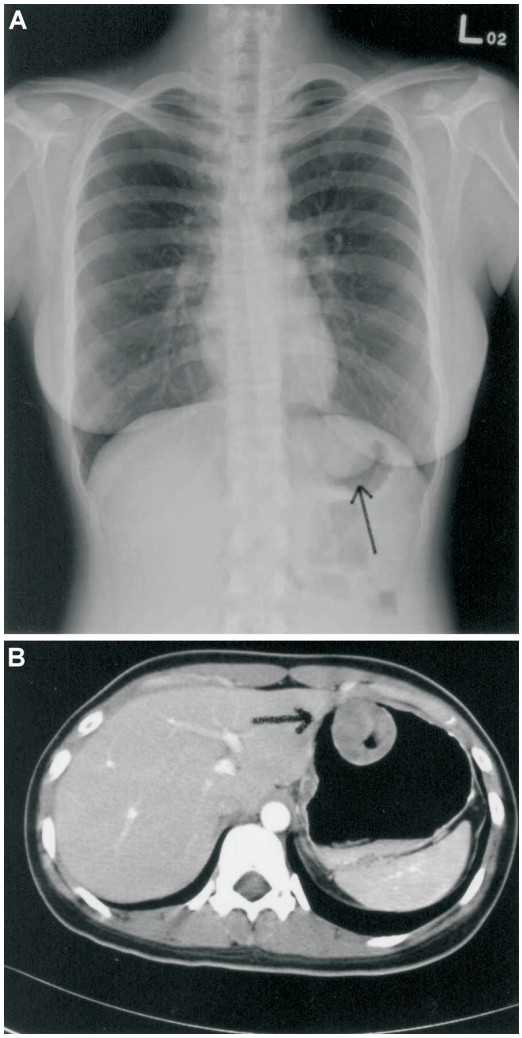

Fig. 2. (**A**) Chest radiography showing a mass lesion in the stomach (black arrow). (**B**) Computerized tomography scanning of the upper abdomen demonstrating a mass lesion in the anterior wall of the stomach.

Thus she came back to Taiwan for more treatment.

In our thoracic division, the patient received a series of examinations of the gastric tumor. Repeated endoscopic examination showed a 4-cm mass lesion with a deep central ulceration in the gastric fundus (Fig. 1). Biopsy revealed only chronic inflammation without any malignant cells. Routine chest radiography showed no active lung lesions but a suspicious mass in the gastric high body (Fig. 2A). Further computed tomography scanning of the upper abdomen showed the tumor arising from the anterior wall of the high body of the stomach (Fig. 2B). Tumor markers of AFP, CA-125, CA-199 and CEA were all within normal limit. Abdominal sonography demonstrated no definite intra-abdominal metastasis, and there was also no significant bony metastasis found in the whole body bony scanning.

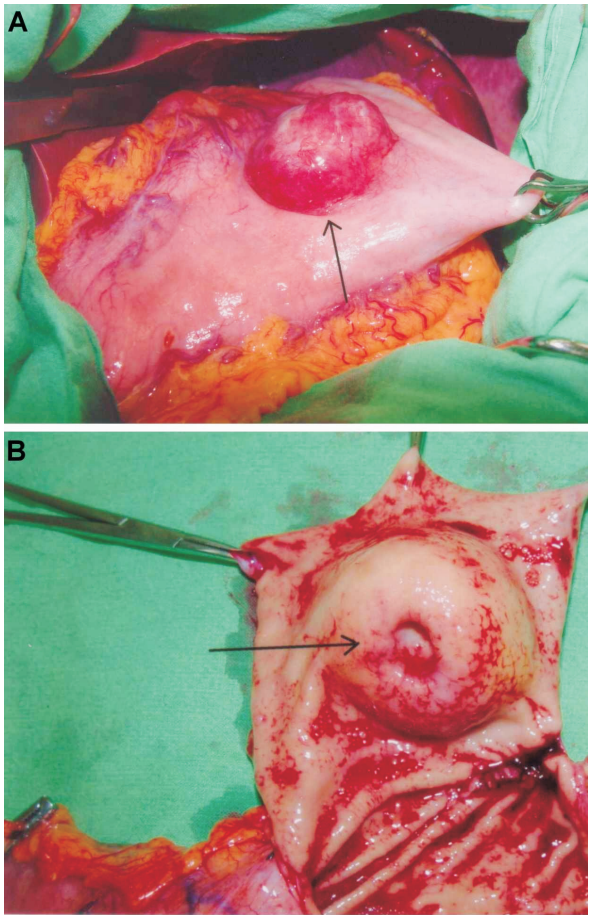

Fig. 3. (**A**) The photography showing the operative findings of the tumor. The tumor penetrated throughout the wall of the stomach. (**B**) Close-up view of the mass lesion. An ulcerative cavity was noted.

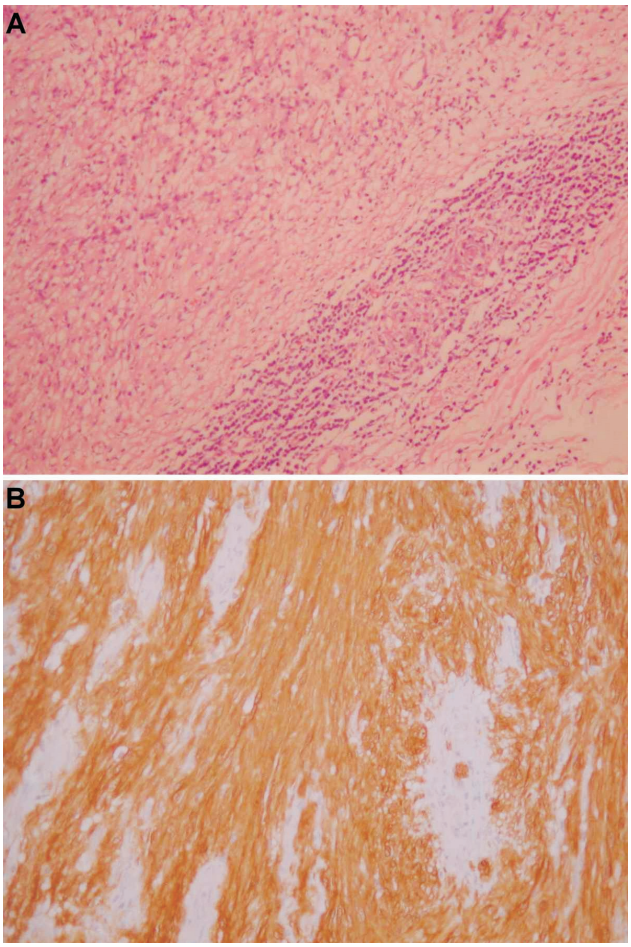

Fig. 4. (**A**) Lymphocytic cuffing at the peripheral part of the tumor (H&E, X200). (**B**) The tumor cells positive for S-100 protein (Immunostaining of S-100 protein, X200).

Submucosal tumor with the possibility of GIST (gastrointestinal stromal tumor) was suspected and surgical intervention was recommended. The patient received sub-total gastrectomy and B II anastomosis through left-side thoracoabdominal approach. During operation, a round tumor measuring 3.8 × 3.5 × 3.2 cm in size, located in the anterior wall of the high body of the stomach, was seen (Fig. 3A). The tumor penetrated into the gastric serosa. There was a deep ulceration on the mucosa upon the tumor (Fig. 3B). The postoperative course was uneventful. Patient was discharged in stable conditions. The pathological examination revealed a picture of spindle cell tumor consistent with schwannoma. Under microscopic examination, the picture of H&E stain revealed histocytic aggregation and lymphcytic cuffing at the peripheral part of the tumor (Fig. 4A) .The tumor was strongly positive for S-100 protein (Fig. 4B), and non-reactive for CD34, CD117, actin, HHF-35, desmin, melan-A and HMB-45.

DISCUSSION

Gastric mesenchymal tumors can be divided into gastrointestinal stromal tumor, leiomyoma or leiomyosarcoma, or schwannoma. Their cellular structures are of spindle shape and look similar under light microscopic examinations. By the aid of immunohistochemical staining, Sarlomo-Rikala[8] and Christopher[9] reported the differences between these spindle cell tumors. Positive desmin and muscle actin stains indicate leiomyoma or leiomyosarcoma, positive CD34 and CD117 indicate GIST and positive S-100 indicates schwannoma. In this case, the tumor revealed spindle cells, strongly positive for S-100 stain, and non-reactive for for actin, HHF-35, desmin, CD34 and CD117, which indicated the diagnosis of schwannoma.

Schwannoma is a kind of neurogenic tumor, according to the classification by Ranson in 1940.[10] It is the most common peripheral nerve-sheath tumor and usually solitary. Gastric schwannomas arise from the nerve sheath of Auerbach plexus or, less commonly, Meissner plexus. They are slowly-growing encapsulated tumors composed of Schwann cells in a collagenous matrix. As the tumor enlarges, it displaces the nerve to the periphery of the tumor, preserving neural function.[6]

Gastric schwannomas occur more frequently in the fifth to sixth decade of life and commonly in female patients.[8,11] They are often asymptomatic and can be discovered incidentally at laparotomy or radiographically. The most common presenting symptom is an episode of upper gastrointestinal bleeding. In Burneton review series, most patients presented with bleeding, followed by abdominal pain.[12] Hemorrhage is thought to be secondary to the emerging submucosal mass producing a tenuous blood supply to the gastric mucosa. The mucosa overlying the mass may then ulcerate secondary to ischemia, or form a reduced tolerance to the gastric acidity.[13]

When patients suffer from upper gastrointestinal bleeding, endoscopic examination is the procedure of choice for evaluations. It can offer good visualization to the lesions for diagnosis and therapeutic procedures. The

typical endoscopic appearance of gastric schwannoma is a round protruding submucosal mass with overlying ulcerated mucosa. False-negative results of endoscopic biopsy would be encountered because normal mucosa overlies the submucosa lesion.[12] Like the case we reported, the endoscopic biopsy revealed only chronic inflammation without any malignant cells.

Radiographic evaluation for the gastric schwannoma or other gastric mass lesions is necessary. Chest radiography should be taken to detect extra-gastric pulmonary lesions. Occasionally, gastric tumor can be found in the chest radiography. Upper gastrointestinal series with barium contrast is a useful tool to localize the lesion with relationships to the esophagus and stomach. Computerized tomography can demonstrate the extent of invasion and help to determine the appearance of a benign *versus* malignant lesion.[12]

Surgical resection, including wedge resection, subtotal resection or near-total resection, is the treatment of choice for gastric schwannoma. Complete resection of the tumor is proper.[14] Although the definite diagnosis of gastric schwannoma is usually made in the permanent pathology, the frozen pathology can offer the pictures of spindle cell tumors. Prognosis for patients with solitary schwannoma of stomach following resection is excellent. Malignant transformation of a solitary lesion is rare.

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