

Gastric Schwannoma: Case Report and Literature Review

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Gastric schwannomas are rare tumors of mesenchymal origin that arise from Schwann cells of the neural plexus within the gastric wall. Gastrointestinal schwannomas are typically solitary and occur most commonly in the stomach. Schwannomas comprise only 0.2% of all gastric tumors and only 4% of all benign gastric neoplasms. Here, we present the case of an 85-year-old female patient with an incidentally noted submucosal gastric tumor. She underwent wedge resection of the stomach under suspicion of a gastrointestinal stromal tumor, but postoperative histopathological and immunohistochemical findings confirmed the diagnosis of schwannoma. Although schwannomas are universally benign, they are often difficult to distinguish preoperatively from malignant tumors such as gastrointestinal stromal tumors. Therefore, resection is usually recommended, even for asymptomatic patients.

Key words: schwannoma, neurilemmoma, stomach, submucosal tumor, neurogenic gastrointestinal tumor

INTRODUCTION

Schwannomas (also known as “neurilemmomas,” “neurinomas,” “neurolemmomas,” and “Schwann cell tumors”) are benign nerve sheath tumors composed of Schwann cells. Schwannomas rarely develop in the gastrointestinal tract, but when they do, they occur most commonly in the stomach. Although schwannomas are always benign, they are often difficult to distinguish preoperatively from other submucosal tumors, especially malignant tumors such as gastrointestinal stromal tumors. Therefore, resection is usually recommended. Here, we present a female patient with a gastric schwannoma that was incidentally found during admission and the pathology of which was confirmed after surgery.

CASE REPORT

An 85-year-old woman with type 2 diabetes and

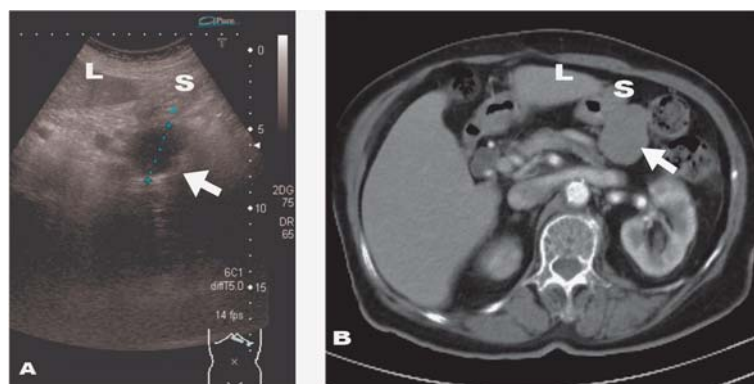


Fig. 1 (A) Abdominal sonography showing a homogeneous hypoechoic mass approximately 3.7 cm in diameter in the upper abdomen near the stomach. (B) Abdominal computed tomography showing a 5×4 cm exophytic and homogeneous soft tissue mass at the posterior wall of the stomach. (L: liver; S: stomach; arrow: tumor)

hypertension was admitted to our hospital for the treatment of acute pyelonephritis. An abdominal sonography was performed during the admission process, and a hypoechoic mass approximately 3.7 cm in diameter was incidentally detected in the upper abdomen (Fig. 1A). The patient did not have any clinical complaints except for a mild fullness sensation after meals. The mass was not palpable by physical examination. There was no tenderness or rebound tenderness in the epigastric area.

An upper gastrointestinal (UGI) endoscopy revealed intact gastric mucosa and no gross tumor lesions in the stomach. A computed tomography (CT) scan of the abdomen revealed a 5×4×3 cm exophytic and homogenous

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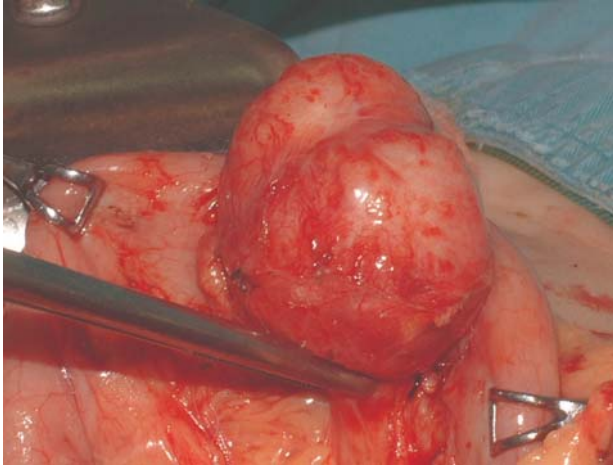


Fig. 2 An exophytic and solid mass with a smooth surface in the posterior wall of the stomach measuring 4.6×4×3 cm.

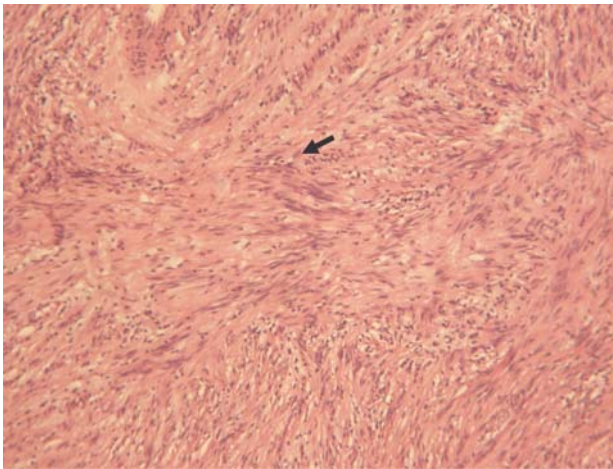


Fig. 3 The tumor consisted of spindle cells with large nuclei and nuclear palisading (arrow) (hematoxylin and eosin stain, ×100).

soft tissue mass at the posterior gastric wall (Fig. 1B). There was no evidence of metastasis or enlargement of the lymphoid nodes. According to the preoperative UGI endoscopy and CT scan reports, the gastric submucosal tumor was impressed preoperatively, including a leiomyoma or gastrointestinal stromal tumor (GIST).

Endoscopic ultrasonography (EUS) was not available at our hospital, and a biopsy could not be performed because the tumor lesion was not seen on UGI endoscopy. Although the imaging study results suggested the presence of a benign lesion, the diagnosis of GIST could not be excluded without a histological diagnosis. Following discussion with the patient and her family, surgical resec-

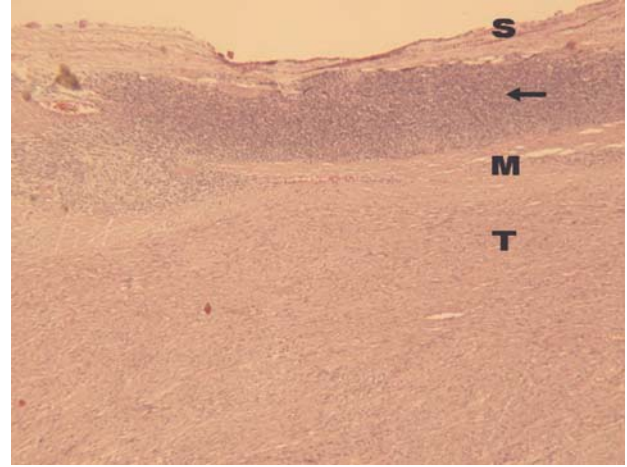


Fig. 4 A cuff-like lymphoid aggregate was recognized around the tumor (arrow: lymphoid cuff; S: serosa; M: muscular layer; T: tumor) (hematoxylin and eosin stain, ×40).

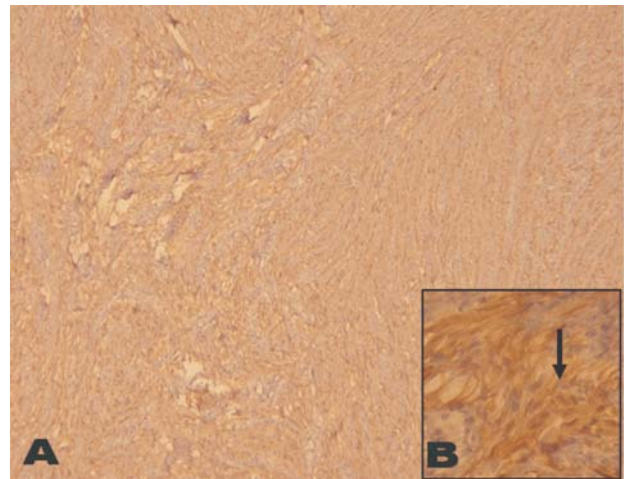


Fig. 5 Immunohistochemical staining. (A) The spindle tumor cells showing a diffuse positive reaction for S-100 protein (S-100 stain, ×100). (B) Positive cytoplasmic staining (arrow) (S-100 stain, ×400).

tion was chosen. She underwent an elective laparotomy and wedge resection of the stomach with a free tumor margin of 1 cm. On gross inspection, the tumor was an exophytic solid mass with a smooth surface (Fig. 2), measuring 4.6×4×3 cm.

Histologically, the tumor was composed of bland spindle cells with nuclear palisading (Fig. 3). Peritumoral lymphoid cuff was also present (Fig. 4). Mitoses, atypia, and necrosis were absent. The tumor cells showed diffuse positive cytoplasmic staining for S-100 (Fig. 5), whereas they tested negative for C-kit and smooth muscle actin.

This patient recovered well postoperatively, and no further treatment was required.

DISCUSSION

Schwannomas most likely develop from Schwann cells of the neural plexus. They can occur in any part of the gastrointestinal tract, but they are most commonly observed in the stomach. Gastric schwannomas belong to the family of gastrointestinal mesenchymal tumors that includes GISTs, leiomyoma, and schwannomas. Approximately 80% of gastrointestinal mesenchymal tumors are GISTs.¹ GI schwannomas have been reported to represent only 3% of all GI mesenchymal tumors.² Of all gastric tumors, only 0.2% are schwannomas, and schwannomas comprise only 4% of all benign gastric neoplasms.³ Gastric schwannomas are most commonly intramural (65%), but they can be intraluminal or subserosal. The tumors arise most commonly from the body of the stomach (50%), and fewer arise from the antrum (32%) or the fundus (18%).⁴

Gastrointestinal schwannomas occur most commonly in the fifth or sixth decade of life. Women are affected slightly more frequently than men.⁴⁻⁸ The tumors are usually encased by intact mucosa and typically involve the submucosa and muscularis propria. Furthermore, they generally present asymptotically or with abdominal discomfort. Bleeding may be present in the case of deep ulceration, and a mass may be palpated in the epigastric area in the presence of exophytic growth.⁹ Other less common symptoms and signs include weight loss, dyspepsia, and vomiting. Perforation with abscess formation¹⁰ or pleural effusion¹¹ was rarely reported.

On CT scans, gastric schwannomas are well-defined, round, and mural masses with homogenous attenuation.¹² Schwannomas may appear exophytic or project intraluminally. They typically show no evidence of necrosis, hemorrhage, or cystic change on CT scans. Sonography at sufficient resolution enables the determination of the tumor's layer of origin. The use of magnetic resonance imaging is important for defining the exact tumor location and extent based on the degree of displacement of the surrounding organs or vessels.¹³ UGI endoscopy is commonly used as a diagnostic tool for gastric tumors. However, there is a high rate of false-negative endoscopy biopsy results for gastric schwannomas because normal mucosa often overlies the lesion, resulting in a low diagnostic field.

EUS, which is particularly useful for visualizing submucosal lesions, is another important diagnostic tool for

lesions of the stomach. The endosonographic features of schwannomas include homogeneous hypoechoic internal echoes with a marginal halo and without internal echogenic foci. Histopathological examination shows that the marginal halo corresponds to the lymphoid cuff.¹⁴ In addition, the echogenicity of a schwannoma is much lower than that of the normal surrounding muscle layers. These findings may be useful for differentiating schwannomas from GISTs; furthermore, EUS-guided needle core biopsy may avoid the sampling errors that occur with superficial mucosal biopsies during standard endoscopy. In fact, it is the preferred method of preoperative tissue diagnosis for submucosal tumors of the stomach. Unlike GISTs, schwannomas are benign, and malignant transformation is extremely rare. Even though gastrointestinal mesenchymal tumors are >3 cm, if EUS findings indicate a schwannoma, EUS-guided biopsy should be performed.¹⁴

Recently, [(18)F] fluorodeoxyglucose (FDG) positron emission tomography (PET), an evolving diagnostic modality, has been used for tumor detection, staging, therapeutic monitoring, and follow-up evaluations for various malignant tumors. FDG-PET has been adopted to distinguish benign tumors from malignant mesenchymal tumors such as GISTs, but a gastric schwannoma exhibiting increased fluorodeoxyglucose uptake has been reported.¹⁵ As such, gastric schwannoma should be included in the differential diagnosis of submucosal tumors of the stomach with FDG uptake.

Although imaging studies may be useful in identifying such lesions, the definitive diagnosis is only made based on histology and immunohistochemistry results. Pathological diagnosis of schwannomas is based on their spindle cell morphology with nuclear palisading, peritumoral lymphoid cuff, and positive staining for S-100.

The preoperative differential diagnosis of a gastric submucosal tumor includes GIST, leiomyoma or leiomyosarcoma, and schwannoma. Despite improvements in radiology techniques, it is difficult to make a definite preoperative diagnosis and to distinguish these lesions and their malignant potential; therefore, surgical resection is usually the treatment of choice, even for asymptomatic patients. Unlike gastric adenocarcinoma, submucosal tumors, including GISTs, have a low propensity for metastasizing to local lymph nodes or distal organs. Current evidence suggests that a laparoscopic approach to gastric GISTs or other small submucosal tumors can be accomplished safely with negative margins, minimal postoperative morbidity, and favorable long-term outcomes.¹⁶

In conclusion, gastric schwannomas are rare tumors. Although they are usually benign, it is often difficult to

distinguish them preoperatively from malignant tumors such as GISTs. Imaging studies, especially EUS, are useful for identifying such lesions, but the definitive diagnosis is made only after the histopathological diagnosis. Surgical resection is the treatment of choice, and a laparoscopic approach is the preferred method for small submucosal tumors. The overall prognosis of patients with gastric schwannomas is very good.

DISCLOSURE

The author declares that this study has no conflict of interest.

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