

Case Report

A Rare Case of Gastric Schwannoma: A Case Report and Literature Review

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Keywords

Gastric schwannoma · Surgical resection · Laparoscopic surgery

Abstract

In general, schwannoma is a benign and slow-growing neoplasm that rarely occurs in the gastrointestinal tract as a submucosal tumor (SMT), with the most common site being the stomach. As gastric schwannoma (GS) is a rare tumor, there is limited data in the literature about its clinical features. The diagnosis of schwannoma can only be made by pathological examination with positive staining for S-100 protein. It is necessary to obtain an accurate diagnosis to introduce optimal treatment options preoperatively. However, a precise diagnosis of GS is difficult, even with modern imaging techniques. On the other hand, a complete resection with a negative surgical margin (R0) of GS is considered the best treatment, with an excellent prognosis. We present a case of a 66-year-old female patient who underwent laparoscopic-assisted wedge gastrectomy for gastric SMT, pathologically diagnosed as GS, with positive staining for S-100 protein and negative for c-kit and CD34. At 12-month follow-up after surgery, there was no recurrence or metastasis of GS. Our treatment is appropriate and effective in case of GS exceeding 50 mm.

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Introduction

In general, schwannoma is a benign neurogenic tumor originating from Schwann cells. It is slow growing and enfolds the axons of the peripheral nerves. Theoretically, schwannoma can develop anywhere along the peripheral course of the nerve. However, it commonly occurs

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in the head or neck, and rarely in the gastrointestinal tract, where the most common site is the stomach.

Gastric schwannoma (GS) accounts for less than 1% of all gastric tumors [1, 2]. GS arises from the nerve sheath of Auerbach's or Meissner's plexus and is observed endoscopically as a submucosal tumor (SMT) [3, 4]. Although GS is a benign neoplasm with an excellent prognosis after complete surgical resection, the clinical or imaging features have not been sufficiently specific to enable a precise preoperative diagnosis, because gastric SMTs are similar in their gross and imaging findings, and the diagnosis by biopsy does not have a high accuracy rate. At present, only a pathological examination can distinguish a schwannoma from other SMTs, with positive staining for S-100 protein, and negative for c-kit, CD34, desmin, or smooth muscle actin [1, 4, 5].

Herein, we present a case of GS located at the greater curvature of the stomach. The surgical procedure we chose is considered simple and appropriate with several perspectives in case of GS exceeding 50 mm.

Case Report

A 66-year-old female had a history of laparoscopic cholecystectomy. She visited our hospital due to an abnormal upper gastrointestinal X-ray at the medical checkup (Fig. 1a). An upper endoscopy revealed an elevated submucosal gastric mass on the greater curvature, and a normal overlying mucosa without ulceration (Fig. 1b). A contrast-enhanced computed tomography (CT) showed the tumor measuring 52 mm on the axial section (Fig. 1c), with extramural growth on the coronal section in the stomach (Fig. 1d). The serum carcinoembryonic antigen level was within the normal range. Laparoscopic-assisted wedge gastrectomy was performed and a complete resection with negative surgical margin (R0) was obtained (Fig. 2a, b). Pathological examination with hematoxylin and eosin staining of the specimen revealed a solid tumor which was highly cellular and consisted of spindle cells (Fig. 3a), surrounded by a peripheral lymphoid cuff (Fig. 3b). Mitosis was scattered, with 0–5 mitoses per 50 high-power field. Immunohistochemistry revealed that the tumor cell was strongly positive for S-100 protein (Fig. 3c) and negative for CD34 and c-kit (Fig. 3d, e). In addition, the MIB-1 max labeling index was 5% (Fig. 3f). These pathological results had confirmed the diagnosis as GS.

She displayed no complications and was discharged on day 8 after surgery. At the 12-month follow-up after surgery, there has been no recurrence or metastasis of GS on CT and upper endoscopy.

Discussion and Conclusion

Schwannoma is generally a slow-growing and benign neoplasm that rarely occurs in the gastrointestinal tract. Gastrointestinal schwannoma was first reported by Daimaru et al. [1], who identified schwannoma as a primary gastrointestinal tumor based on the positive S-100 protein immunostaining. GS, which is the most common gastrointestinal schwannoma, accounts for only 0.2% of all gastric tumors and, principally, involves the submucosa and muscularis propria [1, 2]. Although GS is mostly benign, the differential diagnosis is gastrointestinal stromal tumor (GIST). On account of the typical presentation as SMT with spindle cell histology, GS and GIST are grossly similar. In the diagnosis of such an SMT, an endoscopic biopsy can lead to false-negative results and is thus ineffective. On the other hand, endoscopic ultrasound-fine needle aspiration (EUS-FNA) could possibly aid in the diagnosis [4, 6–8].

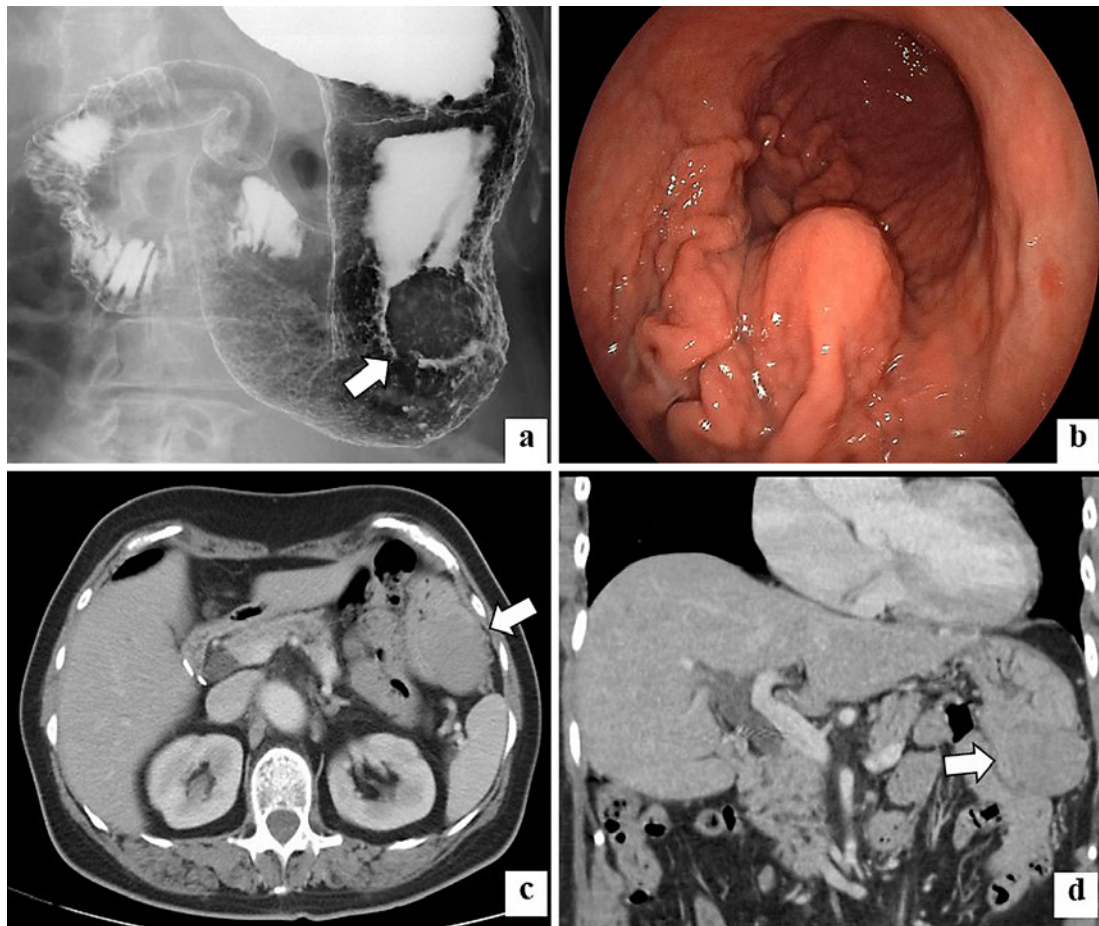


Fig. 1. Preoperative imaging inspection findings. **a** The shadow defect with bridging fold, about 40 mm in diameter, was pointed in the middle of the gastric body in the upper gastrointestinal X-ray. **b** Upper endoscopy revealed an elevated submucosal mass, about 40 mm in diameter, in the gastric body at the greater curvature. **c** A contrast-enhanced CT in the axial section showed the tumor measuring 52 mm in the stomach. **d** A contrast-enhanced CT in the coronal section showed the tumor with extramural growth in the stomach.

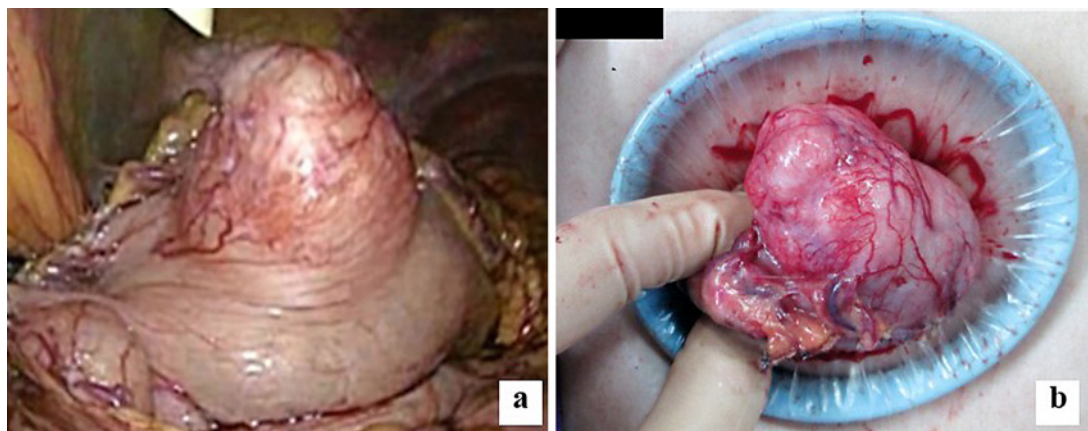


Fig. 2. Intraoperative findings. **a** The great omentum was dissected by laparoscopic surgery to expose the tumor. The tumor was then pulled just below the port of the laparoscope. **b** The part of the stomach with the tumor was removed from the body. Wedge gastrectomy was performed.

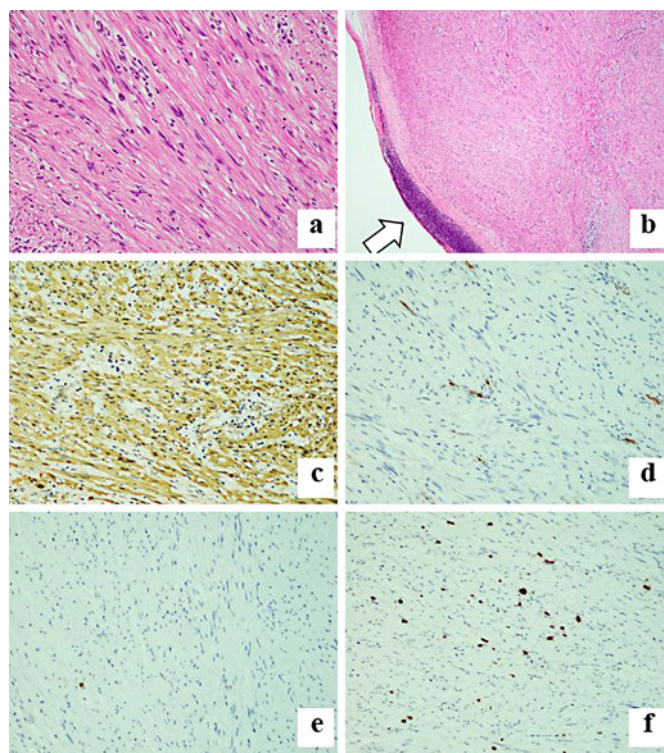


Fig. 3. The results of HE staining and immunostaining. **a** The tumor shows the lesion, composed of spindle cells with nuclei, arranged in a palisade. **b** There is lymphocytic cuffing at the peripheral part of the tumor. **c** The tumor cells are positive for S-100 protein. **d** The tumor cells are negative for CD34. **e** The tumor cells are negative for the c-kit. **f** The MIB-1 labeling index is 5%.

However, there is no consensus on the accuracy rate; additionally, routine EUS-FNA is not recommended for primary resectable GIST by The National Comprehensive Cancer Network (NCCN) guidelines, due to the risk of tumor rupture and spread, which is associated with poorer prognosis [4, 6–9].

The precise preoperative diagnosis to distinguish between GS and another SMT remains difficult, even with modern imaging modalities such as CT or ^{18}F -fluorodeoxyglucose-positron emission tomography (FDG-PET) [2, 4, 10]. For example, GS displays as round and the pattern of contrast enhancement is classified as either homogeneous or heterogeneous on CT; furthermore, FDG-PET does not help in evaluating whether tumors are benign or malignant [2, 4]. Thus, none of these modalities has shown the diagnostic features specific to GS. However, a complete resection with a negative surgical margin is the curative treatment for GS, as with GIST or other SMTs [3–5, 7, 9]. Recently, laparoscopic and endoscopic cooperative surgery (LECS) has been increasingly applied for gastric SMTs [11]. The conventional LECS procedure runs the potential risk of gastric content or tumor cell spilling into the abdominal cavity. Kikuchi et al. [12] developed a modified LECS procedure named “closed LECS” to avoid this problem. They concluded that “closed LECS” is indicated for gastric SMTs, 30 mm or less in diameter. In addition, LECS requires highly sophisticated laparoscopic and endoscopic techniques or equipment with high medical costs. Therefore, in the treatment of such SMTs, any approach in which complete surgical resection is performed safely would be acceptable.

The possibility of malignancy could not be ruled out in our case, because a case of malignant tumor exceeding 50 mm in diameter has been reported [13]. In order to prevent its rupture, the gastric tumor was removed from the abdominal cavity under laparoscopic guidance. A wedge gastrectomy was performed, with the tumor removed out of the body. We did not carry out a preoperative diagnosis with useful modern examinations, such as EUS-FNA or FDG-PET, and did not employ the latest surgical methods, including LECS. However, in view of medical costs, minimal invasiveness and safety of the patient, and oncological aspects, the

treatment we chose is beneficial enough for GS exceeding 50 mm, and there is no disadvantage to the patient.

GS is a benign neoplasm with no recurrence irrespective of its size [14]. Nevertheless, we believe that regular follow-up is necessary for GS because of the report of such a malignant case.

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Statement of Ethics

Written informed consent was obtained from the patient.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

S.Y. made a substantial contribution toward the concept and design of the study and in data acquisition and interpretation. K.K., H.T., S.K., Y.T., and K.S. were involved in drafting the manuscript and critical revision for intellectual content. S.Y. approved the final version of the manuscript submitted for publication. All authors read and approved the final manuscript.

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