Case Report

Glomus Tumor of the Stomach Treated with Laparoscopic Partial Resection

Chouhei Sakakura1*, Makoto Miyamae1, Minoru Nishio1, Yukihisa Nishimura2, Toshimori Kou2, Noboru Nakagawa2, Mitsunori Yasuda3, and Eigo Otsuji1

1Department of Digestive Surgery, Kyoto Prefectural University of Medicine, Kamigyo-ku, Kawaramachi-dori, Kyoto, 602-8566, Japan
2Department of Surgery, hakaihoken Kobe Central Hospital, Soyama-cho, 2-1-1, Kobe, Japan 651-1145
3Department of Internal Medicine, Shakaihoken Kobe Central Hospital, Soyama-cho, 2-1-1, Kobe, Japan 651-1145

*Corresponding author: Chouhei Sakakura, M.D., Ph.D. Department of Digestive Surgery, Kyoto Prefectural University of Medicine, Kamigyo-ku, Kawaramachi-dori, Kyoto, 602-8566, Japan.

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Abstract

A 56-year-old female diagnosed incidentally with a gastric tumor during a health screening X-ray examination was admitted to our hospital. A submucosal tumor was detected with endoscopy, endoscopic ultrasonography (EUS), and X-ray examination. Preoperative EUS-guided biopsy showing that the tumor was a glomus tumor. A laparoscopic partial resection of the stomach was performed. Histological examination confirmed that the tumor was a glomus tumor. A glomus tumor of the stomach was first reported in Japan in 1962; to date, only 69 such cases have been reported in Japan, with only a few of these tumors being resected laparoscopically. The literature on gastric glomus tumors in Japanese patients is reviewed.

Keywords: Gastric Glomus Tumor; SMT; Laparoscopic Surgery

Introduction

Glomus tumors are painful tumors that often arise at the tip of a limb. Most of these tumors occur in the dermis or subcutis, but are rarely located in the stomach, where they constitute ~2% of all benign gastric tumors [1-5]. Gastric glomus tumors are usually solitary, well-defined, submucosal lesions in the antrum, and present with a variety of symptoms, with epigastric discomfort being the most common initial symptom. Rarely, these tumors may metastasize to the liver. Surgery is often performed promptly since malignancy cannot be excluded due to the rarity of this tumor. Gastric glomus tumors have a good prognosis due their low rates of recurrence and malignant transformation. However, extended patient follow-up is necessary. Here, we report a patient with a glomus tumor of the stomach that was successfully resected laparoscopically and review the literature on gastric glomus tumors in Japanese patients.

Case Report

A 56-year-old woman was referred to our hospital after being incidentally diagnosed with a gastric tumor during a health screening X-ray examination. Endoscopy and endoscopic ultrasonography (EUS) showed a submucosal tumor 2.5 cm in diameter (Figure 1), with the latter showing a protrusion on the posterior wall of the gastric antrum (Figure 2). Histological examination of a preoperative EUS-guided biopsy sample revealed that the tumor was a glomus tumor. Large, circular, uniform tumor cells were observed within the proper muscle layer. The tumor was small, round in shape, positive for αSMA, vimentin, and negative for CEA and S100 immunohistochemically (Figure 3), as well as for synaptophysin, chromogranin A, laminin, and desmin. The proliferation marker Ki-67 was positive in <5% of tumor cell nuclei (data not shown). Computed tomography (CT) identified a mass on the antrum ~25 mm in diameter.

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Figure 1. Preoperative gastric endoscopy in our patient, showing a solid, elevated mass about 25 mm in diameter.

Figure 2. Preoperative EUS findings showing a round, demarcated, heterogeneous, hyperechoic tumor about 20 mm in size, originating from the fourth EUS layer (muscularis propria).

Figure 3. Immunohistochemical analysis of preoperative biopsy specimens. (A) Microscopic examination showing numerous dilated, thin-walled blood vessels, lined by a single layer of endothelial cells and surrounded by multilayer round glomus cells (hematoxylin and eosin staining; magnification, ×200). (B) Immunoperoxidase staining for smooth muscle actin (SMA) and vimentin, showing that tumor cells were positive for both.

Laparoscopic partial resection of the stomach was successfully performed. Briefly, the tumor, located on the rear wall of the stomach, was excised, along with the surrounding area, followed by suture closing (Fig. 4). The patient’s postoperative course was good, and she was discharged from the hospital 10 days after the operation. At present, 5 years later, she remains alive without tumor recurrence. Postoperative double contrast X-ray examination revealed little deformity of the stomach with good oral intake.

Figure 4. Operative findings in our patient. (A) Location of the tumor on the gastric posterior wall. (B) Laparoscopic partial resection of the stomach. (C and D) Removal of the area of the stomach containing the tumor, followed by closing with 3-vicryl interrupted sutures.

Discussion

Glomus tumors are rare benign mesenchymal tumors arising from the glomus body. Glomus tumors of the stomach are especially rare, have low malignant potential, and rarely metastasize to the liver [6-9]. The criteria for identifying the malignant potential of gastric glomus tumors remain to be established. Most of these tumors are located in the gastric antrum and are usually solitary, with no specific clinical features.

Preoperative diagnosis of gastric glomus tumors is difficult, requiring multiple imaging modalities, including CT, MRI, and EUS. On EUS, gastric glomus tumors appear as heterogeneous, hypervascular, and either hypo- or hyperechoic masses with internal hyperechoic spots and few tubular structures, mostly located on the fourth echolayer. CT and EUS are useful in the early identification of gastric glomus tumors, particularly in assessing tumor blood supply [10-14].

Preoperative EUS-guided fine needle aspiration (FNA) can rapidly distinguish glomus tumors from more aggressive gastric tumors, thus avoiding extensive surgical resection, especially in patients with larger tumors [15,16]. These tumors consist of distinctive small, uniform, and round tumor cells surrounding capillaries. These cells are strongly positive for SMA, vimentin, calponin, collagen type IV, and laminin[17], making immunohistochemistry (IHC) the preferred diagnostic tool. However, FNA can also incorrectly diagnose glomus tumors as leiomyomas or well-differentiated neuroendocrine tumors. Similar to our patient, the correct diagnosis of several of these tumors by preoperative EUS-guided FNA and cell-block IHC was recently reported [18,19].
Surgical treatment may include subtotal gastrectomy, wedge resection of the stomach, or tumor excision, depending on the location and size of the tumor. Subtotal gastrectomy has been proposed for tumors suspected of malignancy [1]. Complete surgical excision is the optimal treatment for a single lesion [18,19]. The benign nature and small median size (2 to 3 cm) of glomus tumors allows their removal by methods that minimize surgical trauma and inflammatory responses. These methods include laparoscopic wedge resection [21,22] or endoscopic submucosal endonucleation in select patients [22,23], where the lesion is not close to the pylorus or portahepatis or along the lesser curvature. In our patient, the residual stomach showed little deformity, and her oral intake has been good. Minimally invasive laparoscopy and endoscopy cooperative surgery (LECS) may be increasingly used in the future for patients with these tumors.

In conclusion, gastric glomus tumors are rare mesenchymal tumors with no specific clinical finding. These tumors can be diagnosed preoperatively by EUS-guided FNA and IHC. Local laparoscopic resection is usually the most efficient therapy, although minimally invasive LECS may be more desirable in the future.

References
