Case Report

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Endoscopic resection of gastric glomus tumor: a case report and literature review

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Abstract

Objectives: Gastric glomus tumor (GGT) is a rare mesenchymal tumor, mostly located in the gastric antrum region, and occasionally displays malignant behavior. Due to the lack of typical endoscopic or clinical features that distinguish GGT from other gastric submucosal tumors, the diagnosis is based primarily on postoperative histopathological and immunohistochemical findings. The first-line treatment is either local laparoscopic resection or open surgical intervention. Endoscopic resection techniques can also be used to successfully treat such lesions.

Case presentation: This case report presented a 39-year-old woman suffering from anorexia for the past 15 days. Barium upper gastrointestinal radiography suggested a benign space-occupying lesion in the antrum region. Endoscopically, a non-ulcerative, smooth submucosal lesion was observed in the greater curvature of the antrum. Endoscopic ultrasound (EUS) examination revealed a hypoechoic lesion with an anechoic zone in the center, originating from the muscularis propria layer of the stomach wall, which could be a gastrointestinal stromal tumor (GIST).

Conclusions: The lesion was successfully removed via submucosal tunneling endoscopic resection (STER). Based on histopathological and immunohistochemical findings, the patient was diagnosed with GGT.

Keywords: gastric glomus tumor; minimally invasive techniques; submucosal tunneling endoscopic resection.

Introduction

A gastric glomus tumor (GGT) is a rare mesenchymal tumor that originates from the cells of the glomus body. Glomus bodies serve as the neuromyoarterial receptors that regulate arterial blood flow [1]. GGT mainly occurs within the distal limbs, superficial soft tissues, and subcutis but can also appear at the deep, visceral sites, like the stomach, lungs, liver, pancreas, genitourinary, and gastrointestinal (GIT) tracts [2]. Kay et al. [3] reported the first case of GGT in 1951. GGT is an uncommon tumor and accounts for approximately 1% of all stromal GIT cases [4]. GGT is typically portrayed as a solitary, submucosal mesenchymal neoplasm with a distinct boundary that may occasionally exhibit malignant potential in later stages. GGT is commonly treated with laparoscopic or open surgery. Most GGTs are benign and can be treated surgically, and with the advancement of various endoscopic techniques, lesions can be treated with endoscopic resections [5–7]. Here, we report a rare case of GGT in an adult female patient who underwent STER.

Case report

A 39-year-old woman visited the Liaocheng People’s Hospital (Shandong Province, China) on May 24, 2017, with a history of anorexia for the past 15 days. Although she reported 5 kg of recent weight loss, she denied any associated abdominal pain, bloating, nausea, vomiting, or melena. She had received traditional Chinese medicine in another hospital, but her condition had not improved. A thorough physical examination revealed no obvious abnormalities, and serum tumor marker levels were within normal limits. Barium upper gastrointestinal (GI) radiography suggested a benign space-occupying lesion present in the antrum region and was considered for gastric polyps. A gastrointestinal examination described a non-ulcerative, smooth, submucosal neoplasm in the greater curvature of the antrum. EUS imaging revealed a 25 mm × 23 mm round, hypoechoic mass with an anechoic zone in the center, arising from superficial muscularis propria suggestive of a gastric submucosal tumor, especially gastrointestinal...
stromal tumor (GIST). After a thorough case evaluation, the patient refused surgical intervention and underwent endoscopic resection. The patient gave informed consent, and the operation was approved by the Liaocheng People’s Hospital Ethics Committee. Given the diagnosis of GIST, the lesion was successfully removed using STER, a method first described by Meidong X et al. (Figure 1) [7].

The patient was discharged after postoperative day 7 due to the absence of delayed bleeding, infection, and perforation. The histopathological analysis described cystic degeneration areas rather than clear tumor necrosis without any atypical mitosis. Hence, a diagnosis of a mesenchymal tumor displaying GGT characteristics was made. The tumor consists of solid lamellar cells surrounded by lacunar capillaries. The tumor cells are round, with clear cytosol, round nuclei and fine chromatin. A confirmatory immunohistochemical (IHC) analysis revealed a positive result for Type IV collagen and smooth muscle actin (SMA). At the same time, it

Figure 1: Barium meal of gastrointestinal tract, endoscopic ultrasonography and pictures under endoscope. A: Upper gastrointestinal barium X-ray radiography shows a space-occupying lesion. B: Upper gastrointestinal endoscopy showing a round submucosal mass in the gastric antrum. C: EUS showed a round, hypoechoic lesion with an echoless area in the center 25 × 23 mm in size, originating from the fourth EUS layer (muscularis propria) with a marginal halo. D–E: View of the submucosal layer and direct dissection of the tumor with the use of a soft transparent hood. Completely resected specimen. The mucosal incision was closed with several metallic clips successfully.
was negative for CD117 and DOG1 as well as chromogranin A (CgA) and synaptophysin (Syn), ruling out the possibility of GIST and neuroendocrine tumor (NET), respectively. The Ki-67 index was 2% (Figure 2).
A final diagnosis of GGT was given, and the patient underwent endoscopic resection. Because the patient had previously undergone an abdominal computed tomography (CT) scan, a contrast-enhanced axial CT scan was performed to assess the lesion’s potential malignant behavior. Following the endoscopic resection, the scan revealed the absence of enlarged lymph nodes, ascites, liver metastasis, and peritoneal carcinomatosis. The patient recovered uneventfully without relapse or metastasis three years after the resection.

Discussion

Gastric submucosal tumors include gastrointestinal mesenchymal tumors (GIST), non-GIST sarcomas, lipomas, smooth

muscle tumors, nerve sheath tumors, hemangioblastomas, hemangiomas, inflammatory fibrous polyps, inflammatory myofibroblastosomas, and plexiform fibromucinous tumors. GGT is an isolated tumor located in the submucosa, mostly in the gastric sinus, with well-defined margins. Most patients do not have any specific clinical symptoms. Still, some patients have nonspecific symptoms of epigastric pain, nausea, vomiting, and gastrointestinal bleeding, and they account for 1% of gastrointestinal mesenchymal tumors (GIST) [6]. The lack of distinct endoscopic or clinical features makes GGT diagnosis and distinguishing it from other gastric submucosal tumors difficult. A conventional endoscopic biopsy can be used to diagnose GGTs, but because most GGTs are located in the submucosa and are not ulcerated, it is difficult to collect enough specimens for a conventional biopsy. Although ultrasound endoscopy (EUS) can help identify the site of origin, the preoperative diagnosis of GGT is inaccurate due to a lack of specific clinical signs. Based on this, fine-needle aspiration (FNA) biopsy can help rapidly identify GGT and other malignant gastric tumors preoperatively, thus, avoiding extensive surgical intervention for larger tumors [10, 11]. Kazuya Akahoshi et al. [12] reported the accuracy and safety of EUS-FNA for the diagnosis of gastric SMT smaller than 2 cm. They reported that the diagnostic accuracy of EUS-FNA for subepithelial gastric lesions smaller than 2 cm was 73%, and the diagnostic accuracy of EUS-FNA using immunohistochemical analysis was 98% in cases of surgical resection. However, FNA can cause GGT to be misdiagnosed as a highly differentiated reticulocytoma or a smooth muscle tumor. Although CT aids in the differential diagnosis of GGT, definitive diagnostic criteria are lacking. The diagnosis of GGT depends on the pathomorphology of the surgical specimen and immunohistochemical findings. A study of 21 clinicopathological and immunohistochemical cases [13] showed that most GGT is clinically benign and immunohistochemistry can be used for differential diagnosis, and local surgical excision is the most effective treatment with a recurrence rate of 10% [14].

Although most GGTs are benign lesions, they might lead to liver and other organ metastases in cases of malignant transformation [15]. Folpe et al. [16] established criteria to define the GGT malignancy grade as well as to predict the metastasis/recurrence risk, which included tumors of size<20 mm, presence of atypical mitotic figures, deeper location of the tumor, the mitotic activity of >5 mitoses/50 high-power fields (HPF), and tumors with moderate-to-high nuclear grade. Miettinen et al. [4] observed that a GGT having the lowest mitotic activity (1–3/50 HPF) exhibited metastatic potential, and internal malignant GGT had a favorable prognosis when compared to tumors located in deep peripheral tissues. Because GGT>5 cm had a metastatic potential, a size of 5 cm was typically suggested as a more appropriate indicator of risk for GGT [17]. Based on this, it was stated that GGT having minimal mitoses might become malignant, while the ‘deep location’ feature does not apply to GGT with a bad prognosis. Thus, it was concluded that a size of 5 cm was a more suitable factor indicating the malignant potential of GGT. Because GGT is a rare tumor, there are no exact guidelines for determining its malignancy risk. In our case, its behavior was deemed benign because there was no mitosis, and the tumor was only 2.8 cm in size. Furthermore, distinct histological characteristics do not predict aggressive biological behavior or metastatic potential. Therefore, our patient was advised to return for regular check-ups.

Conclusions

Laparoscopic or open surgical resection is considered a major treatment modality for GGT. Endoscopic resection techniques, such as ESD, are now being increasingly used in treating GGT due to increased feasibility and efficacy [18]. Compared to endoscopic resection, surgical resection is more invasive, which may impact patients’ Quality of Life. Our findings show that submucosal tunneling endoscopic resection (STER) is now regarded as the best and least invasive technique for treating GGT with high precision and effectiveness.

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References