Glomus Tumor of the Stomach

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ABSTRACT

Glomus tumors are uncommon submucosal lesions of the stomach. We report a 57-year-old female who developed symptom of tarry stool for one week with initial clinical interpretation as gastric carcinoma by gastroendoscopic study. Finally the tumor was confirmed by microscopic histological study of an endoscopic biopsy specimen as a glomus tumor of the stomach. The sonographic, endoscopic, endosonographic, computed tomography, magnetic resonance image and histologic features of a gastric glomus tumor are reviewed from the literature. Multimodality images can contribute to the pre-operative diagnosis. Correct identification of this essentially benign and uncommon gastric tumor can prevent unnecessary radical operative procedures.

CASE REPORT

A 57-year-old female, who was a housewife, developed the symptoms of abdominal discomfort and general weakness since three months. She had past history of end-stage renal disease under regular continuous ambulatory peritoneal dialysis. There was tarry stool which was noted for one week. The hemoglobin level was 7.0 g/dL, with a hematocrit of 20.8%. The platelet count and coagulation profile were normal. Upper gastrointestinal endoscopic study was performed and revealed an ulcerative mass with hemorrhage, located on the posterior wall of the gastric antrum (Fig. 1). The ulcer measured 1.2 cm in radius and presented with irregular bulging margin. Due to the initial clinical impression as Bormann type II gastric carcinoma, biopsy was done. Biphasic contrast-enhanced abdominal computed tomography scan showed a well-defined submucosal nodular tumor, measuring approximately 2.9 cm in radius, at the gastric antrum with prominent enhancement in post-contrast study. The differential diagnosis included glomus tumor, carcinoid, neuroendocrine tumor, and hemangioma (Fig. 2). An...
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Figure 1. Gastroendoscopic finding shows a 1.2 cm ulcerative mass (black arrow) with hemorrhage and irregular bulging margin on the posterior wall of the stomach antrum.

Figure 2. Biphasic contrast-enhanced CT scan shows a well-defined tumor (white arrow) with persistent hyper-vascular enhancement. 

a. Noncontrast-enhanced CT scan.
b. Prominent enhancement of the tumor up to the same level of portal vein in arterial phase.
c. This enhancement persists to portal venous phase.
abdominal sonogram showed a submucosal hypervascular tumor at the antrum of the stomach (Fig. 3). Endoscopicographic study revealed a $3 \times 2.8$-cm hyperechoic homogeneous well-defined, round-shaped lesion with central ulceration and a calcification spot which was located at muscularis propria layer of the stomach with invasion of the mucosal layer (Fig. 4).

Biopsy of the gastric lesion was done and histological examination suggested glomus tumor of the stomach. Microscopically, the specimen showed ulcer with necrotic debris, and leukocytic infiltrate. Some round tumor cells surrounding some vascular spaces were seen beneath the ulcer. The tumor cells were round, with centrally located uniform nuclei. The mitotic figure was hard to find in the section. The immunohistochemical study demonstrates that these cells were positive for smooth muscle actin (Fig. 5) and negative for cytokeratin, CD34 and CD117. After five days hospitalization with supportive care, the patient was discharged in stable condition.

**DISCUSSION**

The glomus tumor was first described by Barre and Masson in 1924 and was identified as derived from the pericytes of Zimmerman by Murray and Stout in 1942 [4]. Although gastric glomus tumors can be considered more likely benign, a small possibility of malignant behavior cannot be ruled out. Particularly larger gastric glomus tumors require close follow-up [5].

Glomus tumors of the stomach typically appear as a submucosal nodule or mass on the greater curvature side of the antrum [6]. Clinically, this uncommon tumor can mimic most of the tumor lesions of the stomach, in spite of its benign or malignant nature. In barium study, previously reported cases were localized on the greater curvature side of the antrum in the majority of cases, and they appear as smooth submucosal masses with or without ulceration [6]. The differentiation from the more common gastric lesion, especially malignant tumors, is most important.

Macroscopic appearances on gastroendoscopy are non-diagnostic. On triphasic contrast-enhanced CT scan, gastric glomus tumors manifest as well-defined submucosal masses with homogeneous density on unenhanced study and may contain calcification spots [7]. After contrast medium administration, these tumors show strong enhancement on arterial phase images and persistent enhancement on portal venous phase images [8]. Regarding the MRI, these tumors are slightly hypointense on T1-weighted images and slightly hyperintense on T2-weighted images and are hypervascular and demonstrate persistent enhancement after gadopentetate dimeglumine administration [8].

Glomus tumor of the stomach should be included in the differential diagnosis if there is a solitary, hypervascular submucosal tumor on the greater curvature side of the antrum. Other mesenchymal tumors, such as carcinoid tumor, neurilemmoma, hemangioma, and GIST, may show a similar presentation on contrast-enhanced computed tomography scan. Hemangioma may have phleboliths that are more easily indentified on CT scan. Furthermore, hemangioma may have higher signal on T2-weighted MRI images. Imaging characteristics of GIST are variable [6].
Small tumors appear as intramural masses. As the tumors grow, they stretch the overlying mucosa and can ulcerate. When large (>5 cm), the tumors often appear exophytic and may contain areas of central necrosis or calcification [9, 10]. Central areas of low attenuation correspond to hemorrhage, necrosis, or cyst formation [11]. Leiomyoma, lipoma, and ectopic pancreas may be differentiated from glomus tumor, owing to their location and enhancement pattern on CT scan [8]. As a further matter, due to macroscopic fat content of lipoma, it can be easily identified on CT scan [12]. Aneurysms may be ruled out by serial images on CT scan.

The sonographic findings have been described as a hypoechoic mass in the third or fourth submucosal layers with internal heterogeneous echogenicity mixed with hyperechoic spots and lacking a capsule [13]. Endosonographic appearances are generally heterogeneous and
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poorly-reflective, and consequently fail to differentiate glomus tumor from other potential diagnoses by this modality alone [13].

Histological confirmation of the diagnosis is only possible when a fine-needle biopsy is inclusive of abnormal tissue. Gastric glomus tumors are in essence benign in nature; hence recognition of these lesions preoperatively may spare the patient a more extensive surgical resection [14]. We have reviewed the multimodality imaging presentations of other reported glomus tumors of the stomach in the literature and summarized the imaging features that help to establish the correct diagnosis of glomus tumors of the stomach.

REFERENCES


Figure 5. Histologic and immunohistochemical stain findings. a. The tumor is composed of sheets of uniform small round cells around abundant, variable sized dilated vessels. The tumor cells have round, regularly shaped nuclei and eosinophilic cytoplasms and show no mitosis or nuclear atypia (H&E stain, ×400). b. On immunohistochemistry, tumor cells were positive for smooth muscle actin-Ab reaction (Immunohistochemical stain, ×100).