

A Case Report of a Gastric Schwannoma on the Lesser Curvature of the Stomach Presenting with Upper Gastrointestinal Bleeding

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Received January 11, 2019; Revised February 14, 2019; Accepted March 04, 2019

Abstract Introduction: Gastric schwannomas are extremely rare mesenchymal tumors that represent only 0.2% of all gastric neoplasms. These tumors arise from the Auerbach or Meissner's plexus and are most commonly found incidentally. Of those presenting with a gastric schwannoma only 12.8% of patients will present with upper gastrointestinal bleeding. **Case Presentation:** In this report, we present the case of a 51 year old female with signs and symptoms of upper gastrointestinal bleeding from a gastric schwannoma. The patient's computed tomography revealed a 6.4 x 5.7 cm mass on the lesser curvature of the stomach near the pylorus. She subsequently underwent esophagogastroduodenoscopy with endoscopic ultrasound and fine needle aspiration revealing SMMS-1, Pankeratin, CD34, DOG-1, and CD117 negative immunohistochemical stains, which suggested a spindle cell neoplasm. The patient's tumor was surgically resected two weeks later via laparoscopic distal gastrectomy with gastrojejunostomy. On immunohistochemistry, the tumor stained positive for S100, suggesting a gastric schwannoma. The patient's postoperative course was complicated by possible early dumping syndrome which resolved in one week with dietary changes. She is tolerating regular food on follow-up and doing well. **Discussion:** With only a handful of reported cases, the need for inclusion of gastric schwannomas to the differential diagnosis of a bleeding gastric mass is essential. From these figures the likelihood of a patient with a gastric mass and upper gastrointestinal bleeding being caused by a gastric schwannoma is 0.026%. This points to the fact that this patient presentation is extremely rare but that gastric schwannomas do occur and need to be on the differential diagnosis of a patient with a gastric mass and signs of upper gastrointestinal bleeding.

Keywords: gastric schwannoma, S100, upper gastrointestinal bleeding, gastric tumor, gastric neoplasm

Cite This Article: Matthew Hager, and Joey Jarrard, "A Case Report of a Gastric Schwannoma on the Lesser Curvature of the Stomach Presenting with Upper Gastrointestinal Bleeding." *American Journal of Medical Case Reports*, vol. 7, no. 3 (2019): 33-35. doi: 10.12691/ajmcr-7-3-1.

1. Introduction

When it comes to tumors of the gastrointestinal tract, mesenchymal tumors form the minority. These include gastrointestinal stromal tumors (GISTs), leiomyoma or leiomyosarcoma, and schwannomas [1]. Gastric schwannomas represent only 0.2% of all gastric tumors and tend to follow a benign course compared to the most common gastric neoplasm of mesenchymal origin, a GIST, which tends to have a greater malignant potential. Of the neoplasms that are known to present with hemorrhage, GISTs are by far the most common as they often grow relatively fast and tend to erode or ulcerate through the bowel mucosa [2]. Gastric schwannomas on the other hand, more commonly found incidentally as a slow growing mass occasionally with symptoms of abdominal pain or discomfort rather than hemorrhage. In addition to their imbricating symptoms, macroscopically GISTs and gastric schwannomas appear almost identical which makes

endoscopic diagnosis rather difficult. With only a handful of reported benign hemorrhagic gastric schwannomas, we present a case of a 51 year-old female presenting with upper gastrointestinal bleeding from a benign gastric schwannoma.

2. Case Presentation

Patient is a 51 year-old black female who presented to the emergency department with two days of coffee ground emesis and melena. She complained of gnawing abdominal pain in the left upper quadrant and a presynopal event prior to arrival. Patient had a past medical history of hypertension and tension headaches. The physical exam was unremarkable apart from discomfort in the left upper quadrant, which did not elicit gross tenderness to palpation. On admission, laboratory analysis revealed a hemoglobin of 7.2 with a hematocrit of 21.5. On computed tomography scan, a gastric mass measuring 6.4 x 5.7 cm in size was seen to involve the

lesser curvature of the stomach near the pylorus. In addition, multiple enlarged lymph nodes within adjacent mesentery were seen, but were presumed to be reactive in nature given the rarity of lymphatic spread in mesenchymal tumors. Upper gastrointestinal endoscopy revealed a submucosal mass with some superficial ulcerations and erythema, but without active bleeding and was in close proximity to the pylorus. The pathology of the mass suggested a spindle cell neoplasm that was SMMS-1 negative, Pankeratin negative, CD34 negative, DOG-1 negative, and CD117 negative on immunohistochemical staining. Since there was no further evidence of bleeding, the patient was discharged and scheduled for surgical resection of the gastric mass. Two weeks following initial presentation to the ED, the patient underwent an elective laparoscopic distal gastrectomy with gastrojejunostomy and intraoperative esophagogastroduodenoscopy. On macroscopic examination, the gastric mass measured 6.2 cm in greatest dimension. Immunohistochemical stain of the tumor cells revealed a positive S100 marker, which is suggestive of a gastric schwannoma. 0/9 of the regional lymph nodes that were incidentally removed during resection tested positive for metastatic disease. The patient had an uneventful hospital stay and was discharged on post-operative day three. One week following discharge, the patient experienced significant diarrhea, which was concerning for early dumping syndrome. The patient was educated on appropriate dietary changes, such as avoiding liquids thirty minutes before and after solid meals, minimizing dairy, and increasing fiber intake. She was also started on psyllium husk and as-needed Immodium. Her diarrhea fully resolved after a few days. She was then seen two weeks post-operatively without any new complications.

3. Discussion

Gastric schwannomas are rare neoplasms that arise from the nerve cell sheath of Schwann cells, more specifically from the Auerbach or Meissner's plexus [3]. They make up only 0.2% of all gastric tumors and are often misdiagnosed by clinicians preoperatively. Benign gastric schwannomas can occur in males and females but have a preponderance to females in the fifth decade of life. Malignant gastric schwannomas, on the other hand, do not seem to have a predisposition for certain genders, but they do have a wider age variation in reported cases [4]. By far, the majority of gastric schwannomas are benign and slow growing tumors that are found incidentally. These neoplasms typically arise from the lesser curvature of the stomach as solitary lesions [5]. Of the reported cases, only 18.9% of gastric schwannomas were found in the antrum of the stomach, which adds to the significance of this case [4].

In a recent review of 221 cases, Hu, B. et al. reported only 12.8% of gastric schwannomas presented initially with gastrointestinal bleeding. The majority of cases reported in that study were found incidentally (43.29%) or presented with abdominal pain or discomfort (20.73%) [6]. This study refuted the Bruneton et al. review of 1983 in which gastric schwannomas were first thought to present commonly with gastrointestinal bleeding followed by

abdominal pain [7]. With this knowledge, gastrointestinal bleeding from gastric schwannomas is now considered the minority of cases found today.

Preoperative diagnosis of a gastric schwannoma is rather difficult due to its nonspecific findings on computed tomography (CT). Endoscopic evaluation, however, of a mesenchymal tumor often reveals a mass with normal overlying mucosa which is highly specific for mesenchymal tumors. Both gastric schwannomas and GISTs arise from a mesenchymal origin and reveal no distinct clinical features from one another. Endoscopic ultrasound is far better at delineating mesenchymal tumors given that the overlying mucosa is often normal in appearance. GISTs are often rapid-growing and often outgrow their own blood supply. This causes central necrosis, hemorrhage, and the typical heterogeneous appearance [9]. A lack of these features does not exclude a GIST but can be helpful if they are present.

Following a step-wise approach, after CT confirmation of a gastric mass, endoscopy with EUS and FNA can be performed as it was in this case. Gastric schwannomas typically have a rubbery or firm consistency with a homogenous tan-yellow surface. On histology, they appear well circumscribed surrounded by a lymphoid cuff, which is one of the distinguishing features that help differentiate this lesion from GISTs or other stromal tumors. The presence of spindle shaped cells is also pathognomonic for a neural or neuroendocrine tumor. Another distinguishing feature of gastric schwannomas is the lack of an epineurium capsule on histology, which helps differentiate it from peripheral schwannomas [9]. Nowadays, differentiating GISTs from gastric schwannomas with immunohistochemistry includes, but is not limited to, S100, CD34, CD117, and DOG-1 stains. GISTs will test positive for CD34, CD117, and DOG-1, while Gastric schwannomas will test negative for all except for S100. Due to the high false negative rate of endoscopic biopsy, the majority of these stains are performed on the final resected specimen to establish the definitive diagnosis. The goal of imaging and endoscopic biopsy preoperatively is to exclude the presence of distal metastases and to rule out mucosal-based tumors, respectively.

Depending on the size and extent of the lesion, treatments of choice for a gastric schwannoma include open or laparoscopic approaches for wedge resection, subtotal gastrectomy or near-total resection, and total gastrectomy [4]. In this case, a laparoscopic distal gastrectomy with gastrojejunostomy was performed due to the location of the tumor on the lesser curvature, near the pylorus. Overall, gastric schwannomas tend to have a good postoperative prognosis and have an extremely low recurrence rate with complete surgical resection.

4. Conclusions

In considering the rarity of gastric schwannomas (0.2%) of all reported gastric neoplasms and the prevalence of gastrointestinal bleeding from a gastric schwannoma (12.8%), the likelihood of a patient with a gastric mass and upper gastrointestinal bleeding due to a gastric schwannoma is 0.026% [4]. This points to the fact that

this patient presentation is extremely rare but that gastric schwannomas need to be on the differential diagnosis of a patient with a gastric mass and signs of upper gastrointestinal bleeding. In addition, further research can be done in the time-to-diagnosis of gastric schwannomas and efficacy of the different types of surgical resections.

Consent

Oral informed consent was obtained from the patient for publication and/or presentation of this case report and any accompanying images.

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