

# Incidental Finding of Gastric Schwannoma in a Renal Failure Patient – Managed by a Minimally Invasive Procedure: Report of a Rare Case

Authors' Contribution:  
Study Design A  
Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
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**Conflict of interest:** None declared

**Patient:** Female, 69  
**Final Diagnosis:** Gastric Schwannoma  
**Symptoms:** Asymptomatic  
**Medication:** —  
**Clinical Procedure:** —  
**Specialty:** Gastroenterology and Hepatology





**Objective:** Rare co-existence of disease or pathology  
**Background:** Schwannomas are benign tumors originating from any nerve with a Schwann cell sheath. It is an extremely rare tumor, accounting for 0.2% of all gastrointestinal tumors and 4% of all benign tumors of the stomach. Clinical differentiation of gastrointestinal mesenchymal tumors is challenging and confirmatory diagnosis requires biopsy. Surgical resection is the treatment of choice when tumor size is less than 30 mm or when it is located within the muscularis propria. Here, we present a case of a large (>50 mm) gastric Schwannoma that was resected using a new laparoscopic technique suitable for larger tumors.

**Case Report:** A 69-year-old woman with past medical history of hypertension, diabetes mellitus, and stroke, and CKD stage 4, presented to the Emergency Department (ED) with persistent nausea, vomiting, and weakness. She was found to have uremia requiring emergent hemodialysis. Eventually, she underwent peritoneal catheter insertion for peritoneal dialysis. A mass on the gastric antrum was found incidentally during the procedure. Biopsy confirmed the diagnosis of gastric Schwannoma. The tumor was removed successfully using a minimally invasive procedure via robotic-assisted laparoscopy.

**Conclusions:** Gastric Schwannoma is a rare submucosal tumor arising from Auerbach's plexus in the muscularis propria. It is usually asymptomatic, but can present with symptoms such as epigastric pain, or upper gastrointestinal bleeding. Tissue biopsy and immunohistochemical staining are the criterion standard for diagnosis. It has no tendency for malignant transformation. Tumors smaller than 30 mm are removed endoscopically, while tumors larger than 30 mm can be removed surgically. In this case, the tumor was removed successfully by minimally invasive robotic-assisted laparoscopy.

**MeSH Keywords:** Laparoscopes • Schwann Cells • Stomach Diseases

**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/916487>

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## Background

Schwannomas are benign tumors originating from any nerve with a Schwann cell sheath [1]. Most manifest as acoustic neuromas in the vestibule-cochlear nerve (CN VIII). It can be unilateral as a primary tumor or bilaterally associated with neurofibromatosis type 2 [2]. Extracranial Schwannomas, including gastrointestinal Schwannoma, are extremely rare [2]. Gastrointestinal Schwannomas arise from Auerbach's nerve plexus in the muscularis propria. It is considered a mesenchymal tumor of the gastrointestinal tract, along with gastrointestinal stromal tumors (GIST), leiomyomas, and leiomyosarcomas [3]. Gastrointestinal Schwannomas are usually asymptomatic, but can present as epigastric pain, bleeding, and a palpable mass [4]. Clinical differentiation of gastrointestinal mesenchymal tumors is challenging and requires biopsy to confirm the diagnosis [5]. Here, we presenting a rare case of a gastric Schwannoma found incidentally during laparoscopy, which was treated by using new laparoscopic technique.

## Case Report

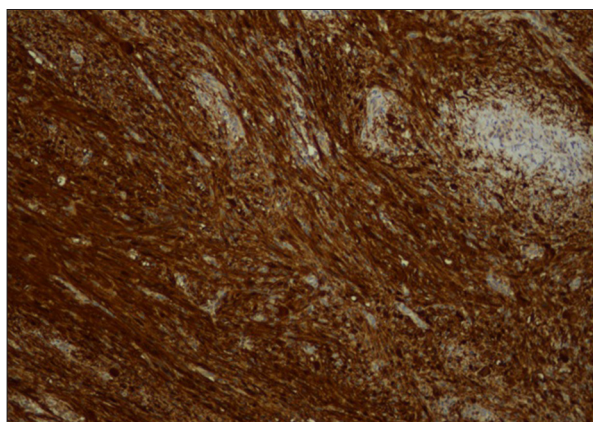
A 69-year-old woman with past medical history of hypertension, diabetes mellitus, and CKD stage 4 presented to the Emergency Department (ED) with persistent nausea, vomiting, and weakness for 1 week. At the ED, her vitals were pulse 86/min, blood pressure 179/86 mmHg, temperature 98.2°F, respiratory rate 18 breaths/min, and oxygen saturation 96% on room air. Her physical examination was unremarkable, without any signs of volume overload. Laboratory investigations revealed BUN 51 mg/dl (reference value, 5–25 mg/dl), serum creatinine 4.58 mg/dl (reference value 0.44–1.0 mg/dl), and liver function test results were normal. WBC was 9 (reference value (4.0–11 K/uL), hemoglobin was 7.7 mg/dl (reference value 12–16 mg/dl), hematocrit was 22.6 (reference value 3–48%), and platelet count was 207 (reference value 140–450 K/uL). After discussion with the nephrologist, we decided to start emergency hemodialysis due to persistent uremic symptoms. A dialysis catheter was inserted and the patient received emergent hemodialysis. After improvement



**Figure 1.** Laparoscopic image showing a mass on the anterior wall of the stomach.



**Figure 2.** Upper gastrointestinal endoscopy showed a large submucosal mass larger than 50 mm on the anterior wall of the stomach.

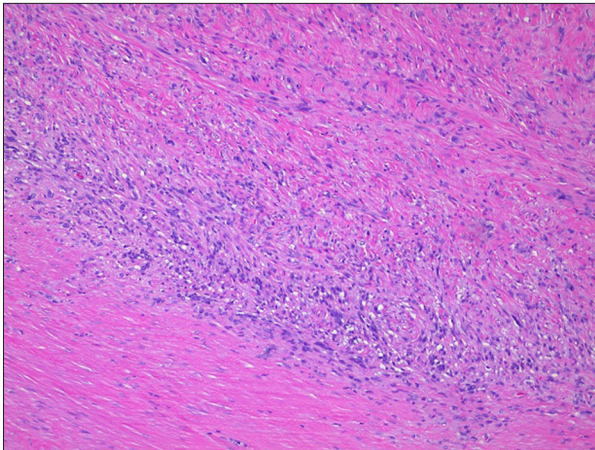


**Figure 3.** Biopsy slide shows tumor cells staining with S100, consistent with a Schwannoma.

of clinical condition and discussion, the patient agreed to have peritoneal dialysis and a dialysis catheter was inserted by laparoscopy. During the procedure, a mass was visualized on the anterior wall of the stomach at the antrum (Figure 1). No biopsy was taken at that time due to risk of bleeding and infection. Gastroenterology was consulted and we proceeded with upper gastrointestinal endoscopy, which showed a large submucosal mass larger than 50 mm on the anterior wall of the stomach in the antrum (Figure 2). The mass was biopsied, showing tumor cells staining with S100, consistent with a Schwannoma (Figure 3). The patient subsequently underwent robotic-assisted laparoscopic partial gastrectomy with complete resection of the tumor, without any complications.

## Discussion

Gastric Schwannomas, also known as neurilemmomas or neurinomas, are benign neurogenic tumors originating from Schwann



**Figure 4.** Tissue slide (medium magnification) shows spindle cells and lymphoid aggregate.

cells, which are a part of the sheath around axons in peripheral nerves [4]. It is a rare gastrointestinal tumor, and only accounts for only 0.2% of all gastrointestinal tumors and 4% of all benign tumors of the stomach [2,5]. It is classified as a mesenchymal tumor of the gastrointestinal tract. It can be misdiagnosed as a gastrointestinal stromal tumor (GIST) or a leiomyoma [6]. Definitive diagnosis is made by biopsy specifically assessing immunohistochemical markers [4]. It is most common in patients 50–70 years old. Our patient was 69 years of age. It is more common among females (male/female ratio 1: 2.5) [3,5]. Patients usually remain asymptomatic. It is usually an incidental finding discovered during abdominal imaging, endoscopy, or laparoscopy performed for other reasons [3,5,7]. The most common symptoms are epigastric pain and upper gastrointestinal bleeding. Other symptoms include loss of appetite, indigestion, weight loss, and vomiting [5,6,8,9]. The most common location of gastric Schwannomas is the middle third of the stomach, along the lesser curvature [8] – 57% are located in the antrum as in our patient, 28% are in the body, and 14% are in the fundus of the stomach [1]. Gastric Schwannomas typically manifest as ovoid, well-defined, exophytic, or mixed-growth-pattern masses on computed tomography (CT) of the abdomen [10]. However, CT scans are nonspecific and cannot differentiate Schwannomas from GIST radiologically. In our case, a CT scan was not done, and we proceeded to perform an endoscopy, as suggested by the gastroenterologist. On endoscopy, a large (about 50 mm) tumor was found.

The most common pattern of growth when evaluated by endoscopic ultrasound (EUS) is extramural (71%) versus intramural (29%) [1]. In 100% of cases, tumors grow from the muscularis propria and 100% of the lesions are hypoechoic on EUS [1]. Gastric Schwannomas do not have cystic changes or calcifications, but do have marginal halos on EUS [1]. Most Schwannomas show intact mucosa on endoscopy. Central ulceration is present in many cases due to erosion from gastric

acid [7,9]. In our case, there was no central erosion or ulceration. Diagnosis was confirmed by endoscopic biopsy, with positive S100 immunohistochemical staining. S100 is a calcium-binding protein found within cells of neural crest origin. It is positive in Schwannomas, as in our case, but is negative in GIST. On histology slides, Schwannomas are composed of arranged spindle cells (Figure 4) and show positive staining for S100 (100%) (Figure 3) and CD34 (14%); however, it is negative for smooth-muscle actin (but positive in leiomyomas), Ki-67, Dog-1, and CD117 (also known c-kit), but is positive in GIST [11]. In our case, CD117/c-kit, DOG-1, CD34, and SMA were all negative.

Treatment of Schwannomas depends on the size and depth of the tumor [2]. Resection of the whole tumor with healthy margins is the standard of care [4]. Surgical resection is the treatment of choice if tumor size is more than 30 mm or if tumor is within the muscularis propria [12,13]. In our patient, complete laparoscopic resection was performed without any complications, even though it was over 50 mm in size. Our literature search did not find any other cases of Schwannomas this size that were resected laparoscopically. Multiple endoscopic modalities recently developed for the treatment of Schwannomas include endoscopic submucosal dissection (ESD) and endoscopic full-thickness resection (EFTR), which are less invasive options in treatment of Schwannomas less than 30 mm in size [1]. Hu et al. found EFTR was used in 71% of patients, ESD was used in 21%, and ligation-assisted endoscopic enucleation was used in 7% [1], and 100% of cases had a complete resection using those modalities. The same study showed that, after a follow-up period of 4–53 months, no recurrence or metastasis were found after using those endoscopic modalities [1]. We are closely monitoring our patient for early recurrence.

## Conclusions

Gastric Schwannoma is a rare submucosal tumor arising from Auerbach's plexus in the muscularis propria. It is usually asymptomatic, but can present with symptoms of epigastric pain or upper gastrointestinal bleeding. Tissue biopsy and immunohistochemical staining is the most accurate way to establish diagnosis. Treatment depends on the size of the tumor – those smaller than 30 mm are removed endoscopically, while tumors larger than 30 mm can be removed surgically. In the present case, the tumor was removed successfully by minimally invasive robotic-assisted laparoscopy, suggesting that laparoscopy should be considered to remove larger tumors in appropriate clinical setting, but this needs to be further evaluated for safety in multiple cases.

## Conflict of interests

None.

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