

## Case and Review

# Gastric Lipomas: A Case Series and Review of the Literature

Simone A. Jarrett<sup>a,b</sup> Sahana Tito<sup>a,b</sup> Matthew Chan<sup>c,b</sup>  
Dominic E. Jarrett<sup>b,d</sup> Kevin B. Lo<sup>c,b</sup> Richard DePalma<sup>c,d</sup>

<sup>a</sup>Department of Internal Medicine, Albert Einstein Medical Center, Philadelphia, PA, USA;

<sup>b</sup>Sidney Kimmel College of Thomas Jefferson University, Philadelphia, PA, USA; <sup>c</sup>Department of Gastroenterology and Hepatology, Albert Einstein Medical Center, Philadelphia, PA, USA;

<sup>d</sup>University of the West Indies, Mona, Kingston, Jamaica

## Keywords

Case report · Gastric lipoma · Gastric mass · Gastrointestinal bleed · Anemia

## Abstract

**Introduction:** The purpose of this case series was to review a rare subset of tumors known as gastric lipomas, which are typically found incidentally. The motivation for this study arose from the identification of 2 cases within our institution in a short period. **Case Presentation:** The study involved a review of the diagnosis and management of 2 patients presenting with gastric lipomas at our institution after symptoms of gastrointestinal bleeding. With the advent of new radiologic investigations such as computed tomography and magnetic resonance imaging and advances in endoscopy, there are new approaches to identifying and managing these tumors. On further evaluation of the literature, we found that despite the availability of minimally invasive endoscopic techniques such as mucosal resection and submucosal dissection in the setting of large tumors, most patients tend to have to resort to surgical management. **Conclusion:** This case series underscores the rarity of gastric lipomas and their often-incidentally discovery. Further investigation into endoscopic approaches for managing these tumors is needed, and additionally, there is a need to explore a potential association between gastric lipomas and malignancy, as chronic inflammation of the overlying mucosa may play a significant role.

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## Introduction

Lipomas are benign tumors of mature lipocytes. Gastric lipomas account for <3% of all benign tumors of the stomach and <1% of gastric tumors [1]. Only 217 cases have been reported in the literature as of 2021 [2]. Typically, these tumors remain small and asymptomatic;

Correspondence to:  
Simone A. Jarrett, [simone.jarrett@jefferson.edu](mailto:simone.jarrett@jefferson.edu)

however, with increasing size, they may present with symptoms such as abdominal discomfort, dyspepsia, gastric outlet obstruction, and rarely upper gastrointestinal (GI) bleeding [3]. We describe a case series and review of literature involving 2 patients who presented with upper GI bleed managed with gastric resection. This case was submitted utilizing the CARE Checklist which has been completed for this case report and attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000534973>).

## Case Description

### Case 1

A 67-year-old African American man with history of hypertension, heart failure, and COPD presented with a 1-week history of multiple episodes of black tarry stools but no other symptoms. He denied use of NSAIDs or anticoagulants.

Physical exam was remarkable for hypotension and tachycardia. Lab work revealed an acute 3 g/dL drop in hemoglobin to 10.9 from prior of 13.6 and an elevated BUN of 41 mg/dL. Computed tomography (CT) imaging shown in Figure 1 revealed a 4.5 cm fat density within the wall of the gastric antrum, representing a lipoma; however, no etiology of GI bleed was identified.

Esophagogastroduodenoscopy revealed a large lipoma, 50 mm in diameter on the greater curvature of the gastric body and posterior wall of the stomach with an associated 1-cm clean-based ulcer (shown in Fig. 2). He underwent a laparoscopic partial wedge gastrectomy with removal of the lipoma.

On pathologic gross examination, macroscopic findings revealed a 7.0 × 4.0 × 2.8 mm partially encapsulated tan-yellow lobulated mass (shown in Fig. 3). Histology demonstrated tan, yellow homogenous adipose tissue with focal areas of hemorrhage and no evidence of invasion, confirming the diagnosis of submucosal gastric lipoma (shown in Fig. 4). The patient was well on follow-up 6 weeks after.

### Case 2

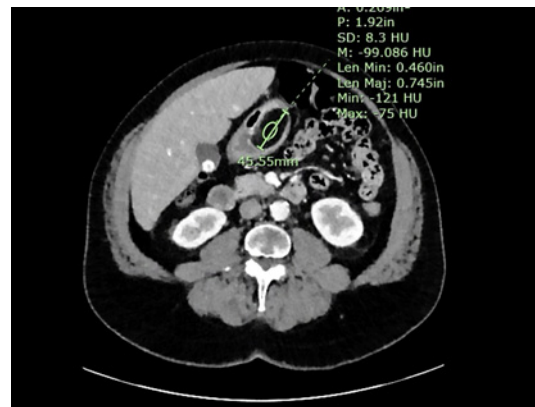
A 66-year-old Caucasian man with history of primary biliary cirrhosis, diverticulosis, GERD, diabetes mellitus, hypertension, known gastric lipoma presented with nausea and vomiting for the last 5 days. He described bloody emesis with black tarry loose stools. He denied abdominal pain. No history of NSAID or anticoagulant use.

Vitals were significant for hypotension with blood pressure 96/54 mm Hg. Labs revealed BUN of 48 mg/dL and hemoglobin of 10.6 g/dL. Prior CT imaging (shown in Fig. 5) had revealed an 8.9 × 2.8 × 5.4 cm fat density mass consistent with a lipoma. Esophagogastroduodenoscopy revealed a gastroduodenal ulcerated mass with attachments in the antrum and duodenal bulb, as shown in Figure 6. He remained stable and was discharged with plans for elective surgery as an outpatient. He underwent exploratory laparotomy with transgastric resection of submucosal gastroduodenal ulcerated lesion.

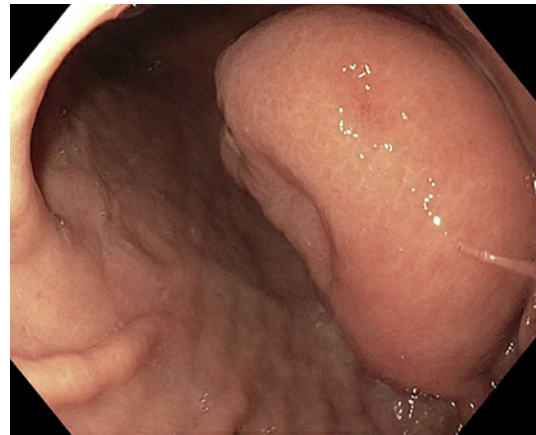
Macroscopically, the mass was lobulated, rubbery pink-red tissue. Sectioning revealed gelatinous lobulated yellow gray mass, measuring 3 × 2.5 × 1.5 cm, consistent with previously described lipoma on imaging. Post-operatively, the patient had no complications.

## Discussion

Gastric lipomas occur within any of the five layers of the gastric wall and are frequently located in the submucosa, predominantly in the antral region, as was seen in both our cases [4]. There are no specific risk factors associated with development of gastric



**Fig. 1.** CT showing a 4.5 cm fat density within the wall of the gastric antrum.

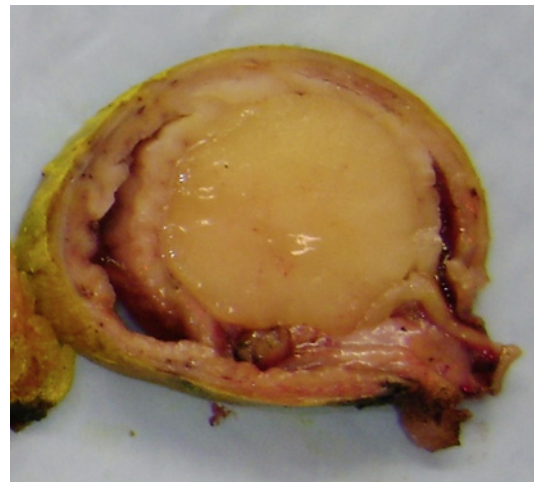


**Fig. 2.** Endoscopic view of large lipoma on the greater curvature of the gastric body.

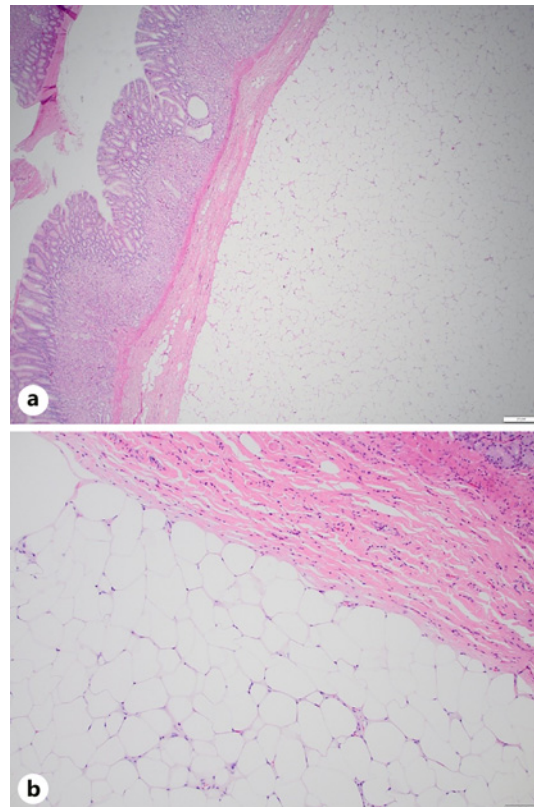
lipomas; however, these tumors are increasingly prevalent in obese people, diabetic patients, and those aged >45 years [5]. While most are detected incidentally and do not require treatment [6], those patients with > 2 cm lipomas can present with abdominal pain, dyspepsia, change in bowel habits, upper GI hemorrhage, or obstruction. Bleeding is usually chronic, leading to anemia, but rarely, it can be acute secondary to mucosal ulceration, leading to massive hemorrhage requiring emergency intervention and intubation [7]. Gastric outlet obstruction is less common and typically seen with pedunculated lipomas [8].

When visualized during endoscopy, lipomas appear as smooth, oval or round, yellowish, protruding masses covered by mucosa and can have ulcerated areas. When probed, the tumors are soft and collapse to create an indentation known as the “cushion sign.” Biopsy forceps can usually grasp the overlying mucosa to create the “tenting sign” by pulling the mucosa away from the submucosal growth. The extrusion of fat from the tumor is noted upon biopsy described as the “naked fat sign” [9]. A biopsy during endoscopy shows normal overlying mucosa and often fails to sample underlying submucosal tissue, making it non-diagnostic [10].

Endoscopic ultrasound (EUS) is recommended for lipomas inaccessible to routine mucosal biopsy, typically in the submucosal gastric layer, where most of these lipomas reside [11]. It’s also useful in endoscopic mucosal resection (EMR) planning as it identifies the location of tumor within the layers of the gastric wall [12]. CT has higher diagnostic



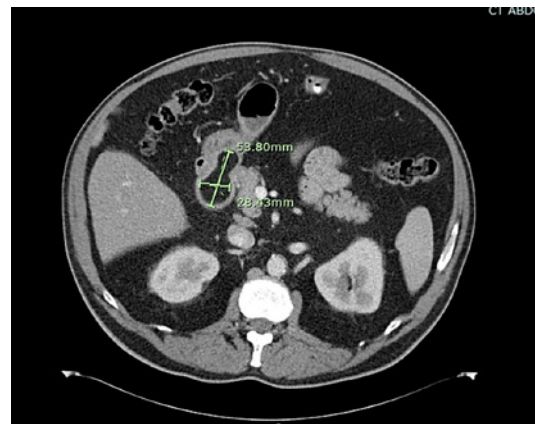
**Fig. 3.** Gross specimen showing a well-defined submucosal mass with a uniform yellow-cut surface.



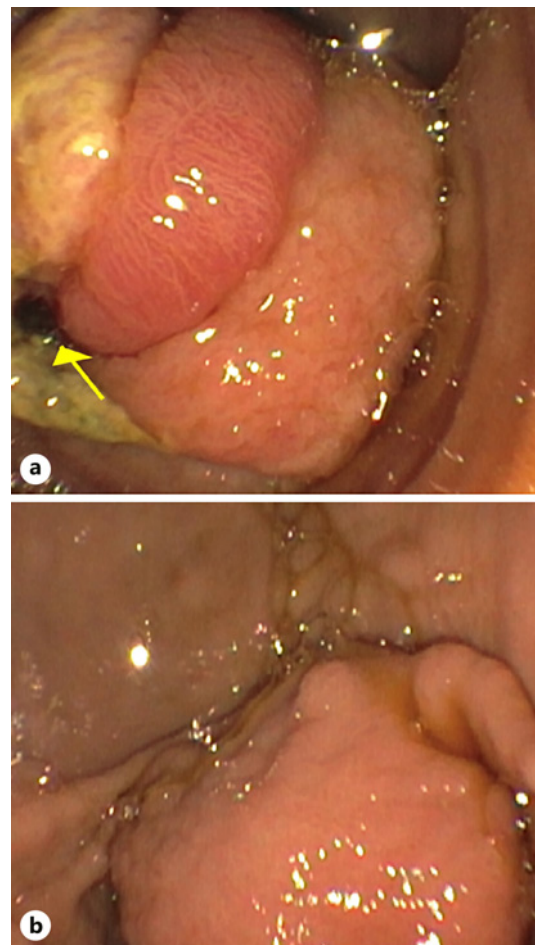
**Fig. 4. a** Low-power view (hematoxylin and eosin stain, ×20) of the mass, showing a well-circumscribed lipomatous tumor in the submucosa. **b** Low-power view (hematoxylin and eosin stain, ×100) of the mass highlighting mature adipose cells.

sensitivity and specificity compared to endoscopy and EUS. It shows uniform hypoattenuation of the homogenous fatty tumor, measuring  $-70$  to  $-120$  Hounsfield units which is diagnostic [13].

In terms of management, small and asymptomatic lipomas can be monitored, while larger or symptomatic lesions require removal either surgically or endoscopically. Surgical removal involves an open or laparoscopic partial gastrectomy [11]. Other indications for gastrectomy could be in the setting of bariatric surgery. However, with the advent of less invasive techniques, EMR is the preferred option for submucosal gastric lipomas [14].



**Fig. 5.** CT showing fat density mass consistent with a lipoma.



**Fig. 6. a** Endoscopic view of tumor in duodenal bulb, arrow showing ulcerated area with blood clot. **b** View of tumor from the gastric body.

Endoscopic techniques used include polypectomy, snare resection, unroofing and enucleation, EMR, and endoscopic submucosal dissection (ESD) [15]. Polypectomy is safely performed in lipomas with bases < 2 cm; however, the risk of perforation increases with larger tumors due to potentially deeper extension [16]. For larger tumors, mucosal resection using snare or submucosal dissection with an electrocautery knife is preferred

[15]. In these, epinephrine and/or hypertonic saline are injected around the tumor, causing elevation of the mass from the underlying muscularis propria, and EUS can be used to confirm adequate separation if it is not fully visible by the endoscopist [17].

While endoscopy is the preferred option due to being minimally invasive, both our patients underwent surgical removal of their gastric lipomas. ESD has been shown to be effective in removal of those tumors <5 cm with a resection rate approaching 92% [18]. Literature suggests that ESD may be used for larger tumors; however, it requires an experienced endoscopist as it is technically difficult [19]. There is also possibility of incomplete resection, hemorrhage, and gastric perforation. Considering this, surgical resection was the treatment of choice in our patients due to tumor size and concerns for bleeding. Further research is needed into the management of these rare tumors to estimate the efficacy of endoscopic techniques such as EMR and ESD versus that of surgery [20].

In terms of risks associated with gastric lipomas, only 13 cases of gastric liposarcoma have previously been described in the literature, and malignant degeneration from gastric lipoma has never been demonstrated [21]. There is, however, some suggestion that there may be some predisposition to chronic inflammation of overlying tissue which is a risk factor for gastric cancer [22]. Therefore, any departure from classic imaging characteristics in a gastric lipoma may warrant follow-up imaging and/or further intervention [23].

### Statement of Ethics

Ethical approval is not required for this study in accordance with local and national guidelines. Written informed consent was obtained from the patients for publication of the details of their medical case and any accompanying images.

### Conflict of Interest Statement

The authors declare that none of them has a conflict of interest regarding the publication of this paper.

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### Author Contributions

Simone A. Jarrett performed the literature review, assisted in the initial manuscript, performed revisions, and is the article guarantor. Sahana Tito, Dominic E. Jarrett, and Kevin B. Lo performed the literature review and assisted in the initial manuscript. Matthew Chan and Richard DePalma performed the endoscopic procedures, performed revisions, and edited the manuscript. All authors read and approved the final manuscript.

## Data Availability Statement

All data generated or analyzed during this study are included in this article and its online supplementary material files. Further inquiries can be directed to the corresponding author.

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