

# Gastric Angiomyolipoma Masquerading as Gastric Malignancy

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## ABSTRACT

Gastric angiomyolipoma (AML) is extremely rare, with only 3 cases reported in English literature, all of which presented with upper gastrointestinal bleed, either in the form of hematemesis or melena. A 42-year-old man presented with upper gastrointestinal bleed, the source of which was found to be a large mass in the stomach, which was shown histologically to be gastric AML. This is the fourth but largest tumor (9 × 6 × 5 cm) to be reported to date.

## INTRODUCTION

Angiomyolipoma (AML) belong to the group of mesenchymal neoplasm known as PEComas (perivascular epithelioid cell tumors), which show distinctive association with blood vessels and are characterized by myomelanocytic differentiation. AML commonly occurs in the kidney. Extrarenal AML is rare and are usually observed as “incidentalomas” during imaging for other diseases.<sup>1</sup> Gastric AML (GAML) is extremely rare, with only 3 cases reported in the literature.<sup>2</sup>

## CASE REPORT

A 42-year-old man presented with fatigue, loss of appetite, and melena for 2 months. There was no history of acid peptic disease or weight loss. An esophagogastroduodenoscopy (EGD) performed at another hospital revealed a 9-cm submucosal lesion with overlying ulceration in the body of the stomach (Figure 1). Repeated endoscopic mucosal biopsies were negative for malignancy. In view of persisting melena, anemia, and the large mass in the stomach, the patient was referred to a tertiary center for further management. Abdominal computed tomography showed a lipomatous lesion extending from mid-body to distal stomach along with multiple enlarged regional lymph nodes. Due to persistent significant bleeding from the mass, which resulted in a critical drop in hemoglobin level (9.4 g/dL), endoscopic ultrasound was deferred and a subtotal gastrectomy with lymph node clearance was performed without a definitive preoperative histological diagnosis.

Gross examination of the subtotal gastrectomy specimen showed a large polypoidal circumscribed mass measuring 9 × 6 × 5 cm in the anterior wall of the stomach, with central mucosal ulceration and hemorrhage (Figure 2). The tumor extended to the serosa, without serosal perforation. The cut surface of the tumor was pale yellow, with gray-white areas and few thickened blood vessels (Figure 2). Multiple lymph nodes were identified, with the largest measuring 2 cm.

Microscopic examination revealed a submucosal tumor composed predominantly of mature adipose tissue (80%) with interspersed medium to large thick-walled vessels and smooth muscle cells (red on Masson's trichrome stain) emanating from the thick-walled vessels. There was mucosal ulceration with a feeding vessel. The lymph nodes showed reactive changes only. Histomorphology was suggestive of benign GAML. Immunohistochemical studies showed positive expression of S100, SMA, and desmin in the spindle cells and negative expression for HMB45 and

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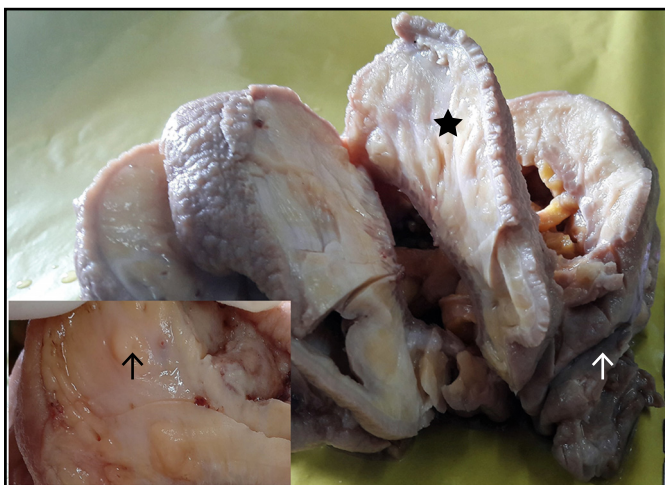
**Figure 1.** Endoscopic image of the stomach showing a large submucosal lesion with overlying ulceration in the gastric body.

ER (Figure 3). There were no features to suggest tuberous sclerosis clinically. Patient is currently doing well on follow up.

## DISCUSSION

AML belongs to the expanding family of mesenchymal neoplasms known as PEComas, and it has distinctive perivascular cells that usually show myomelanocytic differentiation. Clear cell sugar tumor of the lung, lymphangiomyomatosis, clear cell myomelanocytic tumor of the falciform ligament are other members of the PEComa family.<sup>3,4</sup>

AML most commonly occurs in the kidney, accounting for 1-3% of renal tumors.<sup>3</sup> Extrarenal AMLs are rare and have been reported in the nasal cavity, oral cavity, lung, chest wall, skin, ear, breast, heart, spinal cord, spermatic cord, penis, vaginal wall, adrenal gland, anterior mediastinum, and uterus.<sup>5</sup> In the



**Figure 2.** Gross picture showing a large submucosal tumor of stomach, a mass with overlying mucosa (star), and adjacent normal gastric mucosa (white arrow). The inset shows a yellow cut surface with gray and white areas and prominent vessels (arrow).

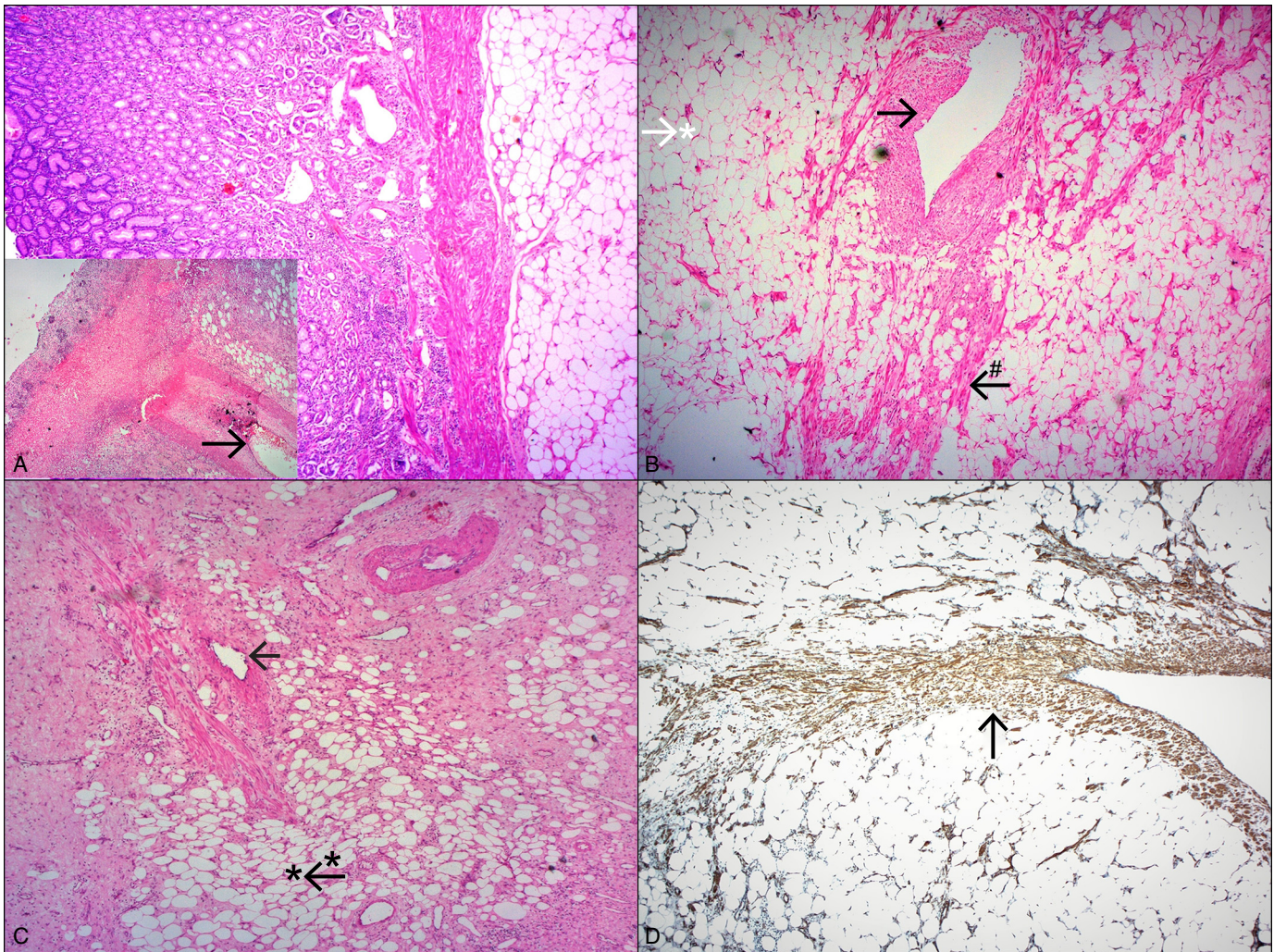
gastrointestinal (GI) tract, it has been reported in the liver and less commonly in the duodenum, appendix, pancreas, and stomach.<sup>2</sup>

GAML is an extremely rare entity. To our knowledge, only 3 cases have been reported in the literature. Because of the vascular nature of the tumor, GAML has a predilection to present with upper GI bleeding.<sup>6</sup> This was seen in our case and also described previously.<sup>2,7</sup> Therefore it must be considered as a rare cause of upper GI bleed associated with a neoplasm.

GAML is a subepithelial lesion that appears as a bulge or mass covered by mucosa which may be normal or ulcerated on EGD. Signs and symptoms may not appear in patients with benign AML, and the tumors often are only incidentally detected while imaging for other issues. Some patients have sudden back or flank pain, nausea, vomiting, hematemesis, melena, anemia, or hypertension. As many as 20% of symptomatic patients present with shock. Diagnosis with endoscopy can be difficult because of nonspecific mucosal features and inadequate depth on routine biopsy specimens.<sup>6</sup> Two of the previously reported cases of GAML were polypoidal on EGD with central ulceration located in the gastric body and the pylorus, respectively.<sup>2,7</sup> Another case reported a mass with ulceration in the antrum.<sup>6</sup> Endoscopic ultrasound (EUS) is preferred over EGD for evaluation of submucosal lesions because it differentiates the 5 layers of the gastric wall, which helps in identifying the layer of origin of the lesion and yields information about the echotexture of mass. Suspicious malignant findings on EUS includes size >3-5 cm, irregular margins, cystic spaces, and heterogeneous echos.<sup>8</sup> EUS-guided fine-needle aspiration or trucut biopsy can help with tissue diagnosis.<sup>9,10</sup> There are no definitive radiological features for AML, but it should be considered in the context of a lipomatous tumor presenting with upper GI bleed.

Because GAMLs are rare, their demographic profile is not clearly known. Like renal AML, an extrarenal AML may arise sporadically or in association with tuberous sclerosis.<sup>3</sup> The largest GAML previously reported in the literature is  $6 \times 3 \times 3$  cm.<sup>2</sup> Our patient's AML was  $9 \times 6 \times 5$  cm, and we had the additional finding of associated multiple enlarged regional reactive lymph nodes, which has not been described with GAML previously.

Histogenesis of AML is not definitively known. Studies have hypothesized that AML arises from pluripotent stem cells derived from the neural crest.<sup>11</sup> The diagnostic microscopic feature of AML is the triphasic histology characterized by thick-walled vessels, sheets and bundles of myoid cells, and adipocytes, each constituting at least 10% of the tumor.<sup>4</sup> Radial arrangement of the smooth muscle fibers emanating from blood vessels is a frequent finding.<sup>3</sup> The presence of marked cytological atypia and pleomorphism, mitotic figures,



**Figure 3.** (A) Hematoxylin and eosin (H&E) stain (50 $\times$ ) showing gastric submucosal lipomatous tumor cells with mucosal ulceration. Inset shows source of bleeding (arrow). (B and C) H&E stain (100 $\times$ ) of triphasic component of tumor comprising adipocytes (arrow with star), thick-walled vessel (black arrow), and smooth muscle emanating from the vessel (arrow with #). (D) Smooth muscle actin stain (100 $\times$ ) highlighting smooth muscles emanating from the vessel wall (arrow).

necrosis, and infiltrative margins suggests malignant potential and recurrences. These aggressive features were absent in our case.

Immunohistochemically, AML co-expresses myoid markers (eg, SMA, desmin) and melanocytic markers (eg, HMB-45, Melan A, tyrosinase, MiTF), likely due to AML's origin in perivascular pluripotent cells. The AML in this case was positive for S100, SMA, and desmin, and it was negative for HMB-45. Extrarenal AMLs and PEComas have been shown to have positive or negative expression of HMB45.<sup>12</sup> In the 3 previously reported cases of GAMLs, HMB-45 positivity was observed in only 1 case. The lack of expression of HMB-45 may be explained by aberrant antigenic expression and specific mutation that may prevent the expression of premelanosome epitopes as explained by other studies.<sup>12</sup>

AML is generally benign and can be treated with drugs like everolimus or embolization techniques. Other modalities of treatment include endoscopic submucosal resection (if the size is <3 cm) and laparoscopic procedures, such as wedge resection or partial gastrectomy. In the absence of bleeding or other complaints, there is no indication for aggressive intervention.<sup>6</sup> In the first case in the literature, the patient underwent laparotomy and tumor excision; laparoscopic wedge resection was done in the second case, and laparoscopic submucosal resection of the tumor was done in the third case.<sup>2,6,7</sup> In our case, due to the size (9  $\times$  6  $\times$  5 cm) and clinical suspicion of malignancy, a subtotal gastrectomy was deemed appropriate. The previously reported cases, as well as our case, had a benign course with no recurrence or metastasis.

GAML is an extremely rare and usually benign submucosal lesion of the stomach that must be considered in the

differential diagnosis of upper GI bleed. EUS and EUS-guided biopsies can help establish a preoperative diagnosis, but this must be done with caution when GAML is suspected because it has a tendency to bleed. A triphasic pattern on histology is characteristic of this entity. Dual expression of myogenic and melanocytic immunohistochemical markers aids in diagnosis. Extensive sampling of biopsy specimens is warranted to identify any histologically atypical features that would suggest aggressive behavior.

## DISCLOSURES

Author contributions: All authors contributed equally to the manuscript. RR Paulose is the article guarantor.

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Informed consent was obtained for this case report.

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