Angiolipoma is a benign tumor composed of adipose tissue and proliferating blood vessels that is commonly found in the subcutaneous tissue of the trunk and extremities. Gastric angiolipoma is a rare entity, and to the best of our knowledge, only 4 cases have been reported in the English-language literature thus far. These tumors may present as gastrointestinal bleeding and anemia or with obstructive symptoms. Accurate preoperative diagnosis is challenging because of nonspecific clinical symptoms and lack of specific findings on imaging studies. The correct diagnosis is usually made by histopathologic examination. The clinical significance lies in being aware of this rare entity in the stomach and distinguishing it from other benign and malignant gastric neoplasms that may be in the differential diagnosis. We herein discuss the clinical presentation, radiologic and histopathologic features, ancillary studies, differential diagnosis, and treatment and prognosis of this rare entity.

(CLINICAL AND ENDOSCOPIC FEATURES)
Angiolipomas generally present as encapsulated subcutaneous tumors. They are usually smaller than 2 cm in diameter, and young adult patients typically present with multiple tender masses in the arms and trunk.12 Gastrointestinal (GI) angiolipoma is rare, and to the best of our knowledge, only 4 angiolipoma cases have been reported in the stomach so far (Table).4–7 Occasional cases have been reported in other areas of the GI tract, including the esophagus,13 duodenum,8,14 small intestine,15,16 colon,9,11,17–19 and rectum.20,21 Angiolipoma in the GI tract almost exclusively occurs as a solitary lesion and usually lacks specific clinical manifestations. Patients may be asymptomatic, or some may present with ulcerative GI bleeding and anemia, or symptoms of obstruction or intussusception due to the increasing size of the tumor. In the 4 reported gastric angiolipoma case reports, 3 presented with GI hemorrhage and anemia4–6 and 1 with intussusception caused by synchronous occurrence of a large solitary gastric Peutz-Jeghers polyp (Table).7 Hemorrhage is generally attributed to the proliferating vessels or due to the ulcer.

The antrum appears to be the most common site for gastric angiolipomas. Upper GI endoscopy typically shows submucosal polypoid mass with superficial ulceration, probably due to the mass effect of the expanding lesion (Figure 1).4–6

(RADIOLOGIC FEATURES)
Angiolipoma appears as a mass with a central hyperechoic portion surrounded by a hypoechoic part on the periphery on abdominal echo.5,11 Endoscopic ultrasound can show isoechoic and hyperchoeic parts, probably in part secondary to the stromal fibrosis induced by ulceration.9 Abdominal computed tomography (CT) can show variable findings. Usually gastric angiolipomas on CT has a heterogenous appearance,13 with mixed fat and soft tissue density, raising a radiologic concern for mixed mesenchymal tumors or intratumoral hemorrhage (Figure 2). It appears as a low and isodense lesion on the pre-enhanced CT, but it could appear as a high-density mass in the post-enhanced CT because of its lipomatous component. However, because the overall density of the lesion on CT can vary according to the proportion of different components, nonenhancement may also be seen.5 Thus, the CT findings are not entirely specific and may not be very helpful to distinguish it from other subepithelial lesions. Magnetic resonance imaging typically shows a fat signal intensity mass with areas of low signal intensity.
intensity on T1-weighted and high signal intensity on T2-weighted images, and intense enhancement representing the vascular component of the lesion.22

Not surprisingly, the overall preoperative diagnostic accuracy for gastric angiolipoma is not very high, given the rarity of the neoplasm coupled with the nonspecific clinical presentation and lack of specific findings on imaging studies.

**PATHOLOGIC FEATURES**

The size of reported gastric angiolipoma ranges from 0.5 up to 5 cm (Table).4–7 Grossly, angiolipoma is a well-circumscribed, encapsulated lesion, the cut surface of which varies from yellow to red according to the prevalence of fat or vascular component. The surface of the tumor may demonstrate brownish-red erosion. Angiolipoma can be classified by the ratio of adipose and vascular tissue components as predominantly lipomatous or angiomatous type. Histologically, gastric angiolipoma is circumscribed and pretty much encapsulated, and is composed of mature adipose tissue with an interspersed vascular proliferation (Figures 3 to 6). Additionally, these lesions often ulcerate into the overlying mucosa, along with active inflammation and reactive epithelial changes with fibrinopurulent exudate (Figure 4). In contrast to cutaneous angiolipomas, an interesting histologic feature of gastric angiolipoma and many other nonsubcutaneous angiolipomas is the absence of fibrin thrombi (Figure 5). Therefore, the presence of fibrin thrombi is not a required diagnostic criterion for nonsubcutaneous angiolipomas. The reason for this histologic difference between subcutaneous and nonsubcutaneous angiolipomas remains unclear. The external location of the subcutaneous angiolipomas and the largely peripheral location of the fibrin thrombi in these tumors suggest that physical irritation may be a contributory factor.6

Given the predominant submucosal location of the neoplasm, a preoperative biopsy specimen mostly is limited to superficial mucosa and likely shows nonspecific features, including ulcer without lesional tissue. Hence, the accurate diagnosis of gastric angiolipomas is often made on final surgical pathology examination of the excised specimen.

**ANCILLARY STUDIES**

Angiolipoma is typically diagnosed with hematoxylin-eosin stain, and immunohistochemistry is rarely, if ever, needed. Angiolipoma shows focal to diffuse positivity for S100 protein in the adipocytes as well as positivity for endothelial markers (eg, CD34 and CD31) in the vascular component. Cytogenetically, angiolipoma is almost unique among adipocytic neoplasms because, with a single exception, all tumors investigated cytogenetically have had a normal karyotype.23 This suggests that the pathogenesis of angiolipoma may be different from that of ordinary lipoma. Angiolipoma seems to show aberrant expression of full-length HMGA2, although at levels lower than in lipoma with 12q rearrangements.24

**DIFFERENTIAL DIAGNOSIS**

The differential diagnosis may include some benign and malignant gastric neoplasms, such as nonneoplastic gastric polyps; some other soft tissue tumors with lipomatous components/differentiation, such as lipoma, angiomyolipoma, and well-differentiated liposarcoma; and vascular lesions, such as angiodysplasia and glomus tumors.25
Figure 1. Endoscopic examination shows a polypoid and focally ulcerating, partially circumferential submucosal-based mass.

Figure 2. Abdominal computed tomography shows a stomach mass with mixed fat and soft tissue density, raising a concern for intratumoral hemorrhage or rare lesion, such as mixed mesenchymal tumor or a liposarcoma.

Figure 3. Low-power photomicrograph of gastric angiolipoma showing the overlying gastric antral mucosa and the submucosal proliferation of mature adipose tissue and blood vessels (hematoxylin-eosin, original magnification ×20).

Figure 4. Low-power photomicrograph highlighting the gastric angiolipoma ulcerating into the overlying gastric antral mucosa. Associated fibrinopurulent exudate and reactive epithelial changes can be seen (hematoxylin-eosin, original magnification ×20).

Figure 5. Photomicrograph highlighting the proliferating blood vessels in gastric angiolipoma. Note the absence of fibrin thrombi in the gastric angiolipoma, in contrast to the subcutaneous angiolipomas (hematoxylin-eosin, original magnification ×100).
Nonneoplastic submucosal gastric lesions include inflammatory fibroid polyp. Inflammatory fibroid polyp exhibits a submucosal proliferation of bland spindle-shaped cells, prominent vessels, and inflammatory cells “typically” rich in eosinophils dispersed in a fibromyxoid stroma. “Onion-skinning” characterized by a concentric proliferation of bland lesional spindle cells around blood vessels is often seen. The lesional cells are immunoreactive for CD34. Other gastric polyps, including hyperplastic polyp and fundic gland polyp, are less likely in the differential because these are predominantly “mucosal-based” polyps. Additionally, hyperplastic polyps show elongated, distorted, and branched foveolar glands in a background of edematous and inflamed lamina propria. Fundic gland polyps have a proliferation of small and dilated glands lined by cytologically bland parietal and chief cells.

Other soft tissue tumors with lipomatous differentiation may demonstrate gross and/or endoscopic features similar to those of angiolipoma. Definitive diagnosis often relies on histopathologic examination. Unlike angiolipoma, lipoma lacks vascular components, whereas angiomylipoma additionally shows lesional spindle or epithelioid-appearing cells along with thick-walled blood vessels and is immunoreactive for HMB-45 and MART-1, and shows variable staining for smooth muscle actin. Another main differential diagnosis would be well-differentiated liposarcoma, which is characterized by atypical, often multinucleated adipocytes and lipoblasts admixed with mature, uniform adipocytes with thick fibrous septa. Typically, angiolipoma does not demonstrate the cytologic atypia usually seen in well-differentiated liposarcoma. As ancillary tools, MDM2 and CDK4 are becoming increasingly popular immunohistochemical markers for well-differentiated liposarcomas because they are essentially never overexpressed in benign lipomas. Karyotypic analysis has shown that well-differentiated liposarcoma is characterized by the presence of ring or giant marker chromosomes. Concomitant amplification of MDM2, CDK4, and HMG1A2, as well as overexpression of the encoded proteins, is characteristic of well-differentiated liposarcomas. The high specificity and sensitivity of detection of MDM2 and CDK4 amplification by using fluorescent in situ hybridization have been shown to be powerful tools for separating well-differentiated liposarcomas from benign lipomatous lesions.

Other vascular lesions, such as angiodysplasia, can be distinguished from angiolipoma because the former do not contain appreciable adipose tissue and do exhibit a proliferation of small, dilated, and distorted thin-walled blood vessels with focal mucosal extension. Glomus tumors show abundant dilated, thin-walled blood vessels, are lined by a single layer of endothelial cells, and are surrounded by nests of uniform and round glomus cells, which are strongly positive for smooth muscle actin and vimentin.

CONCLUSIONS

Angiolipoma is a rare entity, which can present as chronic GI bleeding and anemia or obstructive symptoms. These are benign lesions with no propensity for local recurrence or aggressive behavior, and hence the clinical significance lies in being aware of this entity, being aware of its characteristic histologic features in the stomach, and distinguishing it from other benign and malignant neoplasms that may come in the clinical and/or radiologic differential diagnosis.

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References


