Gastrointestinal Stromal Tumor of the Stomach Mimicking Perigastric Abscess with Hepatic Portal Venous Gas: a case report

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Gastrointestinal stromal tumors (GIST) are the most common mesenchymal tumors of the gastrointestinal (GI) tract. We present the case of a 58-year-old woman complaining of fever and epigastric pain. Computed tomography (CT) showed hepatic portal venous gas (HPVG) and a 7-cm thin-walled perigastric cystic mass containing mixed gas, fluid, and debris. CT-guided drainage was performed for a presumed perigastric abscess. Follow-up abscessogram and CT scan showed only mild shrinkage of the abscess cavity and a small communication with the gastric lumen. The cystic mass was therefore excised. Histologic and immunohistochemical studies demonstrated features of a GIST. To our knowledge, this is the first reported case of GIST presenting as a perigastric abscess with HPVG.

CASE REPORT

A 58-year-old woman presented to the emergency department complaining of fever (38.2°C) and chills and worsening epigastric pain for 5 days. She had had chronic epigastric discomfort for 9 months, along with mild nausea, abdominal fullness, and hunger pain. She denied symptoms of GI bleeding such as coffee ground vomitus, melena, or hematochezia. Physical examination revealed tenderness in the epigastric area but no muscle guarding or rebound tenderness. She had leukocytosis (WBC: 13600 /µL). Serum hemoglobin was within normal limits (Hb: 11.7 gm/dL). Abdominal sonography showed scattered gas in the liver. On CT scan, there was hepatic portal venous gas (HPVG), located mainly in the periphery of the liver, predominantly in the left lobe (Fig. 1a). A 7-cm thin-walled cystic mass containing mixed air, fluid, and debris was located between the liver, stomach and pancreas, contiguous with the lesser curvature of the stomach (Fig. 1b). There was no evidence of bowel ischemia or necrosis. The tentative imaging diagnosis was perigastric abscess with HPVG. We
therefore performed CT-guided drainage with an 8-Fr pigtail tube, which yielded brown pus. Culture of this material yielded mixed growth, including *Bacteroides capillosus*, *Prevotella buccae*, and other anaerobic bacteria. Over subsequent days, the drainage was poor, with solid debris mixed with the pus. Follow-up CT scan with intraabsscess contrast medium injection only a mild decrease in the size of the cavity, which contained a lot of debris. We also identified a small communication between the abscess cavity and the gastric lumen (Fig. 2), which was confirmed by the passage of contrast medium from the abscess cavity into the gastric lumen. The HPVG had resolved.

As the cystic mass had failed to resolve with drainage alone, laparotomy was performed. The perigastric mass was found in fact to originate from the gastric wall, and it was excised. Microscopically, there were clumps of necrotic debris mixed with acute inflammatory cells and blood, similar to

![Figure 1a. Contrast-enhanced CT scan shows HPVG, mainly in the periphery of the liver, predominantly in the left lobe.](image)

![Figure 1b. Contrast-enhanced CT scan shows a 7-cm thin-walled cystic mass containing mixed air, fluid, and debris located between the liver, stomach and pancreas, contiguous with the lesser curvature of the stomach.](image)

![Figure 2. CT scan obtained after injection of contrast medium into the cystic cavity shows a small communication (thick arrow) between the cystic mass and the gastric lumen with contrast medium leaking into the gastric lumen (thin arrow). Considerable debris is still present in the abscess.](image)

![Figure 3. Fascicles of spindle tumor cells in the abscess wall, with positive immunoreactivity to KIT (original magnification, X150; Dako CD117/c-KIT, Code A4502).](image)
the content of an abscess. The wall of the mass contained inflamed or fibroblastic granulation tissue, but there were also fascicles of fairly uniform spindle tumor cells, most of which were degenerating or necrotic except for a few small foci of viable tumor cells. Both the viable and necrotic tumor cells stained positively for KIT (CD117) (Fig. 3) and CD34 but negatively for actin and S100 protein. The cellularity was not high, and no frank nuclear atypia was seen. The pathology diagnosis was GIST with low malignant potential, complicated by an abscess. The patient recovered well from the surgery. After discharge, she was treated with imatinib as adjuvant therapy. No evidence of tumor recurrence or metastasis was found in one year of follow-up.

**DISCUSSION**

This patient with GIST had both unusual presenting symptoms and a strikingly unexpected imaging finding. As noted above, patients with GIST most commonly present with various symptoms or signs of GI bleeding, such as melena or hematemesis, or more insidious bleeding marked by weakness and anemia. Other symptoms and signs include pain and upper abdominal discomfort, abdominal fullness or increased girth, tumor rupture causing intraperitoneal hemorrhage, dysphagia, gastric outlet obstruction, and pulsatile gastric contractions [3]. Some gastric GISTs are asymptomatic and found incidentally. An abscess within a GIST is rare. In fact, our patient did have chronic epigastric discomfort, but this symptom was apparently not bothersome enough to prompt further investigation.

Because GISTs usually arise from the muscularis propria, the outer muscular layer of GI tract wall, they have a propensity for exophytic growth [3]. They are typically well-circumscribed masses that compress adjacent tissue. Often, a component of the tumor extends to the mucosal surface of the stomach with resulting mucosal ulceration and hemorrhage. Cystic degeneration is common in larger tumors secondary to extensive hemorrhage or necrosis, and, as in our patient, the cystic portion may communicate with the gastric lumen [4]. GISTs can be histologically classified by their predominant cell morphology as spindle cell (most common) or epithelioid, or a mixture of these two morphologies. Outcome is strongly dependent on tumor size and mitotic activity. In general, malignant GISTs are larger, more highly cellular, and more mitotically active than their benign counterparts. Malignant GISTs may present with adjacent organ invasion, ascites, omental and peritoneal tumor spread, or liver metastasis. Metastatic lymphadenopathy is not common.

In our case, the tumor presented as a thin-walled perigastric cyst communicating with the gastric lumen. A cystic GIST with a uniformly thin wall is unusual; more commonly, a soft tissue component or irregular wall thickness is present. However, an abscess may cause more extensive tumor necrosis and contribute to further thinning of the tumor wall. Air is often seen in such a tumor cavity if gastric mucosal ulceration occurs, allowing gas from the lumen to enter the cyst. However, if no evidence of a tract between the cyst and the lumen is seen, the appearance is more suggestive of an abscess involving gas-forming bacteria, particularly in a patient with clinical signs of infection.

HPVG was once considered as an ominous sign of bowel ischemia or necrosis. The mortality in those conditions is high, demanding emergency surgery. Early studies of HPVG were based on plain abdominal radiography. A literature review in 1978 reported an associated mortality rate of 75% [5]. However, CT has created more opportunities to visualize HPVG, revealing a host of benign conditions. Nelson et al. [6] reviewed the subject in 2009 and found > 50% mortality if HPVG is detected by plain radiography or by CT in a patient with additional evidence of necrotic bowel. Mortality is somewhat lower – reportedly 20% to 30% – in a number of other conditions with HPVG detected by CT, including active peptic ulcer disease, abscesses, intestinal obstruction and/or dilatation, or mucosal disease such as Crohn disease or ulcerative colitis. HPVG seen on CT after surgical or endoscopic manipulation, on the other hand, appears to be a benign condition. Pan et al. categorized three sonographic patterns of HPGV based on the amount of portal venous gas: (1) small dots, a finding which is usually transient and benign; (2) streaks; and (3) a fruit-pulp-like pattern. Both of the latter signs in their small series were associated with more serious disease [7]. Two leading hypotheses to explain the pathogenesis of HPVG are (1) microbe-derived gas production or (2) absorbed intraluminal air. In our case, both mechanisms might have been at work. The patient has an infection superimposed on gastric GIST. The abscess may have caused septic phlebitis with in situ accumulation of gas in the portal system, or gas generated within the abscess or from the gastric lumen might have entered the portal system via the gastric or perigastric vasculature.
Surgery remains the standard initial management for all localized GISTs. Locally advanced and metastatic GISTs are treated with imatinib, a molecularly targeted tyrosine kinase receptor blocker used as neoadjuvant or adjuvant therapy in combination with surgery. Such treatment often results in a dramatic response and markedly improved long-term survival.

CONCLUSION

We have presented a case of gastric GIST with a superimposed infection. Both the clinical presentation and radiologic features suggested a perigastric abscess associated with HPVG. To our knowledge, this is the first such case reported in the literature.

REFERENCES


胃臟的胃腸道基質瘤模仿成胃臟旁膿瘍併肝門靜脈氣體：病例報告

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胃腸道基質瘤是胃腸道的間質瘤中最常見的。我們報告的是一位五十八歲女性，其症狀是發燒及上腹痛。電腦斷層掃描顯現肝門靜脈氣體及一個七公分包含有氣體、液體、組織殘骸的薄壁囊狀病灶於胃臟的旁邊。初步診斷是胃臟旁膿瘍，於是施行了電腦斷層定位引流術。之後的膿瘍攝影及電腦斷層追蹤顯現只有輕微的膿瘍萎縮，另外還有一個小通道連通膿瘍及胃臟。最後腫瘤被切除了。組織學及免疫組織化學研究顯示出胃腸道基質瘤的特徵。據我們所知，這是第一例以胃臟旁膿瘍併肝門靜脈氣體來呈現的胃腸道基質瘤之病例報告。