Ectopic pancreatic tissue on the lesser curvature of the stomach: case report and literature review

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Date accepted for publication 2 March 2013

Abstract

Ectopic pancreatic tissue is most often an incidental finding of imaging, surgery, or autopsy. Image-guided diagnosis is difficult, and definitive diagnosis usually relies on histological analysis. A case of ectopic pancreatic tissue located near the lesser curvature of the stomach is presented followed by a brief discussion of the clinical management of heterotopic pancreas.

Keywords

Heterotopic pancreas; pancreatic rests.

Case report

A 37-year-old woman presented to the emergency room (ER) with moderate, colicky abdominal pain located in the left lower quadrant. The patient had a history significant for missed menstrual periods (last menstrual period reported 8 months ago) and a surgical history remarkable for a right oophorectomy due to menstrual associated pain. The patient was otherwise healthy and was without any other systemic illnesses.

On presentation the patient denied fever, diarrhea, constipation, black stools, hematochezia, hematemesis, dysuria, or abnormal vaginal bleeding. On physical examination, vital signs were within normal limits. The abdomen was soft, non-distended, but mildly tender in the left lower quadrant inferiorly. No rigidity, rebound, or guarding was present.

Comprehensive metabolic profile, amylase, lipase, and urinalysis were all within normal limits. Her white blood cell count was increased to 21,300/\textmu l with a left shift. Her pregnancy test was negative. A computed tomography (CT) scan of her abdomen and pelvis was ordered, which revealed a left periadnexal mass and a 2-cm exophytic mass adjacent to the lesser curvature of the stomach and to the lateral segment of the left lobe of the liver. Ultrasonography confirmed the left periadnexal mass to be cystic. Her pain was thought to be due to the ovarian cyst. The patient improved with pain management and intravenous fluids; she was then discharged home with pain medication and referred to general surgery for consultation on the upper abdominal mass.

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The patient presented to the surgery clinic 1 month later for evaluation of the upper abdominal mass. She denied any events of abdominal pain since her ER visit. The abdomen was soft and slightly tender in the left adnexal region, but no masses were palpated. Esophagogastroduodenoscopy (EGD) was advised to confirm there were no changes on the wall of the stomach. The CT was also repeated to document any change.

The EGD showed an extrinsic/submucosal mass with extrinsic compression into the gastric lumen. The overlying gastric mucosa was normal in appearance. The follow-up CT found the mass to be essentially unchanged. The radiologist found it difficult to elucidate the origin of the soft tissue focus given the proximity to the gastric lesser curvature and left hepatic lobe.

The patient then chose to pursue a diagnostic laparoscopy. The lateral segment of the left lobe of the liver was inspected and was found to be normal. The left lobe was elevated to visualize the mass, which was associated with the lesser curvature of the stomach. It was surrounded by some fairly significant vasculature, but it appeared these were just branches of the gastric arteries in normal anatomic location. The stomach was then retracted inferiorly to visualize the mass without elevating the liver. The mass was fairly soft, and had the appearance of non-inflamed pancreatic tissue. A biopsy was performed and sent to pathology for permanent sections. The patient was closed and sent to recovery in stable condition.

Histological findings showed clusters of benign uniform glands embedded in dense fibroconnective tissue without inflammation, and was consistent with pancreatic tissue. Acini, islets and ductal structures were all identified (Heinrich type I). Given the histology and the location of the biopsy, the mass was diagnosed as a small benign focus of ectopic pancreatic glandular tissue. The patient was counseled regarding treatment; given the rare risk of malignant transformation, and the fact that it was completely asymptomatic, she elected conservative management and observation. At 1-year follow-up, the patient remains completely asymptomatic.

Discussion

Definition

Heterotopic pancreas, also known as pancreatic rests, is the presence of pancreatic tissue found outside the normal anatomic position and lacking vascular connection with the body of the pancreas\(^7\). In most cases, the tissue is functional and is commonly found along the greater curvature of the stomach, duodenum, and jejunum\(^1,3,6\). Other reported sites include Meckel’s diverticulum, esophagus, liver, lungs, mediastinum, fallopian tubes, gallbladder, and umbilicus\(^5,8,9\).

Epidemiology

The incidence of heterotopic pancreas has been reported to be as high as 1 in 500 upper abdominal operations\(^5,10\). In adults, it occurs most often in males during the fourth to sixth decades of life\(^5\). Autopsy reveals the presence of incidental heterotopic pancreas ranging from 0.6% to 14%\(^1,11-13\).

Pathophysiology

The pathophysiology of heterotopic pancreas is not fully understood, and multiple theories exist. One explanation proposes that during embryogenesis, pancreatic metaplasia of the endodermal tissues localized in the gastric mucosa occurs\(^6,14\). Another theory suggests that heterotopic pancreas could be caused by the inhibition of normal cellular signaling during development; inhibiting hedgehog signaling in chick embryos leads to ectopic budding of pancreatic structures in the stomach and duodenum\(^14\).

Presentation

Most patients are asymptomatic, but symptoms can include nausea, vomiting, epigastric pain, dyspepsia, abdominal fullness, and melena\(^1,3-7\). The most common symptom is epigastric pain\(^7\). About a third of symptomatic patients report clinical symptoms that mimic disease related to the organ in which the tissue resides\(^5\). More serious complications can ensue such as massive...
gastrointestinal bleeding, gastric outlet obstruction, gastric or duodenal ulceration, pancreatitis, and malignant degeneration[7,15–23].

Diagnosis

Diagnosis of heterotopic pancreas can be very difficult and is dependent on presentation. The physical examination rarely provides clues to the diagnosis of pancreatic rests as they are rarely, if ever, large enough to be detected by palpation[2]. CT can sometimes be helpful; the findings usually depict a small, round or oval sharply marginated broad-based mass[11]. Occasionally, it may appear as a mass with an irregular surface resembling an adenomatous polyp or polypoid carcinoma[11]. Five criteria on CT have been used with good sensitivity and specificity to help differentiate between ectopic pancreas and gastrointestinal stromal tumor (GIST)[25]. These criteria are as follows: pre-pyloric antrum or duodenum in location, an ill-defined border, an endoluminal growth pattern, a long diameter/short diameter ratio of greater than 1.4, and prominent mucosal enhancement. When two or more criteria are met, the sensitivity and specificity for diagnosing ectopic pancreas approaches 100% and 82.5%, respectively[25].

EGD can be useful and findings can be described as a small (around 2 cm) nodular, submucosal mass covered by normal mucosa with or without central umbilication[3,5–7]. Endoscopic ultrasonography can be helpful for determining the nature of the mass. Findings of indistinct borders, anechoic duct-like structures, mural growth pattern, presence in more than one layer, and indistinct borders suggest ectopic pancreatic tissue (and less likely other tumors) in the stomach[24]. Barium swallow studies reveal a similar appearance[6]. Biopsies done during EGD are frequently non-diagnostic due to the superficial sample; they are usually reported as normal.
Fig. 3. EGD showing an extrinsic/submucosal mass with normal overlying mucosa.

Fig. 4. Mass identified lifting the left lobe of the liver.

Fig. 5. Mass viewed by retracting the stomach inferiorly. The mass has a gross appearance of pancreatic tissue.
gastric mucosa\(^6\). Definitive diagnosis is always made histopathologically\(^{15,7}\). Specimens can be sent for frozen section\(^{6,7}\).

**Treatment**

Treatment of heterotopic pancreas is specific for the patient and the symptomatology. In the asymptomatic patient, maintaining medical supervision with periodic reviews is recommended\(^5\). The symptomatic patient usually experiences relief when the lesion is removed\(^{1–3,6,7}\). When encountered incidentally during surgery, lesions can be excised to prevent further operations or complications\(^5\).

**Prognosis**

The prognosis in patients with surgically treated pancreatic rests is usually excellent\(^{1–7}\). Although most of these lesions remain asymptomatic, it is important to remember that these lesions are still susceptible to the same pathologic conditions as normal pancreatic tissue such as pancreatitis and malignant change\(^{1,5–7}\).

**Opinion**

Heterotopic pancreas is an infrequent diagnosis and rarely makes its way into differential diagnoses. Symptoms can be variable and the incidence is low enough so that many physicians have never seen a case. Although many modalities are available for workup, definitive diagnosis is always histological. Specific CT findings described above can be helpful for differentiating between ectopic pancreas and GIST. However, the tumor in our case only met one criterion (pre-pyloric), and therefore the diagnosis could not be made with CT alone. Frozen section can allow for immediate local excision without further operations. However, in our case, it was felt the risk of complication with excision outweighed the benefit because the patient was asymptomatic. In this circumstance, we felt that monitoring would be a more appropriate option.

**References**

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