Pancreaticoduodenal tuberculosis simulating metastatic ovarian carcinoma

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Mycobacterial infection remains a significant health problem in North America. Despite a dramatic decline in the past 50 years, the incidence of mycobacterial infection is on the increase again, particularly in certain subsets including immigrants and refugees from developing countries. Unusual presentations of pulmonary tuberculosis and tuberculosis (TB) in unusual sites are becoming more prevalent (1-3). We present a case of TB arising in the duodenum and pancreas but with a presentation suggestive of ovarian carcinoma with retroperitoneal metastases.

CASE PRESENTATION

A 43-year-old woman complained of chronic recurrent epigastric pain, nausea and vomiting antedating her arrival in North America from Thailand five years earlier. An upper gastrointestinal series showed an irregular stricture and ulceration in the proximal second duodenal segment. This was attributed to peptic ulceration, and she was started on omeprazole with only partial relief. Repeat upper gastrointestinal series several months later showed further stricturing and proximal dilation. The ampulla of Vater was adjacent to the stricture, and contrast refluxed into the common bile and pancreatic ducts (Figure 1). At endoscopy an ulcerated circumferential stricture was seen between the apex of the duodenal bulb and the ampulla. The ampullary mucosa appeared normal. Biopsy revealed acute and chronic duodenitis, and stains for *Helicobacter pylori* were negative. Abdominal and pelvic ultrasonography showed a dilated fluid-filled stomach, extensive retroperitoneal lymphadenopathy, a solid mass in the pancreatic head and uncinate process, and bilateral complex, mainly solid ovarian masses. Using computed tomography (CT), additional enlarged lymph nodes in the porta hepatis and mesentery were seen (Figure 2). The enlarged lymph nodes and ovaries had low density centres suggestive of necrosis. The pancreatic head and uncinate process were enlarged, and the wall of the second duodenal segment was circumferentially thickened adjacent to the pancreas but not separate from it. Pneumobilia...
was seen by both CT and an acute abdomen plain film series. A chest radiograph was normal.

Laparotomy was performed with a provisional diagnosis of carcinomatosis, more likely ovarian than duodenal or pancreatic in origin. The ovarian masses, however, appeared benign, and ovarian biopsies showed serous adenofibromata. Nodal biopsies showed caseating granulomatous inflammation with histiocytes and giant cells, and acid-fast bacilli were identified and later cultured. Postoperatively the patient began isoniazid and ethambutol therapy and underwent endoscopic dilation of the duodenal stricture with symptomatic and radiologic improvement (Figure 1).

**DISCUSSION**

After decades of declining incidence, the number of new cases of TB in North America has been increasing, mainly in certain subsets including immigrants from developing countries and visible minorities (1). Alimentary tract involvement is much less common than pulmonary involvement, and in the alimentary tract the disease most often involves the ileocecal region. Upper gastrointestinal TB is rarer, even in patients with pulmonary or ileocecal lesions, and most often involves both the stomach and duodenum contiguous (2-8). Most large reported series come from developing or newly developed countries; in a series of 50 patients from Kuwait, the esophagus, stomach, duodenum and pancreas were all involved in one patient, compared with small and/or large intestine involvement in 16 patients, lymph nodes in 21 and peritoneum in 18 (5).

Infection by bovine TB has been virtually eliminated in North America, and gastrointestinal TB now results from either ingestion of infected sputum in patients with active pulmonary disease or, more often, from hematogenous spread from a distant site (3,7,8). In over 50% of cases, as in our patient, there may be little or no evidence of pulmonary TB (2,3,7). Both clinically and radiologically, upper gastrointestinal TB simulates peptic disease, Crohn’s disease or malignancy. The initial lesions are mucosal erosions and ulceration that can heal completely, but can also persist or

**Figure 1** Composite from upper gastrointestinal series before (left) and after (right) endoscopic dilation showing an irregular duodenal stricture (arrowheads) extending from the bulbar apex to the ampulla. The bulb (B) is markedly dilated. Barium has refluxed into the common bile duct (closed arrows) and pancreatic duct (open arrows). The duodenal lumen is wider postdilation.

**Figure 2** Computed tomographic scans with oral and intravenous contrast. A (Above) Level of the pancreatic head and renal veins. The head (H) is enlarged and the fat plane between the head and the superior mesenteric vein (closed arrow) is obliterated. The duodenal wall (arrowhead) is thickened and the lumen narrowed, and the pancreaticoduodenal interface is obliterated. Enlarged lymph nodes are seen on both sides of the aorta (open arrows). B (Top right) Level of the pancreatic uncinate process. The uncinate process (U) is enlarged. The duodenal lumen is wider than in A. The para-aortic nodal masses (open arrows) have low density centres. C (Right) Level of the uterus and ovaries. The ovaries (arrowheads) are enlarged with low density centres and have an appearance similar to the para-aortic nodal masses.
heal with excessive fibrostenosis. The disease can spread by the lymphatics to the regional nodes and from both the hollow viscera and nodes to the peritoneum (2-8). In our patient the lymphadenopathy and the pancreaticoduodenal and bilateral ovarian masses were so striking that the provisional diagnosis was an advanced malignancy, probably ovarian carcinoma. Low density centres in enlarged lymph nodes are a common feature of tuberculous lymphadenitis, but are not specific for TB and can occur in metastatic carcinoma, lymphoma and untreated celiac disease (2,3,5,9). The diagnosis of abdominal TB was made only at operation.

Two unusual radiologic findings were pancreatic involvement, and reflux of air and contrast into the biliary tract and pancreatic duct. Pancreatic TB is very rare, particularly when the only site of involvement is the digestive system, usually diagnosed only after malignancy has been excluded. TB pancreatitis most commonly involves the head (as in our patient) because of a richer lymphatic drainage than the neck, body or tail (3,5). Spontaneous fistulization between the biliary and alimentary tracts due to TB must be extremely rare, and has only been reported once to our knowledge (5). Because we did not identify a duodenal sinus or fistula and the ampullary mucosa appeared normal, we suggest another mechanism. Barium reflux into the pancreatic duct and pancreatitis have been reported as rare complications of duodenal Crohn’s disease, with submucosal fibrosis causing ampullary incompetence (6). Since the stricture in our patient extended from the duodenal bulb apex to the ampulla we believe that reflux into the common bile duct and pancreatic duct resulted from a similar phenomenon. Reflux of infected duodenal material and bile into the pancreatic duct, as well as lymphatic drainage, resulted in TB pancreatitis.

CONCLUSIONS
Alimentary tract TB should be included in the differential diagnosis when any patient presents with obscure gastrointestinal symptoms or radiologic findings, particularly when the patient is an immigrant or refugee from a developing country. While CT may not exclude other more common diseases, it can direct the radiologist in obtaining a histological and bacteriological diagnosis.

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