CASE REPORT

A 55-year-old man was referred to the Department of Infection and Critical Care Medicine, Beijing Friendship Hospital, Capital University of Medical Sciences (Beijing, China), because of persistent fever over 40°C for 9 days with shaking and chills. He also complained of general fatigue and loss of appetite but had no abdominal pain, vomiting, weight loss, or other symptoms. His previous medical history was unremarkable. On physical examination, fever was present (39.3°C), lung fields were clear, heart sounds were regular without murmur, and the abdomen was soft, nondistended, and with no palpable mass.

Initial laboratory studies showed a white blood cell count of 16.7 × 10^9/liter with 83.6% neutrophils. A stool occult blood test was negative. Inflammatory tests showed the following results: a C-reactive protein level of >160 mg/dl (normal, 0.0 to 0.8 mg/dl) and a procalcitonin (PCT) level of 2.32 ng/ml (reference range, 0 to 0.05 ng/ml). Tumor markers CA125 and CA19-9 increased greatly: CA125 and CA19-9 to >1,200 U/ml (reference range, 0 to 37 U/ml) and CA125 to 247.9 U/ml (reference range, 0 to 37 U/ml). However, the carcinoembryonic antigen level was normal. The results of the pancreatic amylase test and creatinine, glucose, and liver function tests were all within normal limits. Blood cultures were collected.

A chest radiograph was unremarkable; however, a chest computed tomography (CT) scan showed lobar consolidation in the left lower lobe with associated pleural effusion. An abdominal ultrasound exam demonstrated a hypoechoic area in the spleen with an unclear margin, suggestive of a splenic abscess. An en-doscopy ultrasound exam demonstrated a hypoechoic area in the spleen and multiple hypodense lesions in the liver, along with the left lower lobe with associated pleural effusion. An abdominal computed tomography (CT) scan showed lobar consolidation in the left lower lobe with associated pleural effusion. As a result, fever was present (39.3°C), lung fields were clear, heart sounds were regular without murmur, and the abdomen was soft, nondistended, and with no palpable mass.

Splenic abscesses caused by *Streptococcus bovis* are rarely reported in the literature and are mainly seen in patients with endocarditis and associated colonic neoplasia/carcinoma. We report the first case of splenic abscess caused by *Streptococcus gallylyticus subsp. pasteurianus* (*Streptococcus bovis* biotype II/2) as presentation of a pancreatic cancer.
Splenitis was the probable cause of the large abscess, which caused persistent fever with positive blood culture.

A variety of microorganisms have been isolated from splenic abscesses (6, 7). The frequently isolated aerobic and facultative isolates were Escherichia coli, Proteus mirabilis, S. bovis, Klebsiella pneumoniae, and Staphylococcus aureus. The isolated anaerobes were Peptostreptococcus spp., Bacteroides spp., Fusobacterium spp., and Clostridium spp. (6, 7). The organisms isolated often reflect the underlying pathogenesis: i.e., S. aureus and S. bovis were associated with endocarditis, K. pneumoniae with respiratory infection or liver abscess, E. coli with urinary tract and abdominal infection, and Bacteroides spp. and Clostridium spp. with abdominal infection (6). Cases of splenic abscess caused by S. bovis are rare and usually due to septic emboli from endocarditis in patients with colonic cancer (8, 9). To our knowledge, our case is the first report of a splenic abscess in association of pancreatic cancer along with subspecies identification.

S. gallolyticus subsp. pasteurianus belongs to the group D streptococci and was previously recognized as S. bovis biotype II/2. S. bovis is found as part of the human gastrointestinal microbiota in 5 to 16% of individuals (10). Using the scheme proposed by Schlegel et al. (11), on the basis of DNA studies, there are two Streptococcus species of principal interest: S. gallolyticus, with the subspecies galloyticus (formerly biotype I), pasteurianus (formerly biotype II/2), and macedonicus; and S. infantarius (formerly biotype II/1), with the subspecies coli and infantarius. Each biotype has somewhat different pathogenicity. S. galloyticus subsp. galloyticus (biotype I) has been associated frequently with underlying colorectal cancer (12). S. infantarius (biotype II/1) could be associated with noncolonic cancers (13). S. galloyticus subsp. pasteurianus (biotype II/2) has been reported recently to cause neonatal and adult meningitis (14–16) and bacteremia and peritonitis (17, 18) but not solid organ infections.

The association between S. bovis bacteremia and pancreatic carcinoma was first reported in 1980 (19) and has been reported in only a few case reports to date (13, 19–22), but molecular genetic characterization of strains was not described in the studies. One of them described the association with S. infantarius (13), but there is no reported case associated with S. pasteurianus. Our case of S. galloyticus subsp. pasteurianus bacteremia with splenic abscess and underlying pancreatic cancer reminds clinicians that malignancy might be a potential feature to search for.

Splenitis abscess as a complication of pancreatic cancer has been reported in only a few cases to date (23–27). This may be due to the location of the tumor in the pancreas. As we all know, pancreatic carcinoma occurs most commonly in the head, and as such, usually presents with obstructive jaundice. Conversely, the least common location for pancreatic carcinoma, as seen in our patient, is in the

FIG 1 (a) CT scan (portal phase) image of a hypodense area that invaded hilum of spleen, in the tail of pancreas (white arrow), and an irregular hypodense area with an unclear margin in the spleen (black arrow). (b) CT scan (arterial phase) image of nonenhancing hypodense area that invaded hilum of spleen, in the tail of pancreas (white arrow 1), and an irregular nonenhancing hypodense area in the spleen (black arrow). The splenic artery is slender (white arrow 2).
the tail. These cancers tend to present later and are larger at presentation than pancreatic head tumors, with signs of advanced disease, such as contiguous organ extension, vascular invasion, and distant metastases (24), and splenic involvement can include infarction, abscess, intrasplenic pseudocysts, and hemorrhage (28).

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REFERENCES