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OPINION REVIEW

- 2658 Effective use of the Japan Narrow Band Imaging Expert Team classification based on diagnostic performance and confidence level
Hirata D, Kashida H, Iwatate M, Tochio T, Teramoto A, Sano Y, Kudo M

MINIREVIEWS

- 2666 Low fermentable oligosaccharides, disaccharides, monosaccharides, and polyols diet in children
Fodor I, Man SC, Dumitrascu DL
- 2675 High-resolution colonic manometry and its clinical application in patients with colonic dysmotility: A review
Li YW, Yu YJ, Fei F, Zheng MY, Zhang SW

ORIGINAL ARTICLE**Retrospective Study**

- 2687 Predictors of rebleeding and in-hospital mortality in patients with nonvariceal upper digestive bleeding
Lazăr DC, Ursoniu S, Goldiș A
- 2704 Analgesic effect of parecoxib combined with ropivacaine in patients undergoing laparoscopic hepatectomy
Huang SS, Lv WW, Liu YF, Yang SZ
- 2712 Prognostic significance of 14v-lymph node dissection to D2 dissection for lower-third gastric cancer
Zheng C, Gao ZM, Sun AQ, Huang HB, Wang ZN, Li K, Gao S

Observational Study

- 2722 Wall shear stress can improve prediction accuracy for transient ischemic attack
Liu QY, Duan Q, Fu XH, Jiang M, Xia HW, Wan YL

Prospective Study

- 2734 Characterization of microbiota in systemic-onset juvenile idiopathic arthritis with different disease severities
Dong YQ, Wang W, Li J, Ma MS, Zhong LQ, Wei QJ, Song HM

SYSTEMATIC REVIEWS

- 2746 Sinusoidal obstruction syndrome: A systematic review of etiologies, clinical symptoms, and magnetic resonance imaging features
Zhang Y, Jiang HY, Wei Y, Song B

META-ANALYSIS

- 2760** Respiratory training interventions improve health status of heart failure patients: A systematic review and network meta-analysis of randomized controlled trials
Wang MH, Yeh ML

CASE REPORT

- 2776** *Mycobacterium chimaera* infections following cardiac surgery in Treviso Hospital, Italy, from 2016 to 2019: Cases report
Inojosa WO, Giobbia M, Muffato G, Minniti G, Baldasso F, Carniato A, Farina F, Forner G, Rossi MC, Formentini S, Rigoli R, Scotton PG
- 2787** Giant squamous cell carcinoma of the gallbladder: A case report
Junior MAR, Favaro MDL, Santin S, Silva CM, Iamarino APM
- 2794** Liver re-transplantation for donor-derived neuroendocrine tumor: A case report
Mrzljak A, Kocman B, Skrtic A, Furac I, Popic J, Franusic L, Zunec R, Mayer D, Mikulic D
- 2802** Calcifying fibrous tumor originating from the gastrohepatic ligament that mimicked a gastric submucosal tumor: A case report
Kwan BS, Cho DH
- 2808** Pancreatitis, panniculitis, and polyarthritis syndrome caused by pancreatic pseudocyst: A case report
Jo S, Song S
- 2815** Glomus tumor of uncertain malignant potential of the brachial plexus: A case report
Thanindratar P, Chobpenthai T, Phorkhar T, Nelson SD
- 2823** Conservative pulp treatment for Oehlers type III dens invaginatus: A case report
Lee HN, Chen YK, Chen CH, Huang CY, Su YH, Huang YW, Chuang FH
- 2831** Propofol pump controls nonconvulsive status epilepticus in a hepatic encephalopathy patient: A case report
Hor S, Chen CY, Tsai ST
- 2838** Teriparatide as nonoperative treatment for femoral shaft atrophic nonunion: A case report
Tsai MH, Hu CC
- 2843** Successful repair of acute type A aortic dissection during pregnancy at 16th gestational week with maternal and fetal survival: A case report and review of the literature
Chen SW, Zhong YL, Ge YP, Qiao ZY, Li CN, Zhu JM, Sun LZ
- 2851** Inferior pancreaticoduodenal artery pseudoaneurysm in a patient with calculous cholecystitis: A case report
Xu QD, Gu SG, Liang JH, Zheng SD, Lin ZH, Zhang PD, Yan J

- 2857** ALK-positive anaplastic large cell lymphoma of the thoracic spine occurring in pregnancy: A case report
Yang S, Jiang WM, Yang HL
- 2871** Multiple gastric adenocarcinoma of fundic gland type: A case report
Chen O, Shao ZY, Qiu X, Zhang GP
- 2879** Repair of the portal vein using a hepatic ligamentum teres patch for laparoscopic pancreatoduodenectomy: A case report
Wei Q, Chen QP, Guan QH, Zhu WT
- 2899** Pleomorphic lipoma in the anterior mediastinum: A case report
Mao YQ, Liu XY, Han Y
- 2905** Guillain-Barré syndrome in a patient with multiple myeloma after bortezomib therapy: A case report
Xu YL, Zhao WH, Tang ZY, Li ZQ, Long Y, Cheng P, Luo J
- 2910** Bowen's disease on the palm: A case report
Yu SR, Zhang JZ, Pu XM, Kang XJ

ABOUT COVER

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Pancreatitis, panniculitis, and polyarthritis syndrome caused by pancreatic pseudocyst: A case report

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Abstract

BACKGROUND

Panniculitis, polyarthritis, and pancreatitis (PPP) syndrome is a triad comprising an extremely rare extra-pancreatic complication of pancreatic disease. Herein, we describe a patient with PPP syndrome caused by fistula formation between the inferior vena cava (IVC) and pancreatic pseudocyst.

CASE SUMMARY

A 64-year-old man visited the hospital with bilateral leg pain that began one week prior. He had no specific diseases, except hypertension. His vital signs were normal. Blood test revealed the following findings: White blood cell count, 28690/ μ L; amylase level, 9055 U/L; lipase level, 2089 U/L; and C-reactive protein level, 12.94 mg/dL. Computed tomography of the pancreas revealed recent acute pancreatitis. Nonsteroidal anti-inflammatory drugs were administered with no improvement. After steroid administration, pain slightly improved. Skin lesions were diagnosed as panniculitis. Bone scan and knee magnetic resonance imaging revealed osteoarthritis and bone marrow infarctions. Surgical treatment was considered; total pancreatectomy with splenectomy was performed. A pseudocyst was present posterior to the head of the pancreas, forming a fistula with the suprarenal IVC. After surgery, amylase and lipase levels decreased. However, the patient died of an uncontrolled infection on the 13th postoperative day.

CONCLUSION

PPP syndrome should be suspected when accompanied by skin and joint lesions. Delays in diagnosis could have catastrophic consequences.

Key words: Panniculitis; Polyarthritis; Pancreatitis; Fistula; Case report

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Core tip: Panniculitis, polyarthritis, and pancreatitis syndrome must be considered when skin lesions and joint symptoms are associated with suspected pancreatitis. Treatment of the causative pancreatic disease is helpful in relieving symptoms. Surgical treatment is needed when fistulas of the pancreatic duct and systemic circulation formed. Delays in diagnosis could have catastrophic consequences.

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INTRODUCTION

Pancreatic diseases may have extra-pancreatic manifestations, such as lobular panniculitis or polyarthritis. Pancreatic panniculitis can be seen several days or weeks before pancreatitis occurs. Very rarely, polyarthritis can develop in patients with pancreatic panniculitis, forming a triad of panniculitis, polyarthritis, and pancreatitis (PPP), which is referred to as the PPP syndrome^[1]. Its pathogenesis is unclear; however, it is known that the pancreatic enzyme enters the systemic circulation^[2]. Here, we report the case of a patient with PPP syndrome caused by fistula between the pancreatic pseudocyst and inferior vena cava (IVC).

CASE PRESENTATION

Chief complaints

A 64-year-old man visited the hospital with bilateral leg pain that began a week prior.

History of present illness

He had several nodular skin lesions on both knees and calves, and the lesions caused pain and edema. The patient did not complain of abdominal pain.

History of past illness

He had no specific disease, except hypertension; however, he had a history of alcohol abuse.

Physical examination

His vital signs were normal, and there were no specific findings, except skin lesions on both legs.

Laboratory examinations

Laboratory tests revealed white blood cell counts of 28690/ μ L, amylase level of 9055 U/L, lipase level of 2089 U/L, blood urea nitrogen level of 41 mg/dL, creatinine level of 2.71 mg/dL, lactate dehydrogenase level of 742 U/L, C-reactive protein level of 12.94 mg/dL, and D-dimer level of 8606 ng/mL. Leptospira antibody, Orientia tsutsugamushi antibody, and Hantaan virus antibody were tested, but they were negative. Pancreatic enzyme levels were extremely high.

Imaging examinations

Computed tomography (CT) of the pancreas revealed a cystic lobulated lesion along the peripancreatic tail and a portion of the distal body with retropancreatic extension and a mild dilatation of the main pancreatic duct from the head to the tail. CT findings revealed potential recent acute pancreatitis or stricture at the periampullary level (Figure 1).

Further diagnostic work-up

Based on the diagnosis of pancreatic panniculitis owing to the presence of pancreatitis; the patient was advised to fast and was administered antibiotics. Normal diet was resumed following improvement in skin lesions and joint symptoms. However, the patient complained of abdominal pain, and lipase levels increased to 12354 U/L; the patient was advised to fast again. Nonsteroidal anti-inflammatory drugs (NSAIDs) were administered for ankle arthritis; however, the pain became



Figure 1 Computed tomography of the pancreas. Cystic lesion with an attenuated lobulated margin along the peripancreatic tail and distal portion of the body of the pancreas (yellow arrow).

more severe. Following administration of a steroid, the pain showed minor improvement. Histological examination of the skin lesions was performed; a diagnosis of lobular panniculitis was made. Further laboratory tests were negative for antinuclear antibody, antineutrophil cytoplasmic antibody, C3/C4, and IgG/IgG4. Bone scan showed small hot lesions on both wrist joints. There was an increase in the uptake at the left 2nd and 3rd metacarpophalangeal joints and 2nd and 3rd distal phalanges. There was also an increase in the pathological nuclide uptake at the right 2nd metacarpophalangeal joint. Both knees had small hot lesions in the left and right tibial tuberosities. These findings could be attributed to the presence of osteoarthritis (Figure 2). Magnetic resonance imaging (MRI) was performed on the more painful left knee, which revealed diffuse multifocal ischemia or infarction in the bone marrow spaces of the left knee. Joint effusion and multiloculated fluid collection in the superficial and deep infrapatellar fat pad were also seen. MRI suggested an early stage of bone marrow infarction in the patella, proximal tibia, and distal femur (Figure 3).

FINAL DIAGNOSIS

The patient was diagnosed with PPP syndrome, and his condition did not improve. Endoscopic retrograde cholangiopancreatography was performed to control pancreatitis; however, the guidewire could not enter the pancreatic duct and entered an unexpected path.

TREATMENT

Because of the lack of improvement following medical treatment, surgical treatment was considered. We could not assess if the pancreatic pseudocyst and IVC formed a fistula preoperatively. Hence, we performed the Kocher maneuver owing to the planned total pancreatectomy. Simultaneously, the IVC and head of the pancreas were severely attached with a small cystic lesion. As the pancreas head was separated from the IVC, massive bleeding was encountered from the IVC. We performed a primary suture after isolating the proximal and distal IVC of the injured area. A pseudocyst was present in the posterior aspect of the pancreas, forming a fistula with the suprarenal IVC (Figure 4). We reviewed the CT after surgery and found that there was a small thrombosis in the IVC and a fistula could be suspected (Figure 5).

OUTCOME AND FOLLOW-UP

After total pancreatectomy, amylase and lipase levels decreased; however, fever persisted, and pain and swelling in the left ankle and knee did not improve. Wound evisceration was noted 10 d postoperatively, and reoperation was performed. The patient died of uncontrolled infection on the 13th postoperative day.

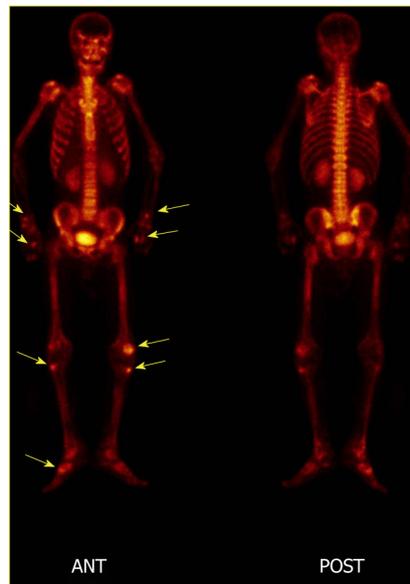


Figure 2 Bone scan. Small hot lesions on both wrist joints and knee joints are seen (yellow arrows).

DISCUSSION

The incidence of panniculitis owing to pancreatic disease is approximately 2%–3%^[3]. Very rarely, arthritis with intraosseous fat necrosis occurs together in these patients to form a triad of pancreatitis, panniculitis, and polyarthritis, referred to in the literature as the PPP syndrome. Only about 70 cases have been published, most of which are case reports and only estimate the pathogenesis of the syndrome^[4]. However, most authors believe that the pancreatic enzyme enters the systemic circulation for various reasons causing these symptoms to appear. In most cases, lipase levels were particularly increased; however, the degree of lipase does not indicate the severity of acute pancreatitis, but appears to be related to the degree of extra-pancreatic symptoms in PPP syndrome^[2].

Abdominal pain occurs in approximately 26% of patients^[1]. This lack of abdominal symptoms may lead to delayed diagnosis and contribute to an increase in the mortality rate for this syndrome. The mortality rate of PPP syndrome associated with acute and chronic pancreatitis is approximately 24%, while that associated with pancreatic cancer is approximately 74%^[1,5]. Early identification of the relationship between pancreatic disease, panniculitis, and arthritis is crucial.

PPP syndrome can occur at any age but is typically common among middle-aged men with a history of alcohol abuse^[6]. It may occur before, concurrently, or following the pancreatic manifestation. Primary pancreatic diseases include acute or chronic pancreatitis, pancreatic carcinoma, neuroendocrine carcinoma, insulinoma, ischemic pancreatic disease, abdominal trauma, and pancreatic duct stenosis. Some reports present cases of fistulas of pseudocyst and superior mesenteric vein; however, a fistula associated with inferior vena cava, as in the present case, has not been reported^[2]. However, in this case, there was no suspicion of fistula between the pseudocyst and IVC before surgery, and massive bleeding occurred during surgery. If a fistula is suspected, such intraoperative complications may be prevented. A small fistula may be difficult to detect during surgery; however, if thrombosis is observed in the superior mesenteric vein, portal vein, or IVC on preoperative imaging, a fistula may be suspected^[2].

In PPP syndrome, pancreatic panniculitis usually causes erythematous brown, exquisitely tender, edematous subcutaneous nodules in the lower limb. The size of the lesion may vary, and oily viscous material, formed by spontaneous ulceration of the adipocytes may be released. These skin lesions naturally improve with decrease in the inflammation of the pancreas^[7]. These lesions are seen histologically as lobular panniculitis without vasculitis. A characteristic necrotic adipocyte called a “ghost cell” is observed; however, these findings are not seen in other forms of panniculitis^[8]. The osteoarticular symptoms are polyarthritis, polyserositis, and intramedullary fat necrosis. Most joint symptoms appear before the diagnosis of pancreatic disease. The ankles, knees, and wrists are the commonly involved joints; however, multiple joints may be simultaneously involved. On synovial aspiration, a creamy substance with high fat content and high viscosity is observed. MRI is more sensitive than



Figure 3 Magnetic resonance imaging of knee. Diffuse multifocal ischemia or infarction is seen in the bone marrow spaces of the left knee (yellow arrows).

conventional radiographs and enables detection of intraosseous fat necrosis^[9].

Treatment is primarily supportive and targets the underlying pancreatic disease. In the case of chronic pancreatitis owing to pancreatic duct stricture, relief of stenosis with pancreatic duct stent insertion may improve pancreatitis, panniculitis, and arthritis. In addition, when PPP syndrome occurs owing to pancreatic cancer, appropriate surgical resection is necessary^[1]. Even if fistula of the pseudocyst and superior mesenteric vein or portal vein occurs, surgical treatment is required to reconstruct the superior mesenteric vein and portal vein by removing the fistula^[2]. Surgical correction is also needed when fistula with IVC occurs simultaneously. In some cases, octreotide may be administered to reduce the production of pancreatic enzymes and improve symptoms. Administration of glucocorticoids and NSAIDs to improve skin lesions and arthritis is usually ineffective^[1].

CONCLUSION

Polyarthritis with lobular panniculitis is a rare complication of pancreatic disease, which may occur weeks or months prior to the appearance of the underlying pancreatic disease. Skin lesions occurring in patients suspected of suffering from pancreatic disease may be important evidence, and histological findings of these skin lesions are pathognomonic. Early diagnosis is important, and the relationship of panniculitis, arthritis, and pancreatic disease should be considered. Treatment of the causative pancreatic disease may improve the symptoms associated with it. In such cases, it is necessary to confirm involvement of the main blood vessels and formation of a fistula in patients with PPP syndrome so that complications may be avoided in patients who need surgery.

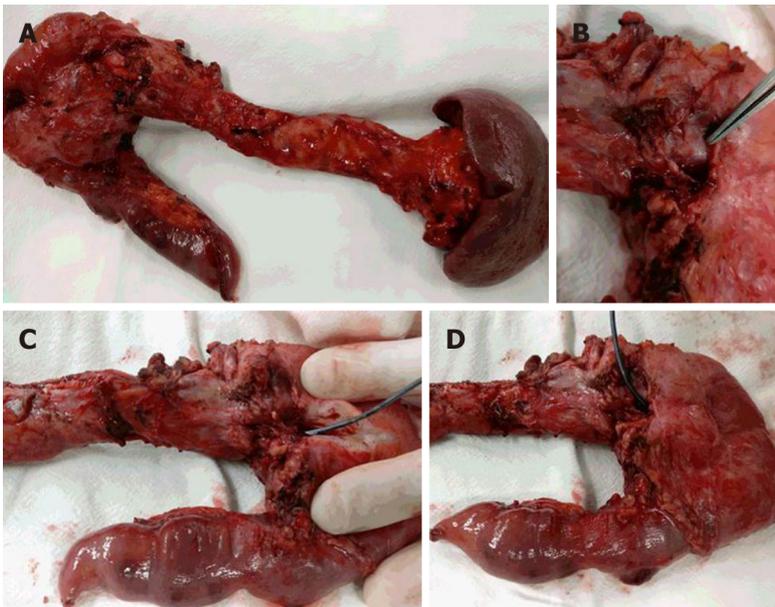


Figure 4 Surgical specimen. A: Total pancreatotomy with splenectomy performed; B: A pseudocyst is seen at the posterior aspect of the head of the pancreas; C and D: The probe proceeding to the main pancreatic duct through the pseudocyst.

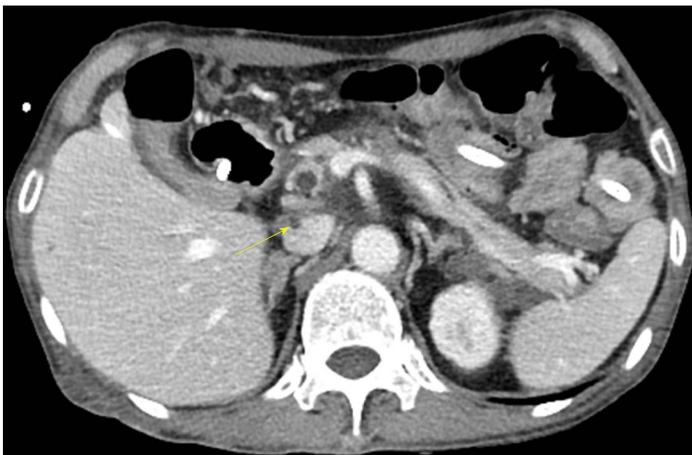


Figure 5 Computed tomography of the pancreas. Thrombosis in the inferior vena cava (yellow arrow) is seen.

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