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CASE REPORT

Isolated Right Internal Jugular Vein Thrombosis: a Rare Complication of Acute Pancreatitis — a Case Report

Reshma Kaushik[1] · Arpit Punetha[1] · Madhurima Kaushik[2] · Tarun Joshi[3] · Rajeev M. Kaushik[1]

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Abstract

Vascular complications particularly splanchnic vein thrombosis can occur in acute as well as chronic pancreatitis, but extra-splanchnic thrombosis occurs rarely. We report a rare case of acute pancreatitis complicated by isolated internal jugular vein thrombosis. A 26-year-old Indian woman presented with complaints of severe epigastric pain radiating to the back, vomiting, and abdominal distension. Investigations showed low hemoglobin and serum calcium, and a raised serum amylase and lipase. Contrast-enhanced computerized tomography (CECT) of the abdomen suggested acute pancreatitis with bilateral pleural effusion and mild ascites. The patient was managed for acute pancreatitis with antibiotics, analgesics, pantoprazole, and other supportive treatment. She subsequently developed pain and swelling on the right side of the neck. Ultrasound Doppler examination of the neck revealed an isolated thrombus in the right internal jugular vein (IJV). The patient was started on enoxaparin and transitioned to warfarin. The patient improved symptomatically and was discharged on warfarin. A follow-up ultrasound Doppler examination showed a partial resolution of the clot. The patient was maintained on oral anticoagulants for 6 months. Isolated IJV thrombosis may complicate acute pancreatitis. A timely diagnosis and prompt treatment are critical for a positive outcome.

Keywords Acute pancreatitis · Extra-splanchnic thrombosis · Internal jugular vein thrombosis · Thrombosis · Venous thrombosis

Introduction

Acute pancreatitis is an acute inflammatory process of the pancreas associated with local tissue damage which may lead to a systemic inflammatory response [1]. The most common etiologies are alcohol and gallstones but idiopathic cases may also be seen [2]. Vascular thrombosis is one of the complications that can occur in pancreatitis and involves the splenic vein, portal vein, and superior mesenteric vein more frequently [3]. Extra-splanchnic thrombosis is uncommon, particularly in the internal jugular vein and inferior vena cava [4]. We report a rare case of acute pancreatitis complicated by isolated internal jugular vein thrombosis.

Case Presentation

A 26-year-old Indian woman presented with complaints of pain in the abdomen for 4 days, abdominal distension, and vomiting for 3 days. The pain was severe, more localized to the epigastric region, and radiated toward her back. It subsided on taking analgesics. Initially, the pain was associated with 3–4 episodes of vomiting. The vomiting was non-bilious and non-projectile and was relieved on taking medications. There were no complaints of fever or jaundice. There was no history suggestive of peptic ulcer disease. The patient was a non-smoker and non-alcoholic. She was married and had her last menstrual period 2 weeks ago. She was

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✉ Reshma Kaushik
reshma.kaushik@rediffmail.com;
reshmakaushik@srhu.edu.in

[1] Department of General Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, P.O. Jolly, Grant-248016 Dehradun, Uttarakhand, India

[2] Department of Ophthalmology, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Uttarakhand, Dehradun, India

[3] Department of Radiodiagnosis, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun, Uttarakhand, India

not using oral contraceptive pills. Examination of the patient revealed a blood pressure of 120/70 mm Hg, pulse rate of 110/min, and respiratory rate of 20/min. Her body mass index (BMI) was 23 kg/m^2. Icterus, cyanosis, clubbing, lymphadenopathy, ascites, and pedal edema were absent. Pallor, tachycardia, and marked epigastric tenderness were present.

Investigations showed hemoglobin 6.6 g/dL, total red blood cell (RBC) count 3.46 million/mm^3, packed cell volume (PCV) 23.4%, white blood cell (WBC) count 11,900/mm^3, and platelet count 223,000/mm^3. The peripheral blood film showed a microcytic hypochromic picture. Random blood sugar was 124 mg/dL, blood urea nitrogen 21 mg/dL, serum creatinine 1.1 mg/dL, amylase 801 IU/L, lipase 703 IU/L, corrected calcium 8.32 mg/dL, and prothrombin time (PT) 12.1 s. Liver function tests, serum electrolytes, and lipid profile were normal. Hepatitis and HIV markers were negative. Serum ferritin was 115.6 ng/mL, iron 55 mcg/dL, total iron binding capacity (TIBC) 401 mcg/dL, and vitamin B_{12} 285 pg/mL. Urine and stool examination reports were normal. Contrast-enhanced computerized tomography (CECT) of the abdomen showed a diffusely bulky pancreas with heterogeneous attenuation and peripancreatic fat stranding representing acute pancreatitis. Few non-enhancing areas in the head, body, and tail of the pancreas were seen. There was no evidence of calcification or dilatation of the pancreatic duct. Bilateral pleural effusion, mild ascites, and edema-induced subcutaneous fat stranding in the entire abdominal wall were appreciated. The modified CT severity index was 8. Chest X-ray showed bilateral pleural effusion predominantly on the right side (Fig. 1). A diagnosis of acute pancreatitis with severe anemia with hypocalcemia with bilateral pleural effusion and ascites was made. Anemia was attributed to iron deficiency.

The patient was treated conservatively with intravenous fluids, antibiotics (intravenous meropenem) to prevent secondary pancreatic infection, analgesics, pantoprazole, and other supportive treatment. The patient was kept nil by mouth and Ryle's tube was inserted. Right-sided thoracocentesis was done and about 1 L of fluid was removed. Pleural fluid was straw-colored, exudative in nature, and characterized by high amylase. Pleural fluid adenosine deaminase (ADA) was 18 U/L. Polymerase chain reaction (PCR) assay was negative for *Mycobacterium tuberculosis*/non-tuberculous mycobacteria.

After 4 days, the patient was started on an oral liquid diet followed by a semi-solid diet. Sequential X-rays showed the resolution of the pleural effusion. After 10 days of illness, the patient complained of swelling and pain on the right side of the neck with fever, difficulty in swallowing, and mild headache. The patient did not have any previous instrumentation to the IJV or any indwelling lines like central venous catheter (CVC) or peripherally inserted central catheter (PICC) line. There was no history of trauma to the neck,

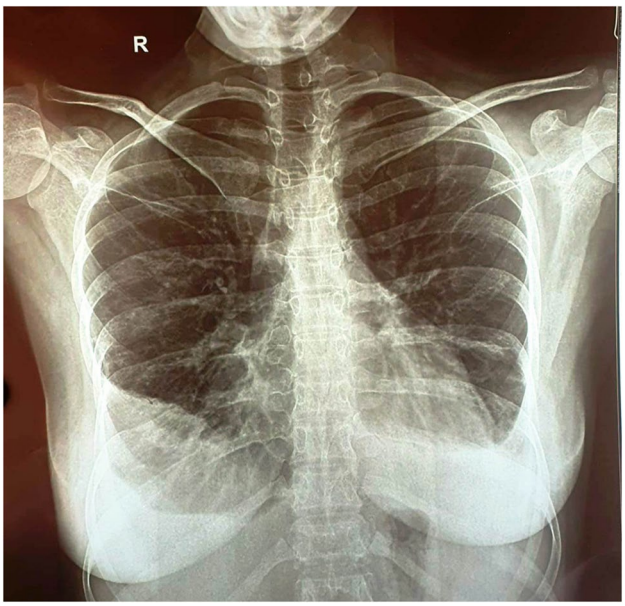

Fig. 1 X-ray chest showing bilateral pleural effusion mainly on the right side

prior deep venous thrombosis, or intravenous drug abuse. Local examination revealed tenderness and swelling over the right side of the neck. Fundoscopic examination of the eyes was normal. Investigations showed hemoglobin 8.24 g/dL, WBC count 11,200/mm^3, platelet count 254,000/mm^3, erythrocyte sedimentation rate (ESR) 54 mm in the first hour, serum ferritin 207.64 ng/mL, procalcitonin 0.07 ng/mL, and thyroid stimulating hormone (TSH) 0.51 mIU/mL. The real-time polymerase chain reaction (RT-PCR) test was negative for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA. Blood and urine cultures were sterile. PT, activated partial thromboplastin time (aPTT), and thrombin time (TT) were normal. D-Dimer test was positive — 4.74 µg/mL (FEU). Ultrasonographic examination of the neck revealed an ill-defined hetero-echoic material in the right internal jugular vein (IJV) for a craniocaudal span of 5–6 cm which occupied the whole lumen of the vein. Right IJV was dilated and non-compressible with no color flow on color Doppler examination, which was suggestive of venous thrombosis. Other great vessels appeared normal (Fig. 2). A diagnosis of right IJV thrombosis was made. In view of IJV thrombosis, the patient was further evaluated for a hypercoagulable panel including homocysteine, protein C and S, antithrombin III, factor V Leiden, and antiphospholipid antibodies which were normal.

The patient was started on subcutaneous enoxaparin 40 mg subcutaneously twice daily and oral anticoagulants (warfarin 4 mg once daily) with other symptomatic treatment. On achieving the appropriate prolongation of the international normalized ratio (INR) after 5 days of

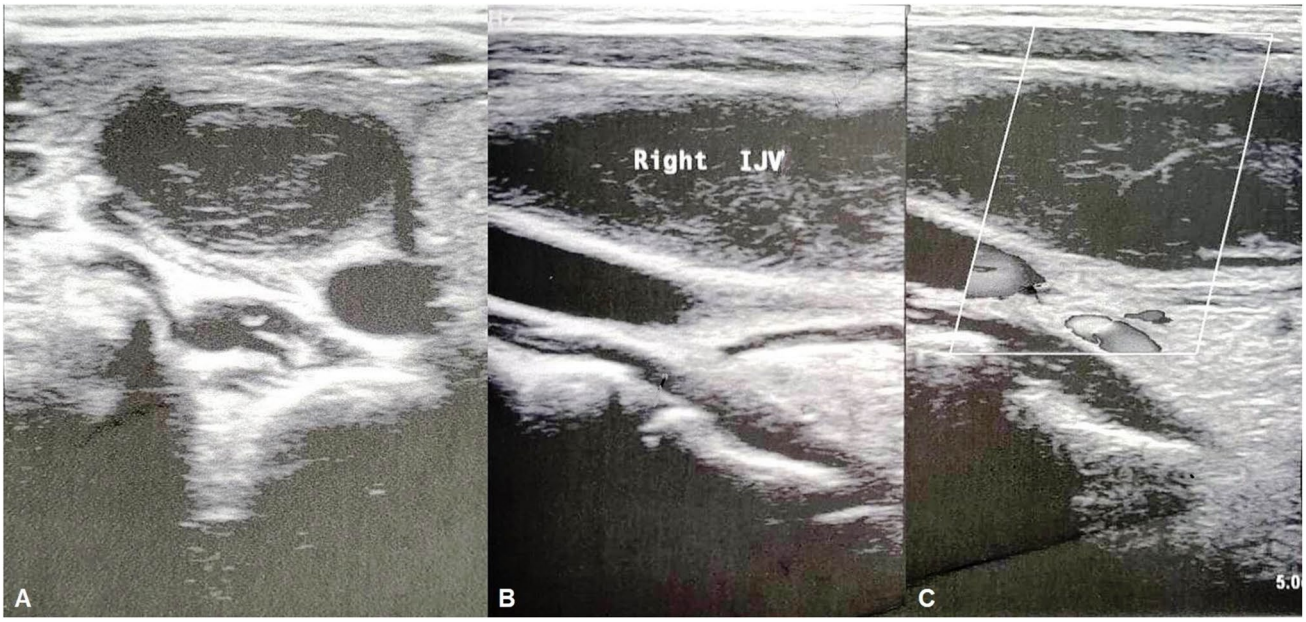

Fig. 2 Axial (**A**) and longitudinal (**B** and **C**) gray images showing distended right internal jugular vein with echogenic content within. Color Doppler images show no flow within.

treatment with warfarin, enoxaparin was discontinued. The neck swelling and pain started to subside after 7 days of anticoagulant therapy. The patient improved symptomatically and was discharged after 15 days on antibiotics (faropenem 200 mg twice daily orally) to prevent subsequent sepsis and septic emboli, warfarin 3 mg daily, oral iron, and other supportive treatment. Venous Doppler examination during follow-up after 3 months showed a partial resolution of the clot with few venous collaterals. The patient was maintained on warfarin for 6 months and is presently doing well.

Discussion

Vascular complications like venous thrombosis, arterial erosion, hemorrhage into pseudocyst, and varices formation develop in around 25% of patients with acute pancreatitis. Thrombosis of veins is a relatively uncommon complication with an incidence of 1–2% [3]. Venous thrombosis most commonly occurs in the splanchnic circulation, most commonly the splenic vein (40%) while the portal vein and superior mesenteric vein also are frequently involved [5, 6]. Thrombosis of splanchnic veins supposedly results from direct inflammatory insult caused by the release of proteolytic and lipolytic enzymes from inflamed pancreatic tissue, extrinsic compression by the edematous gland, and fluid collection or hypercoagulable state [7, 8].

The involvement of extra-splanchnic circulation is quite uncommon in patients with pancreatitis [9]. Inflammatory vasculitis and a generalized hypercoagulable state are postulated as causes of extra-splanchnic venous thrombosis [8]. Ma et al. reported a case of inferior vena cava thrombosis along with renal vein thrombosis [11]. Parikh et al. reported a rare case with subclavian vein, superior and inferior vena cava, and internal jugular vein thromboses with normal splanchnic circulation [8]. Similarly, Patel et al. also observed a case with suprahepatic inferior vena cava and internal jugular vein thrombosis [4] while recently Atif and Hamed reported a case with bilateral internal jugular vein and subclavian vein thromboses [12]. Another rare but recognized vascular complication of pancreatitis is pulmonary embolism [13, 14].

Isolated thrombi have also been reported in the IVC [10] and the renal vein [9]. To the best of our knowledge, isolated internal jugular vein thrombosis observed by us has not been reported earlier as a complication of acute pancreatitis. The absence of risk factors predisposing to venous thrombosis like obesity, smoking, pregnancy, oral contraceptive pills, prior deep vein thrombosis, and prolonged immobilization suggests that IJV thrombosis could be attributed to acute pancreatitis. Moreover, the absence of common etiological factors like prolonged central venous catheterization, trauma to the neck, any obvious malignancy, sepsis, and hypercoagulable states like hyperhomocysteinemia, protein C deficiency, protein S deficiency, antithrombin III deficiency, antiphospholipid antibodies, and polycythemia too supports this presumption. Also, the normal ovaries shown by the CECT examination negate the possibility of ovarian hyperstimulation syndrome (OHSS) as a cause of IJV thrombosis. The presence of co-existing anemia, pleural effusion, and

unusual complication of isolated IJV thrombosis could delay the diagnosis of IJV thrombosis with an adverse impact on the outcome. However, an early diagnosis of the IJV thrombosis by ultrasound Doppler led to its proper management and a positive outcome in our case.

Conclusions

Isolated internal jugular vein thrombosis may occur rarely in acute pancreatitis. Awareness of such complications aids in early detection and prompt management of the patient and prevents further morbidity and mortality.

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Author Contribution RK and RMK conceived the work. RK, AP, MK, and TJ contributed to the diagnosis and treatment. AP prepared the initial manuscript. RK, RMK, MK, and TJ revised the manuscript critically for important intellectual content. All authors read and approved the final manuscript.

Data Availability Data can be obtained from the corresponding author on reasonable request.

Code Availability Not applicable.

Declarations

Ethics Approval Not applicable. The procedures followed in this report were in accordance with the Helsinki Declaration of the World Medical Association.

Consent to Participate Not applicable.

Consent for Publication A written consent was obtained from the patient for the publication of this case report and any accompanying images.

Competing Interests The authors declare no competing interests.

References

1. Peery AF, Dellon ES, Lund J, et al. Burden of gastrointestinal disease in the United States: 2012 update. Gastroenterology. 2012;143(5):1179–87.
2. Imamura M. Epidemiology of acute pancreatitis - incidence by etiology, relapse rate, cause of death and long-term prognosis. Nihon Rinsho. 2004;62(11):1993–7 (Japanese).
3. Mallick IH, Winslet MC. Vascular complications of pancreatitis. JOP. 2004;5(5):328–37.
4. Patel AN, Patel MM, Patel KR. Suprahepatic inferior vena cava and internal jugular vein thrombosis: a rare complication of pancreatitis: case report. Int J Med Res Rev. 2014;2(6):621–3.
5. Bernades P, Baetz A, Levy P, et al. Splenic and portal venous obstruction in chronic pancreatitis. A prospective longitudinal study of a medical-surgical series of 286 patients. Dig Dis Sci. 1992;37:340–6.
6. Antony SJ, Loomis T, Brumble L, et al. Inferior vena cava thrombosis associated with acute pancreatitis: an unusual vascular complication. Angiology. 1994;45:1009–14.
7. Barge JU, Lopera JE. Vascular complications of pancreatitis: role of interventional therapy. Korean J Radiol. 2012;13:S45–55.
8. Parikh H, Shukla A, Aswani Y, et al. Multiple extra-splanchnic venous thromboses: a rare complication of pancreatitis. A case report. JOP. 2012;13:317–9.
9. Van Gansbeke D, Struyven J. Renal vein thrombosis in a case of pancreatitis. J Belge Radiol. 1985;68:468–9.
10. Stringer MD, Michell M, McIrvine AJ. Inferior vena caval thrombosis complicating acute pancreatitis. Case report. Acta Chir Scand. 1988;154:161–3.
11. Ma SK, Kim SW, Kim NH, et al. Renal vein and inferior vena cava thrombosis associated with acute pancreatitis. Nephron. 2002;92:475–7.
12 Atif QAA, Hamed A. Isolated internal jugular and subclavian vein thrombosis: a rare complication of pancreatitis - a case report. J Pak Med Assoc. 2022;72(4):752–4.
13. Ohta H, Hachiya T. A case of inferior vena cava thrombosis and pulmonary embolism secondary to acute exacerbation of chronic pancreatitis: a rare finding in radionuclide venography. Ann Nucl Med. 2002;16:147–9.
14. Zhan Q, Zhang QX, Tan XP, et al. Pulmonary embolism with acute pancreatitis: a case report and literature review. World J Gastroenterol. 2012;18:583–6.