Pylephlebitis as a Complication of Sigmoid Diverticulitis: Report of Two Cases and Review of the Literature

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ABSTRACT

Pylephlebitis is a rare but serious complication of intra-abdominal infections, especially acute diverticulitis. It is characterized by septic thrombosis of the portal venous system and has potential consequences such as liver abscesses and sepsis.We present two clinical cases that illustrate the diverse presentation and management of this condition. Both patients were diagnosed using computed tomography and Doppler ultrasound. They were treated with broad-spectrum antibiotics and had favorable outcomes. The importance of early diagnosis and timely treatment to improve prognosis is discussed.

Keywords: *Pylephlebitis; Diverticulitis; Portal thrombosis; Liver abscess; Sepsis*

INTRODUCTION

Pilephlebitis, also known as septic thrombosis of the portal system, is a rare complication of gastrointestinal infections or abdominal inflammatory processes. It has an estimated incidence rate of 0.3 to 2.7 cases per 100,000 individuals. It is characterized by thrombosis of the portal vein or its branches resulting from a septic embolism that originates in a pyogenic inflammatory focus and spreads to the mesenteric veins. This process activates the inflammatory cascade through the interaction between pathogens and the vascular endothelium.[1]

The main cause of septic portal thrombophlebitis is acute diverticulitis. Diagnosis requires a high level of suspicion because the symptoms are nonspecific, and there are no definitive signs of the disease. It should be considered in the differential diagnosis of cholangitis, liver abscesses, or pancreatitis, especially when persistent fever is accompanied by abdominal pain, abnormal liver function tests, and bacteremia without an obvious source. The primary diagnostic tool is a computed tomography (CT) scan with oral and intravenous contrast, as it enables the identification of thrombosis and its etiology. Although there is no specific image, this study can identify an infectious source, such as acute diverticulitis, which guides the definitive diagnosis.[2]

Empirical treatment should be initiated promptly, covering both enterobacteria and anaerobes, and then adjusted according to the antibiogram.[1] While the initial approach involves medical treatment, urgent surgical intervention may be necessary due to complications such as intestinal perforation.[3]

The objective of this study is to present two cases of patients with pylephlebitis and to provide an update on the available literature.

CASE 1

A 62-year-old male patient consulted for abdominal pain that had been present for several days, located in the left iliac fossa, and associated with hematuria and fever. He subsequently developed jaundice and abdominal distension. Diverticular disease was his only relevant medical history.

Physical examination revealed hemodynamic instability, mucocutaneous jaundice, and overweight, with a body mass index of 30.8. His abdomen was distended and painful in the left iliac fossa, with guarding and rebound tenderness. Laboratory tests revealed leukocytosis, neutrophilia, and elevated C-reactive protein.

A CT scan revealed signs of complicated diverticulitis in the sigmoid colon, with no cleavage plane with the bladder, an apparent fistulous tract, and a pericolic abscess (Hinchey Ib). Additionally, air bubbles were observed in the inferior mesenteric, portal, and splenic veins, findings consistent with pyelophlebitis (Fig. 1).

Figure 1. *Computed tomography of the abdomen, coronal section. The presence of an air bubble within the splenomesenteric trunk is observed (arrow).*

The patient was stabilized hemodynamically in the intensive care unit, and a transverse loop colostomy was subsequently performed. The patient was administered a combination of anticoagulants and antibiotics, consisting of piperacillin-tazobactam and vancomycin, for 26 days. He was discharged from the hospital 28 days after surgery due to favorable progress. At the 15-day follow-up appointment at the coloproctology clinic, the patient was asymptomatic.

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CASE 2

A 39-year-old male patient consulted for pain in the left iliac fossa that had been present for nine days, initially associated with diarrhea. The pain became constant, radiating to the epigastrium and right upper quadrant, and was accompanied by fever. Laboratory tests showed leukocytosis, neutrophilia, and abnormal liver function tests.
An abdominal CT scan with intravenous contrast revealed a heterogeneous liver with diffuse hypodense lesions. Sigmoid diverticulitis was identified, with parietal thickening and rarefaction of regional fat, associated with the presence of air bubbles in the portal vein, inferior mesenteric vein, and splenic vein. A Doppler ultrasound of the liver revealed a thrombus in the vena cava (Fig. 2).

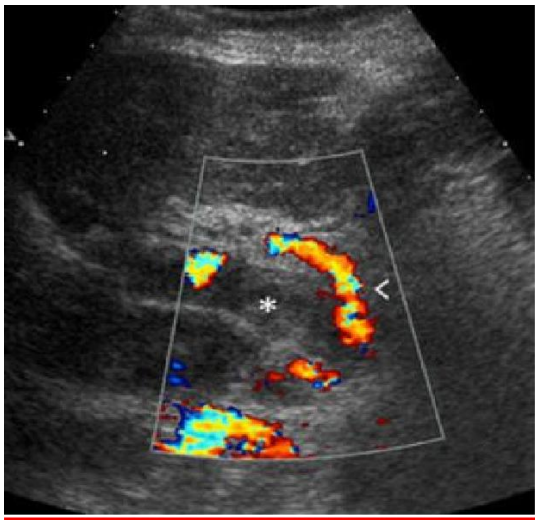

Figure 2. *Echo-Doppler showing a 22 mm portal vein with echogenic material completely obstructing its lumen, findings consistent with a portal vein thrombosis.*

The patient was admitted to the Intensive Care Unit and began receiving an empirical, broad-spectrum antibiotic treatment consisting of piperacillin-tazobactam and metronidazole. Given the presence of multiple liver abscesses and extensive portal vein thrombosis, anticoagulation with low molecular weight heparin was indicated. Percutaneous drainage guided by imaging was performed on liver abscesses larger than 5 cm. Due to the persistence of the primary septic focus, surgical intervention with loop colostomy was indicated as initial management of complicated diverticulitis.
The patient exhibited marked improvement in his general condition and a decline in inflammatory parameters. Follow-up imaging revealed a reduction in the size of the hepatic collections and recanalization of the portal system. He completed a four-week course of intravenous antibiotic treatment and was instructed to continue with outpatient anticoagulation.
He was discharged from the hospital after 30 days, with follow-up scheduled at the coloproctology and hepatology clinic. Successive check-ups showed favorable progress. There were no infectious relapses or hepatic sequelae.

DISCUSSION

Pilephlebitis is a rare condition, but it can lead to significant morbidity and mortality if not identified and treated promptly. Its etiology is linked to intra-abdominal infectious processes that drain into the portal venous system. The most common cause of this condition in adults is acute colonic diverticulitis. Other causes include appendicitis, cholecystitis, inflammatory bowel disease, and pancreatitis.[4,5]

From a pathophysiological perspective, pylephlebitis results from the spread of a pyogenic infection to the splanchnic venous system, triggering an endothelial inflammatory response. This interaction promotes the formation of septic thrombi and the eventual spread of septic emboli to the liver, which can lead to the formation of liver abscesses,[6] as evidenced in the second clinical case.
Clinical diagnosis is often challenging due to the nonspecific nature of the symptoms. Patients may present with persistent fever, abdominal pain, and abnormal liver function tests in the context of an infection without an apparent focus. Given these findings, it is essential to consider pylephlebitis in the differential diagnosis, especially in the presence of a history of diverticular disease or previous abdominal infections.[7]
A contrast-enhanced CT scan is the preferred study because it allows visualization of the septic source and the extent of thrombosis. It can also detect indirect signs, such as air in the portal system or liver lesions that suggest the presence of an abscess.[8] Doppler ultrasound can be used to complement the diagnosis by revealing intravascular thrombi and portal flow abnormalities.
Treatment with broad-spectrum antibiotics that cover enterobacteria and anaerobes should be started early. It is recommended to start treatment with piperacillin-tazobactam or carbapenems combined with metronidazole, which can be adjusted according to the results of the cultures.[9] In both clinical cases presented, the choice and duration of antimicrobial treatment were appropriate, resulting in a good clinical response.
The use of anticoagulants remains controversial. Although there are no conclusive randomized studies, several observational studies suggest that anticoagulants may slow thrombus progression, reduce the risk of intestinal ischemia, and promote venous recanalization.[10] Anticoagulation was initiated in our patients with favorable results.
The indication for surgical intervention is not initially present, but rather in the context of complications arising from the primary septic focus, such as perforation, peritonitis, or abdominal abscesses. We performed a colostomy in both patients as part of the management of abdominal sepsis secondary to complicated diverticulitis, achieving satisfactory clinical outcomes.
The development of clinical management algorithms facilitates the systematic evaluation and treatment of this pathology, optimizing the diagnostic-therapeutic approach and enhancing the overall prognosis of the patient.

CONCLUSION

Pilephlebitis, a rare but potentially fatal complication of intra-abdominal infections, is most commonly associated with acute diverticulitis. Early diagnosis requires a high level of clinical suspicion supported by imaging studies, such as an abdominal CT scan and Doppler ultrasound. Empirical treatment with broad-spectrum antibiotics should begin early and be adjusted according to microbiological results. In select cases, particularly when there is extensive thrombosis or progressive vascular compromise, anticoagulation may be considered. Surgical intervention should be reserved for complications associated with the primary infectious focus.

REFERENCES

1. Fusaro L, Di Bella S, Martingano P, Crocè LS, Giuffrè M. Pylephlebitis: a systematic review on etiology, diagnosis, and treatment of infective portal vein thrombosis. *Diagnostics.* 2023;13(3):429.
2. Rajesh S, Mukund A, Arora A. Imaging diagnosis of splanchnic venous thrombosis. *Gastroenterol Res Pract.* 2015;2015:101029.
3. Plemmons RM, Dooley DP, Longfield RN. Septic thrombophlebitis of the portal vein (pylephlebitis): diagnosis and management in the modern era. *Clin Infect Dis.*1995;21(5):1114–1120.
4. Baril N, Wren SM, Radin R, Ralls PW, Stain SC. The role of anticoagulation in pylephlebitis. *Am J Surg.* 1996;172(5):449–452.
5. Kanellopoulou T, Alexopoulou A, Theodossiades G, Mariolis-Sapsakos T, Archimandritis AJ. Pylephlebitis: an overview of non-cirrhotic cases and factors related to outcome. *Scand J Infect Dis.* 2010;42(11-12):804–811.

6. Saxena R, Adolph M, Ziegler JR, Murphy W, Rutecki GW. Pylephlebitis: a case report and review of outcome in the antibiotic era. *Am J Gastroenterol*. 1996;91(6):1251–1253.
7. Choudhry AJ, Baghdadi YM, Amr MA, Alzghari MJ, Jenkins DH, Zielinski MD. Pylephlebitis: a review of 95 cases. *J Gastrointest Surg*. 2016;20(3):656–661.
8. Ben-Ami R, Bakhanashvili M, Katz DE, et al. Pylephlebitis associated with appendicitis: case report and review. *Scand J Infect Dis*. 2003;35(10):709–711.
9. Naymagon L, Tremblay D, Schiano T, Mascarenhas J. The role of anticoagulation in pylephlebitis: a retrospective examination of characteristics and outcomes. *J Thromb Thrombolysis*. 2020;49(2):325–331.
10. Flores-Anaya L, León-Lozada C, Torres-Damas W. Pylephlebitis: case report and literature review. *Medwave*. 2015;15(8):e6258.