Septic Pylephlebitis of the Inferior Mesenteric Vein Secondary to Diverticulitis: A Case Report

Cabilao-Maala S
Garcia ACR
Valdez CM
Macatula T

The Medical City
Ortigas Avenue, Pasig City
Philippines

Correspondence:
Dr. Stephanie Cabilao-Maala
cabz_stephanie@yahoo.com

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Abstract

Background: Pylephebitis is a rare complication of intraabdominal infections, with diverticulitis being the most common inciting condition. Due to its high mortality rate, a high index of suspicion is needed, and proper diagnostic work-up including radiologic imaging is important. *Case Presentation:* We report a 56-year-old Filipino male, who presented with a one-week history of fever, chills and abdominal bloatedness. Physical examination showed icteric sclerae and epigastric tenderness. Laboratory tests showed leukocytosis and liver function typical of a cholestatic jaundice. Ultrasound of the abdomen showed acalculous cholecystitis and abdominal CT scan revealed sigmoid diverticulitis with pylephlebitis of the inferior mesenteric vein. He was started on intravenous piperacillin-tazobactam and heparin drip. Antibiotics were later shifted to intravenous meropenem and oral warfarin with eventual resolution of both the thrombosis and the diverticulitis. *Recommendation:* Septic pylephlebitis is associated with high morbidity and mortality. Early diagnosis with appropriate imaging is important in order to initiate life-saving therapy with antibiotics and anticoagulation.

Keywords: anticoagulation, septic pylephlebitis, sigmoid diverticulitis, thrombophlebitis

Introduction

Colonic diverticulitis is defined as inflammation and/or infection of the diverticulum. Symptoms depend on the severity of inflammation as well as the location of the diverticulum. Approximately 25% of patients would have associated complications such as abscess, obstruction, fistula or perforation.[1] Pylephlebitis or thrombophlebitis of the portomesenteric venous system is a rare complication of diverticulitis, and can potentially cause death if not recognized early on.

Case Report

A 56-year old hypertensive Filipino male presented to the emergency room due to a one-week history of dyspnea, fever, chills, easy fatigability and abdominal bloatedness. Vital signs revealed blood pressure of 140/90, heart rate of 100 beats per minute, respiratory rate of 18 per minute, and a temperature of 37.4^{0}C. SpO_2 was 95% at room air. Further examination revealed icteric sclerae, regular heart rhythm, bibasal crackles without wheezing, and epigastric and left lower quadrant tenderness. Laboratories showed leukocytosis (12.6 cells/L) with 6% band forms and 77% neutrophil predominance. Creatinine was slightly elevated at 1.38 mg/dl. Electrolytes were within normal limits. Liver function tests showed elevated total bilirubin at 6.48 mg/dl, direct bilirubin at 4.83 mg/dl, indirect bilirubin at 2.96 mg/dl, alkaline phosphatase at 299 mg/dl, normal ALT and AST at 52 IU/L and 95 IU/L, respectively.

Cholestatic jaundice with a probable intraabdominal infection was entertained. He was started on intravenous (IV) ceftriaxone and metronidazole. Ultrasound of the upper abdomen revealed a thickened gallbladder wall without any intraluminal stones or

densities, indicating acalculous cholecystitis. A CT scan of whole abdomen with IV contrast showed the presence of multiple saccular outpouchings at the ascending, transverse, descending and sigmoid colon with surrounding fat stranding densities at the distal descending and proximal sigmoid colonic segments, indicating acute diverticulitis (**Figure 1**). Furthermore, contrast study showed poor opacification of the inferior mesenteric vein (IMV) with surrounding fat stranding densities along the course of the IMV and its tributaries including the left colic vein and sigmoidan veins. This was indicative of thrombophlebitis of the IMV, left colic and sigmoidan veins.

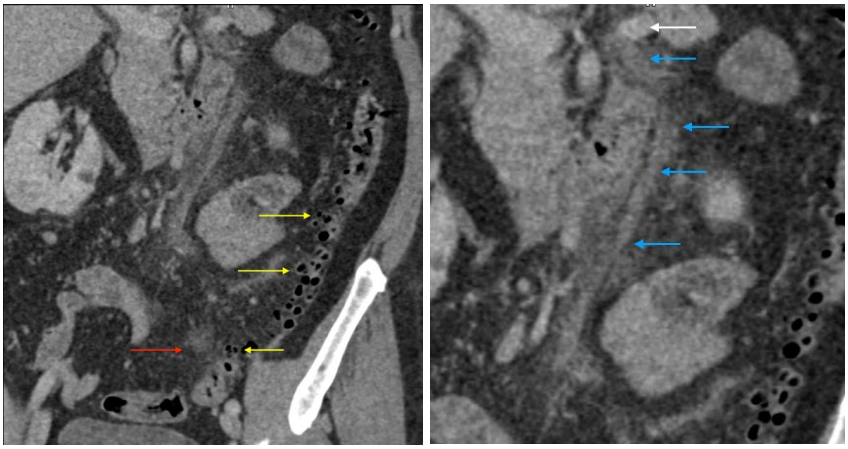

Figure 1. Contrast CT scan findings. (A) Multiple saccular outpouchings (yellow arrow) at the ascending, descending and sigmoid colon with fat stranding (red arrow) noted at the distal descending and proximal sigmoid colon. (B) Contrast study showing poor opacification of the inferior mesenteric vein (blue arrow) with surrounding fat stranding densities (white arrow) along the course of the IMV and its tributaries.

Anticoagulation with heparin drip was started for the thrombophlebitis. Antibiotics were shifted to piperacillin/tazobactam for empiric coverage and later to meropenem. Blood cultures were taken, and no organisms were isolated. Work-up for a hypercoagulable state included protein C, protein S, anti-thrombin III, antiphospholipid antibodies, lupus anticoagulant and factor V, the results of which were all inconclusive. There was noticeable improvement of the patient's symptoms, with lysis of fever and resolution of abdominal pain, jaundice and bloatedness. After completing 14 days of IV antibiotics, he was discharged stable and advised to continue anticoagulation with plans to continue oral warfarin for six months. A follow-up CT scan (**Figure 2**) was done four weeks later and showed resolution of both diverticulitis and the IMV thrombosis.

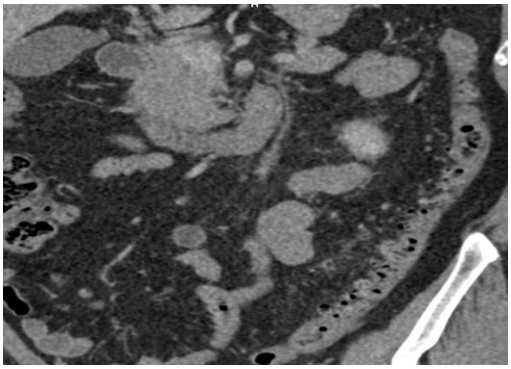

Figure 2. Follow-up CT scan (four weeks from initial CT): resolution of acute diverticulitis and thrombosis in IMV.

Discussion

Pylephlebitis is an infective suppurative thrombosis of the portal vein that develops secondary to an intraabdominal or pelvic infection draining into the portal venous system.[2] The right portal vein is identified as the most common site of thrombosis (33%), whereas the inferior mesenteric vein is the least common site (8%). Appendicitis was considered the most common inciting infection;[3] however, more recently, diverticulitis and other intra-abdominal infections have taken over. It is usually polymicrobial, and *Bacteroides fragilis* is the most commonly isolated organism in blood.[4] The symptoms are nonspecific; however, abdominal pain and fever are the most common findings at presentation.[5] Furthermore, mortality rate is high especially if complicated by hepatic abscess or bowel ischemia. Other nonspecific clinical features include fatigue, malaise, chills, nausea, vomiting diarrhea, anorexia, and weight loss. More advanced signs include hepatomegaly and jaundice. Laboratory testing is very nonspecific and no specific laboratory test points to the presence of pylephlebitis. Leukocytosis may be a common early finding, but both normal and decreased white blood cell counts have been noted in the literature. Liver function test abnormalities may or may not be present. In one study, blood cultures were found to be positive in 44% of patients[6] whereas other studies have shown the rate to be between 50 and 88%.[7] Pylephlebitis is diagnosed primarily by radiographic means. Doppler ultrasound and contrast-enhanced CT facilitate early diagnosis. Ultrasound may show portal vein thrombosis, and contrast-enhanced CT scan can display intraabdominal processes like appendicitis and diverticulitis as well as mesenteric and portal vein thrombosis, liver abscesses, and bowel ischemia.[8]

Antibiotics should be initiated once pylephlebitis is suspected and should cover for gram-negative bacilli, anaerobes, and aerobes. Antibiotics such as metronidazole, gentamicin, piperacillin, ceftizoxime, imipenem, and ampicillin have been associated with success; however, no empiric antibiotic regimen has been established.[9] Duration of antibiotic therapy hasn't been established either. In a report by Lim et al., there was clinical improvement in a patient with septic pylephlebitis after monotherapy with imipenem for two weeks.[10] On the other hand, results of a prior case series suggests a minimum of four weeks of antibiotic therapy.[2] Hepatic abscesses were found to be a frequent complication of pyelephlebitis and administering antibiotics for at least four weeks seemed prudent as developing abscesses may not be visualized on CT scan.

Our present case was treated initially with ceftriaxone and metronidazole, later on shifted to piperacillin/tazobactam, then finally to meropenem, since despite negative blood cultures, the patient had persistent fever episodes and abdominal pain. He was given a total of 14 days of IV antibiotics as in-patient and was sent home off antibiotics. Administration of antibiotics for less than the usual four weeks in the literature may still be as successful for as long as proper coverage is achieved. In this particular case, two weeks of antibiotic treatment (IV meropenem) was sufficient to give complete symptomatic relief together with anticoagulation.

Several case series and case reports describe the use of anticoagulation as part of their management; however, there is no clear consensus on its role in the treatment of pylephlebitis. Early anticoagulation in mesenteric and portal vein thrombosis is considered to minimize complications such as bowel ischemia and infarction. According to Baril et al., anticoagulation was recommended to be given only in patients with documented coagulation disorder or disease-associated hypercoagulable state.[11] Plemmons et al. noted a 100% survival rate among patients who received heparin, compared to 60% survival among those who did not.[2] Kanellopoulou et al. noted that the early use of anticoagulation in portal vein thrombosis may minimize serious sequelae and speed up recanalization.[4] Our patient underwent tests for hypercoagulable state. The results, however, were inconclusive; and no hypercoagulable state or thrombophilia was present. Anticoagulation was started, initially with heparin drip, eventually bridged to oral warfarin, which the patient continued as outpatient for six months.

No guidelines exist for when a repeat imaging should be done. Some suggest repeat imaging after completion of antibiotics. On follow-up, our patient had a repeat contrast abdominal CT scan which showed resolution of both diverticulitis and inferior mesenteric vein thrombosis. Although universally fatal in the pre-antibiotic era, the outcome of this infection has improved somewhat with modern diagnostic and therapeutic modalities.

Surgery is not usually required for the management of pylephlebitis. However, surgical drainage of the precipitating focus may be necessary in some cases.[12]

Conclusion

A case of septic pylephlebitis of the inferior mesenteric vein secondary to diverticulitis has been presented. Pylephlebitis is a rare complication of intraabdominal infections. Due to its high mortality rate, a high index of suspicion is needed, and proper diagnostic work-up, including radiologic imaging, is important. To the best of our knowledge, there has been no published study on its incidence in the Philippine setting. Ultimately, it should be treated aggressively and comprehensively with the objective of avoiding visceral ischemia, liver abscess, and chronic portal hypertension. Antibiotics are essential because uncontrolled infection, not visceral ischemia, is the primary threat to the patient's life.

In the context of data from case reports and series, further prospective randomized studies are recommended to establish duration of antibiotic use and to assess the need for anticoagulation.

Conflict of Interest

The authors declare no conflict of interest.

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