Portal vein thrombosis complicating appendicitis

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Summary
Appendicitis is still the most common acute surgical abdomen all over the world and its complications may be grave. We report an adult case of acute appendicitis complicated by Portal Vein Thrombosis (PVT) and ascending portomesenteric phlebitis treated successfully with antibiotics and anticoagulation with no residual morbidity. Review of published works on the subject matter is also presented.

Key words: Appendicitis, Portal vein thrombosis, Pylephlebitis, Anticoagulation, Appendicectomy

Résumé
L'appendicite demeure un abdomen chirurgical aigu le plus courant partout dans le monde entier et son implication pourrait être sévère. Nous rapportons le cas d'une appendicite aigue compliquée par Portal Veine Thrombose (PVT) et phlébite portomesentérique ascendante soignée conçu avec des antibiotiques et anticoagulation avec aucune morbidité résiduelle. Il s'agit également d'une présentation d'un bilan des travaux publiés sur le contenu de la recherche.

Introduction
Appendicitis is one of the common causes of intra-abdominal sepsis presenting as acute abdomen. If this condition is diagnosed early and appropriately treated, has a good prognosis but its complications may be grave. Portomesenteric vein thrombosis (PVT) with pylephlebitis is rare but it does occur and few of such cases have been reported in both children and adults 1,2. An adult case of appendicitis complicated by thrombopylephlebitis is hereby reported.

Case report
60-year-old man presented with two weeks history of right-sided lower abdominal pain, recurrent fever and rigors. The pain was said to be of sudden onset and worsened progressively over days. There was associated nausea and vomited three times since the onset of symptoms. He also lost his appetite and some weight with malaise. There was no history of similar pain in the past. He had bilateral laparoscopic inguinal hernia repair in 1997 and he is known to have hypertension on amlodipine 5mg and bendroflumazole 2.5mg.

He was ill-looking, febrile with rigors (temp 38.9 degree Celsius), jaundiced and dehydrated. Vital signs: HR-105/min, RR-18/c/min, BP-142/90mmHg, and SaO2-99% on room air. Abdomen was full and tender in the right iliac fossa but no rebounds. There was tender hepatomegaly of 10cm below the costal margin. Bowel sound was normoactive and digital rectal examination was essentially normal. Chest was clinically clear.

Investigations revealed elevated total bilirubin of 94mg/dl, alkaline phosphatase of 1196IU/L, alanine transerase of 51IU/L and amylase of 102. Hb was 13.3g/dl, total white cell count of 34.7 with 82% neutrophilia and platelets of 296, INR was 1.3 with APTT ratio of 1.4. Blood culture showed growth of Bacteroides fragilis sensitive to metronidazole and resistant to penicillin and ampicillin. Hepatitis serology was negative for hepatitis A, B, C viruses.

Abdominal ultrasound scan showed hepatomegaly, enlargement of both kidneys and normal gallbladder and pancreas. There was blood clot in the portal vein and an abnormality in the right iliac fossa suspected to be an

![CT scan of abdomen showing the partial occlusion of the portal vein by thrombus.](image-url)
Infamed thick walled appendix forming an inflammatory mass. CT scan confirmed same pathology with involvement of portomesenteric veins.

He was reassessed with fluids and electrolytes, analgesics and commenced on cefuroxime and metronidazole. Anticoagulation therapy with enoxaparin (Clexane) was started and eventually changed to warfarin used for six months. He was readmitted 3 months later after complete resolution of portomesenteric vein thrombosis for appendectomy and findings at operation included residual inflammatory mass with adherent retrocaecal appendix. Post operative course was uneventful and was discharged home second day post operatively.

Discussion

Portal thrombophlebitis usually occurs when there is ascending sepsis from the gastrointestinal tract into the portal system. This complication of intra-abdominal sepsis is rare and it has been reported in association with inflammatory bowel disease, appendicitis, diverticulitis, biliary tract infections, amoebic colitis, post operative intra-abdominal sepsis, necrotizing pancreatitis, umbilical vein infection, parapharyngeal sepsis and as part of generalised septicaemia 8, 10. It was previously reported that 50% of cases of appendicitis, diverticulitis, and other inflammatory bowel diseases were complicated by portal vein thrombosis and liver abscess before the advent of antibiotic therapy 11. Early diagnosis and use of antibiotics and prompt surgical treatment have reduced the incidence of ascending portal thrombophlebitis to 0.05% in acute appendicitis and 3% in rupture appendix 12. Septic pylephlebitis has been reported to be strongly associated with Bacteroides bacteraemia and this is the case in our patient whose blood culture yielded Bacteroides fragilis 13.

Patient with infected portal vein thrombosis clinically presents with abdominal pain, which may be predominantly right upper quadrant or may be localized to the primary site of intra-abdominal sepsis, spiking pyrexia, malaise, anorexia, weight loss and jaundice 13, 14. Portal vein thrombosis due to other causes rather than intra-abdominal sepsis expectedly does not present with fever but with abdominal pain, hepatosplenomegaly and ascites 13, 14, 15.

Imaging techniques are the diagnostic investigation of choice in PVT and in most cases its primary cause. The radiological features are variable and depend on the timing of diagnostic imaging in relation to the time of onset of thrombosis. Ultrasound is the first-line diagnostic technique because of its accuracy, non-invasive nature and low cost. There is also evidence that this modality has an acceptable sensitivity and specificity as far as the diagnosis or exclusion of appendicitis or appendicular mass is concerned in good hands. The use of colour Doppler imaging is added innovation and is especially helpful in the detection and diagnosis of PVT. There is absence of intraluminal flow signal with pulsed and colour Doppler imaging 10. Contrast-enhanced CT scan is quite effective in demonstrating PVT as a non-enhancing, low-density intraluminal defect. Contrast-enhanced CT scan has the advantage of better sensitivity and specificity over ultrasound of displaying both the luminal clot and hepatic parenchymal abnormalities. MR and CT angiography are other imaging tools, which are not routinely used in PVT caused by infective intra-abdominal lesions but in other pathology requiring shunt surgery or liver transplantation. They are required in pre-operative assessment and planning of these surgical interventions.

The standard treatment of PVT and pylephlebitis involves intravenous fluid and electrolyte resuscitation, administration of broad spectrum antibiotics that cover both anaerobic and aerobic bacteria and anti-coagulation therapy. Tung et al 16 suggested prolonged use of antibiotics because of difficulty in adequate penetration into infected thrombus but ideal duration of therapy is unclear. Early use of anti-coagulation therapy with heparin is able to achieve recanalization of occluded portomesenteric venous system in about 75% of cases 13, 14, 16. The recommended duration of anti-coagulation therapy is at least 6 months and this avoids early recurrence. Recanalization however can follow efficient antibiotic therapy alone even in the absence of anti-coagulation 17. The use of thrombolytic agents like recombinant tissue plasminogen activator (rTPA) has been suggested and used but are usually contraindicated in acute PVT because of higher risk of haemorrhage should surgery be required 10. In appendicitis and other intra-abdominal sepsis, laparatomy may be required to deal with these lesions or for the effects of thrombosed portal system on the gut if there is no resolution with initial
conservative measures. Surgery sometime may be delayed as part of standard practice like in our patient whose appendix was removed 3 months later. This also gives time for patient’s condition to be optimised before surgical intervention.

Conclusion
Pylephlebitis is a rare complication of appendicitis but must be taken seriously once diagnosed as high mortality rates have been variously reported. Early detections of septic-ascending pylephlebitis and adequate treatment have decreased the mortality rate.

References