Portal vein thrombosis complicating appendicitis

***A. A. Ayantunde and S. A. Debrah[+]**
**Department of Surgery*
Queen Elizabeth Hospital
Stadium Road, Woolwich
London, SE184QH
Darlington Memorial Hospital, Darlington[+]
biodunayantunde@yahoo.co.uk

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 portomesentugue ascendant soignée connu du succès avec antibiotiques et anticoagulation avec aucune morbidité résiduelle. Il s'agit également d'une présentation d'un bilan des travaux publiés sur le contenu du 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 [1-7]. 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 bendrofluazide 2.5mg.

He was ill-looking, febrile with rigors (temp-38.9 degree Celsius), jaundiced and dehydrated. Vital signs: HR-105b/min, RR-18c/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 transferase 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

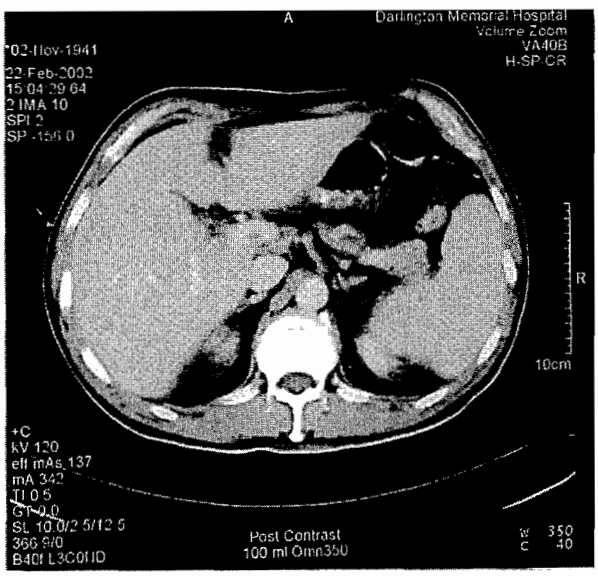

Fig. 1 ***CT scan of abdomen showing the partial occlusion of the portal vein by thrombus.***

**Correspondence*

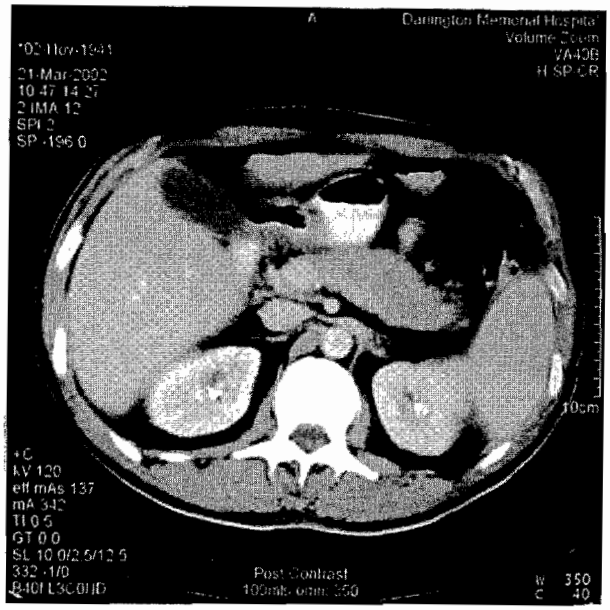

Fig. 2 ***Repeat CT scan demonstrating recanalisation of portal vein after treatment***

inflamed thick walled appendix forming an inflammatory mass. CT scan confirmed same pathology with involvement of portomesenteric veins.

He was resuscitated 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 appendicectomy 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 thrombopylephlebitis 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, perianal 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[8-13]. 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[3, 14, 15].

Imaging techniques are the diagnostic investigations 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 scan is the first-line diagnostic technique because of its accuracy, non-invasiveness 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 appendiceal mass is concerned in good hand[1]. The use of colour Doppler imaging is an 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 anticoagulation therapy. Tung et al [10] suggested prolonged use of antibiotics because of difficulty in adequate penetration into infected thrombus but ideal duration of therapy is unclear. Early use of anticoagulation therapy with heparin is able to achieve recanalization of occluded portomesenteric venous system in about 75% of cases [13, 15, 16]. The recommended duration of anticoagulation therapy is at least 6 months and this avoids early recurrence. Recanalization however can follow efficient antibiotic therapy alone even in the absence of anticoagulation [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 [18]. 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[3,13,14,19]. Early detections of septic ascending pylephlebitis and adequate treatment have decreased the mortality rate.

References

1. Sirit CJ. Diagnosis of acute appendicitis in children: spectrum of sonographic findings. Am J Radiol 1993; 161: 147-152.

2. Shaw PJ, Saunders AJ, Drake DP. Case report: Ultrasonographic demonstration of portal vein thrombosis in the acute abdomen. Clin Radiol 1986; 37: 101-102.

3. Scully RE, Mark EJ, McNeedy WF, McNeedy BU. Case reports of the Massachusetts general hospital: case 22, 1991. N Engl J Med 1991; 324: 1575-84.

4. Babcock DS. Ultrasound diagnosis of portal vein thrombosis as a complication of appendicitis. Am J Radiol 1979; 133: 317-319.

5. Dehner LP, Kissane JM. Pyogenic hepatic abscess in infancy and childhood. J Paediatr 1969; 74: 763-773.

6. Triger DR. Extrahepatic portal venous obstruction. Gut 1987; 28: 1193-1197.

7. Falk S, Schutze U, Guth H, Stuttle HJ. Chronic recurrent appendicitis: a clinicopathologic study of 47 cases. Eur J Paediatr Surg 1991; 1: 277-281.

8. Taylor FW. Regional enteritis complicated by pylephlebitis and multiple liver abscesses. Am J Med 1949; 8: 836-40.

9. Lerman B, Garlock JH, Janowitz HD. Suppurative pylephlebitis with multiple liver abscesses complicating regional ileitis. Review of literature 1940-1960. Ann Surg 1962; 155: 441-448.

10. Tung JY, Johnson JL, Liacouras CA. Portal-Mesenteric pylephlebitis with hepatic abscesses in a patient with Crohn's disease treated successfully with anticoagulation and antibiotics. J Paediatr Gatroeneterol Nutr. 1996; 23: 474-478.

11. Slovis TL, Haller JO, Cohen HL, Berdon WE, Watts FB Jr. Complicated appendiceal inflammatory disease in children: pylephlebitis and liver abscess. Radiology 1989; 171: 823-825.

12. Scwartz SI, Shires GT, Spencer FC, Husser WC. Principles of Surgery. 6th ed. New York: McGraw-Hill, 1994: 1327.

13. Valla DC, Condat B. Portal vein thrombosis in adults: Pathophysiology, pathogenesis and management. J Hepatol 2000; 32: 865-871.

14. Boley SJ, Kaleya RN, Brandt LJ. Mesenteric venous thrombosis. Surg Clin North Am 1992; 72: 183-201.

15. van Spronsen FJ, de Langen ZJ, van Elburg RM, Kinpen JL. Appendicitis in an eleven-year-old boy complicated by thrombosis of the portal and superior mesenteric veins. Paediatr Infect Dis J 1996; 15: 910-912.

16. Baril N, Wren S, Radin R, Ralls P, Stain S. The role of anticoagulation in pylephlebitis. Am J Surg 1996; 172: 449-452; discussion 452-453.

17. Condat B, Pessione F, Helene Denninger M, Hillaire S, Valla D. Recent portal or mesenteric venous thrombosis: increased recognition and frequent recanalization on anticoagulant therapy. Hepatology 2000; 32: 466-470.

18. Trum JW, Valla D, Cohen G et al. Bacteroides bacteraemia of undetermined origin: strong association with portal vein thrombosis and cryptogenic pylephlebitis. Eur J Gatroeneterol Hepatol 1993; 5: 655-659.

19. Kumar S, Sarr M, Kamath SP. Mesenteric venous thrombosis. New Engl J Med 2001; 345: 1683-1688.