Case Report

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Two cases of portal vein thrombosis associated with *Fusobacterium* bacteraemia

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This report presents two cases of *Fusobacterium* bacteraemia associated with portal vein thrombosis. A 63-year-old man with a history of hypercholesterolaemia and nephrolithiasis was admitted to the hospital with fever and abdominal pain. A computed tomography (CT) scan revealed thrombosis of the posterior right portal vein. Blood cultures were positive for *Fusobacterium nucleatum*. The second case was a 53-year-old man with alcoholic steatohepatitis admitted with fever, chills and abdominal pain. A CT scan revealed right portal vein thrombosis and *Fusobacterium necrophorum* was isolated from his blood cultures. Both patients were successfully treated with intravenous ertapenem 1 g day⁻¹ for 4 weeks with resolution of symptoms. These case reports underscore the importance of considering the diagnosis of portal vein thrombosis in patients with *Fusobacterium* bacteraemia of unclear aetiology.

Keywords: *Fusobacterium*; portal vein; bacteremia.

Introduction

Both *Fusobacterium necrophorum* and *Fusobacterium nucleatum* cause bacteraemia in humans (Henry *et al.*, 1983). While Lemierre's syndrome is classically associated with *F. necrophorum*, there have been cases attributed to *F. nucleatum* (Williams *et al.*, 2003). Few cases of *Fusobacterium* bacteraemia in association with venous thrombus disease caudal to the head and neck have been described.

This report presents two cases of portal vein thrombosis associated with *Fusobacterium* bacteraemia.

Case reports

Case 1

A 63-year-old man with a history of mastocytosis, hypercholesterolaemia, nephrolithiasis and squamous cell skin cancer was admitted to hospital with fever and abdominal pain. The pain started 3 weeks prior to admission, lasted 48 h and resolved spontaneously. The day before the patient was admitted, he developed shaking chills and diaphoresis. His other symptoms included diffuse myalgias, arthralgias and bilateral lower-quadrant abdominal pain associated with one episode of bilious vomiting.

On physical examination, the patient was febrile with a temperature 38 °C. His abdomen was diffusely tender without guarding, rebound or rigidity. His white

blood cell count was 11.6×10^3 cells μl^{-1} (normal range $4\text{--}10.6 \times 10^3$ cells μl^{-1}) with 9.7×10^3 neutrophils μl^{-1} (normal range $1.8\text{--}8.5 \times 10^3$ neutrophils μl^{-1}), total serum bilirubin 2.4 mg dl⁻¹ (normal range 0.2–1.2 mg dl⁻¹), direct bilirubin 0.67 mg dl⁻¹ (normal range 0–0.2 mg d⁻¹), alkaline phosphatase 131 IU l⁻¹ (normal range 30–120 IU l⁻¹) and alanine aminotransferase 59 IU l⁻¹ (normal range 0–41 IU l⁻¹).

A computed tomography (CT) scan revealed complete thrombosis of the posterior right portal vein (Fig. 1). Bacterial growth in BD Bactec liquid media was established after 61 h incubation. Gram staining revealed an indole-positive, Gram-negative bacillus. *F. nucleatum* was isolated using CDC anaerobe 5 % sheep blood agar, and biochemical identification was performed with the Remel IDS system for anaerobes (RapID; Remel Microbiology Products). The patient was initially treated with intravenous (IV) piperacillin–tazobactam 3.375 g every 6 h, followed by 1 g day⁻¹ ertapenem IV for a total of 4 weeks. He was also anticoagulated with warfarin, with complete resolution of his symptoms.

Case 2

A 53-year-old man with a history of gastroesophageal reflux disease, obstructive sleep apnoea, alcoholic steatohepatitis, obesity and hypercholesterolaemia was admitted complaining of fever, chills and abdominal pain for 1 week. Prior to the patient's presentation at the hospital, he had taken levofloxacin prescribed by his physician, without resolution of his symptoms.

Abbreviations: CT, computed tomography; IV, intravenous.

Fig. 1. CT scan showing thrombosis of the right posterior portal vein in case 1.

On physical examination he had a temperature of 39.2 °C and left upper-quadrant tenderness to palpation. The patient's white blood cell count was 13.9×10^3 cells μl^{-1} (normal range $4\text{--}10.6 \times 10^3$ cells μl^{-1}) with 12.6×10^3 neutrophils μl^{-1} (normal range $1.8\text{--}8.5 \times 10^3$ neutrophils μl^{-1}), total serum bilirubin 1.3 mg dl^{-1} (normal range 0.2–1.2 mg dl^{-1}), alkaline phosphatase 152 IU l^{-1} (normal range 30–120 IU l^{-1}) and alanine aminotransferase 70 IU l^{-1} (normal range 0–41 IU l^{-1}).

A CT scan revealed thrombosis of the right portal vein (Fig. 2). After 24 h incubation, *F. necrophorum* was isolated from the anaerobic sample in a fashion similar to that described in case 1. The patient's symptoms resolved following treatment with 1 g day^{-1} ertapenem IV for a total of 4 weeks. He was also anticoagulated with warfarin.

Discussion

Fusobacterium species are obligate, anaerobic, non-spore-forming Gram-negative bacilli. *F. necrophorum* and

Fig. 2. CT scan showing right portal vein thrombosis in case 2.

F. nucleatum are a normal part of the oropharyngeal flora and are not usually invasive. Of the 13 species in this genus, *F. necrophorum* is classically associated with internal jugular vein thrombosis in the form of Lemierre's syndrome. However, cases caused by *F. nucleatum* have been described (Williams *et al.*, 2003).

While *F. necrophorum* is known to induce platelet aggregation, thrombotic events outside of the head and neck are rare (Forrester *et al.*, 1985; Horose *et al.*, 1992). When they do occur, they are mainly seen in elderly patients and mortality can approach 25 % (Hagelskjaer & Prag, 2000). Portal vein thrombosis in association with both *F. necrophorum* and *F. nucleatum* has been reported (Bultink *et al.*, 1999; Hamidi *et al.*, 2008; Redford *et al.*, 2005). The source of bacteraemia in these patients is not always evident, and it has been suggested that in cases of *Fusobacterium* bacteraemia of unknown origin, portal vein thrombosis should be ruled out (Hamidi *et al.*, 2008).

Fusobacterium species are normally susceptible to penicillin, clindamycin, carbapenems and metronidazole (Garrett & Onderdonk, 2010). Interestingly, the *F. nucleatum* species isolated from the second case described was resistant to metronidazole. Routine sensitivity testing of anaerobic isolates is not performed in all laboratories, but might be worthwhile. Antimicrobial therapy is generally recommended for several weeks for the treatment of Lemierre's syndrome (Hagelskjaer *et al.*, 1998). In addition to 4 weeks of parenteral antimicrobial therapy, we chose to anticoagulate our patients with warfarin, as this has been shown to increase vessel recanalization (Sheen *et al.*, 2000).

In conclusion, this report describes two cases of *Fusobacterium* bacteraemia in association with portal vein thrombosis. Both patients responded well to antimicrobial therapy and anticoagulation. A diagnosis of portal vein thrombosis should be considered in patients with *Fusobacterium* bacteraemia of unclear aetiology.

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