Fusobacterium Unveiled: The Power of Prolonged Incubation

Manish Shah MD, Ruchi Devbhandari MD, Sabin Tripathee MD, Shivani Modi MD, Mudita Patel DO
Department of Internal Medicine, Jefferson Einstein Montgomery, East Norriton, PA

INTRODUCTION

Liver abscesses are uncommon but serious infections typically caused by bacterial pathogens such as *Escherichia coli*, *Klebsiella species*, and *Streptococcus species*. However, anaerobic bacteria, particularly *Fusobacterium* species, are rare etiologies. *Fusobacterium*, a Gram-negative bacillus often associated with periodontal disease, can lead to severe systemic infections in rare cases, including Lemierre's syndrome. This case report describes a rare instance of a liver abscess caused by *Fusobacterium* in a 70-year-old female with a history of thyroid cancer, hyperlipidemia, gastric bypass surgery, and a recent dental infection. The case underscores the diagnostic challenges, particularly the importance of prolonged incubation periods for slow-growing pathogens.

CASE PRESENTATION

A 70-year-old female with a complex medical history, including thyroid cancer post-resection, hyperlipidemia, and a history of gastric bypass surgery, presented with acute right upper quadrant pain, generalized weakness, and a three-day history of loose stools. Of note, she had a recent dental infection, raising concerns about the potential spread of bacteria systemically. Upon admission, the patient was hypotensive with a blood pressure of 84/48 mmHg and exhibited tenderness in the epigastric region without signs of organomegaly.

Initial laboratory tests showed marked leukocytosis, with her white blood cell count rising from 28.6 x 10^9/L to 31.8 x 10^9/L. Additionally, her C-reactive protein (CRP) level was elevated to 42 mg/L, indicating significant systemic inflammation. Liver function tests (LFTs) were within normal limits. A CT scan of the abdomen revealed a 4.2 cm complex cystic lesion in the inferior right hepatic lobe, suggestive of a liver abscess (Fig 1-A). Due to the size and complexity of the lesion, percutaneous drainage was performed, and 20 cc of purulent fluid was aspirated. Initial cultures and gram stain were negative during the first 72 hours of incubation, prompting the care team to extend the culture period due to suspicion of a slow-growing bacterium. On day five, *Fusobacterium* species were isolated (Fig 2), confirming the diagnosis of a *Fusobacterium* liver abscess.

Empirical broad-spectrum antibiotics, including Ceftriaxone and Metronidazole, were initiated at admission. Once *Fusobacterium* was confirmed, the antibiotics were narrowed to Amoxicillin/Clavulanate, and treatment was continued for four weeks. The patient showed significant clinical improvement, with fever and abdominal pain resolving within a week of drainage. Repeat imaging after four weeks demonstrated a marked reduction in abscess size (Fig 1-B), and laboratory markers normalized. Incidental findings included a stable right adrenal myelolipoma on CT imaging.

This case illustrates the diagnostic complexity of liver abscesses caused by slow-growing organisms like *Fusobacterium* and highlights the importance of prolonged culture incubation for accurate pathogen identification.

FIGURE

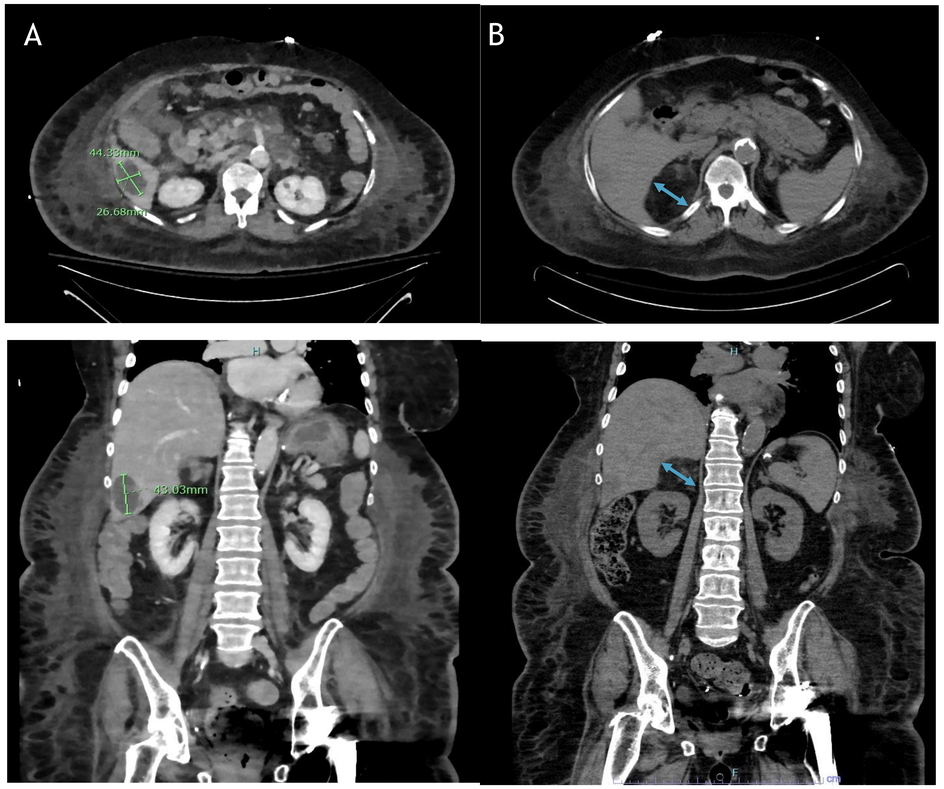

Fig 1: Loculated liver abscess (Left - Green) with mild capsular enhancement in the lateral right liver that resolved in 1 month on treatment (Right). Note an incidental, stable right adrenal myelolipoma (Blue)

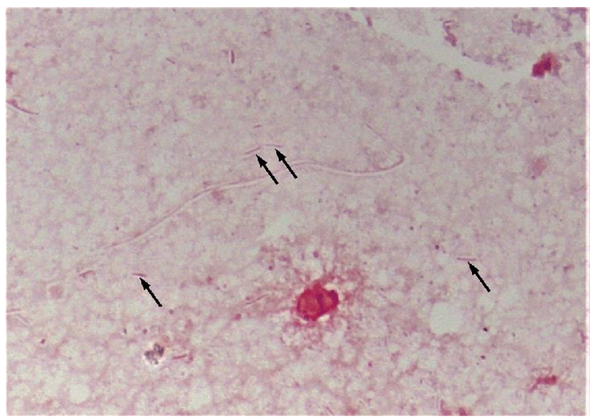

Fig 2: Gram Stain showing Gram negative spindle bacilli, *Fusobacterium*

DISCUSSION

This case highlights the importance of considering anaerobic organisms like *Fusobacterium* in liver abscess cases, particularly when initial cultures are negative. *Fusobacterium* infections are rare but can be life-threatening, especially in individuals with predisposing factors such as recent dental infections. The case also emphasizes the value of prolonged culture incubation for identifying slow-growing bacteria, which may not be detected within standard 72-hour incubation periods.

Early diagnosis of *Fusobacterium* liver abscesses is challenging due to its rarity and slow growth. Imaging techniques, including CT scans, play a crucial role in identifying abscesses, while microbiological evaluation through extended incubation times is essential for diagnosing atypical pathogens. In this case, prompt percutaneous drainage and the timely adjustment of antibiotic therapy based on culture results were critical to the patient's recovery. The therapeutic approach underscores the need for individualized care in managing complex infections.

CONCLUSION

This case underscores the diagnostic challenges posed by *Fusobacterium* liver abscesses and the importance of prolonged incubation for cultures when slow-growing organisms are suspected. Timely drainage and antibiotic therapy tailored to culture sensitivity are key to successful outcomes. Clinicians should include *Fusobacterium* in the differential diagnosis of liver abscesses, especially in patients with risk factors like dental infections. A multidisciplinary approach, involving collaboration between infectious disease specialists, radiologists, and microbiologists, is vital for optimal management and outcomes in such cases.

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