

## **Cryptogenic Pyogenic Liver Abscess due to *Parvimonas micra* and *Fusobacterium nucleatum***

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Case: A 30-year-old male presented with fevers, chills, body aches, and abdominal pain for 7 days. He had a medical history of obesity and alcohol use. He reported abdominal pain as colicky in nature and associated with nausea, persistent non-bloody and non-bilious vomiting. At the time of hospital admission, he was afebrile but tachycardic with a heart rate of 122 BPM. His physical exam was significant for epigastric and right upper quadrant abdominal tenderness with negative Murphy's sign. Initial workup was significant for hypokalemia, hyperbilirubinemia, CRP greater than 30 mg/dL, ESR of 58 mm/hour, and urinalysis with elevated ketones, protein, and urobilinogen. He did not have significant leukocytosis or transaminitis. An abdominal ultrasound showed a heterogeneous hypo-attenuating lesion in the right hepatic lobe. MRI of the abdomen confirmed a mature hepatic abscess measuring 9.8 x 9.6 x 8 cm in the right lobe of the liver, as well as splenomegaly. He had no evidence of biliary or pancreatic pathology on imaging. The patient was started on empiric piperacillin-tazobactam and ultrasound-guided aspiration of the abscess with drain placement was performed by Interventional Radiology. Cultures obtained from the abscess grew *Parvimonas micra* and *Fusobacterium nucleatum*. Blood cultures remained negative throughout his admission. The patient clinically improved and was discharged with abdominal drain in place and continued course of amoxicillin-clavulanate. Outpatient follow up was arranged with plans for future colonoscopy to rule out colorectal cancer.

Discussion: Pyogenic liver abscess (PLA) is a serious and potentially fatal condition that involves accumulation of pus in the liver parenchyma. It is typically a result of a polymicrobial bacterial infection, usually caused by enteric gram-negative bacteria such as *Escherichia coli*, *Klebsiella pneumoniae*, and other anaerobic organisms. PLA can result from portal vein pyemia, invasion from primary biliary infection, or hematogenous seeding [2]. Several risk factors have been correlated with PLA including Diabetes Mellitus, underlying hepatobiliary or pancreatic disease, immunosuppression, liver transplants, and use of proton-pump inhibitors [3, 4]. An increased risk of colorectal cancer (CRC) has also been seen in relation to cryptogenic PLA [5]. Management includes antibiotics to cover enteric gram-negative bacilli and anaerobes, and prompt aspiration/drainage of the abscess [2].

While both organisms are colonizers of the oropharynx and gastrointestinal tract and are associated with odontogenic infections, there are only a few case reports of *Parvimonas* and *Fusobacterium* hepatic abscesses, particularly in young, healthy, and immunocompetent patients. Furthermore, it is exceedingly rare to have co-infection of these pathogens, with only one other case report seen at time of this writing. A finding of pyogenic liver abscess with these organisms concomitantly should prompt further history and evaluation for potential periodontal disease and abscess or colorectal malignancy [6]. Further, certain bacteria have been identified as potential heralds of CRC [5]. One study specifically found *Parvimonas micra*, *Peptostreptococcus stomatis*, *Fusobacterium nucleatum* and *Akkermansia muciniphila* as overrepresented in the gut microbiomes in a cohort of CRC patients [7]. *Parvimonas micra* has

also been independently associated with enhancing the carcinogenic process in colorectal cancers through various mechanisms.

In conclusion, PLA should prompt a search for the source of infection and assessment for pre-disposing risk factors. In cases of cryptogenic PLA, it is reasonable to consider underlying malignancy as potential source, especially when bacteria typically associated with CRC are isolated from abscess cultures.

## Citations

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