

Liver abscess caused by Gram-negative spiral bacilli

Hideharu Hagiya,^{1,*} Keigo Kimura,² Isao Nishi² and Kazunori Tomono¹

CASE SUMMARY

A man in his eighties presenting high fever accompanying right flank pain visited us. He had had an episode of several weeks of diarrhoea a month previously. Laboratory analysis showed an elevation of serum C-reactive protein (9.55 mg dl⁻¹), and enhanced computed tomography showed a hepatic mass suggesting liver abscess (Fig. 1a). Pus was drained through percutaneous paracentesis, and Gram staining of the purulent material was performed (Fig. 1b).

DISCUSSION

Correct Answer: 5. *Desulfovibrio desulfuricans*.

The Gram staining shows Gram-negative spiral bacilli. Although species of the genera *Helicobacter* and *Campylobacter* are clinically common Gram-negative spiral bacilli, these pathogens rarely cause liver abscess. The organism was an obligate anaerobe that was positive for the desulfovirdin test and hydrogen sulfide production. The results of 16S rDNA sequence analysis confirmed the organism to be *Desulfovibrio desulfuricans* subsp. *desulfuricans* with concordance rates of 99.7% (1508/1513 bps) to a reference strain ATCC 27774.

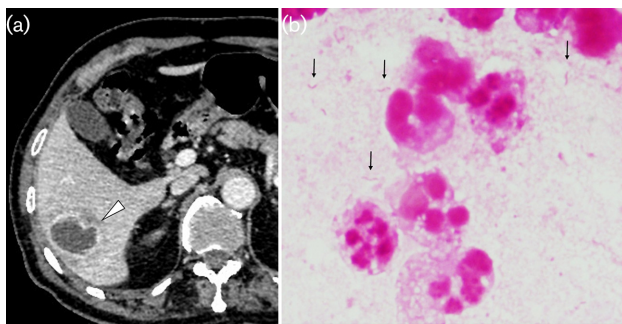


Fig. 1. Contrast-enhanced computed tomography showing the liver abscess (a) and Gram-negative spiral bacilli in the pus (b).

QUESTION

Which of the following organisms is the most plausible pathogen?

ANSWER OPTIONS

1. *Helicobacter pylori*
2. *Helicobacter cinaedi*
3. *Brachyspira pilosicoli*
4. *Campylobacter fetus*
5. *Desulfovibrio desulfuricans*

Members of the genus *Desulfovibrio* are anaerobic, Gram-negative, sulfate-reducing bacteria possibly colonizing the human digestive tract [1]. Although its spiral form is characteristic of the organism, identification of species of the genus *Desulfovibrio* is usually difficult due to their rarity and slow growth, leading to under-reporting of the infection [2]. It has been reported that *Desulfovibrio* infections usually involve elderly men with abdominal illnesses, especially hepatobiliary diseases [3]. *Desulfovibrio* infections should be suspected when spiral bacilli are detected in anaerobic culture deriving intra-abdominal samples [4, 5]. The patient recovered well after treatment with cefoperazone/sulbactam, followed by oral metronidazole.

Funding information

The authors received no specific grant from any funding agency.

Conflicts of interest

The authors declare that there are no conflicts of interest.

References

1. Gibson GR, Macfarlane GT, Cummings JH. Occurrence of sulphate-reducing bacteria in human faeces and the relationship of dissimilatory sulphate reduction to methanogenesis in the large gut. *J Appl Bacteriol* 1988;65:103–111.

Received 14 March 2018; Accepted 24 May 2018

Author affiliations: ¹Division of Infection Control and Prevention, Osaka University Hospital, 2-15 Yamadaoka, Suita, Osaka 565-0871, Japan; ²Laboratory for Clinical Investigation, Osaka University Hospital, 2-15 Yamadaoka, Suita, Osaka 565-0871, Japan.

*Correspondence: Hideharu Hagiya, highgear@hp-infect.med.osaka-u.ac.jp

Keywords: Liver abscess; *Desulfovibrio*.

2. Warren YA, Citron DM, Merriam CV, Goldstein EJ. Biochemical differentiation and comparison of *Desulfovibrio* species and other phenotypically similar genera. *J Clin Microbiol* 2005;43:4041–4045.
3. Vasoo S, Mason EL, Gustafson DR, Cunningham SA, Cole NC et al. *Desulfovibrio legallii* prosthetic shoulder joint infection and review of antimicrobial susceptibility and clinical characteristics of *Desulfovibrio* infections. *J Clin Microbiol* 2014;52:3105–3110.
4. Goldstein EJ, Citron DM, Peraino VA, Cross SA. *Desulfovibrio desulfuricans* bacteremia and review of human *Desulfovibrio* infections. *J Clin Microbiol* 2003;41:2752–2754.
5. Hagiwara S, Yoshida A, Omata Y, Tsukada Y, Takahashi H et al. *Desulfovibrio desulfuricans* bacteremia in a patient hospitalized with acute cerebral infarction: case report and review. *J Infect Chemother* 2014;20:274–277.

Five reasons to publish your next article with a Microbiology Society journal

1. The Microbiology Society is a not-for-profit organization.
2. We offer fast and rigorous peer review – average time to first decision is 4–6 weeks.
3. Our journals have a global readership with subscriptions held in research institutions around the world.
4. 80% of our authors rate our submission process as 'excellent' or 'very good'.
5. Your article will be published on an interactive journal platform with advanced metrics.

Find out more and submit your article at microbiologyresearch.org.