

Introduction

- Helicobacter cinaedi* (*H. cinaedi*) inhabits intestinal and hepatobiliary tracts of various mammalian hosts.
- The organism was first isolated from rectal cultures of Human Immunodeficiency Virus-positive men who have sex with men but more recently reported in immunocompetent hosts.
- Clinical syndrome of *H. cinaedi* infection causes a wide range of conditions including cellulitis, bacteremia, and gastroenteritis.

Case Presentation

HPI:

- 41-year-old man with recently diagnosed right lower extremity cellulitis and diarrheal illness presenting with Gram-negative rod bacteremia which the lab is unable to culture.
- Day 1: ER visit for R. ankle pain + erythema x 3 days. Also with resolving watery diarrhea. Discharged with clindamycin x 1 week.
- Day 11: ED without improvement in symptoms. Right foot x-ray did not reveal an effusion. Discharged with cephalexin and trimethoprim-sulfamethoxazole for 7 days.
- Day 15: called back to the ED because day 11 blood cultures in 2/2 sets returned positive for Gram-negative rods. Symptoms resolved.
- Past medical history includes acute cholecystitis status post laparoscopic cholecystectomy, 4 years prior to admission. No other medical problems nor medications/allergies.
- He is heterosexual and has 1 sexual partner. Lives with daughter and wife at home. Born and raised in Sacramento, California. Denies travel outside country. Owns 1 dog. Non-smoker without alcohol use nor illicit drug use.

Objective (on presentation):

- Vitals: T 36.5°C, HR 65, BP 121/58, RR 16
- Patient's right lower extremity was without any erythema, warmth, nor tenderness to palpation.

Hospital Course

Complete blood count and comprehensive metabolic panel within normal limits

Urinalysis without pyuria

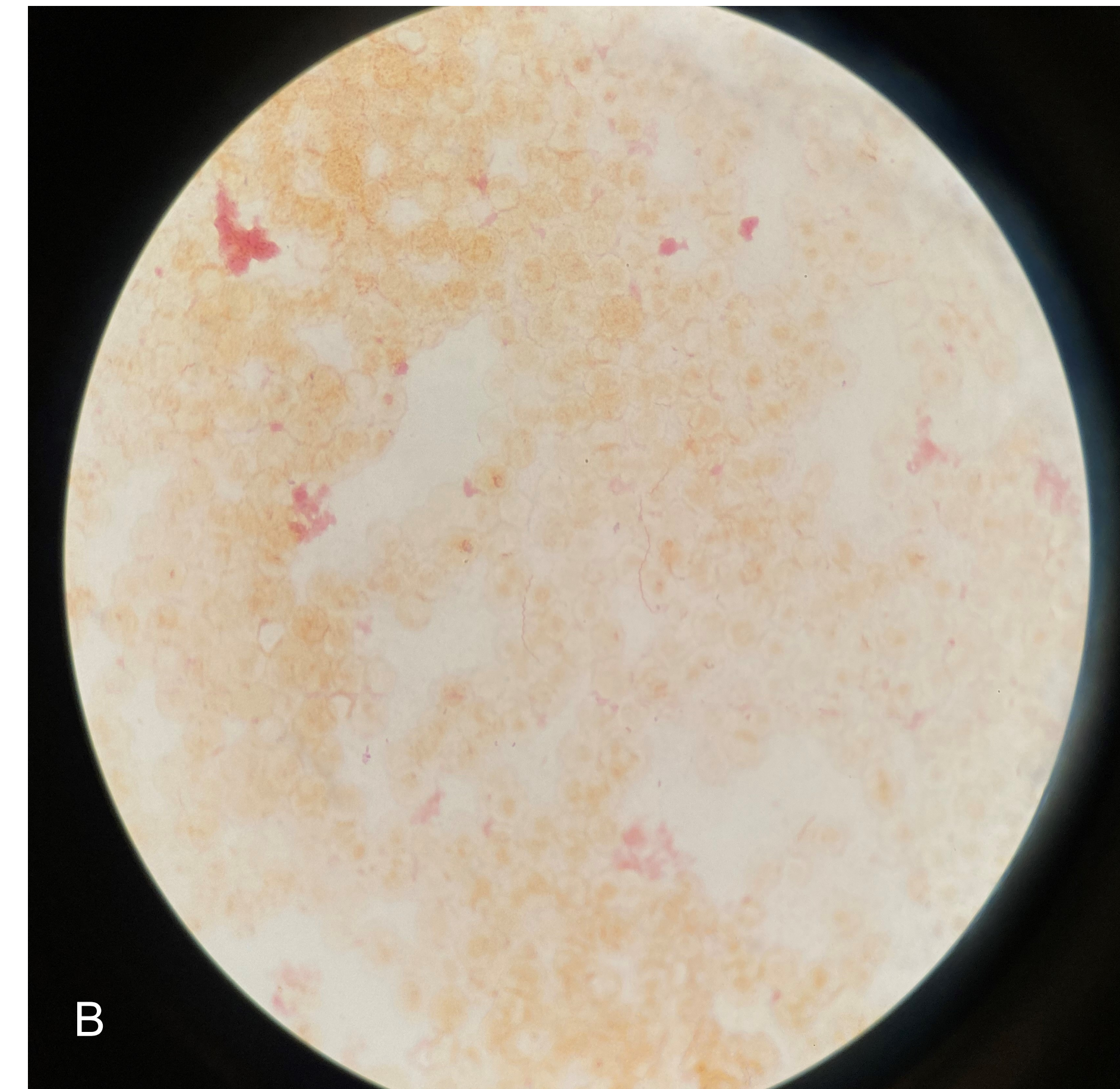
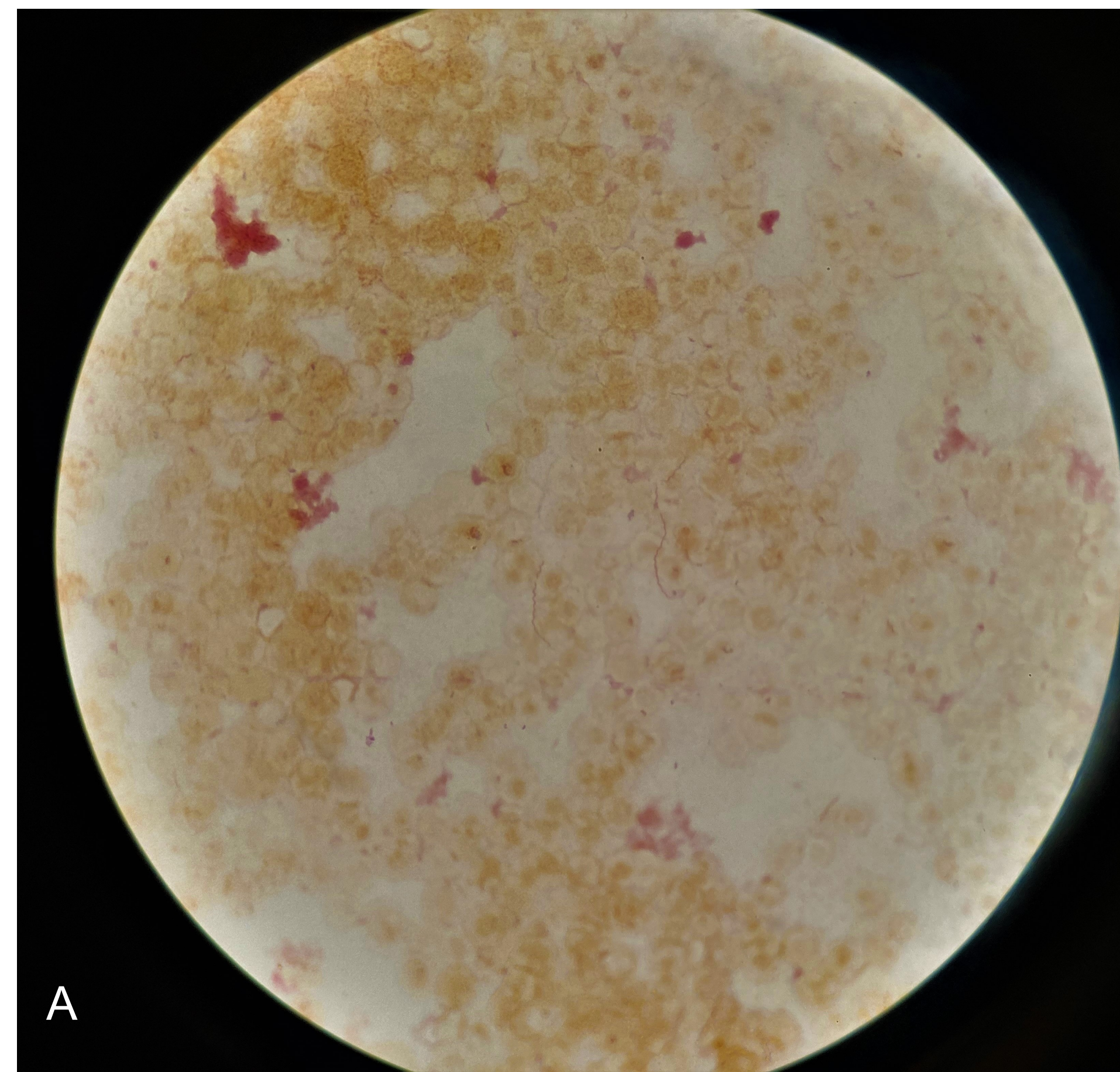
Positive day 11 blood cultures in 2/2 sets for Gram negative rods. Lab is unable to grow organism after 2 days of standard conditions.

Repeat blood cultures pending

Figure 1

(A) Gram stain, image 1, 100x - curved, spiral shaped Gram-negative rod

(B) Gram stain, image 2, 100x - curved, spiral shaped Gram-negative rod



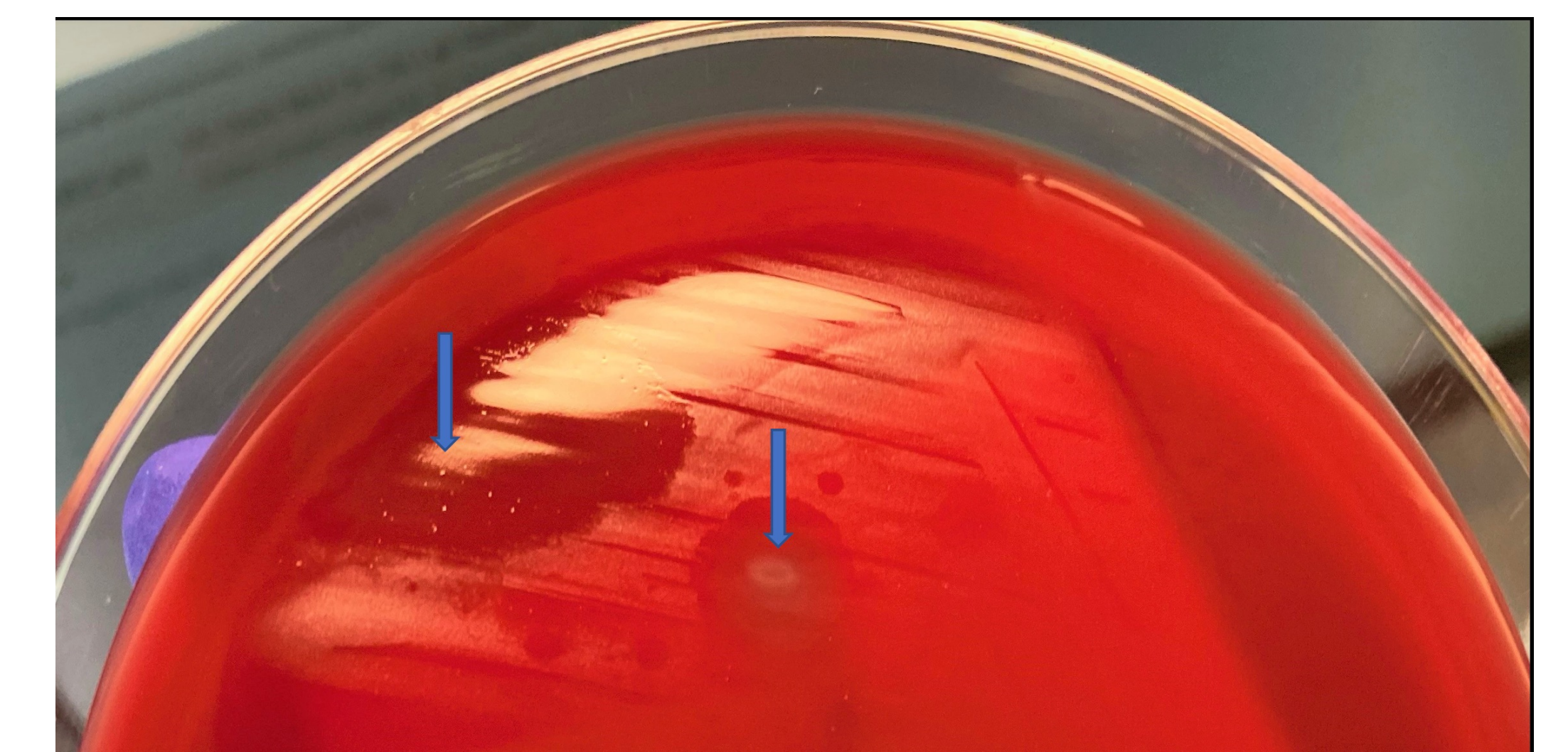
Diagnosis and management:

- Given clinical picture of Gram-negative rod bacteremia with preceding diarrheal illness with right lower extremity cellulitis, this raised suspicion for *H. cinaedi* infection.
- The microbiology lab was notified and then sub-cultured the organism at 37°C in microaerophilic conditions with high humidity. The organism then grew after 10 days. Gram stain and blood agar plate photo shown in Figures 1A, 1B and 2.
- Isolate identified on the Matrix Assisted Laser Desorption/Ionization (MALDI) as *H. cinaedi*.
- Initial blood culture bottle also sent for 16S rRNA sequencing which also returned as *H. cinaedi*.
- Received ceftriaxone for 4 days in the hospital. Discharged with cefpodoxime 400 mg oral twice daily for 10 days
- Repeat blood cultures negative

Discussion

- H. cinaedi* is a fastidious organism which makes prompt diagnosis difficult.
- Culture media incubation should occur in an microaerobic environment at 35-37°C with high humidity for up to 10 days.
- Laboratorians and clinicians should keep in mind the potential need for extended culture incubation periods and specific sub-culture conditions to isolate this organism given difficulty growing this pathogen from blood culture.
- This organism's spiral, comma shape on gram stain can be a major clue to diagnosis.
- Collaboration between the clinician team and laboratory team made isolation and identification of this organism possible.
- There are no recommended treatment guidelines regarding choice and duration of therapy but in general high minimum inhibitory concentrations have been seen with macrolides and quinolones.
- Recurrence occurs in 30 to 60% of patients.

Figure 2: Blood agar plate



References

- Araoka H, Baba M, Okada C, Kimura M, Sato T, Yatomi Y, Moriya K, Yoneyama A. Risk Factors for Recurrent *Helicobacter cinaedi* Bacteremia and the Efficacy of Selective Digestive Decontamination With Kanamycin to Prevent Recurrence. *Clin Infect Dis*. 2018 Aug 16;74(4):573-578. doi: 10.1093/cid/ciy114. PMID: 29462291.
- Bateman AC, Butler-Wu SM. The Brief Case: Bacteremia Caused by *Helicobacter cinaedi*. *J Clin Microbiol*. 2016 Dec 28;55(1):5-9. doi: 10.1128/JCM.02936-15. PMID: 28031444; PMCID: PMC5228261.
- Inoue K, Sasaki S, Yasumi T, Imai K, Kusunoki T, Morio T, Kanegane H. *Helicobacter cinaedi*-Associated Refractory Cellulitis in Patients with X-Linked Agammaglobulinemia. *J Clin Immunol*. 2020 Nov;40(9):1132-1137. doi: 10.1007/s10875-020-00830-6. Epub 2020 Sep 10. Erratum in: *J Clin Immunol*. 2021 May;41(4):847. PMID: 32914284.
- Kawamura Y, Tomita J, Morita Y, Fujii S, Okamoto T, Akaike T. Clinical and bacteriological characteristics of *Helicobacter cinaedi* infection. *J Infect Chemother*. 2014 Sep;20(9):517-26. doi: 10.1016/j.jiac.2014.06.007. Epub 2014 Jul 9. PMID: 25022961.
- Kitamura T, Kawamura Y, Chikusa K, Masaki T, Washita H, Sawa T, Fujii S, Okamoto T, Akaike T. *Helicobacter cinaedi* cellulitis and bacteremia in immunocompetent hosts after orthopedic surgery. *J Clin Microbiol*. 2007 Jan;45(1):31-8. doi: 10.1128/JCM.01507-06. Epub 2006 Nov 1. PMID: 17078500; PMCID: PMC1828951.
- Matsumoto T, Goto M, Murakami H, Tanaka T, Nishiyama H, Ono E, Okada C, Sawabe E, Yagoshi M, Yoneyama A, Okuzumi K, Tateda K, Misawa N, Yamaguchi K. Multicenter study to evaluate bloodstream infection by *Helicobacter cinaedi* in Japan. *J Clin Microbiol*. 2007 Sep;45(9):2853-7. doi: 10.1128/JCM.00465-07. Epub 2007 Jun 27. PMID: 17596362; PMCID: PMC2045256.
- Uckay I, Garbino J, Dietrich PY, Ninet B, Rohner P, Jacomo V. Recurrent bacteremia with *Helicobacter cinaedi*: case report and review of the literature. *BMC Infect Dis*. 2006 May 23;6:86. doi: 10.1186/1471-2334-6-86. PMID: 16719920; PMCID: PMC1482711.