"Complication of Brucella Infection in Previously Healthy Adult Male"

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Introduction

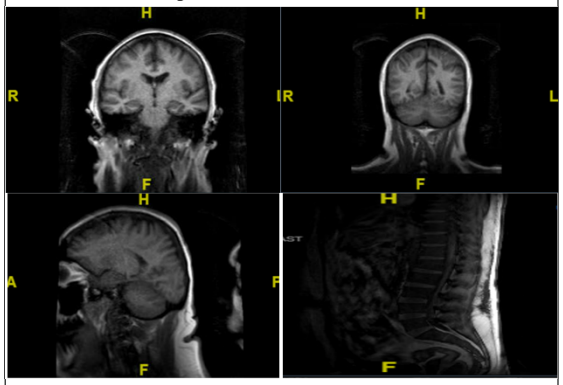
Brucella is one of the most common zoonotic infections in the world, typically spread from infected farm animal to humans by ingestion of unpasteurized food products or by contact with infected tissue or fluids [1]. Endemic areas include Mexico and other portions of central South America. 500,000 cases are reported yearly, however only about 100 to 200 are in Northern America. Brucella is the pathogen that causes the disease brucellosis (also known as Undulant Fever, Malta Fever, and Mediterranean Fever)[1]. Brucellosis presents with insidious onset fever, night sweats, and malaise. Physical findings tend to be variable and highly nonspecific [2,5]. There are many complications in the various organ systems those with brucellosis can face with neurological issues occurring in about 10 percent of cases, these manifestations include meningitis, encephalitis, and abscess and can occur during any stage of infection [1,5]. In the setting of neurobrucellosis, CSF findings include elevated blood cells, elevated protein and low glucose, it is very uncommon for the organism to be recovered in the CSF [2].

Patient History

The patient in this case study is a 36 y.o. Mexican immigrant male with no prior medical history, no home medications, no history of surgery and a known anaphylactic reaction to bee stings. From collateral it was obtained he was here doing field work to send money back home to his wife. Per patient's father, he had been staying in a moldy house with coworkers and had eaten unpasteurized cheese. He developed a mild illness that he did not seek care for the week previously, as did some of the coworkers. The morning of his initial presentation, the patient felt fine and did not mention any illness to his father.

Patient presentation1

Patient presented to an outside hospital after being found down in a sugarcane field. He was febrile to 104.7, hypotensive, tachycardic to 160 with a GCS of 3. He had an episode of emesis with new onset seizure activity and agonal breathing and severe bilateral conjunctival hemorrhages. He was refractory to IV fluid resuscitation, started on pressors and intubated before being transferred to UMC. Patient had a refractory metabolic acidosis with pH of 7.23 with increasing creatinine up to 9.33. During his ICU stay, he also had increasing ventilation requirements being diagnosed with severe ARDS. Blood and CSF cultures were drawn, while CSF did not grow bacteria, blood cultures grew many colonies of Brucella. MRI head and spine showed patchy enhancements throughout brain, likely infectious, extensive microhemorrhages, and enhancement of the cauda equina nerve roots suggestive of arachnoiditis/encephalitis.



Images 1-3: MRI Head showing patchy enhancements throughout brain. Image 4: MRI Spine: showing enhancement in the cauda equina nerve roots

Patient pressor requirement decreased after ten days, and he was eventually extubated but continued to have persistent tachycardia, fevers, oliguria, and emesis refractory to all treatment. Patient with continued improvement in mentation until two weeks after initial presentation when he became hemodynamically unstable and was stepped up to the ICU where he was once again placed on pressors and intubated. It was discovered he had an UGIB with unclear etiology and/or relation to brucella infection. As of early October, repeat MRI brain and spine is pending.

Lab Work

Initial lab work showed CSF with RBC count of 381, 2 WBC, protein of 178.7 and glucose of 168, gram stain showed white blood cells but no organisms. Repeat CSF studies showed WBC count increased to 11 with decreased proteins and RBCs. Blood cultures originally grew heavy brucella but have since cleared. He continues to have leukocytosis intermittently in both daily lab work and randomly drawn CSF samples.

Conclusions and Results

The optimal treatment for neurobrucellosis is uncertain as data is very limited [3]. For adults, the standard of care is 4 to 6 weeks of Ceftriaxone plus Rifampin and Doxycycline for 4 to 6 months [3,4]. From studies, those patients who are treated with ceftriaxone therapy are less likely to relapse and represent with infection [3]. With this information, our 34 y.o. male was started on a prolonged course of IV Ceftriaxone, Rifampin and Doxycycline with eventual clearing of blood cultures. Currently, patient has not returned to baseline and continues to face a tumulus hospital course with multiple GI bleeds, ESBL UTIs, and a continued encephalopathy from his bacterial infection, however patient mentation is improving, he is now able to speak in one-word phrases. He primarily uses moans and groans to communicate but is slowly regaining his physical strength and ability to both follow commands and guide providers to what is causing him discomfort or pain. He has a long course ahead of him and after multiple months in the hospital, he will be transferred to an LTAC for continued support.

Sources

[1] Bosilkovski M, Krteva L, Dimzova M, Vidinić I, Sopova Z, Spasovska K. Human brucellosis in Macedonia - 10 years of clinical experience in endemic region. Croat Med J. 2010 Aug;51(4):327-36. doi: 10.3325/cmj.2010.51.327. PMID: 20718086; PMCID: PMC2931438.

[2] Guven T, Ugurlu K, Ergonul O, Celikbas AK, Gok SE, Comoglu S, Baykam N, Dokuzoguz B. Neurobrucellosis: clinical and diagnostic features. Clin Infect Dis. 2013 May;56(10):1407-12. doi: 10.1093/cid/cit072. Epub 2013 Feb 27. PMID: 23446629.

[3] Erdem H, et al Efficacy and tolerability of antibiotic combinations in neurobrucellosis: results of the Istanbul study. Antimicrob Agents Chemother. 2012 Mar;56(3):1523-8. doi: 10.1128/AAC.05974-11. Epub 2011 Dec 12. PMID: 22155822; PMCID: PMC3294949.

[4] Solera, J., Martinez-Alfaro, E. & Espinosa, A. Recognition and Optimum Treatment of Brucellosis. *Drugs* **53**, 245–256 (1997). https://doi.org/10.2165/00003495-199753020-00005

[5] Donald R. McLean, Neville Russell, M. Yousuf Khan, Neurobrucellosis: Clinical and Therapeutic Features, *Clinical Infectious Diseases*, Volume 15, Issue 4, October 1992, Pages 582–590, https://doi.org/10.1093/clind/15.4.582