Case Report

Cat scratch disease scapular osteomyelitis: a case report

Patrick J. Reardon, MD*, William B. Gilbert, MD, John E. Kuhn, MD
Vanderbilt University Medical Center, Nashville, TN, USA

ARTICLE INFO

Keywords:
Bartonella henselae
Osteomyelitis
Cat scratch disease
Scapula

Case report

A 30-year-old male with a remote history of a right shoulder superior labrum anterior to posterior lesion, treated operatively at an outside hospital, presented with a 3-month history of right shoulder pain. Initial shoulder radiographs were performed and appeared to show no abnormality (Fig. 1). His pain continued for another month, and he also developed painful lymphadenopathy. At that point, a noncontrast magnetic resonance imaging (MRI) was obtained (Fig. 2). This showed a destructive lesion in the scapular neck with communication through the articular surface of the glenoid. There was concern for a malignant process, and a positron emission tomography scan and repeat contrast-enhanced MRI were obtained (Figs. 3 and 4). This showed increased uptake in several lymph nodes. An inguinal lymph node biopsy was performed, tissue was sent for histology, and a referral was made to the orthopedic oncology service due to concern for skeletal malignancy. Our orthopedic oncologists did not feel the imaging was consistent with a metastatic process or a primary bone tumor. Due to the patient's history of previous labral pathology, it was felt to be more consistent with a paralabral cyst or postsurgical changes, and a referral was made to the sports medicine service. Around this time, the initial biopsy histology revealed granulomatous inflammation. Bartonella henselae titers were drawn and found to be significantly elevated, at 1:1280 on July 15, 2021. On the same day that the titers were negative.

Institutional review board approval was not required for this case report.

*Corresponding author: Patrick J. Reardon, MD, 1211 Medical Center Drive, Nashville, TN 37232, USA.
E-mail address: pat.reardon@vumc.org (P.J. Reardon).

https://doi.org/10.1016/j.xrrt.2022.06.007

© 2022 The Authors. Published by Elsevier Inc. on behalf of American Shoulder & Elbow Surgeons. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
had finished his course of antibiotics and C-reactive protein/erythrocyte sedimentation rate had normalized. At final follow-up, roughly 6 months later he had no complaints and was back to doing all his previous activities without any discomfort.

**Discussion**

*B henselae* is a gram-negative bacteria responsible for cat scratch disease (CSD). An estimated 12,000-22,000 cases per year are diagnosed in the United States, with over 50% of cases involving children under 18 years of age. As the name would imply, the main carrier of *B henselae* is feral and domesticated cats. The bacteria is transmitted between cats via fleas and ticks. Infection in humans typically occurs through cat bites, scratches, or saliva coming in contact with open wounds. Contact with cats, most often kittens, is reported in 99% of cases, and a site of inoculation is reported 92% of the time. On chart review there was no prior history of exposure to cats, the well-recognized host. Yet, approximately 5 months prior to his presentation with shoulder pain, the patient sustained open fractures to his 2nd-5th toes from a horse stepping on his bare foot. Although not the typical host, horses have been shown to be asymptomatic carriers of *B henselae* and this could have seeded an infection. The most common symptoms include fever, lymphadenopathy, and a pustule at the site of a scratch. In 80%-90% of cases CSD is self-limiting and resolves without treatment in 2-4 weeks; however, in rare cases disseminated disease occurs and may warrant treatment with antibiotics or surgical intervention.

Diagnosis of CSD remains difficult. Culture of the organism is unreliable and may take up to 40 days to show growth. Therefore, if taking cultures, holding them for up to 6 weeks is recommended. Alternatively, if a lymph node or other tissue is removed, it can be examined histologically using a Warthin-Starry silver impregnated stain. In this case, the intraoperative cultures did not grow *B henselae*. The patient had been on antibiotics for several weeks before operative intervention, and even in the most ideal situations, the organism is difficult to culture. However, the most effective and widely used way to diagnose CSD is with serologic testing for antibodies against *B henselae* using enzyme immunonassay or indirect fluorescence method. This patient did have positive titers, as well as the classic lymphadenopathy associated with CSD.

Although uncomplicated CSD does not require any treatment other than supportive measures, azithromycin has been shown in a
prospective double-blinded trial to hasten the resolution of lymphadenopathy, without significant long-term differences between placebo. Significantly less data exist on the best treatment for disseminated disease; however, rifampin, ciprofloxacin, trimethoprim-sulfamethoxazole, and gentamicin are all effective in treating disseminated disease.8

*B. henselae* osteomyelitis has been reported in the literature, although it is exceedingly rare. One series of 1200 patients reported just 2 (0.17%) with osteolytic lesions.1 Another series of 1852 patients reported just 5 (0.27%) with osseous involvement.7 The vertebral column and pelvic girdle make up nearly 70% of reported osseous lesions.7 To our knowledge, there has never been a case report of *B. henselae* osteomyelitis in the scapula. Although *B. henselae* associated osteomyelitis can resolve with time and antibiotics, there are a few reports of operatively treated *B. henselae* osteomyelitis.12,13 These were most often in the spine, and due to concern for cord compression from an associated abscess. We elected to operatively treat this patient with arthroscopic irrigation and debridement due to the concern for continued articular cartilage damage from the osseous lesion, which had already begun to penetrate through the glenoid into the shoulder joint. We were concerned that antibiotic treatment would not work quickly enough and being a young, active male, we did not want the patient’s articular cartilage to be damaged.

**Conclusion**

*B. henselae* osteomyelitis is a rare presentation of an otherwise self-limiting disease. It should be included in the differential diagnosis of a patient with tender lymphadenopathy and history of close exposure with cats. Biopsy of the inflamed lymph nodes may show granulomatous inflammation, and the diagnosis can be confirmed with serological testing. Uncomplicated cases can be treated with supportive measures, whereas disseminated cases may need antibiotics or operative treatment for resolution of symptoms. In this case report, we present the only known case of *B. henselae* scapular osteomyelitis. More research needs to be performed to determine the best treatment options for osseous involvement of *B. henselae* osteomyelitis.

**Disclaimers:**

Funding: No funding was disclosed by the authors.
Conflicts of interest: The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

Patient consent: Obtained.

References