Lyme arthritis versus acute bacterial arthritis: A diagnostic dilemma

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ABSTRACT

Introduction: Lyme disease is a known cause of monoarticular arthritis in Lyme endemic areas. It must be differentiated from other types of acute monoarticular arthritis such as acute bacterial arthritis. Case Report: In this report, we discuss the case of a 9-year-old boy who presented to emergency room with left wrist monoarthritis of one day's duration. Initial laboratory evidence were suggestive of septic arthritis and treatment was initiated for the presumed diagnosis of septic arthritis, but high index of suspicion lead to further investigations and diagnosis of Lyme arthritis. Conclusion: Diagnosis of Lyme arthritis may be difficult. Exposure in an endemic area and clinical findings may help distinguish it from acute bacterial arthritis.

Keywords: Lyme arthritis, Acute bacterial arthritis, Borrelia burgdorferi

INFORMATION


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INTRODUCTION

Lyme disease is a common cause of monoarticular arthritis in Lyme endemic areas. Lyme arthritis is a late manifestation of Lyme disease, occurring in seven percent of patients with Lyme disease [1]. This form of arthritis must be differentiated from other types of acute monoarticular arthritis such as acute bacterial arthritis. This differentiation is important for treatment and prognosis. Failure to diagnose and treat Lyme arthritis can result in persistent joint symptoms and risk of developing additional disease manifestations. In this report, we discuss a patient who presented with wrist monoarthritis, who was initially treated as septic arthritis, but later turned out to be Lyme arthritis.

CASE REPORT

A 9-year-old previously healthy, African-American boy presented to emergency room (ER) with history of one day's swelling and pain of the left wrist joint. Movements of the affected joint were restricted due to pain. There was no history of fever, rashes or other joint involvement. Patient denied trauma or insect bites. He was treated in the ER one month back for left knee arthralgia with effusion attributed to a twisting injury. The symptoms were resolved following treatment with ibuprofen. Patient lived in Bronx, NY, but had traveled upstate New York on several occasions, once for a summer camp about six months prior to the presentation.
Swelling and tenderness over left wrist joint was noted on examination. Wrist X-ray revealed no fractures or dislocation. Complete blood count showed WBC count of 8.7x10^3/mm^3 with 57% neutrophils and 40% lymphocytes. The ESR was 40 mm/1st hr. Joint aspiration was performed in the ER. Five milliliters of purulent fluid was drained. Synovial fluid analysis was significant for WBC count of 2.53x10^5/mm^3 with 93% neutrophils. Blood and synovial fluid cultures were sent. Septic arthritis was diagnosed based on the clinical presentation and synovial fluid analysis results. Patient was started on IV ceftriaxone and vancomycin. The next day the patient underwent left wrist irrigation and debridement. Cultures of the blood and synovial fluid were subsequently reported negative.

The clinical diagnosis of septic arthritis was in doubt as the patient did not have fever, significant pain, leukocytosis or significantly high ESR. These findings and the history of left knee arthralgia with effusion one month prior directed to further investigations. Patient underwent further investigations to rule out other possible etiologies.

Serologic tests for *Borrelia burgdoferi* revealed presence of 9/10 *B. burgdoferi* specific IgG bands and 3/3 *B. burgdoferi* specific IgM bands on western blot. The diagnosis of Lyme arthritis was made and patient was discharged on oral amoxicillin to complete 28 days course of the antibiotic. At one week and one month of follow-up after discharge, the wrist pain and swelling had resolved and normal range of movements of the left wrist was observed.

**DISCUSSION**

Lyme disease is the most common tick borne disease in the US and Europe. *Borrelia burgdoferi* is the sole cause of the disease in the United States. Lyme arthritis is a late manifestation of Lyme disease, occurring in seven percent of patients with Lyme disease [1]. The arthritis is usually monoarticular or oligoarticular and affects the large joints, particularly the knee joint which is involved in more than 90% cases [2, 3]. There is a wide spectrum in the acuity of presentation of Lyme arthritis and in some instances it may be confused with acute bacterial arthritis [3, 4].

Clinical features which may help to distinguish Lyme arthritis from acute bacterial arthritis include [3, 4],

- In Lyme arthritis, the joint pain is less intense than that associated with bacterial arthritis.
- Most children with Lyme arthritis of the knee joint can walk without difficulty despite some limitation of range of motion.
- Associated fever and erythema of involved joint is less common in Lyme arthritis.
- In Lyme arthritis, synovial fluid WBC count usually ranges from 2–6x10^4/mm^3 (but can exceed 1x10^5/mm^3), whereas in acute bacterial arthritis, the synovial fluid WBC count is usually more than 1x10^5/mm^3.
- If untreated, Lyme arthritis usually lasts for several weeks before resolving, only to recur often in a different joint [5]. Acute bacterial arthritis does not improve without treatment.

Serological responsiveness to *B. burgdoferi* is the primary laboratory test for diagnosing Lyme arthritis. Criteria for western blot immunoglobulin requires the presence of at least five out of ten specific bands [6]. For Lyme arthritis in the absence of neurologic disease, the recommended initial regimen is oral doxycycline or oral amoxicillin for 28 days [2]. The Infectious Diseases Society of America has suggested cefuroxime as an alternative agent in those with contraindications to doxycycline or amoxicillin.

**CONCLUSION**

The diagnosis of Lyme arthritis may be difficult. Exposure in an endemic area and clinical findings may help in distinguishing it from acute bacterial arthritis.

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**Author Contributions**

Dinushan Kaluarachchi – Substantial contributions to analysis and interpretation of data, Clinical patient care, Drafting the article, Final approval of the version to be published

Magda Mendez – Substantial contributions to analysis and interpretation of data, Clinical patient care, Drafting the article, Final approval of the version to be published

Shefali Khanna – Substantial contributions to analysis and interpretation of data, Clinical patient care, Drafting the article, Final approval of the version to be published

**Guarantor**

The corresponding author is the guarantor of submission.

**Conflict of Interest**

Authors declare no conflict of interest.

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