

# Atypical Presentation of Rocky Mountain Spotted Fever with Persistent Monoarticular Shoulder Pain

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## Abstract

We report the case of a 27 year old male who presented with persistent and unresolved shoulder pain status post shoulder arthroscopy for a SLAP lesion. A thorough history, examination, and laboratory analysis yielded the diagnosis of Rocky Mountain Spotted Fever (RMSF), a rare cause of monoarticular joint pain. After appropriate treatment with oral doxycycline the patient's symptoms resolved. This case stresses the importance of remaining cognizant for non orthopaedic causes of joint pain during orthopaedic clinical evaluation. This case represents a rare manifestation of RMSF as inflammatory arthritis of the shoulder.

## Case Report

A 27 year old previously healthy male presented to our orthopaedic surgical clinic with the complaint of left shoulder pain. He reported no major medical problems. The pain was described as a dull and achy sensation localized to the lateral deltoid region of the left shoulder without radiation. The pain was relatively constant and was not associated with activity. He also denied any trauma, fevers, chills, or night sweats.

The patient reported the pain began approximately seven months prior and was gradual in onset. He was evaluated by an orthopaedic surgeon and diagnosed with a SLAP lesion and impingement syndrome by MRI arthrogram. After having failed conservative management, the patient underwent arthroscopic surgery. The operative note indicated that a SLAP tear debridement and a subacromial decompression were conducted. The patient then completed a postoperative physical therapy protocol where he regained full range of motion and strength; however, his preoperative shoulder pain remained unchanged. At this point the patient came to our clinic in California.

Physical examination of the shoulder revealed healed arthroscopy portals anteriorly, laterally and posteriorly. He had full range of motion, no clicking, no instability, no AC joint tenderness and 5/5 strength in all planes. Impingement test, Speeds test, Yergason's test and O'Brien's test were all negative. Cervical spine examination was normal. Radiographs of the left shoulder included AP, lateral and scapular Y-view which were unremarkable. Cervical spine radiographs were also unremarkable. Given the fact that the patient had surgery four months prior but had persistent pain, an MRI arthrogram of the left shoulder was done. This showed no SLAP lesion, rotator cuff tear, nor any other significant finding.

As no orthopaedic causes of shoulder pain could be identified, a wider workup was initiated. The patient was questioned further in terms of history, including travel. He had not indicated any travel on his medical questionnaire, however, upon discussion he revealed traveling to his home state of Oklahoma ten months prior. He did recall a mild rash on his chest while in Oklahoma, which resolved after a few days. He did not recall any fever during this episode. At this point blood samples were sent for CBC, Chemistry, Arthritis Panel, Lyme Titer and other tick titers including Rocky Mountain Spotted Fever.

Abnormalities from this workup consisted of: mild leukocytosis with 11.7x10<sup>9</sup> cells/L with a left shift. CRP elevated to 24.3 mg/L, and the patient tested positive for RMSF IgG titer. An infectious disease specialist was consulted and the patient was started on Doxycycline 100mg twice daily for two weeks. The patient responded rapidly to this treatment and his long standing shoulder pain resolved after the first week of treatment.

## Discussion

RMSF is a potentially lethal tick borne disease caused by the bacteria *Rickettsia rickettsii*, a Gram-negative coccobacillus [1,2]. Its primary vector is the American dog tick (*Dermacentor variabilis*) [3]. It is most commonly found in the central and western United States. Sixty percent of cases

occur in five states: North Carolina, Oklahoma, Arkansas, Tennessee and Missouri [4]. Typical symptoms include: fever, chills, headache, malaise, myalgia, nausea, vomiting, neurologic deficits and a maculopapular rash (10% of cases do not develop a rash). The complete triad of fever, headache and rash is present in approximately 62% of patients [5]. It can be fatal in the first week if not diagnosed, although protracted infections with atypical presentations have been reported. Unusual presentations are common; therefore clinicians must be aware to keep RMSF in mind in the workup of challenging cases.

Confirmation of the disease is based on laboratory testing. IgG specific antibody titer by indirect immunofluorescence antibody assay will yield positive results within 7-10 days of illness onset [6]. Administering anti-rickettsial therapy within 5 days of symptom onset significantly decreases the patients likelihood of death compared to those receiving treatment after 5 days of symptoms [7]. It is recommended that antibiotic treatment be initiated immediately after the disease is clinically suspected, based on the typical signs and symptoms, even before laboratory confirmation in order to mitigate complications.

Reports of RMSF most often include significant systemic symptoms including fever, rash, malaise, headache, and/or multisystem disease [1,4,8,9]. When the musculoskeletal system is involved, patients most often complain of generalized arthralgia that are polyarticular and acute in nature, and occur in conjunction with the typical systemic symptoms [9,10]. A thorough review of the literature revealed few cases of RMSF presenting as monoarticular pain. The first reported case of monoarticular arthritis due to RMSF was in 1996 in a 30 year old male with concomitant acute systemic illness. The authors reported confusion with the initial presentation, and the patient's condition quickly deteriorated into multi-system organ failure requiring intubation. He eventually gained full recovery following continued therapy with doxycycline [11]. The most recent report involved the Brazilian Rickettsial species in 2014 where a 30-year-old hiker in Brazil presented with a tick bite, associated macular rash, fever, enlarged lymph nodes in the left groin, and left knee swelling and pain. This case was quickly treated given the identified tick bite site on examination [12]. No reports of RMSF presenting as isolated monoarticular pain, without systemic symptoms, and chronic in nature could be identified in the literature.

Our patient had a very atypical presentation of RMSF as a chronic inflammatory arthritis ten months post exposure, isolated to the left shoulder, and without systemic symptoms. It is our impression that his prior shoulder arthroscopy had no bearing on the presentation or course of the disease as the patient reported that the nature of pain in his shoulder remained unchanged post operatively. His clinical presentation made the correct diagnosis of RMSF very difficult. We arrived at this diagnosis through deductive reasoning. Given

the patient's travel history to the mid-west, and the brief rash he experienced there, we had enough epidemiological suspicion to test for RMSF even though he did not present with any typical systemic disease. Fortunately, in his case, the disease took a moderate course in terms of potential illness and complications.

We emphasize that Orthopaedic clinicians maintain a high index of suspicion for this disease entity, especially in endemic areas during the spring and summer seasons, as missed cases can be fatal. This case serves as a reminder of the importance in considering non-orthopaedic causes of joint pain when symptoms do not correlate with physical examination and imaging studies.

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