Bacillary Angiomatosis Associated with Myositis in a Patient Infected with Human Immunodeficiency Virus

Margot J. Whitfeld, Sassan Kaveh, Jane E. Koehler, Paul Mead, and Timothy G. Berger

A man with AIDS presented with a deep soft-tissue mass involving the right thigh. Biopsy of a skin lesion on the back and culture of a specimen from this lesion showed bacillary angiomatosis due to Bartonella (formerly Rochalimaea) quintana. Magnetic resonance imaging revealed a large heterogeneous mass involving the vastus medialis and intermedius muscles. Therapy with erythromycin caused rapid resolution of both the cutaneous lesion and the muscle lesion. Bartonella infection is proposed as an additional cause of bacterial myositis and expands the spectrum of presentation of bacillary angiomatosis.

Bacillary angiomatosis (BA) usually affects persons with advanced HIV disease [1]. It most commonly involves the skin but may also affect the liver, spleen, bone, lymph nodes, brain, and subcutaneous tissues. BA is caused by Bartonella (Rochalimaea) henselae and Bartonella (Rochalimaea) quintana, the etiologic agents of cat-scratch disease and trench fever, respectively [1–3].

Bacterial myositis is infection of the skeletal muscle, which can be either pyogenic (pyomyositis) or nonpyogenic in nature. We report a case of BA due to B. quintana that occurred in association with myositis of the large thigh muscles and review additional causes of bacterial myositis in HIV-infected persons.

Case Report

A 66-year-old homosexual man with AIDS and a CD4 cell count of 20/mm³ presented with a 1-month history of a subcutaneous mass involving the right thigh; he did not have a history of trauma. His significant medical history included CNS toxoplasmosis and Kaposi’s sarcoma. His medications included pyrimethamine and nebulized pentamidine.

An ultrasonogram of the right thigh showed a highly vascular 3.0 × 2.9 × 3.7-cm soft-tissue mass. Examination of material obtained by fine needle aspiration of the mass revealed proliferation of spindle cells without malignant features and minimal inflammatory infiltrates. No purulent material was obtained, and routine bacterial cultures of the material did not yield any organisms. (Specific conditions for culture of Bartonella species were not used.) Subsequent methenamine-silver staining of the material was negative.

He received a single 250-mg dose of erythromycin as empirical treatment for respiratory symptoms (subsequently found to be due to Pneumocystis carinii pneumonia). Within 48 hours of administration of the single dose of erythromycin, there was a dramatic decrease in the size of the thigh mass, such that it was no longer palpable. Cultures of blood specimens obtained 72 hours after the erythromycin dose was administered were negative for Bartonella.

The patient presented 2 months later with a recurrence of the mass in the same site; the mass measured 10 × 15 cm. It was slightly tender and warm but was not erythematous or fluctuant. Examination of the skin revealed a single 1.0-cm red nodule on the back with a collarette of scale and multiple surrounding satellite lesions. His temperature was 38.3°C. Apart from a poor appetite and recent weight loss, he otherwise felt well. Laboratory evaluation revealed normal WBC and differential cell counts and a mildly elevated serum aspartate aminotransferase level of 63 U/L (normal range, 5–35 U/L). His serum creatine phosphokinase level was <20 U/L (normal range, 30–235 U/L).

A plain film of the right femur did not show any abnormalities. An MRI revealed a large heterogeneous mass (diameter, 4 × 5 cm; length, 10 cm) (figure 1). The mass involved and extended beyond the vastus medialis and intermedius muscles. Signal intensities consistent with vascular lakes, infection, or both were demonstrated. A bone scan showed an increase in uptake contiguous with the femur that extended medially into the soft tissue. A gallium scan revealed abnormal uptake in the soft tissue of the right thigh.

He refused to undergo repeated fine needle aspiration or open muscle biopsy. A biopsy of the cutaneous nodule on his back confirmed the diagnosis of BA. Modified Steiner staining of a biopsied nodule demonstrated clusters of organisms consistent with Bartonella bacilli. Culture of a biopsied nodule yielded B. quintana; the identification of the organ-
ism was confirmed by the presence of a partial 16S rDNA sequence, which was demonstrated using previously described primers (p24E and p12B) and techniques [3].

The patient was treated with oral erythromycin (500 mg q.i.d.), and both the thigh mass and the cutaneous lesion rapidly decreased over the next 4 days; there was clinical resolution in 2 weeks. His antibiotic therapy was continued for 6 months without recurrence of either the muscle or the skin lesion. He died shortly thereafter of other AIDS-related complications.

The diagnosis of BA involving the muscle was made by a combination of the following: the proliferation of spindle cells in the fine needle aspirate from the muscle mass, which was consistent with BA; the ultrasonogram showing a highly vascular mass; cutaneous BA proven by histologic examination and culture; and the dramatic response of both the cutaneous lesion and the muscle lesion to oral erythromycin therapy. Kaposi’s sarcoma, the other diagnostic possibility given the proliferation of spindle cells in the fine needle aspirate, would not have been expected to respond to erythromycin therapy.

**Discussion**

We propose that *B. quintana* should be added to the list of organisms that can cause bacterial myositis. Schinella and Greco [4] described microscopic involvement of muscle, noting an “occasional nodule” of BA within skeletal muscle adjacent to a large soft-tissue mass; however, the involvement of the muscles in our case was extensive.

The principal causative organism of bacterial myositis in both tropical and temperate climates is *Staphylococcus aureus* [5]. In Christin and Sarosi’s review [5] of 98 cases of pyomyositis reported from North America that occurred over the previous 20 years, 18 (18.4%) were associated with HIV infection. In our review of 48 cases of HIV infection and bacterial myositis (table 1) [6–26], 44 patients (92%) had AIDS (based on current diagnostic criteria [27]) at the time that myositis was diagnosed. Thirty-six (84%) of those cases in which an organism was isolated were due to *S. aureus*, but other organisms including gram-negative bacilli were also reported.

Predisposing factors for bacterial myositis include tropical location, exercise or muscle trauma, viral and parasitic infections, diabetes mellitus, drug use and nutritional deficiencies, neutropenia [5, 7, 8, 28], and staphylococcal skin infections. Contributing factors in HIV-infected persons could include AIDS-related myopathies [6], multifactorial neutropenia (which is seen in many persons with AIDS), defective neutrophil function [5, 9, 20], and a marked reduction in the level of immunoglobulins of the IgG2 subclass [8]. The rate of staphylococcal myositis in HIV-infected persons may be further increased because of their high rate of staphylococcal carriage and their frequency of dermatologic conditions.

<table>
<thead>
<tr>
<th>Bacterium</th>
<th>No. (%) of infected patients</th>
<th>No. of infected patients with AIDS</th>
<th>Reference(s)</th>
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</thead>
<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
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<td>33</td>
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<td>[7]</td>
</tr>
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<td>1</td>
<td>[10]</td>
</tr>
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<td>[23]</td>
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<td>1</td>
<td>[10]</td>
</tr>
<tr>
<td><em>Salmonella enteritidis</em></td>
<td>1 (2)</td>
<td>1</td>
<td>[24]</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
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<td>1</td>
<td>[25]</td>
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<tr>
<td><em>Bartonella quintana</em></td>
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<td>1</td>
<td>[PR]</td>
</tr>
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<td>5 (11)</td>
<td>4</td>
<td>[6, 7, 11, 21, 26]</td>
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<tr>
<td>Total</td>
<td>48 (100)</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE. PR = present report.

* Microscopic involvement of muscle by an organism consistent with *Bartonella* (which was demonstrated by Warthin-Starry staining) has also been reported [4].
Examination of needle aspirates and blood cultures are often negative in the early stages of bacterial myositis [5, 7, 29]; therefore, MRI has been advocated as an early diagnostic tool [10, 29]. If BA is suspected, histopathologic documentation of the organisms before institution of antibiotic therapy remains essential because the organisms are rapidly destroyed after antibiotic therapy is commenced. Bacterial cultures cannot yield Bartonella species unless special culture conditions are used [3]. Histopathologic examination of fine needle biopsy specimens is frequently inconclusive for diagnosing BA; therefore, if BA is suspected, then an open muscle biopsy may be required to obtain a diagnosis by histologic examination or culture.

Conclusions

The case reported here demonstrates that BA may be associated with skeletal muscle involvement. Careful examination of the skin elsewhere may reveal typical cutaneous BA, thus facilitating the diagnosis. AIDS appears to be a major risk factor for bacterial myositis, and Q. quintana is an apparent additional cause of bacterial myositis in HIV-infected persons. Early cultures are important, but if initial aspiration does not yield adequate diagnostic material, open muscle biopsy to obtain a specimen for histopathologic examination and culture should then be considered.

Acknowledgments

The authors thank Dr. Sikina Rossi and Dr. George Murakawa for their generous help in preparing this article.

References