BRIEF ARTICLE

Botryomycosis: Delayed Diagnosis Complicates Treatment

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ABSTRACT

Botryomycosis is a chronic bacterial infection that is mostly caused by *Staphylococcus aureus.* More commonly, this rare disease affects the skin, and less often the viscera. In this case, we will discuss a 64-year-old male that was undiagnosed with botryomycosis for over two years. Punch biopsy and culture revealed heavy growth of *Staphylococcus aureus* infection with scar tissue, which confirmed the diagnosis of botryomycosis. The patient was treated with dicloxacillin 500 mg one pill three times daily for two weeks and then another round for ten more days. This therapy was followed by doxycycline 100 mg twice daily for four weeks and surgical debridement. In this case report, the need for early and accurate diagnosis of botryomycosis will be emphasized due to the vast differing cutaneous presentations of this disease, thus preventing the delay of diagnosis and treatment.

INTRODUCTION

Botryomycosis is a chronic bacterial infection that can manifest with both cutaneous and pulmonary involvement.[1] Although it can be caused by certain pathogens, such as *Escherichia coli* and *Pseudomonas aeruginosa*, it is most commonly caused by *Staphylococcus aureus*.[2] In the cutaneous presentation of the infection, Botryomycosis can present clinically as ulcerated tumors or plaques with discharging sinuses draining small white colored granules.[1] The infection can invade deep tissue and lead to extensive damage.[1] Microscopically, botryomycosis is characterized by formation of eosinophilic granules that can resemble the *Actinomyces* species.[2] Additionally, the diagnosis of botryomycosis can be made with microscopic inspection and culture of granules, which reveal either gram positive cocci or gram negative bacilli.[2] This disease mostly affects the skin and soft tissue of the extremities, concentrating on the hands and feet most commonly, with head and neck involvement less common.[3] Although the exact rate of Botryomycosis is unknown, there have been an estimated amount of 200 cases reported in literature.[4]

CASE REPORT

A 64-year-old male presented to a dermatology clinic with complaints of erythematous, firm keloid-like scarring skin lesions and scaly papules on the left dorsal hand and left distal dorsal forearm. At the initial presentation, the patient revealed that he had been undiagnosed for over two years. The patient also complained of tenderness

and burning in the area and that there felt like something in his arm that he could not get out. Patient's dermatologic medical history includes basal cell carcinoma. There is no other pertinent past medical history that the patient provided, other than social history of daily alcohol consumption, which could be related to the case presentation and will be further explained in the discussion portion of the report.

There were four punch biopsies taken (**Figure 1**). After pathological testing, results revealed dermal fibrosis consistent with a scar and heavy growth of *Staphylococcus aureus* on the left distal dorsal forearm with culture testing. A diagnosis of botryomycosis was made, and the patient was treated with oral antibiotic treatment of dicloxacillin 500 mg capsule three times daily for two weeks and then another round for ten more days. This therapy was followed by doxycycline 100 mg twice daily for four weeks and surgical debridement (**Figure 2**). In this case report, the need for early and accurate diagnosis of botryomycosis will be emphasized due to the vast differing cutaneous presentations of this disease, thus preventing the delay of diagnosis and treatment.

DISCUSSION

Botryomycosis is a unique diagnosis as it can present differently amongst patients. Although there is a general treatment plan for those who are diagnosed with botryomycosis, there is no standard treatment due to the rarity of disease. Often there is a delay in diagnosis in many patients due to lack of awareness for this disease plus standard therapy does not exist. In our patient, four tissue specimens were required to diagnose and treat this patient.

Our patient had a delay in diagnosis before appearing in our clinic and required both surgery and oral antibiotics. John *et al.* reported a rare presentation of a case of botryomycosis that required 8 years for diagnosis. The biopsy showed an abscess cavity with Gram positive cocci and culture grew *Staphylococcus aureus*, establishing diagnosis of botryomycosis.[1] This research is relevant to our case because it highlights the long-time duration in which the patient was undiagnosed. While our patient was undiagnosed for two years and this patient was undiagnosed for eight years, it poses a stress on health care providers to be more cognizant of this diagnosis so intervention and treatment can occur sooner.

Another distinct diagnostic feature of botryomycosis is that it is mostly reported in immunocompromised adults.[5] For instance, there are multiple cases reported in literature with patients, including children, who have acquired immunodeficiency syndrome that are diagnosed with botryomycosis.[6] There are also reports that botryomycosis can be related to minor wounds or traumas and underlying illnesses. Diabetes mellitus, alcoholism, skin trauma, steroid treatment and cystic fibrosis are predisposing factors for botryomycosis.[7] It is essential for health care providers to ask their patients about any underlying illnesses and keep these predisposing factors in mind if botryomycosis is suspected.

Mehregan also reports that predisposing factors included alcoholism, diabetes, and trauma.[8] In this case, our patient did admit to daily alcohol consumption, which could have been a predisposing factor. Although more research would have to be done to confirm this as a correlation or significant factor, it can still be considered when diagnosing botryomycosis in a clinic.

Figure 1. Lesions circled; picture taken right before four biopsies. One biopsy was for histopathology and the other three were for bacterial culture & sensitivity, AFB culture & smear, and fungal culture.

Figure 2. Picture taken after suture removal of punch biopsies.

Surgical debridement is another treatment plan for botryomycosis. Devi *et al.* utilized surgical debridement and combination therapy of injectable netilmicin and oral sulfamethoxazole/trimethoprim on a patient with polymicrobial botryomycosis caused by *Staphylococcus aureus*.[9] Like our case, surgical debridement was utilized along with combination antibiotic therapy. This multi-treatment approach may spread awareness

for a standard treatment of botryomycosis, prevent a delay in diagnosis and create better health outcomes for patients.

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