CASE REPORT

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Cutaneous botryomycosis of the right elbow in an immunocompetent adult male - A case report

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ABSTRACT

Botryomycosis is a rare, chronic bacterial infection that can affect the skin or internal organs. This report discusses a case of cutaneous botryomycosis in a 29-year-old male with nodular masses and discharging sinuses on his right elbow for two years. Differential diagnoses included actinomycosis, botryomycosis, and mycetoma. Aerobic culture identified methicillin-sensitive *Staphylococcus aureus*, the most common cause of botryomycosis. Accurate etiological diagnosis is crucial for effective treatment, since the patient responded well to antibiotics tailored to the sensitivity report. Early diagnosis and targeted therapy are key to managing this rare infection.

Introduction

Botryomycosis is a rare, chronic bacterial infection characterized by suppurative granulomatous inflammation, primarily in immunocompromised individuals (1,2). Risk factors include alcoholism, diabetes, immunosuppression, and malnutrition (3). Cutaneous lesions present as nodules, abscesses, and sinuses with purulent discharge containing granules. If untreated, these lesions may form fistulas, invade deeper tissues, create abscesses, mimic malignancies, and heal with atrophic scars (4). Diagnosis is challenging, often misidentified as actinomycetoma (5). Key diagnostic indicators include lesion progression, antibiotic response, and positive bacterial cultures (3). Despite its bacterial origin, the term “botryomycosis” misleadingly suggests a fungal etiology (6). *Staphylococcus aureus* is the most common pathogen, with others including *Pseudomonas aeruginosa*, coagulase-negative *Staphylococci*, *Streptococcus* spp., *Escherichia coli*, and *Proteus* spp. (7).

We report a case of cutaneous botryomycosis in a 29-year-old male with chronic discharging sinuses and indurated nodular masses over his right elbow. This study follows the CARE guidelines. Ethical approval was waived by the Institutional Ethics Committee of K. S. Hegde Medical Academy. The patient provided informed consent, and the study adhered to ethical

principles of Nitte (Deemed to be University) and the Declaration of Helsinki.

Presentation of Case

A 29-year-old male from Mangaluru, Karnataka, presented with a two-year history of multiple swellings over his right elbow following trauma sustained in a road traffic accident. Initial treatment at local healthcare facilities included analgesics, anti-inflammatory medications, and antiseptic lotions, but no antibiotics were administered. Despite these measures, the swelling worsened, prompting him to seek further evaluation at the present tertiary healthcare center.

The patient was well-nourished and well-built, with no comorbidities, signs of pallor, jaundice, cyanosis, or lymphadenopathy. Systemic examinations did not reveal any significant abnormalities. The cardiovascular, respiratory, gastrointestinal, and central nervous systems were within normal limits. The blood tests were within normal limits, including hemoglobin (14.4 g/dL), white blood cell count (6,500 cells/mm^3), platelet count (293,000 cells/mm^3), and C-reactive protein (4.8 mg/L). Cutaneous examination of the right elbow revealed hyperpigmented, indurated nodules and multiple discharging sinuses with seropurulent discharge (Figure 1).

The patient was evaluated for mycetoma, botryomycosis, and actinomycosis. Fungal culture, potassium hydroxide mount, and Ziehl-Neelsen staining were negative. Human immunodeficiency virus and tuberculosis tests also yielded negative results, ruling out immunosuppression. An X-ray of the right elbow (anteroposterior and lateral views) showed no abnormalities. However, ultrasonography of the soft tissue in the right elbow revealed findings suggestive of abscess formation.

Sample collection involved cleaning the area around the discharging sinus with an antiseptic to minimize contamination. A sterile needle or swab was then used to obtain material directly from the site of the discharging sinus infection. In cases where the lesion had penetrated deeper tissues, surgical debridement was performed for sampling. Gram staining of the soft tissue and discharge revealed numerous pus cells and moderate gram-positive cocci in clusters and pairs. The wound culture on 5% sheep blood agar (Himedia, Mumbai, India) yielded beta-hemolytic colonies (Figure 2). The isolate was identified as methicillin-sensitive *Staphylococcus aureus* (MSSA) using the VITEK 2 Compact System and the matrix-assisted laser desorption/ionization-time of flight bacterial identification system, both from bioMérieux (Marcy L'Etoile, France).

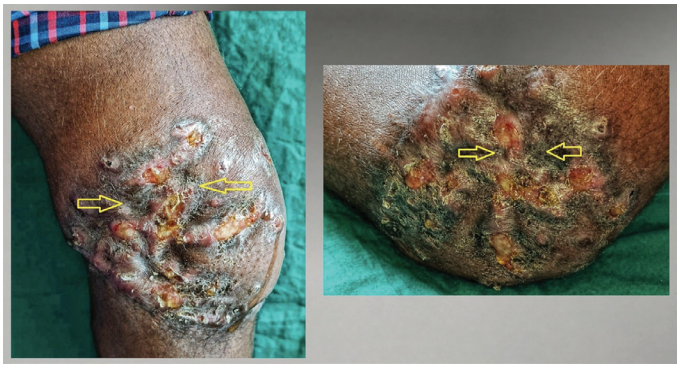

Figure 1. Cutaneous examination of the right elbow revealed hyperpigmented, indurated nodules and multiple discharging sinuses with seropurulent discharge

Antibiotic susceptibility testing, measuring minimum inhibitory concentrations in µg/mL, was conducted using the VITEK 2 system. Susceptibility cards were inoculated and interpreted according to the manufacturer's guidelines (8). The isolate of *S. aureus* was found to be resistant to erythromycin (≥8 µg/mL) and benzyl penicillin (≥0.5 µg/mL). It was sensitive to oxacillin (≤0.25 µg/mL), gentamicin (≤0.5 µg/mL), ciprofloxacin (1 µg/mL), levofloxacin (≤0.5 µg/mL), clindamycin (0.25 µg/mL), linezolid (2 µg/mL), vancomycin (≤0.5 µg/mL), tetracycline (≤1 µg/mL), and trimethoprim/sulfamethoxazole (≤10 µg/mL). The cefoxitin screen was negative.

Histopathological examination of the excised tissue, measuring 0.8 × 0.5 × 0.4 cm, revealed an ulcer on the skin surface (0.3 × 0.3 cm). The undersurface appeared normal, with pale white to brown areas on the cut surface. Microscopic analysis demonstrated dense chronic inflammation with lymphocytes, plasma cells, histiocytes, neutrophils, microabscesses, granulomas, multinucleated giant cells, and surrounding lymphocytic aggregates in the dermis and subcutaneous tissue.

Bacterial aggregates, identified as gram-positive cocci, were embedded in eosinophilic material, forming radiating,

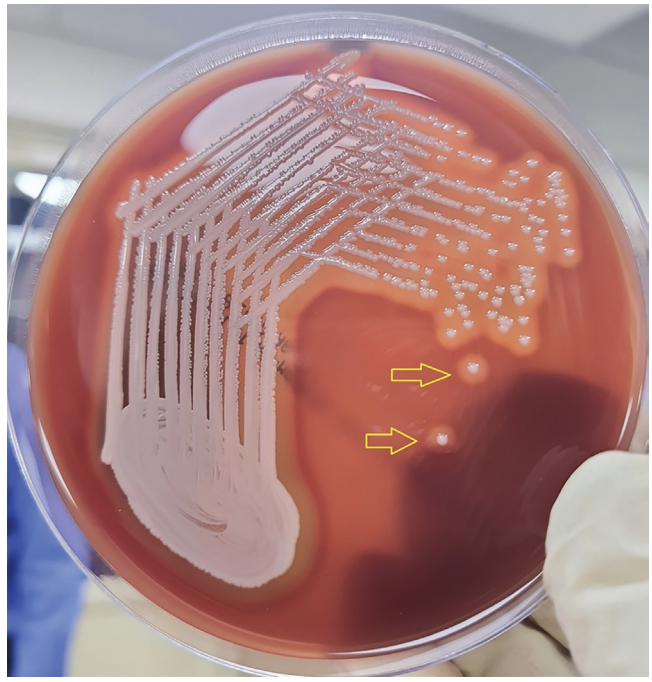

Figure 2. Wound culture on blood agar produced beta-hemolytic colonies

club-shaped structures consistent with the Splendore-Hoeppli phenomenon. Periodic Acid-Schiff was negative. The diagnosis of botryomycosis was confirmed, and no malignancy or fungal organisms were detected. The patient's lesions completely resolved with scarring following a 30-day course of oral clindamycin (300 mg four times daily).

Discussion

Due to the infrequent occurrence of botryomycosis, comprehensive epidemiological data on its prevalence remain poorly defined. However, case reports indicate that MSSA is a frequently associated pathogen. A case series by Sirka et al. (9) documented three cases of cutaneous botryomycosis in immunocompetent individuals; identifying MSSA in two instances, underscoring its etiological role. While MSSA is typically susceptible to methicillin and other beta-lactam antibiotics, emerging resistance necessitates careful antibiotic selection. In the aforementioned case series, MSSA isolates were sensitive to doxycycline, and affected patients responded well to doxycycline monotherapy (9).

Diagnosing cutaneous botryomycosis remains challenging due to its nonspecific clinical presentation, which can resemble actinomycosis, mycetoma, or chronic granulomatous infections. Histopathological examination, revealing characteristic granules, alongside microbiological culture for pathogen isolation, is essential for accurate diagnosis (10).

Therapeutic management often requires prolonged antibiotic therapy. Surgical debridement is considered for extensive lesions, bone invasion, or non-responsive cases to remove necrotic tissue. Given the risk of antimicrobial resistance, treatment should be guided by culture and sensitivity testing (9,10). Effective antibiotics include co-trimoxazole, rifampin, minocycline, erythromycin, and cephalosporins (5). Case reports highlight various treatment approaches, including vancomycin and surgical debridement in Taiwan (11), clindamycin in Sydney (3), and ceftriaxone sodium at the All-India Institute of Medical Sciences, Bhubaneswar (2). Singh et al. (12) reported successful treatment with clindamycin in a similar case.

In the present case, *S. aureus* was isolated from an immunocompetent adult without significant risk factors. Accurate diagnosis enabled appropriate management, leading to complete clinical resolution. At the four-week follow-up, the patient remained asymptomatic, with ultrasonography confirming complete resolution of the mass without residual disease.

Conclusion

This case highlights the significance of accurately diagnosing botryomycosis, distinguishing it from similar conditions like mycetoma and actinomycosis. Appropriate antibiotic therapy, guided by culture and sensitivity results, leads to successful outcomes, with surgical intervention as needed.

Ethics

Informed Consent: Consent form was filled out by all participants.

Footnotes

Authorship Contributions

Concept: A.A.A., V.K.K., Design: A.A.A., V.K.K., Data Collection or Processing: A.A.A., B.C., Analysis or Interpretation: A.A.A., V.K.K., B.C., Literature Search: A.A.A., V.K.K., B.C., Writing: A.A.A., B.C.

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