



BOTRYOMYCOSIS: AN OVERVIEW

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ABSTRACT

Botryomycosis is a rare chronic granulomatous, bacterial infection that affects the skin, and sometimes the viscera. The infection rate appears to be increasing. The diagnosis of botryomycosis is one that is often easily overlooked because it can be confused with other mycetoma, actinomycosis and nocardiosis. Although infrequently botryomycosis is diagnosed, it should be considered in the differential diagnosis of any lesion where there is disruption of tissue-planes, erosion into bone, and granule formation occur. However, since multiple agents may determine formation of granules, varying from fungi to bacteria, direct mycological examinations, cultures in media for fungi to bacteria, and histopathology of the material with special staining are essential. Cases may still be missed or mistakenly identified, mainly due to confusion with fungal infections. It is advised that when a patient presents, all investigations be correlated to reach the proper diagnosis.

KEYWORDS : Bacteria; Granuloma; Pseudomycosis;

Introduction

Botryomycosis; also known as bacterial pseudomycosis, is a rare chronic granulomatous, bacterial infection that affects the skin, and sometimes the viscera.^{1,2} Botryomycosis has been known to affect humans, horses, cattle, swine, dogs and cats. This entity is otherwise referred to as schizomycosis, bacterial pseudomycosis, granular bacteriosis, staphylococcal actinophytosis, granuloma pyogenicum etc. Botryomycosis has been called the 'champignon de castration'³ because of original descriptions of the disease after castration in horses. Though first described by Otto Bollinger in 1870, it was Sebastiano Rivolta 14 years later who coined the term botryomycosis, referring to the grapelike appearance of the granules (Greek. Botryo means grapes) and the presumed fungal etiology (Greek. mykes=mycosis). Opie described the first case in humans in 1913. Magrou, in 1919, reported four cases and the isolated agent was *Staphylococcus aureus*. Winslow, in 1959, reviewed the disease and classified it as cutaneous and visceral forms.⁴ Botryomycosis is a relatively uncommon disease, and its description is limited to case reports. It occurs more commonly among immunocompromised patients, although infection in immunocompetent patients has also been described.⁵ Surgery, abrasion & laceration in road accidents, piercing of pinna are the documented etiological factors.¹ With a relative impairment of cellular immunity, these conditions result in a sort of 'symbiosis' between the two. The major predisposing factors are skin trauma, postoperative complications, diabetes mellitus, liver disorders, treatment with steroids, alcoholism and cystic fibrosis. Less common factors are malnutrition, glomerulonephritis, AIDS, and bronchial asthma.^{6,7}

Microbiology

The most common organism identified in botryomycosis lesions is *Staphylococcus aureus*. Other pathogens associated with this condition include *Pseudomonas aeruginosa*, *Escherichia coli*, *Proteus vulgaris*, coagulase-negative *Staphylococci*, *Streptococci*, and *Micrococci*; and anaerobes such as *Actinobacillus*, *Peptostrep-tococcus*, and *Propionibacterium acnes*.⁸

Immuno-pathogenesis

The pathogenesis of botryomycosis is not well known. It is associated with defects of cellular immunity, particularly with low lymphocyte counts. It may be related to low virulence of agents, large local bacterial inoculum, change in specific cellular immunity (decreased number of T lymphocytes, like in agammaglobulinemia, aplastic anemia, agranulocytosis and AIDS), or in humoral immune

response (reduced IgA or increased IgE levels).⁹ A CMI defect leading atypical tissue response & reduced phagocytosis has been postulated.¹ The decisive factors in the pathogenesis of botryomycosis remain unclear. In a case reported in Brazil, cellular immunity demonstrated deficient response assessing by PPD skin test, streptokinase-streptodornase, oidiomycin and vaccinia. The increased IgG, IgM and gamma globulin levels suggest a possible change in humoral defence of the host.¹⁰

Clinical Presentation

Botryomycosis is a chronic, granulomatous, suppurative bacterial infection of the skin and organs, characterized by release of granules, such as in mycetoma and actinomycosis. Hands, pinna, feet and head are common sites of botryomycosis. Folds of skin in obese patients, skin under pendulous breasts are other vulnerable areas.¹ It can be cutaneous or visceral which may be primary or a secondary infection due to the dissemination.

The skin lesions may be single or multiple and pleomorphic, similar to cysts, abscesses, fistulas, nodules, plaques or ulcers. Most patients present with subcutaneous nodules, but others may develop verrucous lesions or nonhealing ulcers associated with draining sinuses or fistulae. Drainage from these lesions is usually purulent and may contain small yellowish "grains" resembling the sulfur granules seen in actinomycosis. Occasionally, infection may involve contiguous soft tissues such as the subcutaneous tissue, muscles, tendons, and bone. Mucosal involvement of areas such as the tongue and nasal septum has also been described.¹² Lungs is the most common site, presented with chronic cough, dyspnoea, hemoptysis.¹ Botryomycosis involving the liver, spleen, or kidney tends to present with chronic abdominal pain and local tenderness to palpation. Systemic symptoms such as fever, fatigue, or weight loss may or may not be present. Given the prolonged duration and nature of the symptoms, visceral botryomycosis may be sometimes mistaken for malignancy.⁸ Bowel, omentum, brain, prostate, submandibular lymphnode & tonsils are the sites rarely involved.¹¹

Differential Diagnosis

The main differential diagnoses of botryomycosis are exogenous actinomycosis and eumycetoma. Tuberculosis, atypical mycobacterial infection sporotrichosis, lymphoma, Kaposi's sarcoma should be considered also.¹³

Diagnosis

Granular infections are classified by Winslow into the three categories. 1) mycetoma 2) actinomycosis & nocardiosis 3) Botryomycosis.^{14,15} They all clinically present enlarged affected area, fistulas and drainage of granules, but differ in etiology, location and consistency of the lesions.^{5,7} The assessment of size, consistency, color and shape of the granule may suggest the etiological agent. The granules formed by all etiological agents is white in colour excepting *Actinobacillus lignieresii*, which are yellow in colour.¹³ The eumycotic granules contain hyphae in their interior and large and globous edematous cells; the actinomycotic granules have fine and ramified filaments in the periphery; the granule of botryomycosis present as coccoidal or bacillary structures with no fine filaments in their interior.¹¹ Microscopic examination of hematoxylin & eosin stained specimen shows chronic suppurative and granulomatous inflammation with giant cells, epithelioid macrophages & scattered microabscess. There is marked fibrosis and desmoplasia of the connective tissues. Within the areas of purulent inflammation are characteristic grains, the size of fine sand particle which have been referred to as Bollinger's granules.¹¹

Treatment

The treatment of botryomycosis should be based on identification of the etiological agent by means of direct examination, culture and antibiogram of secretion of the lesion. Antibiotic therapy is often used for weeks and, in some cases, surgical excision or drainage of lesions are required.¹³

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