Toothbrushes: Use Only as Directed

A Cautionary Tale of Pulmonary Actinomycosis

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Introduction

Actinomycosis species are commensal anaerobes inhabiting the oropharynx and gastrointestinal tract, and can become opportunistic pathogens.1,2

Learning Objectives

• Identify the risk factors for pulmonary actinomycosis
• Understand the typical presentation of pulmonary actinomycosis
• Review the microbiologic challenges in diagnosis
• Highlight the importance of a high degree of clinical suspicion for correct diagnosis and treatment

Clinical Presentation

A 63-year-old man with a history of chronic kidney disease and prior bariatric surgeries presented with two weeks of cough, progressive shortness of breath, and right-sided thoracic back pain. Physical examination was significant for poor dentition and decreased breath sounds over the right lung base.

Chest X-ray demonstrated a right perihilar pneumonia with moderate pleural effusion. Thoracentesis was performed which revealed an exudative process (pH 5.4, glucose 43 mg/dL, LDH 690 IU). Initial Gram stain was negative.

Computed tomography scan of the chest was performed and demonstrated partially loculated pleural fluid (Figure 1) and a pigtail catheter was placed. Repeat Gram stain was notable for Gram-positive cocci and filamentous branching Gram-positive rods. Acid fast staining was negative. (Figure 2a and 2b). Culture of the fluid grew Peptostreptococcus and Actinomyces species.

On further questioning, the patient disclosed that he often self-induced vomiting with his toothbrush to alleviate fullness after overeating. Purging resulted in aspiration of oral flora, likely leading to pulmonary actinomycosis. Antibiotic treatment was amoxicillin/clavulanic acid for 12 weeks.

Discussion

Pulmonary actinomycosis is rare, constituting only 15% of all Actinomyces infections.2 It likely results from aspiration of oropharyngeal secretions or gastric contents into the respiratory tract supported by basal pneumonia radiologically. Clinical presentation is similar to pneumonia with fever, cough and dyspnea.4,7 however it usually presents in an indolent fashion due to the organism’s low virulence.3 Associated risk factors include age 40-60 years,6 male sex,5,7 and poor oral hygiene.1 Complications include abscesses, empyema, fibrosis and scarring.3,7

Most Actinomyces infections are polymicrobial.1,7 It has been suggested that other organisms in the infection site enhance the pathogenicity of Actinomyces by creating an anaerobic environment in which it thrives.3,4,7

Histologic examination demonstrates filamentous branching Gram-positive rods which are not acid-fast. This distinguishes it from Nocardia, which is acid-fast.2,3 Isolation of the organism is difficult. Actinomyces grow slowly and may need anaerobic culture for up to three weeks.1 Clinicians should maintain a high index of suspicion for pulmonary actinomycosis in patients with poor dentition or risk factors for aspiration and specifically request Actinomyces culture from the laboratory. Over 90% of cases are initially misdiagnosed;6 thus considering actinomycosis in the differential may precipitate diagnosis.

While usually penicillin sensitive, the appropriate antibiotic course for Actinomyces is prolonged.1 Clinicians risk under-treating if the diagnosis is missed.

References


Figure 1. Chest CT scan with partially loculated pleural fluid

Figure 2a. Gram stain

Figure 2b. Acid fast stain