



Case report

Isolated *Streptococcus intermedius* pulmonary nodules

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ABSTRACT

Streptococcus intermedius, a member of the *Streptococcal anginosus* group of alpha-hemolytic streptococci, remains a notable infectious agent causing necrotizing pneumonia and abscesses. We report a case of a young male with pulmonary nodules found to have *Streptococcus intermedius* and no other underlying hepatic or dental history who was treated with ceftriaxone and avoided surgical intervention. A review of the literature reveals cases that are typically treated with a combined surgical and medical approach. These same cases often involve middle aged to elderly individuals who have a past history of tobacco use, alcoholic liver cirrhosis and/or poor dentition. This case stands out given the patient's atypical presentation.

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Introduction

Streptococcus intermedius with *S. anginosus* and *S. constellatus* is a gram-positive cocci that is a component of the regular flora of the oral cavity and gastrointestinal tract. It is notorious for abscess formation in various locations via virulence factors that are presently unclear [1]. This ability to form abscesses gives it a unique distinction compared to other alpha-hemolytic streptococcal species [1]. Consequently, management of most *Streptococcus intermedius* infections consists of surgical intervention along with antibacterial therapy. Reported here is a case of *Streptococcus intermedius* pulmonary nodules found in a patient whose demographics and treatment are not typically documented in the literature.

Case report

Here we present a 29-year-old male with past medical history of congenital nystagmus and umbilical hernia who presented with nonproductive cough associated with intermittent, sharp, right sided chest pain for two days. Prior to this, he was in his usual state of health but went to the emergency room (ER) for evaluation as his symptoms were worsening in intensity and frequency. He was unclear as to the etiology of his pain; he denied trauma, sick contacts, dental work, and exposure to hazardous and/or infectious materials. He denied any fever, chills, nausea, vomiting, diarrhea, palpitations, or night sweats. He smoked tobacco, drank alcohol,

and admitted to past marijuana usage but denied intravenous drug use.

In the ER, physical exam, complete blood count, and complete metabolic panel were all within normal limits. Drug screen was positive only for THC. However, his chest x-ray revealed a right lung nodule at the base measuring approximately 3 cm in diameter. This was followed by a computerized tomography (CT) scan of the chest which showed multiple lung nodules, some of which appeared cavitory in nature. He was admitted and started empirically on vancomycin. The initial blood and sputum culture results, purified protein derivative, and rapid Human Immunodeficiency Virus test were all negative. His rheumatoid factor was minimally elevated at 14.2 IU/ml and erythrocyte sedimentation rate was elevated at 80 mm/h. Meanwhile, his antinuclear antibody was negative. A bronchoscopy and CT guided biopsy of one of the lung nodules was performed (Fig. 1). Cultures from this biopsy grew *Streptococcus intermedius* with sensitivity to ceftriaxone.

Ceftriaxone was started. To rule out the possibility of endocarditis and other occult sources of infection, a transesophageal echocardiogram and CT scan of the abdomen and pelvis were also performed. Both of these were unremarkable. The patient was then discharged home with the plan to finish a 4-week course of ceftriaxone. After completing treatment, a repeat chest CT scan demonstrated essentially complete resolution of the lung nodules. Clinically, the patient was also much improved.

Discussion

Streptococcus intermedius, a Gram-positive coccus that, with *S. constellatus* and *S. anginosus* represent the *S. anginosus* group, remains an important causative agent of pulmonary infections.

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Fig. 1. Computerized Tomography scan of chest showing multiple lung nodules.

Published reports show it is the causative pathogen in 13–44% of pulmonary abscesses/empyema and only 2–5% of cases of bacterial pneumonia [2]. It is a common component of normal oropharyngeal and gastrointestinal flora. This group of streptococci is more likely to produce deep-seated abscesses [2] as compared to other alpha-hemolytic streptococci. This increased pathogenicity parallels that of *Staphylococcus lugdunensis*, a coagulase negative staphylococcus that is more virulent than other coagulase negative staphylococci.

What makes the aforementioned case stand out are the demographics and presentation of the patient. Reviews by Wong et al. and Hannoodi et al. describe multiple common characteristics found in *S. intermedius* cases. These reviews found a mean age of 61 and predisposing factors including alcohol abuse, tobacco use, periodontal disease, prior thoracic surgeries and malignancy [3,4]. The gentleman described above is a 29-year-old male with good dentition, and no prior surgeries. While Hannoodi also postulates that liver cirrhosis from alcohol abuse predisposes to *S. intermedius* infections, our patient showed no signs of liver disease. Pathology of the nodule did not show any signs of malignancy.

Further distinguishing our case from the published literature is the presentation and the course of the disease. Hannoodi et al. state in their review of the literature that patients displayed symptoms between 10 days to 5 months prior to being hospitalized. Here, the patient had an acute onset of symptoms; stating that he was in his usual state of health only two days prior to being admitted. Most cases feature a prolonged hospitalization of necrotizing pneumonia complicated by empyema or abscess,

ranging from 9 to 88 days [3]. This case depicts a week-long hospitalization without surgical intervention, with only outpatient follow up.

It is interesting to note similarities between this case and other infectious organisms. Specifically, *S. aureus* where tricuspid valve endocarditis with normal echocardiogram has been known to present with pulmonary nodules as well, including nodules with cavitation. Further workup showed no signs of abscess or vegetation in those patients, consistent with the case described above [5]. Similarly, a review of the literature shows past cases of members of the *S. milleri* family associated with tricuspid valve endocarditis. However [6], those published reports of *S. milleri* family endocarditis had abscess formation, a history of intravenous drug use and/or chronic rheumatic heart disease [7]; none of which happened in our case. This patient's blood cultures were negative and the echocardiogram showed no abscesses nor vegetation.

Conclusion

Streptococcus intermedius remains a significant pathogen in causing pulmonary infections. While many patients have a prolonged course complicated by abscesses or empyemas, our case features a patient who improved after a short course in the hospital. Additionally, his case features a very rapid onset with an abbreviated hospital stay. Further discussion should focus on determining whether or not diagnosing a patient sooner can lead to shorter hospital stays and avoidance of surgical intervention.

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