

CASE REPORT

Conglomerate mediastinal mass of a different etiology

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Abstract

Streptococcus intermedius is a Gram-positive commensal of the oral cavity with tendency to cause brain and liver abscesses. Mediastinal involvement from *S. intermedius* is very rare. We present a case of 22-year-old male with newly detected mediastinal conglomerate nodal mass. On his way for bronchoscopy, he developed seizures and was found to have three brain lesions. The aspirate from brain biopsy grew *S. intermedius* whereas the aspirate from mediastinum showed only acute inflammation. Follow up imaging after antibiotic treatment showed interval resolution of brain abscesses and the mediastinal mass. We believe that the patient had aspiration pneumonia from *S. intermedius* which then metastasized to mediastinum and brain. Our aim is to make physicians aware of this unusual presentation of *S. intermedius* infection as a mediastinal mass. A strong effort should be made to isolate the organism from the involved body sites and fluid cavities to confirm the diagnosis.

INTRODUCTION

Streptococcus intermedius is a gram positive, catalase negative, facultative anaerobe found in the oral cavity, gastrointestinal tract and genitourinary tract [1]. Along with *Streptococcus constellatus* and *Streptococcus anginosus*, it constitutes the *S. anginosus* group, previously known as *Streptococcus milleri*. *Streptococcus intermedius* is known to cause pneumonia, endocarditis and abscesses in the liver, lung and brain in immunocompetent hosts [2, 3]. Based upon severity, the infection may require medical as well as surgical management. We discuss a rare presentation and clinical course of *S. intermedius* infection in a young man who developed mediastinal mass and brain abscesses secondary to its dissemination.

CASE REPORT

A 22-year-old male from Ohio River valley in USA was referred for the evaluation of a newly detected mediastinal mass. His medical history was significant for three episodes of pneumonia treated with antibiotics in the last 1 year. His social history included cannabis abuse and binge drinking till loss of consciousness. Recent computed tomography (CT) scan of the chest performed at outside hospital revealed a new 3.5–4.5 cm conglomerate nodal mass in the mediastinum compressing the main stem bronchi (Fig. 1). For the further evaluation of the mass, an endobronchial ultrasound with transbronchial needle aspiration (EBUS-TBNA) was planned for the next day.

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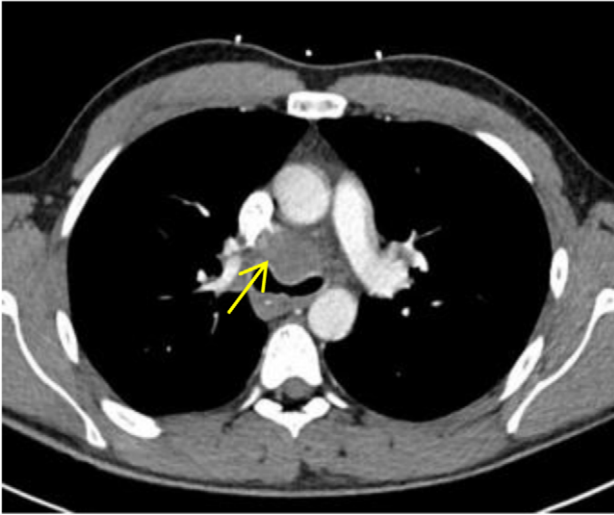


Figure 1: CT chest with $3.5 \times 4.5 \text{ cm}^2$ conglomerate nodal mass in the mediastinum compressing the main stem bronchi (yellow arrow).

En route for EBUS-TBNA, he developed witnessed generalized tonic clonic seizures and was brought to the emergency department. On arrival, he was alert and oriented but complained of right upper extremity numbness and tingling. Physical examination revealed right facial droop, right pronator drift and brisk reflexes on the right side. Laboratory data showed elevated white blood cell count of $15\,000/\mu\text{L}$ and elevated platelet count of $640\,000/\text{L}$. Emergent CT brain revealed supra-tentorial lesions in the fronto-parietal area, right thalamus, and posterior right temporal lobe. Magnetic resonance imaging (MRI) brain confirmed the findings and better delineated the lesions (Fig. 2). The differential included malignancy and infection, but in discussion with the radiology team, the MRI images were considered to be more likely infectious.

To aid in the diagnosis, EBUS-TBNA of the mediastinal mass was performed which revealed acute inflammation with rare necrotizing granulomatous inflammation. The cultures from the EBUS-TBNA were negative for bacterial and fungal infections. The following day, he underwent stereotactic right temporal lobe biopsy with aspiration of purulent material diagnosing an abscess. He had subsequent aspiration of the

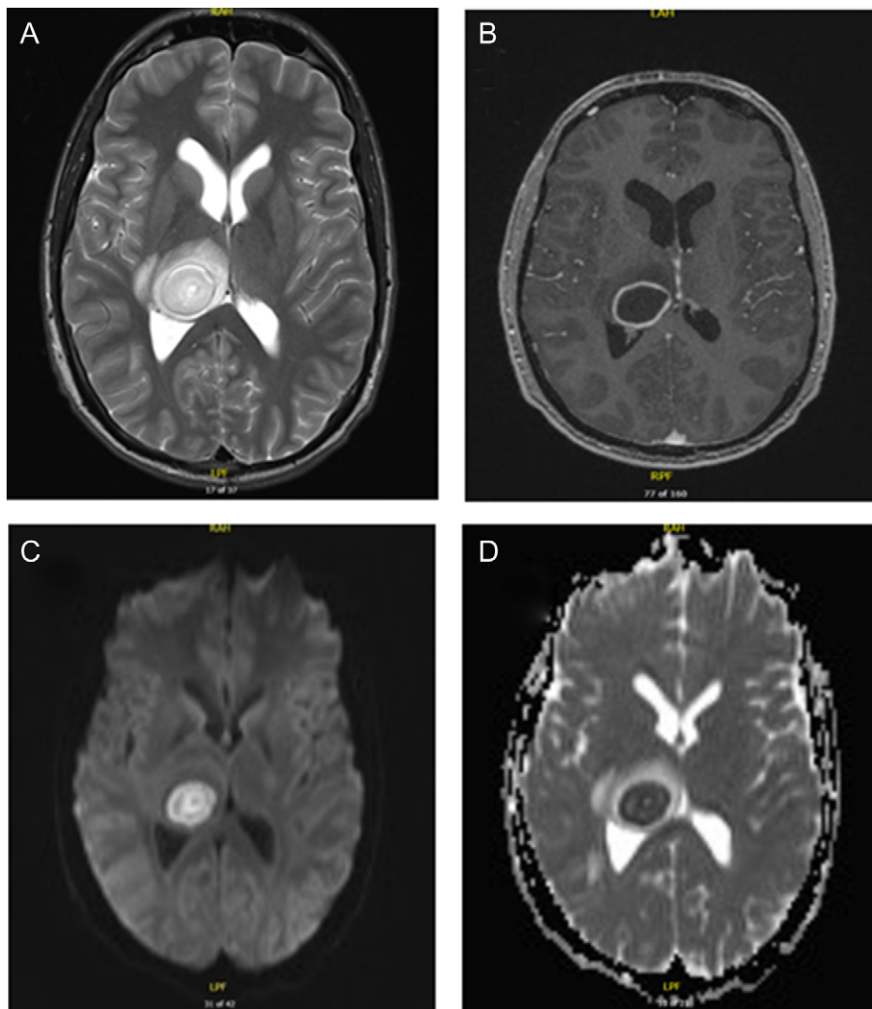


Figure 2: MRI brain showing supra-tentorial lesions: (A) Axial T2 weighted image demonstrating one of the three masses in the right thalamus with a T2-hypointense rim and a modest amount of surrounding vasogenic edema. (B) A thick rim of enhancement seen along the periphery of the mass on the axial gadolinium enhanced T1-weighted image. (C) and (D) Striking central restricted diffusion in the mass on the DWI and ADC images, typical for an abscess cavity.



Figure 3: complete resolution of the mediastinal nodal mass on the follow-up chest CT at 6 weeks.

other two brain abscesses. Brain biopsy showed focal acute and chronic inflammation with mild gliosis. The purulent aspirate from the brain lesions grew *S. intermedius*. Based on the microbiological sensitivities the antibiotic regimen was consolidated to intravenous ceftriaxone and later to meropenem due to development of rash with the former drug. Transthoracic echocardiography was negative for endovascular infection. Dental examination was also unrevealing. He was discharged on intravenous meropenem to complete 6 weeks of therapy.

Upon completion of intravenous antibiotics at 6 weeks, CT chest showed near-total resolution of the conglomerate mediastinal nodal mass (Fig. 3). He also experienced significant improvement in his neurological deficits. Follow-up MRI brain revealed interval reduction in the size of the abscesses and no mass effect. He was placed on oral amoxicillin–clavulanate for 4 more weeks. At 3-month follow up he had full resolution of symptoms.

DISCUSSION

Streptococcus intermedius has been implicated in a variety of purulent infections and abscesses with predilection towards brain and liver. The production of intermedilysin, a human specific cytolyisin by *S. intermedius* is considered as the virulent factor in producing abscesses [3, 4]. Giuliano et al. [4] showed that all the disseminated cases of *S. intermedius* had multiple brain abscesses.

Our patient had history of cannabis and alcohol abuse. He had recurrent pneumonia most likely from aspiration during his binge drinking. The development of lung and brain abscesses from *S. intermedius* in a young patient with substance abuse has been previously reported by Traube et al. [5]. We believe that *S. intermedius*, a part of oral flora, was aspirated during these episodes and led to pneumonia. The bacteria then spread to the mediastinal lymph nodes causing mediastinitis and finally a conglomerate mediastinal mass. The infection hematogenously spread to the brain causing multiple abscesses leading to seizures. Till now, there is only one reported case of mediastinal abscess from *S. intermedius*. It was caused by direct contamination of the lymph nodes with the oral flora during EBUS-TBNA [6]. To best of our knowledge, this is the first ever reported case of *S. intermedius* infection presenting as a mediastinal mass due to mediastinitis secondary to recurrent pneumonia.

A diagnosis of *S. intermedius* infection requires isolation of the organism from the fluid or tissue cultures. All the involved

sites should be accessed until the organism is identified. In our patient, the cultures from brain aspirate grew *S. intermedius* whereas the cultures from EBUS-TBNA were negative. Given the clinical improvement and radiological disappearance of the mediastinal mass with antibiotic treatment, we believe that the mediastinal mass was also caused by *S. intermedius*.

Our aim is to make fellow physicians aware of *S. intermedius* infection as a differential for mediastinal mass in a patient who is at risk for aspiration, or has history of recurrent pneumonia, or has multiple brain lesions. In the appropriate clinical setting, *S. intermedius* can translocate from the oral cavity to the lungs and can further metastasize to the mediastinum and the brain [7]. If there are lesions involving multiple organs, an effort should be made to isolate the organism from the involved body sites and fluid cavities to confirm the etiology. In cases with documented or recurrent *S. intermedius* infection, solitary mediastinal mass can be followed for resolution with appropriate antibiotic treatment.

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CONFLICT OF INTEREST STATEMENT

The authors report no conflicts of interest.

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ETHICAL APPROVAL

None required.

CONSENT

Consent provided by the patient.

GUARANTOR

Shahistha Hameed.

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