Retropharyngeal Abscess and Pott’s Disease Due to Tuberculosis: A Case Report

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Abstract

Introduction: Extrapulmonary mycobacterial infection can lead to vertebral spondylitis and osteomyelitis (Pott’s disease). Retropharyngeal abscess with concurrent spinal osteomyelitis is a rare presentation of tuberculosis in the US. Chart review on a patient was completed, and the relevant published literature was reviewed.

Case Presentation: A previously healthy 34-year-old male originally from Sudan presented to an outside hospital with a 2-month history of neck pain, sore throat, odynophagia, fevers, and chills. MRI showed a retropharyngeal abscess and suspected cervical spine osteomyelitis. Acid-fast bacillus (AFB) smear was positive from a neck drain specimen, but sputum was negative. Chest imaging did not show findings consistent with pulmonary tuberculosis. He was treated with rifampin, isoniazid, pyrazinamide, and ethambutol (RIPE) along with moxifloxacin and linezolid due to concern for possible multidrug resistant tuberculosis and transferred to our center for further care. Culture isolated *Mycobacterium tuberculosis*. CT neck showed vertebral tuberculous osteomyelitis (Pott’s disease) of C1-C3 with a multiloculated retropharyngeal and prevertebral abscess (Figure 1). The patient was taken to the OR for posterior spinal fusion from occiput to C4 and transoral incision and drainage of the abscess. The post-operative course was uneventful, and moxifloxacin and linezolid were discontinued when Xpert MTB/RIF test revealed rifampin susceptibility. At follow-up the patient’s symptoms had resolved. Patient consent was obtained to utilize this case for educational purposes.

Conclusions: This report presents the multidisciplinary treatment of this patient requiring infection control measures and antibiotic therapy by infectious disease, posterior spine fusion by orthopedic surgery, and retropharyngeal abscess drainage by otolaryngology.

Keywords
Pott’s disease, Tuberculosis, Retropharyngeal abscess

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Retropharyngeal Abscess and Pott’s Disease Due to Tuberculosis: A Case Report

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Abstract

Extrapulmonary mycobacterial infection can lead to vertebral spondylitis and osteomyelitis (Pott’s disease). Retropharyngeal abscesses with concurrent spinal osteomyelitis is a rare presentation of tuberculosis in the U.S. Chart review on a patient was completed, and the relevant published literature was reviewed.

A previously healthy 34-year-old male originally from Sudan presented to an outside hospital with a two-month history of neck pain, sore throat, odynophagia, fevers, and chills. MRI showed a retropharyngeal abscess and suspected cervical spine osteomyelitis. Acid-fast bacillus (AFB) smear was positive from a neck drain specimen, but sputum was negative. Chest imaging did not show findings consistent with pulmonary tuberculosis. He was treated with rifampin, isoniazid, pyrazinamide, and ethambutol (RIPE) along with moxifloxacin and linezolid due to concern for possible multidrug resistant tuberculosis and transferred to our center for further care. Culture isolated Mycobacterium tuberculosis. CT neck showed vertebral tuberculous osteomyelitis (Pott’s disease) of C1-C3 with a multiloculated retropharyngeal and prevertebral abscesses. The patient was taken to the OR for posterior spinal fusion from occiput to C4 and transoral incision and drainage of the abscess. The post-operative course was uneventful, and moxifloxacin and linezolid were discontinued when Xpert MTB/RIF nucleic acid amplification testing of the previously obtained specimen was positive for acid fast bacilli; however, this finding likely represents a contaminant rather than a true pathogen in this setting. He was mildly anemic with hemoglobin of 13.0 g/dL. Viral panels including COVID-19, HIV, and hepatitis were all negative.

This report details the diagnosis and treatment of a patient with a retropharyngeal abscess and Pott’s disease due to Mycobacterium tuberculosis without pulmonary infection.

Case Presentation

A 34-year-old male with no prior medical or surgical history presented to an outside hospital with a two-month history of neck pain and swelling, localized to the right posterolateral neck. He also described fevers, chills, and malaise, but without any weakness or decreased sensation. As part of the diagnostic workup, computed tomography (CT) imaging was obtained, which demonstrated a large, multi-loculated fluid collection concerning for retropharyngeal abscess and upper cervical vertebrae C1 to C2 bony erosion with hyperintensities concerning for osteomyelitis and spinal impingement (Fig. 1). A CT of the chest was obtained to evaluate for pulmonary tuberculosis. The CT revealed reticular nodular infiltrates in the left lower lobe; however, no clear evidence of pulmonary tuberculosis was visualized. The patient underwent aspiration of the neck swelling, and a specimen was sent for analysis. Ziehl-Neelsen stain from the fluid specimen was positive for acid fast bacilli (Fig. 2). Cultures grew Mycobacterium tuberculosis.

The patient was transferred to our hospital for further care by the otolaryngology and orthopedic spine teams. On arrival, the patient was noted to have right posterolateral neck tenderness. His physical exam was otherwise largely unremarkable, and he had no shortness of breath and no neurological deficits. Flexible laryngoscopy was performed at bedside showing posterior pharyngeal wall swelling on the right greater than left side, extending from the level of the nasopharynx to the hypopharynx. Laboratory tests revealed AST 67 U/L, alkaline phosphatase 96 U/L, platelet count 677 x109/L, and hemoglobin A1c 6.1%. He was mildly anemic with hemoglobin of 13.0 g/dL. Viral panels including COVID-19, HIV, and hepatitis were all negative.

Together, the physical exam, labs, and imaging results supported diagnoses of retropharyngeal abscess with vertebral spondylitis and osteomyelitis, also known as Pott’s disease. The patient was initially treated with rifampin, isoniazid, pyrazinamide, and ethambutol, along with moxifloxacin and linezolid due to concern for possible multidrug resistant TB. Following transfer to our center, Xpert MTB/RIF nucleic acid amplification testing of the previously obtained specimen from the neck fluid aspiration enabled discontinuation of moxifloxacin and linezolid. Sputum AFB cultures obtained at UNMC to evaluate for pulmonary TB ultimately grew Mycobacterium arupense; however, this finding likely represents a contaminant rather than a true pathogen in this setting. He was taken to the OR by the orthopedic surgery and otolaryngology teams. The patient underwent posterior spinal fusion from occiput to C4 and transoral incision and drainage of the abscesses. Non-purulent, straw-colored fluid was obtained from the abscess cavity, consistent with a cold abscess.

Introduction

Though uncommon in the United States, tuberculosis is still common throughout the world. Clinicians should be aware of the presentation and complications of tuberculosis. Extrapulmonary mycobacterial infection can lead to vertebral spondylitis and osteomyelitis, known by the eponym Pott’s disease. Spinal tuberculosis typically appears in the thoraco-lumbar spinal region and least commonly affects the cervical spine. Pott’s disease can lead to osseous destruction of vertebrae and permanent compression fractures.

A subacute presentation of a retropharyngeal abscess is also a potential complication if the infection involves the facial planes of the posterior pharynx. The presenting symptoms of a retropharyngeal space infection depend on the primary source of the infection, but can include sore throat, dysphagia, odynophagia, difficulty breathing, neck pain, or trismus. While some of these non-specific symptoms can be associated with benign illnesses, a feared complication of a retropharyngeal abscess is extension along the fascial planes into the mediastinum, resulting in mediastinitis and empyema. Historically, prior to the availability of antibiotics, acute necrotizing mediastinitis due to retropharyngeal space infection was the cause of most cases of mediastinitis.

This report details the diagnosis and treatment of a patient with a retropharyngeal abscess and Pott’s disease due to Mycobacterium tuberculosis without pulmonary infection.
The patient’s post-operative course was uneventful, and he was ultimately discharged home on continued antibiotic therapy with close follow-up. In the follow-up visit, the patient denied dysphagia, throat pain, or abscess drainage. He also reported weight gain since the procedure. Interval imaging with neck x-ray revealed no hardware complications of the posterior stabilization of occiput to C4 with alignment within normal limits.

Informed consent was obtained from the patient for publication of the case report.

Figure 1. Ziehl-Neelsen stain of neck fluid specimen was positive for acid fast bacilli with cording typical for tuberculosis.

Discussion

Tuberculous spondylitis, also known as Pott’s disease, typically follows a subacute course, and its relatively slow progression of symptoms compared to other bacterial abscess can lead to delayed diagnosis. A characteristic clinical feature of Pott’s disease is the development of a “cold” abscess when infection spreads to adjacent soft tissues. In cervical spinal infections due to Mycobacteria, pus accumulates in the retropharyngeal space, a potential space located between the pharyngeal constrictors anteriorly, the deep cervical fascia posteriorly, and the carotid sheaths laterally. Retropharyngeal abscesses can produce pressure effects including dysphagia, hoarseness, and difficulty with respiration. Our patient presented with dysphagia, neck pain, and posterolateral neck swelling. If left untreated, infection can lead to progressive airway obstruction and acute respiratory distress.

Pott’s disease more commonly affects the lower thoracic and upper lumbar vertebrae but can also affect the cervical vertebrae. Cervical Pott’s disease can lead to compression fractures of the vertebrae and subsequently spinal nerve impingement or compression of the spinal cord, resulting in neurological deficits or paraplegia. Early signs and symptoms may include pain, weakness, and numbness eventually leading to quadriplegia if left untreated. Our patient denied any neurological weakness or loss of sensation and was neurologically intact on physical exam.

Additionally, an untreated retropharyngeal abscess can spread inferiorly along the fascial planes of the neck into the mediastinum. Historically, prior to the availability of antibiotics, acute necrotizing mediastinitis due to retropharyngeal space infection was the cause of most cases of mediastinitis.

Early diagnosis of Pott’s disease and retropharyngeal abscess is necessary to prevent complications. Diagnosis can be challenging due to nonspecific presenting signs and symptoms, such as dysphagia. A clinical history of fever, dysphagia, and neck pain, like the presenting symptoms in our patient, should raise the clinical suspicion for a retropharyngeal abscess. Imaging studies can be used to identify and characterize deep neck space infections. CT is useful in demonstrating the extent of bone destruction, soft tissue involvement, and abscess formation. Magnetic resonance imaging (MRI) is considered the imaging modality of choice due to its earlier detection of infectious destruction. MRI better visualizes the degree of soft tissue involvement and is better able to depict neural compression. Our patient underwent multiple imaging studies including CT and MRI scans to assess his disease course, enabling diagnosis and treatment of cervical vertebral instability prior to neural compromise.

Multiple other diagnostic investigations can be useful in diagnosing the usual bacterial culprit of Pott’s disease, Mycobacterium tuberculosis. Laboratory testing with acid-fast bacilli (AFB) smear microscopy, mycobacterial cultures, and nucleic acid amplification testing (NAAT) are recommended. A specimen obtained from our patient’s neck at the outside hospital showed acid fast
bacilli on Ziehl-Neelsen stain and growth in a Mycobacteria Growth Indicator Tube (MGIT). Polymerase chain reaction (PCR) was negative for *Mycobacterium tuberculosis*, but cultures eventually yielded the organism. Sputum samples were negative for *M. tuberculosis* by DNA probe and culture, but they did demonstrate a non-tuberculosis mycobacterium (NTM), *Mycobacterium arupense*. This NTM was thought to be a contaminant based on the absence of other clinical signs and symptoms of pulmonary infection and its low pathogenicity in the lungs. 

Treatment of spinal mycobacterial infection with a retropharyngeal abscess commonly includes multidrug antitubercular treatment and drainage of the abscess. Surgical drainage of a retropharyngeal abscess can be accomplished through an oral, cervical, or combined approach. The trans-oral approach was used in our patient. This technique is useful for abscesses medial to the great vessels and confined to the retropharyngeal space. Trans-oral approaches to deep space neck infections also provide further benefits of being technically simpler, offering shorter recovery time, and avoiding an external neck scar. In addition to trans-oral drainage, our patient underwent cervical spinal fusion for stabilization of his vertebrae after osseous destruction caused by the infection. Debridement and instrumentation can be used to remove infected foci, decompress nerves, and reconstruct a deformed or unstable spinal column.

**Conclusion**

Extrapulmonary tuberculosis remains common throughout the world, and it is important to consider in the differential diagnosis of a variety of clinical presentation. This report illustrates the diagnosis and multidisciplinary treatment of this patient, preventing the potentially devastating complications of this disease process.

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**References**


