Case Report

Mycobacterium Tuberculosis Presenting as a Cystic Parapharyngeal Space Mass

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Abstract

The prevalence of Mycobacterium tuberculosis infections is rising worldwide. Head and Neck lymphadenitis is the most common manifestation of extra-pulmonary tuberculosis. Such a condition can act as a precursor to more invasive deep neck space infections and abscess formation, namely in the parapharyngeal and retropharyngeal spaces. The diagnosis of parapharyngeal space tuberculosis abscesses poses a challenge to physicians in general and otolaryngologists in specific, especially in tuberculosis non-endemic areas of the world, where the level of clinical and epidemiological suspicion is low. This article reports a rare case of parapharyngeal space Mycobacterium tuberculosis abscess in an asymptomatic, previously healthy, 25 year old Middle Eastern patient. This report aims to highlight the challenges that lie in the differential and definitive diagnosis of this rare disease and to raise the awareness among general practitioners and otolaryngologists in the developed countries to the importance of maintaining a high index of suspicion whenever dealing with unusual cases, especially in patients originating from, or having recently visited tuberculosis endemic areas. Another aim of this report is to emphasize on the importance of screening such patients for states of immunodeficiency such as HIV status, malignancy, diabetes, long term corticosteroid therapy and inflammatory diseases.

INTRODUCTION

The incidence and mortality of TB have been trending down in the past decades [1]. Despite those efforts, the most recent WHO report states that 9.6 million people are have fallen sick with TB in 2014 of which 12% were HIV-positive and 1.5 million people died because of tuberculosis [1]. In Lebanon numbers have been on the rise since 2005, WHO reports show that in 2005 the incidence was 0.43 (thousands), in 2010 it reached 0.72, and in 2014 the incidence was 0.92 in thousands [12]. Most patients (80%) present with pulmonary tuberculosis while 20% have extra pulmonary manifestations that can be primary or secondary [3]. Involvement of the head and neck area in tuberculosis is very rare [4], this area is rarely affected and is protected from acid fast bacilli by several barriers such as the saliva, the epithelium, saprophytes, musculature as well as pH [5-7]. Cervical lymphadenitis is the most common presentation but different cases have been reported in the literature. Patients could have nasopharyngeal, oropharyngeal or laryngeal tuberculosis, others presented with ear lesions. Along with the rise in immunosuppression mainly due to HIV infection, the incidence of tuberculosis has increased with a larger proportion of patients having extra pulmonary disease (50-67%) mainly affecting cervical lymph nodes [8,9]. The affected lymph nodes appear as firm, non-tender but can become matted and visible with time and the diagnosis can be particularly elusive [10]. Isolated Mycobacterium tuberculosis of the head and neck is rare especially in the developed countries, but a high index of suspicion should be maintained by the physician when dealing with immigrants from developing countries or patients who have recently traveled to tuberculosis endemic areas [3,11]. In this article we report an extremely rare case of Mycobacterium tuberculosis presenting as a cystic parapharyngeal space abscess, in a previously healthy young patient.

Anatomical review of the parapharyngeal space

Also known as the lateral pharyngeal or pharyngo-maxillary space, the parapharyngeal space is an inverted pyramid shaped space that extends from the base of the skull superiorly to the level of the hyoid bone inferiorly [12,13]. It is bounded anteriorly by the medial pterygoid muscle and the pterygo-mandibular...
raphe, the pre-vertebral facia posteriorly. Its medial border is formed by the superior pharyngeal constrictor muscle and its lateral border by the, mandible, retro-mandibular portion if the parotid gland and the lateral pterygoid muscle [12].

Central to our understanding and appreciation of the parapharyngeal space, is the styloid process which divides the space into two unequal compartments both in terms of structural content and pathologic importance: the pre and post-styloid compartments. The pre-styloid compartment contains fat, muscular structures, lymph nodes, the lingual, inferior alveolar and auriculotemporal nerves, as well as the internal maxillary artery, whereas the post-styloid compartment harbors vital neurovascular structures, namely the carotid artery, internal jugular vein, and the ninth, tenth, eleventh and twelfth cranial nerves which can serve as vulnerable structures in case of a complicated abscess [12].

Potential complications of parapharyngeal abscesses can vary from serious to life-threatening. For instance, carotid artery hemorrhage, internal jugular vein thrombosis, Lemierre’s and Horner’s syndromes have been described as serious complications in the literature [14]. Potentially fatal complications are due to either direct or indirect abscess invasion of adjacent spaces down into the mediastinum causing mediastinitis, or to a mechanical compression of the trachea leading to airway obstruction [14].

Hence, the importance of the parapharyngeal space lies in it being a central station that contains the carotid sheath (which courses down into the mediastinum), and links the various deep neck spaces together. It connects postero-medially with the retropharyngeal space, inferiorly with the submandibular space, and laterally with the masticator space [12].

An infection arising in this region can therefore be expected to extend and invade contiguous and relatively remote structures, posing a diagnostic and therapeutic challenge to the inexperienced physician.

In this article, we present a rare case of parapharyngeal space Mycobacterium tuberculosis abscess.

The nature and presentation of this disease, as well as its anatomical location represent a challenge for the treating physician, in terms of diagnosis, treatment and prevention of fatal complications.

CASE REPORT

Mr. T.A, a 25 year old, previously healthy, Middle Eastern male patient presented to the Otolaryngology clinic with a four months history of a painless, slowly growing, right sided upper neck mass. Upon presentation, the patient denied the presence of constitutional symptoms, such as fever, weight loss, night sweats or anorexia but described mild dysphagia to solids and liquids, as well as throat “fullness”. The patient did not report any cough, shortness of breath, history of exposure to animals, contact with infected patients, recent upper respiratory tract infections and no recurrent head and neck infections.

Physical examination revealed a right upper lateral, firm, non-fluctuant, non-pulsating, non-tender mass, of approximately twelve by five centimetres in dimension, with decreased mobility (Figure 1). On oropharyngeal examination, the patient was found to have a left lateral bulging mass into the oropharynx, pushing the right tonsil beyond the midline with an intact mucosa. The lungs were clear to auscultation and there was no associated axillary, or inguinal lymph node enlargement. The rest of the physical exam was within normal limits.

We admitted the patient to our hospital for further investigation and management. Fiberoptic nasopharyngo-laryngoscopy revealed mobile vocal folds, patent and clear laryngeal airway and a narrow oropharyngeal/pharyngeal passages. No mucosal lesions were seen. Initial laboratory workup included a Complete Blood Count that showed no abnormalities. A chest X-ray showed clear lung fields, no consolidations, no infiltrates or effusions. A neck MRI was subsequently performed to better visualise the deep neck spaces and soft tissues. The study revealed an encapsulated cystic mass in the right para-pharyngeal space, pushing the carotid sheath vessels anterolaterally. The official results were reported as “Cystic Schwannoma” (Figure 2). Additionally, a Purified Protein Derivative (PPD) skin test was performed and was mildly positive however the patient lived in an endemic area and was vaccinated. The interventional radiology team was consulted for a CT guided FNA however, no intervention was done because of risk of swelling leading to airway compromise and the relation of carotid artery and jugular vein to the mass. We did not recommend trans-oral biopsy for the same reasons.

![Figure 1](image1.png) A 25 year old male patient with a right upper later neck mass slowly growing since four months.

![Figure 2](image2.png) Coronal section of neck MRI showing a well circumscribed, walled off, cystic, right parapharyngeal space mass with subtotal stenosis of the oropharynx.
After explaining the findings to the patient and obtaining his oral consent, the decision was made to surgically excise the mass because of potential airway compromise. Under general anesthesia, the neck was explored through a vertical incision at the level of the anterior border of the sternocleidomastoid muscle. The carotid sheath and major vessels were identified and carefully retracted antero-medially and the mass was identified deep to them (Figure 3). A frozen section of its wall was taken and the results came back with a reading of “Granulomas and Chronic Inflammation”. The mass was excised en bloc with extreme care taken to spare the neurovascular structures as well as the pharyngeal wall. It came out relatively easily with blunt dissection. Of note, when the mass was incised in the operating theatre, it was found to contain necrotic debris and dark thick fluid. Specimens were subsequently sent for definitive pathology, Hematoxilin and Eosin stain, Gram stain and cultures for bacteria, brucellosis, fungi and tuberculous organisms.

In the immediate postoperative period, the patient reported significant improvement of his symptoms, namely those related to throat fullness and dysphagia. The PPD skin test was read positive most likely due to the fact that the patient comes from an area where Mycobacterium tuberculosis is endemic and the BCG vaccine received earlier in life. The patient followed a smooth and uncomplicated recovery and was discharged home with instructions for follow up visits.

In the meantime, after of five days of incubation the final result for cultures of the specimen came positive for Mycobacterium tuberculosis. Drug susceptibility was done using the mycobacteria growth indicator tube for isoniazid, rifampin, ethambutol and streptomycin. The patient was referred to the Infectious Diseases team for further treatment. He received two months of four drug therapy regimen (Isoniazid, Pyrazinamide, Rifampin and Ethambutol) followed by four months of Isoniazid and Rifampin. Follow up visits on regular intervals were scheduled in coordination between the Infectious Diseases and Otolaryngology teams. The patient regained normal swallowing function and reported full recovery. Upon examination and laboratory follow up, he was found doing very well with no evidence of persistence or recurrence. No drug side effect were noted either.

DISCUSSION

Primary pharyngeal tuberculosis is a rare entity; however it is important for specialists to keep it within their differential diagnosis in head and neck masses and have a high index of suspicion especially in patients presenting from endemic area and patients who are immune compromised. Cervical adenitis is the most common presentation, but in rare cases the disease can extend beyond the lymph nodes leading to deep neck spaces infection. The scarce cases reported in the literature identify the atlanto-occipital vertebral body tuberculosis infection (Pott’s disease) as the major source of retropharyngeal and parapharyngeal space dissemination [15]. Other authors suggested a more direct invasion from tonsillar, peritonsillar and pharyngeal ulcerations [11]. Regardless of the routes of spread and the theories that arise concerning the exact etiology of such abscesses and owing to their relatively low incidence rate in the developed countries, we find it imperative to highlight a few concepts when dealing with similar cases. The majority of cases reported in the literature are retropharyngeal abscesses, whereas parapharyngeal tuberculosis as in our patient is reported in 3 patients. It was reported in a 49 year old diabetic and chronically ill Indian male patient [11]. The diagnostic approach began with a neck MRI that showed a parapharyngeal space abscess. The further steps in diagnosis and management of this patient were performed based on the treating physician’s expertise and clinical common sense. The second patient was a 7 year old boy who had cervical pott’s disease presenting as parapharyngeal abscess, he underwent incision and drainage twice and received antituberculosis treatment [16,17]. The third patient is 30 year old male with sore throat treated as acute pharyngitis with persistent neck swelling and found to have collection in parapharyngeal space treated with antituberculosis drugs [18].

Our case is unique and different than the previously reported cases in that the mass was cystic and nature and was primarily diagnosed as Schwannoma. The 3 patients previously discussed had evidence of infectious process or abscess while in our patient the radiologic findings were not very typical of a tuberculous abscess but was suggestive of cystic schwannoma. There is a wide differential for cervical cystic masses such as cystic metastatic lymph nodes, neurogenic tumors, venous vascular malformations or infectious lesions such tuberculous lymphadenitis [19]. On CT and MRI, tuberculosis has several features which differ depending on the site affected in the head and neck region. In neck abscesses, findings include ill-defined mass with rim enhancement, multiloculated fluid collections, surrounding edema and central necrosis and/or calcifications [20]. On imaging, tuberculosis can mimic a wide variety of
malignant and benign masses; therefore the radiologic findings should be interpreted within the context in which the patient in presenting. The case presented in this article is indicative of the variety found on imaging in tuberculosis and of the importance of keeping tuberculosis in our differential diagnosis in the appropriate setting.

With parapharyngeal abscesses and masses, a thorough history taking and a meticulous physical examination remain the cornerstone of maintaining a high index of suspicion. CT scan is the imaging modality of choice for the initial diagnosis and follow-up whereas MRI is best used to assess for complications such as jugular vein thrombosis and better delineate the soft tissue extent and relationship to the vessels. Screening should not be delayed pending a final diagnosis and surgical intervention is still the preferred treatment modality especially if the diagnosis is not conclusive by imaging, clinic picture or tissue biopsy (Fine needle aspiration usually).

As noted earlier, primary involvement of pharynx is rare thus screening for other aspects of extra-pulmonary tuberculosis is extremely important to avoid undesired pitfalls in the treatment strategy. A routine chest roentgenogram is mandatory to rule out active pulmonary tuberculosis and a PPD skin test should also be performed and the results interpreted as the patient belonging to the medium risk category. Furthermore, screening for states of immunosuppression should be central to our understanding and management of such conditions, therefore HIV status must be determined and malignancies and diabetes ruled out as indicated. In the case we presented, tuberculosis was part of the differential diagnosis, a chest X-ray and a PPD skin test were performed as screening for active pulmonary tuberculosis.

The treatment of parapharyngeal space tuberculous abscesses, as with other polymicrobial deep neck space abscesses, remains highly debatable. To date, no consensus or guidelines are available, possibly due to the lack of large case series on the topic. Surgical management is considered by most experts sufficient for a successful outcome and complete resolution [11,14,15]. This should be followed by a course of an appropriate antimicrobial regimen should be administered and Infectious Diseases consultation should preferably be sought. More recent papers have suggested a less invasive approach with intravenous antibiotics and CT scan follow up, with surgery only indicated in the setting of an increased risk of serious complications [14]. Our patient was treated surgically because the initial imaging-based diagnosis was that of a “Cystic Schwannoma” of the parapharyngeal space, and because of an impending acute upper airway total occlusion, based on the findings of nasolaryngoscopy and imaging. The diagnosis of Mycobacterium tuberculosis “cold” abscess was made in retrospect after surgical excision and culture results.

REFERENCES