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Post-tuberculosis mycetoma: bronchoscopic removal

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Abstract

A 76-year-old male non-smoker presented to our institution with cough and haemoptysis. He had been treated for cavitatory pulmonary *Mycobacterium tuberculosis* of the right upper lobe 10 years previously. Chest radiograph and subsequent computed tomography (CT) of the chest demonstrated a right upper cavity containing a mass suspicious for mycetoma. Flexible bronchoscopy under conscious sedation demonstrated a mass obstructing the anterior segment of the right upper lobe. The abnormality was subsequently removed using a flexible endobronchial cryoprobe. Histopathological analysis demonstrated abundant fungal organisms morphologically consistent with *Aspergillus* species. Microbiological culture of the bronchoalveolar lavage (BAL) from the cavity isolated both *Aspergillus fumigatus* and *Staphylococcus aureus*. The patient was commenced on the anti-fungal drug posaconazole and received a course of flucloxacillin. Three months later, there was no endobronchial obstruction and lavage of the affected cavity again isolated *Staphylococcus aureus* without *Aspergillus* species. Repeat thoracic CT and flexible bronchoscopy demonstrated no further re-occurrence of the mycetoma at 3 months.

Introduction

A pulmonary mycetoma is a fungus ball that fills a pre-existing cavity. Most commonly, these cavities result from tuberculosis (TB), sarcoidosis, or cystic fibrosis [1]. Symptomatology is diverse, ranging from asymptomatic to life-threatening haemoptysis, particularly in those patients with TB [2]. In symptomatic patients, the mainstay of treatment is surgical resection. However, this is often limited by patient co-morbidities, specifically underlying lung conditions. Previously, medical intervention included oral anti-fungal agents and inhaled or intracavitatary instillation of anti-fungal drugs [1]. Therapeutic success of non-surgical interventions has generally been limited. The advent of the flexible cryoprobe offers a novel approach to the removal of mycetoma in patients in whom the mycetoma is endoscopically visible. We report a case of successful removal of mycetoma endoscopically using a flexible cryoprobe in combination with lavage.

Case Report

A 76-year-old male presented to our institution with chronic cough and intermittent haemoptysis for 2 months. He had completed standard anti-TB therapy 10 years prior for smear positive cavitatory pulmonary *Mycobacterium tuberculosis*. Other past medical history was significant for rheumatic fever. He was a lifelong non-smoker. Thoracic computed tomography (CT) done 7 years previously demonstrated traction bronchiectasis and chronic scarring within the right upper lobe. He remained symptomatically well until this presentation.

His physical examination revealed bronchial breath sounds in the right upper lobe. Thoracic CT demonstrated fibrocystic change in an incompletely collapsed right upper lobe. There was now a large cavity with a new 2.1-cm round mass (Fig. 2A, C).

We proceeded to perform flexible bronchoscopy (Olympus 3.2 mm) under conscious sedation. After traversing two segments of the bronchi, an abnormal rounded mass was seen obstructing the anterior segment of the right upper lobe (Fig. 1A). Microbiological culture of bronchoalveolar lavage (BAL) from the right upper lobe cavity subsequently isolated both *Staphylococcus aureus* and *Aspergillus fumigatus*. He was commenced on a one week course of flucloxacillin as well as a prolonged course of the anti-fungal drug posaconazole. He was

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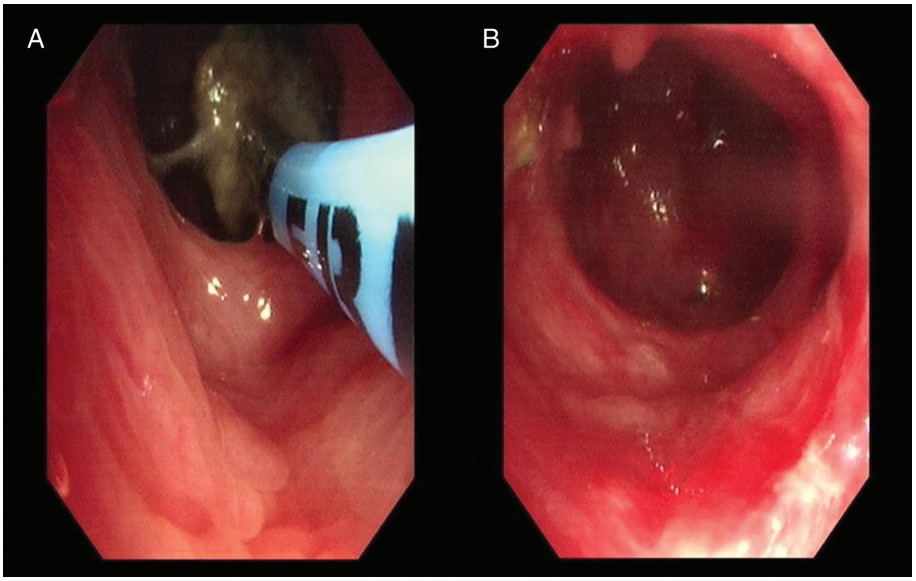


Figure 1. (A) Mycetoma within endobronchial cavity (anterior segment of right upper lobe) being removed with cryoprobe. (B) Endobronchial cavity once mycetoma has been removed.

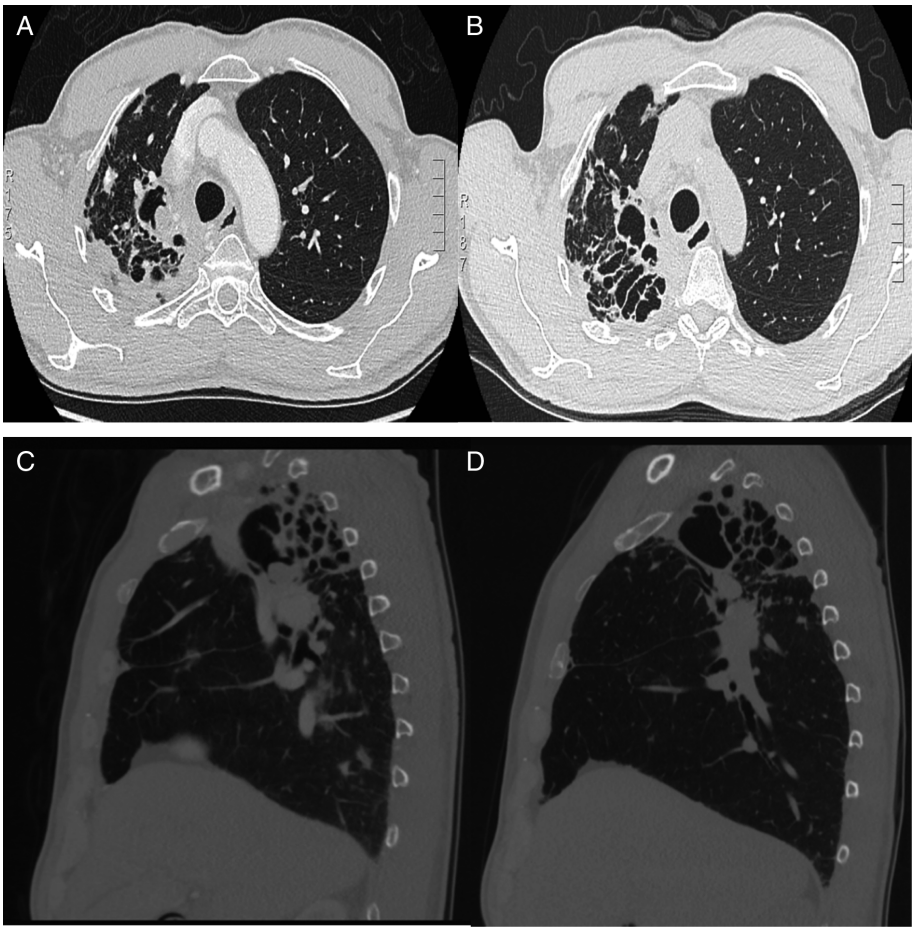


Figure 2. Axial image demonstrating (A) mycetoma in right upper lobe and (B) endobronchial cavity once mycetoma has been removed. Sagittal image demonstrating (C) mycetoma in right upper lobe and (D) endobronchial cavity once mycetoma has been removed.

subsequently discharged and electively readmitted a few weeks later to facilitate bronchoscopic removal of the mycetoma.

At repeat flexible bronchoscopy, a flexible cryoprobe was inserted via the bronchoscope into the cavity. However, en bloc removal of the mass was not possible. The

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cryoprobe was removed and hot forceps was introduced to subdivide the mass into various smaller parts. Then the cryoprobe was reintroduced and the subdivided mass was removed piecemeal. Washing of the cavity was then performed with normal saline until all macroscopically visible mycetoma had been removed. Inspection of the empty cavity revealed inflamed haemorrhagic mucosa (Fig. 1B).

The obtained mass was sent for histopathological analysis. Microscopically, it demonstrated inflamed bronchial mucosa, abundant fungal organisms as well as a bacterial colony consistent with Gram-positive cocci. There was no evidence of invasive fungal infection. The case was discussed at our institution's multidisciplinary respiratory meeting, where a diagnosis of mycetoma was inferred. He was continued on oral posaconazole. Radiological and bronchoscopic surveillance at 3 months demonstrated no reoccurrence of the mycetoma (Figs. 1B, 2B, 2D).

Discussion

A mycetoma is a ball of fungal hyphae formed in a pre-existing cavity of the lung, usually within the upper lobes. Cavities can occur following a variety of pathological insults to the lung, most commonly with TB, sarcoidosis, and cystic fibrosis. The fungal ball is composed of hyphae, inflammatory cells, and fibrin. The majority of mycetomas are asymptomatic. The most common symptom is haemoptysis ranging from mild to life-threatening. Surgical intervention is the mainstay of treatment with inconsistent clinical results from medical therapy. Medical intervention has consisted mainly of anti-fungal agents administered systemically or by direct installation into the mycetoma-containing cavity. However, in general the success of this pharmacological approach has been limited. Surgical intervention has mainly consisted of wedge resection/segmentectomy, cavernostomy, or thoracoplasty [2]. However, surgical resection of the affected cavity is associated with a high complication rate and reported mortality ranging from 7 to 23% [1]. This is often attributed to poor lung function due to underlying co-morbid pulmonary disease.

Previously, the flexible bronchoscopy was reserved only for the visualization of a bleeding site prior to surgery. Bronchoscopic visualization of a mycetoma is rare, and this observation is exploited to facilitate endoscopic treatment [3,4]. Since the introduction of the flexible cryoprobe, it has been utilized in the diagnosis of interstitial lung disease, foreign body removal, and in the treatment of central airway obstruction (benign and malignant). More recently, its utilization in the removal of mycetoma has been reported [5]. Such bronchoscopic intervention affords an opportunity for proximal cavitatory mycetoma removal in individuals in whom the lesion is visible endoscopically. Our patient had pulmonary lung function that would not have precluded him from surgery. However, given the proximal location and visibility of the mycetoma at bronchoscopy, and patient cooperation using conscious sedation, removal was attempted and successful, with no immediate complications. We propose the use of cryotherapy for the removal of proximal mycetoma in suitable patients.

Disclosure Statements

No conflict of interest declared.
Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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