



Case Report on Pulmonary Mucormycosis

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Abstract

Mucormycosis is a life-threatening infection occurs in immunocompromised patients. Increasing prevalence of diabetes mellitus, cancer, and organ transplantation, the number of mucormycosis is increasing. Despite antifungal, high risk surgery therapy, the overall mortality rate is high.

We are reporting a case of 77 years old male, referred to a tertiary care hospital with non resolving pneumonitis, uncontrolled blood sugar and deranged renal function. He was on multiple antibiotics from last 10 days and was later found to have pulmonary Mucormycosis.

Keywords: Pulmonary, Mucormycosis, Fungal infection, Amphotericin.

Introduction

Pulmonary Mucormycosis is an uncommon but life-threatening infection which occurs in immune compromised like Diabetic Ketoacidosis, neutropenia, organ transplantation and corticosteroid therapy. Mucormycosis is associated with angio-invasion and high mortality^(1,2). Study from India reported a rise of Mucormycosis cases from 24.7 cases per year (1990–2007) to 89 cases per year (2013–2015) at a single tertiary-care hospital.⁽²⁾

The incidence of Pulmonary Mucormycosis is up to 24% among all cases of Mucormycosis.^(3,4)

Pulmonary type is the second most common site mucormycosis, seen in patients with hematological disorders and transplant recipients^(1,2). Clinical forms of mucormycosis (in percentage) reported from central Europe and Asia, and Europe is mentioned in figure 1.

Hematological malignancy was the major risk factor (32–40%), followed by diabetes mellitus (32–56%), hematopoietic stem cell transplant (1–9.8%) and solid organ transplant (6.5–9%) and renal disease (13–18%) in pulmonary Mucormycosis^(5,6,7).

Predisposing Factors

As per predisposing conditions, predominate site of mucormycosis infection is also seen, as per table 1.

Table 1

Predisposing condition	Predominant site of infection
Diabetic Keto acidosis	Rhino cerebral
Neutropenia	Pulmonary and disseminated
Corticosteroid	Pulmonary, disseminated or rhino cerebral
Deferoxamine	Disseminated
Malnutrition	Gastro intestinal
Trauma, catheter/Injection site, skin maceration	Cutaneous, subcutaneous

New strategies to prevent and treat Pulmonary Mucormycosis are definitely and urgently needed.

Drugs

Drugs used for mucormycosis with doses is mentioned in table 2.

Table 2

Posaconazole	800mg PO daily in 2-4 divided doses
Conventional Amphotericin B	0.7-1mg/kg/day
Liposomal Amphotericin B	5mg/Kg/Day

Case Report

A 77 year old man with Hypertension, CAD post PTCA and Type II Diabetic Mellitus, was referred from an outside facility for an unresolving Pneumonitis, Sepsis, deranged renal functions and uncontrolled Blood sugar.

The patient was febrile (Temp-102.7F), with tachycardia, hypotension and tachypnea. Oxygen saturation was 90% on room air.

He had decreased breath sounds in lower left lung fields more than right. The remainder of the patient’s physical examination was unremarkable. Complete blood cell count, liver function tests, urinalysis, and chemistry were normal, except for raised TLC (33200), glucose of 309 mg/dL and carbon dioxide total serum of 34 mmol/L and arterial serum pH was 7.46.

Serum ketones were negative, hemoglobin A1C was 10.2%, S-galactomannan and S-procalcitonin level increased.

Chest X-ray (left middle and lower zone opacity with patchy consolidation and blunting of left costophrenic angle suggesting left pleural effusion as in figure 2) and HRCT Chest(as in figure 3) demonstrated a left lung opacity with a consolidation in the left lower lobe and Apicoposterior segment of left upper lobe.

Cytological examination of cultures from the Fibreoptic Bronchoscopy and Thoracocentesis yield gram positive Cocci and gram negative bacilli and culture showed Pseudomonas Aeruginosa which were treated according to sensitivity, but patient’s condition deteriorated.

Repeated Fibreoptic Bronchoscopy was done revealed left lower lobe was blocked with necrotic material could not be sucked out and biopsy sent from the left lower lobe specimens. The biopsy specimen showed: Fungal hyphae in a long filamentous form, are broad and have irregular shapes, right angle branching (as in figure 4). No fruiting body seen. No malignant cells seen. The patient was treated by systemic Amphotericin B, other supportive management and was improved symptomatically.

The patient was planned for middle lobectomy and pleurectomy. He developed severe hemoptysis, hence intubated, but could not be survived.

This patient had an opacity in his left lung, and sputum and broncho alveolar lavage specimens were both positive for Pseudomonas aeruginosa. But he didn’t respond to antibiotics, rather deteriorated. Repeated transbronchial lung biopsy revealed a Mucor species, a definitive diagnosis of pulmonary mucormycosis was made, and treatment with Liposomal amphotericin B was initiated. Patient dramatically improved with the treatment. He was planned for immediate left lower lobe pneumonectomy. But patient had sudden massive hemoptysis and became unresponsive. He was immediately intubated and put on ventilator but couldn’t survive after supportive measures.

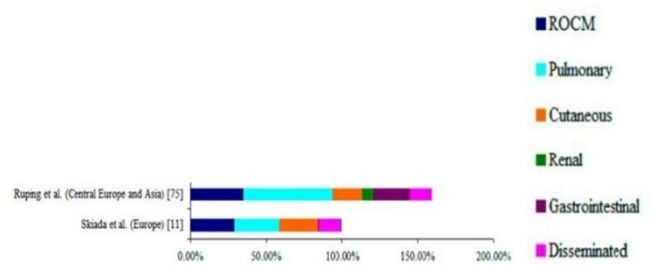


Figure 1

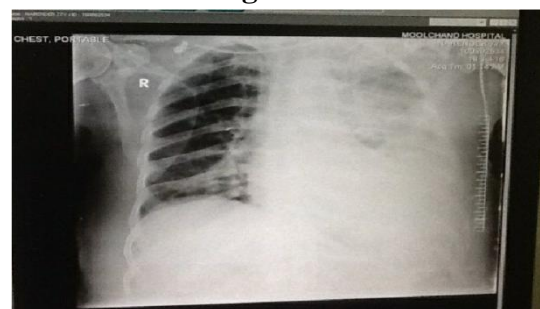


Figure 2

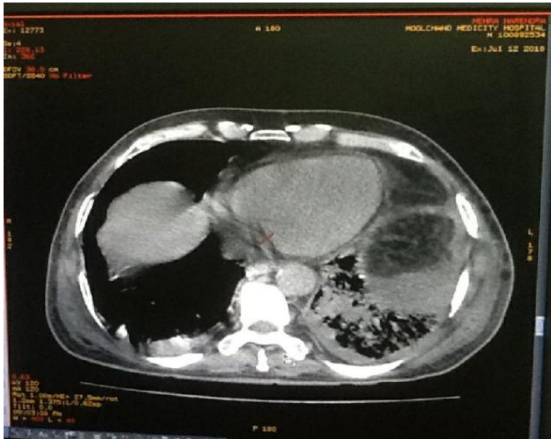


Figure 3

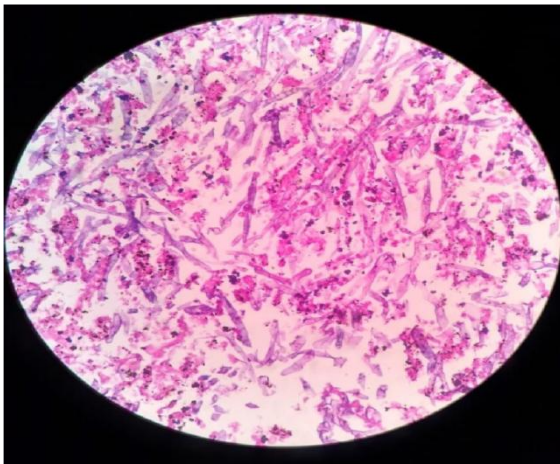


Figure 4

Comment

The characteristic of Pulmonary Mucormycosis are Fever, hemoptysis, and tissue infarction.^(4,1)

The diagnosis of mucormycosis is based on both histopathology by bronchoscopy and cultures. Negative results of bronchoscopy and thoracentesis should prompt the use of VATS (video assisted thoracoscopic surgery) for obtaining biopsy specimens.

Because of early diagnosis, surgical debridement, and newer antifungal agents, the prognosis and outcomes has dramatically improved as compared to only antifungal treatment alone⁽⁸⁾.

Four factors affect the outcome for the treatment of pulmonary mucormycosis: early diagnosis, early surgical resection, amphotericin B, and reversal of host impairment^[9].

Surgical resection of the infected parenchyma should be considered an early intervention to improve survival, due to the limited penetration of

anti-fungal to the affected necrotic tissues, that accompanies this infection.⁽¹⁰⁾

The recommended antifungal agent is liposomal amphotericin B⁽¹⁰⁾. However newer antifungals in combination may be an attractive option.

A recent retrospective study of patients with rhino-orbital mucormycosis treated with a combination of amphotericin B and caspofungin showed a superior success and survival time, when compared to amphotericin B alone treatment of invasive mucormycosis infections⁽¹¹⁾

Recently, the FDA granted approval for isavuconazole in the^[12] due to delays in diagnosis, poor host response (eg, neutropenia), and limited available therapy the chances of mortality is very high in pulmonary mucormycosis.^(13,8)

Main Messages

- All non-recovering pneumonias should be biopsied as in when needed.
- If necrotic areas are seen during bronchoscopy then a good biopsy is taken so that mucormycosis is not missed.
- If mucormycosis is diagnosed, immediate treatment with Liposomal Amphotericin / Posaconazole should be started, with planning to perform a lobectomy as soon as possible to prevent death. Combined antifungal provides better survival.

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