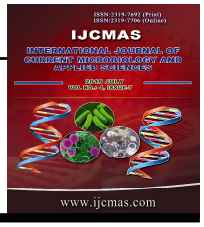
Int.J.Curr.Microbiol.App.Sci (2015) 4(7): 716-719

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 7 (2015) pp. 716-719**
http://www.ijcmas.com



Case Study

Candida albicans as a Rare Causative Agent of Pyopneumothorax

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Keywords

Pyopneumothorax, *Candida albicans*, Amphotericin B

A B S T R A C T

Only few cases of pyopneumothorax due to *Candida* species have been reported worldwide. Here we describe a case of left sided pyopneumothorax of a 35 year old diabetic male presented with fever, cough and dyspnoea for last three months. Patient had a past history of tuberculosis with bronchopleural fistula. The diagnosis was established by culturing the aspirated pleural fluid to blood agar and SDA .The isolate was identified as *Candida albicans* by germ tube test, growth on corn meal agar and biochemical profiles. It was sensitive to fluconazole and amphotericin B. The patient was responded with antifungal treatment and thoracic drainage.

Introduction

Invasive candidiasis has emerged as an important nosocomial infection, especially in critical patients. The most common invasive candidiasis is candidemia and the incidence of nosocomial candidemia has increased in the past few decades.[1,2] Data from the Center of Disease Control revealed that, between 1980 and 1990, *Candida* species emerged as the sixth most common nosocomial pathogen (7.2%)[3]

Fungal empyema thoracis is a rare but severe invasive candidiasis with high mortality, and Candida species are the most frequent isolates.[4] There are not much studies of thoracic empyema caused by fungal species till now; only few cases have been reported in literature .[4-10]

Case history

A 35 years old male patient from poor socioeconomic strata admitted to the chest medicine ward of a tertiary care hospital with complaints of intermittent fever, cough with profuse purulent expectoration for last three months and dyspnoea for last one and a half months. Patient was a known diabetic diagnosed five years back. Patient had past history of pulmonary tuberculosis five years back for which he was treated with antitubercular therapy (ATT). He also had a h/o relapse and was treated again with ATT. On examination the patient was thin built, mild pallor was present, There was dullness on percussion on the left lower side with diminished chest movement. On auscultation, respiratory sounds were

diminished on the left lower region. Other systemic examinations did not reveal any abnormal findings. Due to the fever, the patient was already treated with oral antibiotics prescribed by local doctor.

The patient's investigations revealed that his Hb was 9.4g/dl the total leukocyte count was 11,800 cell/µl with 85% neutrophils, 13% lymphocytes and 2% eosinophils. His fasting sugar was 192g/dl. Urea 33, Creatinine 1.3. Urine analysis was normal. The HIV testing was seronegative. Sputum sample was examined for acid-fast bacilli, which was negative at present. Chest X-ray PA view showed findings suggestive of left sided pyopneumothorax [Figure 1(a)]. He had developed bronchopleural fistula confirmed by fiber optic bronchoscopy/ bronchogram. Diagnostic thoracocentesis revealed pyothorax with malodorous frank pus.

Gram stain of pleural fluid showed plenty of pus cells, but no gram stained organism was seen. The pleural fluid was cultured on blood agar both aerobically and anerobically, also put on Lowenstein Jensen (LJ) medium and Sabouraud's Dextrose Agar (SDA). After 48 hr incubation typical creamy pasty colonies appeared on aerobicbic blood agar and on SDA. [Figure 1(b)], Gram stain showed growth of *Candida spp*. Germ tube test was positive [Figure 2 (a)]. Chlamydiospore was demonstrated after Subculture on cornmeal agar [Figure 2(b)]. The spp. was identified as *Candida albicans* also by biochemical confirmation using API 32CYeast identification kit (BioMerieux). Antifungal sensitivity test according to CLSI guideline showed that the isolate was sensitive to fluconazole and Amphotericin-B. Histopathologic examination was negative for malignancy. Blood culture was sent to see candidemia but there was no growth after 7 days of incubation. Pleural fluid was again sent for culture after 2 days showed same growth.

Oral fluconazole was started first according to antifungal sensitivity report, but the patient's condition did not improve after four days of treatment So IV amphotericin-B was started. He continued to have persistant chest tube drainage. Initial deterioration like thrombocytopenia and hypotension occur after receiving IV amphotericine-B which was managed by supporting with plasma and platelet transfusion The.patient responded gradually and became asymptomatic after 2 weeks of treatment.

Discussion

Candida species are the most common pathogens in fungal empyema thoracis. Empyema thoracis caused by other filamentous fungi is rare, and only sporadic cases have been reported with *Aspergillus* and *Cryptococcus*.[5,6,7] *Candida* empyema thoracis has been reported as a complication of operation, gastropleural fistula, and spontaneous esophageal rupture.[8] Risk factors known to predispose *Candida* infection are parenteral nutrition, corticosteroids, immunosuppressive agents, drug abuse, extensive surgery, use of broad spectrum antibiotics and compromised host state, trauma of the skin and intravascular catheters. Our patient had uncontrolled diabetes and taken multiple broad spectrum antibiotics along with development of bronchopleural fistula most probably as a consequence of tuberculosis. All these factors made him very much susceptible to *Candida* infection in pleural cavity. Cavitatory lung disease in the presence of secretion, itself serving as a living petriplate on which Candida colonize by taking advantage of patient's immunocompromised state

Figure.1 (a) Chest X-ray PA view showing left sided Pyopneumothorax, (b) Candida colonies on Sabouraud's Dextrose Agar

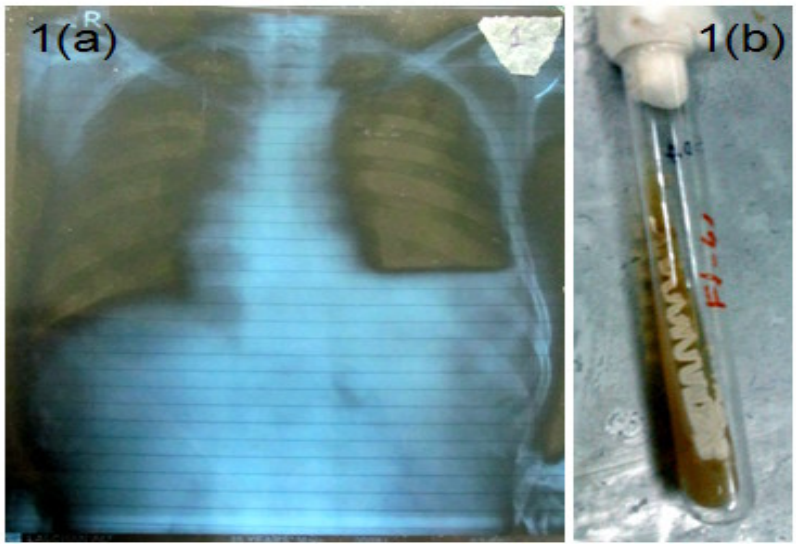
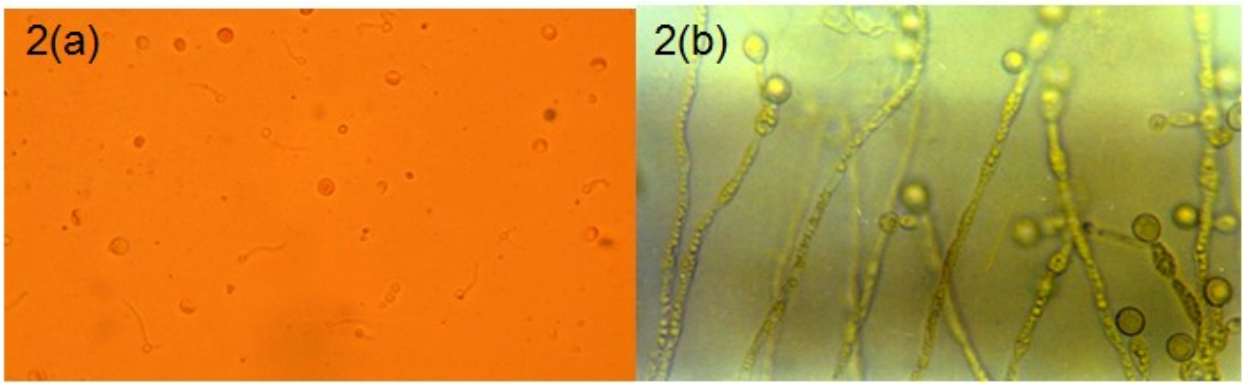


Figure 2: (a) Microscopic view of germ tube formation, (b) the microscopy of the candida colonies grown on cornmeal agar showing terminal clamydospore



The criteria for diagnosis of fungal empyema thoracis were as follows: (1) isolation of a fungal species from the pleural effusion; (2) significant signs of infection, such as fever (body temperature > 38.3°C) and leucocytosis (white blood cell> 10,000/mL); and (3) isolation of the same mold species from pleural effusion on more than one occasion, or from pleural effusion and other specimens such as blood, sputum, or surgical wounds that showed evidence of tissue invasion.[9] In our case the patient was febrile with leucocytosis and the same *Candida spp* was isolated from pleural fluid twice, satisfying all three criteria mentioned above. Data from the Center of Disease Control and Prevention's National Nosocomial Surveillance, which showed *Candida* and *Torulopsis* species to account for 80% of fungal isolates with nosocomial infections.[3] The commonest *Candida* species reported from empyema thoracis is *Candida albicans* followed by *Candida tropicalis.*[3,8]

A large study from Taiwan [8] 67 patients

with fungal empyema thoracis were studied. A total of 73 fungal isolates were recovered from pleural fluid, the most common was *Candida* species (47 isolates 64%), *Torulopsis glabrata* (13 isolates,18%); *Aspergillus* species (9 isolates, 12%). *Candida albicans*(28 isolates) was the commonest followed by *Candida tropicalis*(13 isolates).

The crude mortality of fungal empyema is very high around 73%.[8] Those patients without systemic antifungal therapy or pleural drainage had poor outcomes. Most patients who did not receive antifungal agents died before the culture results became available. In our case early diagnosis and proper choice of antifungal agents increase the survival rate, hammers the importance of early diagnosis and proper coordination with clinicians to reach the utmost outcome.

Acknowledgement

We hereby acknowledge the Department of Chest of IPGME&R for their immense help, support and guidance for completing the report. We are also very grateful to the Director of IPGME&R, for his constant encouragement.

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