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Case Report

Microbiology Section

A Fatal Case of Fungal Empyema Due to *Candida Krusei and Candida Tropicalis*: A Rare Occurrence with an Atypical Presentation

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ABSTRACT

Infections of the pleural cavity remain an important cause of morbidity and mortality despite advancement in diagnostic modalities and therapy. Community acquired empyema thoracis due to *Candida* species are rarely reported in paediatric literature. We hereby report an interesting case of empyema due to co-infection of *Candida krusei* with *Candida tropicalis*. A 11-year-old female child presented with respiratory distress. Chest X-ray showed massive pleural effusion, thoracocentesis showed it as purulent exudate and she was empirically treated with antibiotics. *C. tropicalis* and *C. krusei* were isolated from the pus sample proving to be fungal empyema. Inspite of antifungal agents and mechanical ventilation, her general condition rapidly deteriorated and she succumbed.

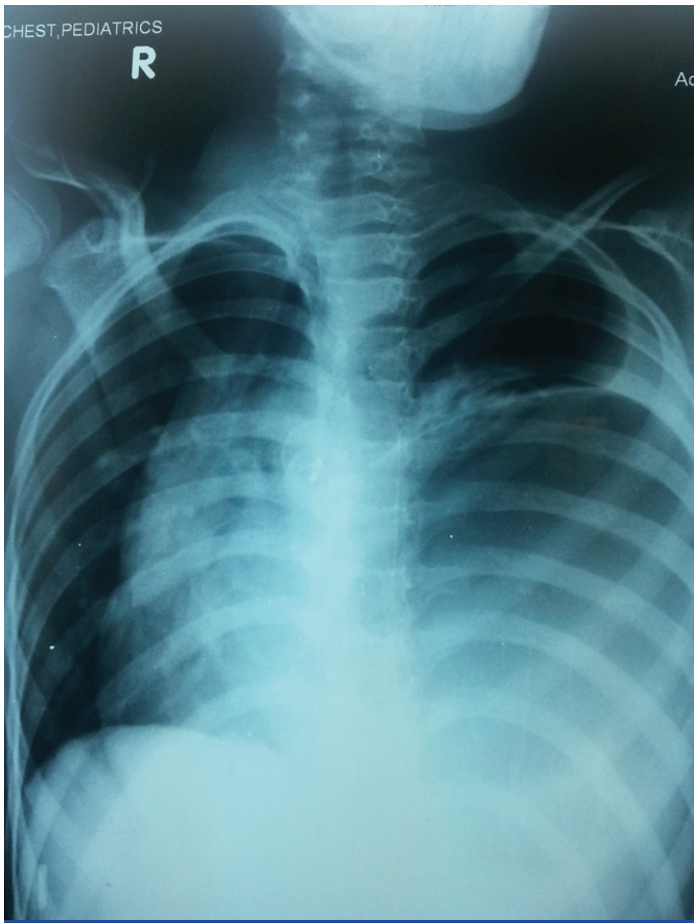
Keywords: Antifungal agents, Empyema thoracis, Pleural effusion, Respiratory failure, Thoracocentesis

CASE REPORT

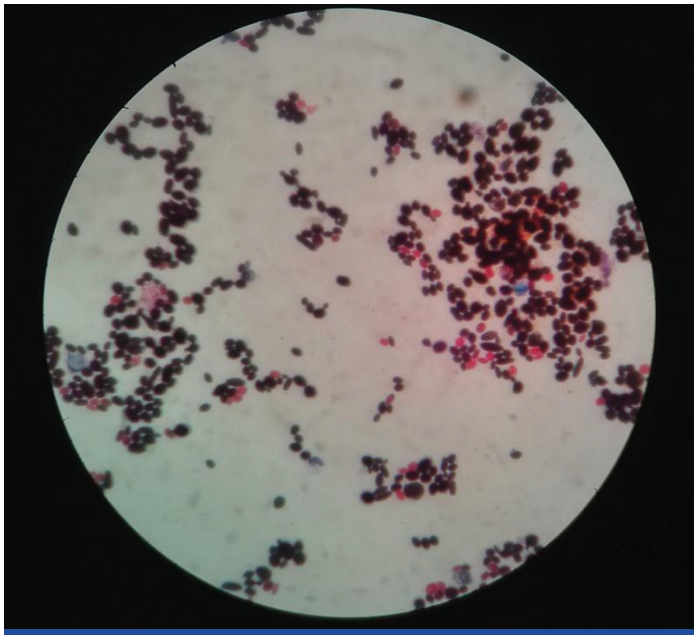
An 11-year-old girl presented to casualty of RL Jalappa hospital with history of pain in abdomen and nausea for two days. There was no history of fever, cough, vomiting and loose stools. Past history revealed that, she had undergone device closure for patent ductusarteriosis (PDA). Her postoperative period was uneventful and followup echocardiography after one year was normal. There was no history suggestive of endocarditis.

On examination she was conscious, afebrile and dyspnioec, SpO_2 was 90-92% at room air. Chest examination revealed tracheal shift to right side and decreased chest movements with dull note over the left hemithorax. Mediastinal shift was noted and point of maximal cardiac impulse was located in the right 5th intercostal space just medial to the mid clavicular line. However on auscultation, heart sounds were normal with no murmurs. On abdominal examination tenderness was localised to the right hypochondrium.

On further evaluation chest X-ray showed left sided massive pleural effusion [Table/Fig-1]. Laboratory investigation showed hemoglobin of 13.6gm%, total leucocyte count of 19,300 cells/mm^3 and erythrocyte sedimentation rate was 22mm/hr. Diagnostic thoracocentecis was performed; frank pus was aspirated and sent for analysis. Patient was subjected to intercostal drainage; about 2500ml of purulent fluid was drained over 48 hour. She was empirically treated with ceftriaxone and clindamycin. Biochemical analysis of Pleural fluid was suggestive of an exudate with protein of 5g/dL, glucose of 388mg/dL and lactate dehydrogenase of 12,300IU/L. Neutrophilic predominance was observed in pleural fluid cytology. Gramstain of the pus sample revealed gram positive budding yeast cells [Table/Fig-2]. A broad spectrum antifungal agent, Amphotericin-B was added pending culture report. Later culture yielded the growth of non albicans candida which was further speciated as *C.krusei* and *C.tropicalis* on chrom agar. These organisms were repeatedly isolated from a second sample of pus showing its clinical significance and satisfying the criteria for fungal empyema [1] Antifungal susceptibility testing was done as per Clinical Laboratory Standards (NCCLS) guideline [2], *C.krusei* is intrinsically resistant to fluconazole and tropicalis was sensitive to fluconazole and voricanazole. Her test for human immunosuppressive virus was negative and abdominal ultrasound was unremarkable. On day 2, she was mechanically ventilated with serial arterial blood gas monitoring. However, the patient's condition deteriorated went in to irreversible shock and could not be revived from respiratory failure.



[Table/Fig-1]: Chest X ray showing left sided pleural effusion with mediastinal shift to right side



[Table/Fig-2]: Gram stain of pleural fluid showing Gram positive budding yeast cells, which are spherical (*Candida tropicalis*) and elongated tubular (*Candida krusei*) with pseudohyphal forms

DISCUSSION

Candida species colonizes the oral cavity, gut and the vagina and cause significant morbidity and mortality through breached epithelial barriers especially in immunocompromised patient [1]. The major causes of fungal empyema thoracis include abdominal infections, bronchopulmonary infections, surgical intervention, and repeated thoracocentesis [1].

In a previous retrospective study done in adult age group, community acquired fungal empyema thoracis comprised only 16% of all fungal empyema cases. Among the clinically significant fungal isolates, 64% were *Candida* species, which includes *C. albicans* (38%), *C. tropicalis* (18%), and *C. glabrata* (18%). All patients undergoing surgery or pleural irrigation with antifungal agents survived [3]. A retrospective analysis of 128 cases of culture positive pleural effusion, Ishiguro et al., [4], demonstrated that isolation of *Candida* species could be an important clue for empyema due to gastrointestinal perforation.

The factors contributing to the death of the patient with fungal pyopneumothorax reported herein included the immuno suppression due to liver cirrhosis, acute respiratory failure, delayed diagnosis and treatment of suspected empyema thoracis with systemic antifungal therapy, and lack of surgical intervention [5]. The exact cause of fungal empyema in our case is not known as she was neither immunocompromised nor had any chronic illness in the past that would have predisposed for fungal entry in to pleural cavity. However, one possibility is, it could entirely be a community acquired infection, and a second remote possibility is PDA device closure which could have acted as the source, though one year echocardiography was normal following the device closure and we could not do the echocardiography during this admission.

CONCLUSION

We are reporting this case to create awareness regarding community acquired fungal empyema in children. With this case report we emphasize that fungal empyema can be a community acquired infection therefore high level of suspicion in such cases is required; also there is a need for greater interaction between clinicians and microbiologists for early decision making which helps in reducing the morbidity and mortality. Infections of the pleural cavity remain an important cause of morbidity and mortality despite advancement in diagnostic modalities and therapy.

The selection of antifungal agents in case of severe fungal infection should be rational, and undue delay on flucanozole as first line empirical treatment may not be encouraging.

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