Open Access

SCHOLARENA

Journal of Infectious Diseases and Pathogenesis

CASE REPORT

ISSN: 2577-7939

Magnusiomyces Capitatus in Immune-Competent Patients with Pulmonary Hemorrhage and Systematic Lupus Erythematosus

Waleed Amasaib Ahmed*, Angham Ahmed Almakki, Abeer Ahmed Bashinim, Abdelgaffar A Mohamed, Amna Al Kalkami and Mohannad Abu Rageila

[1]*Security Forces Hospital, Makkah, Saudi Arebia*

***Corresponding Author:** Waleed Amasaib Ahmed, Security Forces Hospital, Makkah, Saudi Arebia, Tel: 966540488843, E-mail: waleedamasaib@hotmail.com

Citation: Waleed Amasaib Ahmed, Angham Ahmed Almakki, Abeer Ahmed Bashinim, Abdelgaffar A Mohamed, Amna Al Kalkami et al. (2023) Magnusiomyces Capitatus in Immune-Competent Patients with Pulmonary Hemorrhage and Systematic Lupus Erythematosus. . J Infect Dis Pathog 6: 101

Abstract

Invasive fungal infections have grown significantly over the last two decades, owing to an increase in immune compromised hosts and geriatric patients. When the host's defenses are compromised, such infections are associated with severe morbidity and mortality. Here, a rare case of fungal infection in a 61-year-old immune competent male patient from Saudi Arabia was reported, who suffered from pulmonary haemorrhage and Systematic Lupus Erythematosus. Bronchoalveolar Lavage was used as a diagnostic tool to identify the fungus reported in the case. The pathogenic fungal specie identified as Magnusiomyces capitatus, in macroscopic and microscopic morphological characteristics of the colonies. Based on clinical evidence, liposomal amphotericin formulation was recommended for initial therapy against fungal infection. Also, liposomal amphotericin B induced mycological eradication up to 70 percent in patients with proven Magnusiomyces capitatus infection. In addition to addressing suspected Systemic lupus erythematosus, the patient's health has improved with no evidence of pulmonary bleeding and hemoptysis.

Key Message: This was the first case reported from Saudi Arabia, which displays a rare association between Magnusiomyces capitatus with Systemic lupus erythematosus (SLE) and pulmonary haemorrhage.
The fungal culture follow-up and clinical course results revealed that therapy with liposomal Amphotericin successfully treated the patient's fungal infection.

Keywords: Magnusiomyces capitatus; fungal infection; Bronchoalveolar lavage; Pulmonary haemorrhage; SLE (systemic lupus erythematosus); Amphotericin; a case report

Introduction

Magnusiomyces capitatus is a rare Ascomycetes yeast-like organism and has the order Sacchromycetales in the family Dipodsscaceae [1]. M capitatus is a ubiquitous global fungus in the typical microbial ecology colonizing humans. It can cause intrusive disease among immune suppressed patients, particularly those with hematologic issues [2,3]. Likewise, it can infect immune competent patients and is exceedingly uncommon in immune competent patients [4]. This was the first case reported from Saudi Arabia,which displays a rare association between Magnusiomyces capitatus with Systemic lupus erythematosus (SLE) and pulmonary haemorrhage.

Case History

In December 2021, a 61-year-old male resident in Saudi Arabia who retired from the military was admitted to a hospital, namely Security Forces Hospital Program, located in Makkah, Saudi Arabia. He had a history of heavy smoking, diabetes mellitus, hypertension, resolved HBV infection, and chronic kidney disease stage G4/A3. The patient's initial physical screening showed no change in his degree of consciousness or signs of gastrointestinal or urinary problems. Notable findings also included a temperature of 37°C, Blood pressure of 147/59 mm Hg, Pulse rate of 69 beats per minute, and oxygen saturation of 96 % on room air. Pulmonary and neurological examination was normal. The patient appeared to be in good health, mindful, alert, and not in pain, pale or jaundiced. All the body parts were sound and stable. On day +0, the patient was admitted to the intensive care unit for acute coronary syndrome. His initial ECG showed a left bundle branch block with mild elevation in troponin 0.078ng/Ml. For two days (day +1 and day +2), he was introduced to Heparin infusion and dual antiplatelet agents (Aspirin and Plavix). On day +3 in ICU, the patient again experienced Dyspnea with high blood pressure, managed by intravenous Nitroglycerin. His CXR revealed bilateral consolidation in the right middle lobe and left upper lobe with bilateral effusion with pulmonary congestion; his oxygen saturation started to drop to 85-88% on room air. The patient was supplied with oxygen via nasal cannula, placed on BIPAP, and treated with Intravenous diuretics for pulmonary edema. His renal function started to raise Creatinine to 380 umol/L, and he developed oliguria. On ICU day, +4 patients developed Hemoptysis (2 attacks) in moderate amounts. His repeated Hemoglobin showed a drop of 2 g, and he received a blood transfusion in 2 units, and both Heparin and dual antiplatelet (Aspirin and Plavix) were discontinued. CT chest was ordered and revealed dense consolidation on the left upper lobe hemorrhage with right middle lobe nonhomogeneous consolidation and bilateral effusion.(CT chest A,B)

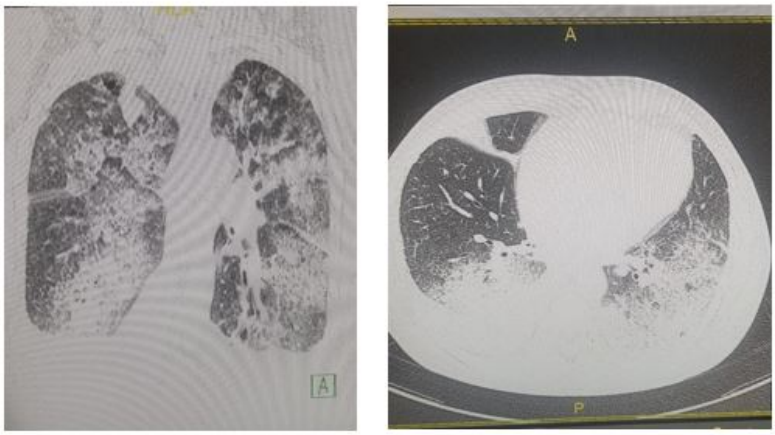

Figure: CT chest A and CT chest B

The patient was suspected of having Rapid progressive glomerulonephritis on top of his chronic kidney disease and developed pulmonary hemorrhage. Workups for possible underlying autoimmune processes causing his rapidly progressive renal deterioration and lung hemorrhage were requested. His Anti-Nuclear Antibody showed positive results, whereas complements were low C4 <0.03 g/L (0.15-0.5), C3 0.56 g/L (0.82-1.8). Ant ds-DNA Antibody was slightly high,202 I huU/ml (0.0-200).

The rheumatology team made the diagnosis of System Lupus Erythematosus(SLE).The plan was to treat him with pulse steroid therapy, Cyclophosphamide, and plasma exchange for SLE with possible SLE nephritis and Pulmonary hemorrhage secondary to SLE. On day +5 of ICU admission, the patient was electively intubated and ventilated because of further deterioration in his oxygen saturation despite a high flow oxygen supply of 40 L 100%. Also, he became more oliguric and started on Hemodialysis. In addition, plasma exchange was initiated (planned for ten sessions), and he received the first dose of pulse steroid therapy and the first dose of Cyclophosphamide. On day +6 of ICU admission, a bronchoscopy was performed, during which bloody secretions were noticed in the trachea, carina, and bronchial trees. Left and right lower lobes, LUL, and RML Bronchoalveolar lavage were done. The right bronchial tree cleared after repeated flushing. However, bloody fluid continued to be retrieved from the left bronchial trees. On days +7, +8, and +9 of ICU admission, the patient continued to have bloody secretion from the tracheal aspiration.

Moreover, on day +10, he completed five sessions of therapeutic plasma exchange and completed three doses of pulse steroid therapy (1 g Methylprednisolone) and then shifted to prednisolone 80 mg intravenous /day. Also, he received a single dose of Cyclophosphamide. However, he was still intubated and ventilated with ongoing hemodialysis sessions. Finally, on day +12 of ICU, the cytological analysis from Bronchoalveolar lavage(BAL) showed abundant septated Hyphae with negative malignant cells.

Later on, the microbiology analysis for the fungal culture reported unidentified rapidly growing fungi (unlikely to be aspergillus, and it looked like trichosporon in direct wet amount). The sample was sent to perform gene sequencing for further analysis. In the following days in ICU patient was not improving. As the patient was on Heparin for a short time, Heparin-induced thrombocytopenia (HIT) assay was requested and reported negative. After excluding other possible causes of thrombocytopenia, it was related to SLE. On Day +15 of ICU admittance, the patient pulmonary hemorrhage was not under control despite the treatment with the pulse steroid, plasma exchange, and Cyclophosphamide. The patient was switched on empirical Liposomal Amphotericin (5 mg/kg IV daily). On Day +18 of ICU admission, the patient completed ten sessions of therapeutic plasma exchange. His respiratory condition improved with low setting ventilator support, and a small amount of clotted blood was observed in the tracheal aspirate. Gene sequencing (PCR) from the BAL fungal culture sample was reported as Magnusiomyces capitatus, and the infectious disease team decided to continue Amphotericin for 14 days. On Day +19 of ICU admission, the patient was started on a weaning trial from the ventilator. On Day +20th, he was disconnected successfully from the ventilator, and his CXR was improving in congestion and consolidation. On Day +23rd, the patient oxygen saturation was 96%, and the oxygen supply was 2 liters' nasal cannula. On Day +25th, the patient was discharged from the ICU to the general ward on tapering steroid and hemodialysis sessions.

Discussion

This study utilized BAL to obtain the fungal sample from the infected lungs of the patient to identify this rare case. In the cytological laboratory, the morphological features of M. capitatus were studied using Sabouraud Dextrose Agar. As illustrated in figure 1, the fungus-infected sample was cultured for 48 hours producing creamy-colored, moist colonies that rapidly grew at 25°C. An advanced molecular technique named PCR was used to identify the fungal pathogen. The identified pathogen was reported as Magnusiomyces capitatus.

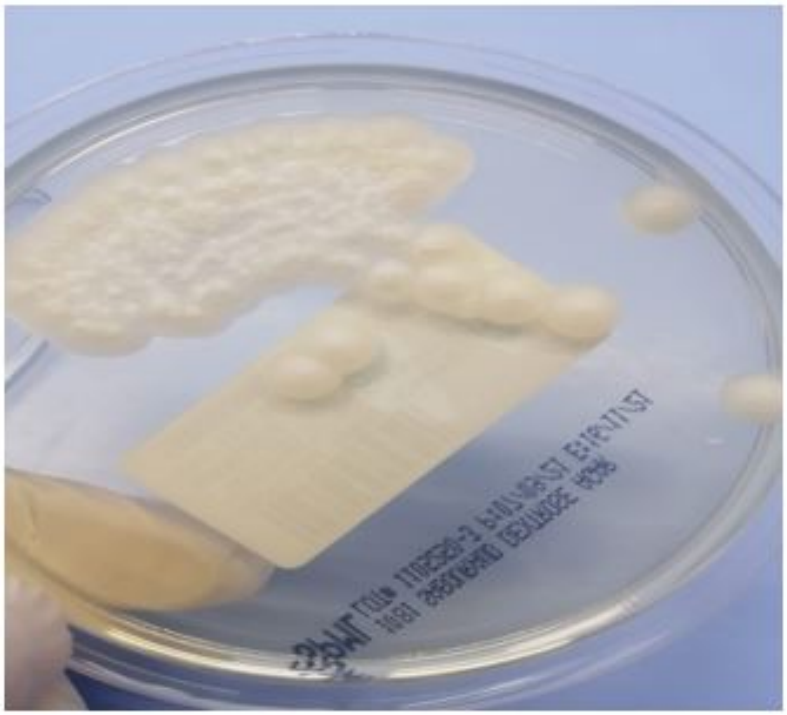

Figure 1: Magnusiomyces capitatus, fungal sample was obtained from BAL, and cultured for 48 hours on Sabouraud Dextrose Agar: Creamy--colored and moist colonies were observed proliferating at 25°C.

The histo pathological results showed hyaline hyphae segmentation into arthroconidia of varying lengths. It was observed microscopically at 40 X magnifications (see figure 2).

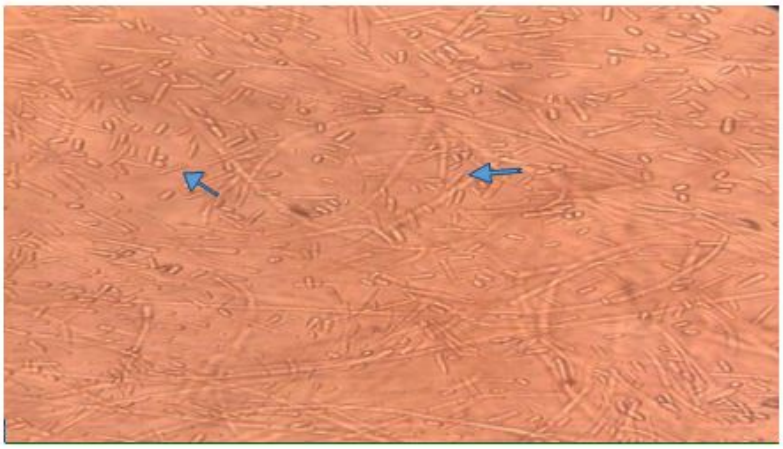

Figure 2: Magnusiomyces capitatus, fungal sample was obtained from BAL, 48 hours' culture, direct wet mount, 40 X magnifications: hyaline hyphae segment into arthroconidia of variable length.

Amphotericin is introduced to the patient intravenously for the rapid initiation of antifungal therapy. In the general ward, the patient completed 14 days of Amphotericin. It was observed that Amphotericin with a cumulative dose of 5 mg/kg per day for 2-4 hours has no harmful side effects. Consistent plasma concentrations at a specific level were achieved by controlling the delivery rate. The patient has completed 14 sessions of therapeutic plasma exchange, received the second dose of Cyclophosphamide, and continued tapering the steroid. The patient's Urine output started to improve, and no further hemodialysis was required. The patient was weaned off the oxygen and remained stable until discharged. The bacterial culture from the BAL returned negative. The patient's health has improved, with no evidence of pulmonary bleeding; hemoptysis has also stopped.

Conclusion

Most fungal infections are caused by immune system malfunctions. Environmental and genetic variables contribute to disease pathogenesis [5,6]. M. capitatus was identified as a significant opportunist, causing pulmonary and disseminated infections in patients with hematological malignancies, and other immune disorder [7,10].

Opportunistic fungal infections often arise in patients with Systemic Lupus Erythematosus (SLE) as a complication of prolonged immune suppression treatment. However, we present here a rare association between SLE and Magnesiumyses capitatus in a patient who was newly diagnosed with SLE.

Healthcare providers should maintain vigilance regarding the potential occurrence of these potentially lethal infections in patients with SLE, considering their compromised immune system.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Research Quality and Ethics Statement

The authors followed applicable EQUATOR Network http://www.equator-network.org/ guidelines, notably the CARE guideline, during the conduct of this report.

Declaration for All Articles

We also certify that none of the authors is a member of the Editorial board of the JGID.

References

1. De Hoog GS, Smith MT (2004) Ribosomal gene phylogeny and species delimitation in Geotrichum and its teleomorphs. Stud Mycol 50: 489-515.

2. Mazzocato S, Marchionni E, Fothergill A, Sutton D, Staffolani S et al. (2015) Epidemiology and outcome of systemic infections due to Saprochaete capitata: case report and review of the literature. Infection 43: 211-5.

3. Tanuskova D, Horakova J, Svec P, Bodova I, Lengerova M et al. (2017) First case of invasive Magnusiomyces capitatus infection in Slovakia. Medical mycology case reports 16: 12-5.

4. Shah A, Mauger T (2017) Magnusiomyces capitatus: a new and emerging pathogen linked to keratomycosis. Digital Journal of Ophthalmology 23: 75.

5. D Assumpcao C, Lee B, Heidari A (2018) A Case of Magnusiomyces capitatus peritonitis without underlying malignancies. Journal of Investigative Medicine High Impact Case Reports.

6. Garcia-Ruiz JC, Lopez-Soria L, Olazabal I, Amutio E, Arrieta-Aguirre I et al. (2013) Invasive infections caused by Saprochaete capitata in patients with haematological malignancies: report of five cases and review of the antifungal therapy. Revista iberoamericana de micologia 30: 248-55.

7. Vaux S, Criscuolo A, Desnos-Ollivier M, Diancourt L, Tarnaud C et al. (2014) Multicenter outbreak of infections by Saprochaete clavata, an unrecognized opportunistic fungal pathogen. MBio 5: e02309-14.

8. Schuermans C, Van Bergen M, Coorevits L, Verhaegen J, Lagrou K et al. (2011) Breakthrough Saprochaete capitata infections in patients receiving echinocandins: case report and review of the literature. Medical mycology 49: 414-8.

9. Samaranayake LP, Keung Leung W, Jin L (2000) Oral mucosal fungal infections. Periodontology 49: 39-59.

10. Birrenbach T, Bertschy S, Aebersold F, Mueller NJ, Achermann Y et al. (2012) Emergence of Blastoschizomyces capitatus yeast infections, Central Europe. Emerging infectious diseases 18: 98.