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Medi Quest BRS Hospital

A monthly News letter from BRS Hospital

CASE REPORT OF INVASIVE FUNGAL SINUSITIS (MUCORMYCOSIS) MANAGED IN BRS HOSPITAL

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Abstract:
Mucormycosis is a rare but severe infection. Though it can involve different parts of the body or be disseminated, it most commonly affects the nose and orbit. It is usually seen in immune-compromised individuals with poor diabetic control. It is difficult to diagnose and treat this disease and is associated with high morbidity and mortality due to the orbital and intracranial complications. Its incidence in India was 0.14 cases per 1000 population in the pre-COVID era. However, during this COVID period its incidence has increased. In these patients, the disease has a varied course in terms of age of the patient, severity of presentation and progression of the disease. Early diagnosis and treatment play a very important role in reducing the morbidity and mortality improving the survival of the patients. In this issue we share our experience in managing one such patient.

Introduction:
Fungi are one of four major groups of microorganisms. They are a group of eukaryotic microorganisms. They exist in nature in one of two forms: unicellular yeast and multicellular molds. Fungi with importance in otolaryngology typically belong to the divisions Ascomycota and Deuteromycota, divisions to which Aspergillus species and Candida species belong respectively.(1) Pathogens in the Zygomycota phylum, including Mucor, Apophysomyces, Rhizomucor, Rhizopus and Absidia, more frequently cause infections in immunosuppressed patients with underlying conditions, such as diabetes and malignancy.(2)

The fungus Mucor causes an invasive and fatal disease. It spreads by direct invasion and angio-invasion leading to erosion of the surrounding bone and invasion of the surrounding structures, including the orbital structures, and the brain and meninges. (3) Hence, early identification and aggressive management is important.

In this COVID era, the number of invasive fungal infections has increased. Of these infections, Mucormycosis has been found to be very common in the patients affected by COVID-19 infection. In these patients it is noted that the onset of symptoms is very fast and very severe at presentation (4) when compared to the patients in the pre-COVID era.

The disease can have varied presentation and it is necessary for the physician to be vigilant to identify the disease at an early stage.

In this issue of Mediquest we discuss the clinical features, course and management of a patient with mucormycosis who was admitted and managed in BRS Hospital.

Case Report :
60-year-old lady, a known Diabetic with Post Covid Status presented with a persistent left cheek swelling of one and half months duration. The summary of her hospital

admissions in the past two months is given below.

First Admission:
The patient was in her usual state of health till two months ago, when she developed fever and on the third day of fever, HRCT scan chest was taken which showed features of COVID- 19. She was admitted in private hospital in her native place and treatment initiated as for COVID -19 which included anti coagulants and IV Methyl Prednisolone. RTPCR test for COVID-19 test was not done during this admission.
After 5 days she developed palpitations and noted to have tachycardia, with heart rate to going up to 200/min, for which a Cardiologist's opinion was sought and was transferred to a tertiary care Government Hospital at her native place.

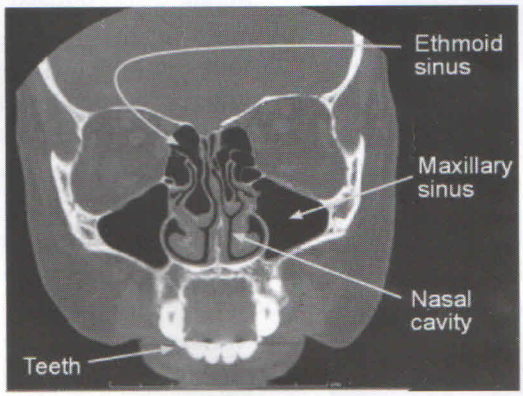
Second Admission:
During her second admission RT PCR for SARS-CoV-2 virus was done which was negative, but increase in Radiological findings on CT scan was supportive of COVID-19. During this hospital stay she developed features of renal failure with elevated urea of 193 mg/dl and creatinine of 11.6mg/dl hence was referred to Chennai for further management.

Third Admission:
She was admitted in a private hospital in Chennai and was managed for renal failure due to pyelonephritis with hemodialysis 4 cycles and in addition a Bilateral DJ stenting was done.

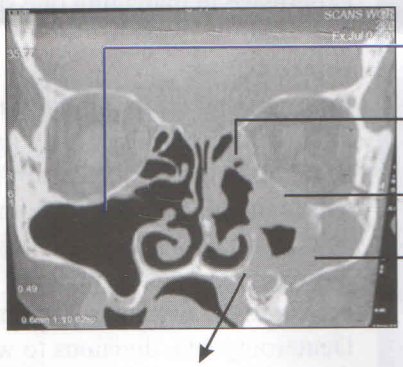
The patient had generalised edema which regressed after dialysis, but swelling in the left cheek persisted with tenderness on palpation. There was no history of nasal discharge or epistaxis. CT scan sinus raised the possibility of Mucormycosis. FESS was done on frank pus aspirated and debris removed from left maxillary sinus. Complete Ethmoidectomy done. Excision biopsy staining was positive for fungal elements. The patient was started on IV Amphotericin. IV Amphotericin was not tolerated and the dosing was reduced. A repeat endoscopy was done prior to discharge the findings of which are not known. The patient was discharged with the advice to continue alternate day IV Amphotericin at 50mg / day for 3weeks.

Fourth Admission:
BRS Hospital
After discharge from previous hospital the left cheek swelling persisted and was tender to touch. A repeat CT scan again done; showed revealed mucosal thickening in the left frontal, ethmoid and maxillary sinuses with breach in the inferior wall of left orbit, inferomedial , inferolateral aspect of maxillary sinus of residual infection and MRI confirmed the same hence was admitted in BRS hospital for repeat surgical intervention .

Normal CT Scan of Sinuses



CT Scan Para Nasal Sinus of the Patient



In BRS HOSPITAL left infrastructural maxillectomy with endoscopic debridement of paranasal Sinuses and left endoscopic orbital decompression was done under general anaesthesia and prosthesis of the palatal and maxillary defect was placed at the end of the procedure.
Th patient was started on Inj. Amphotericin B and a cumulative dose of approximately 1500 mg was administered. Her renal parameters were monitored regularly and the dose of Amphotericin was titrated accordingly. She developed an episode of Supraventricular tachycardia after Inj Amphotericin infusion, which was treated with IV Metoprolol subsequently she maintained sinus rhythm.
After 1 week of her treatment at our centre, we discharged her with oral anti-fungal medication, Posaconazole. At the time of discharge, her nasal cavity and the maxillary cavity was inspected and cleaned. She was discharged with full consciousness and was stable. On follow up as an outpatient she was doing well and the swelling had subsided.

Discussion:

Mucormycosis is an angioinvasive disease characterized by infarction and necrosis.(5) it is an extremely rare infection in healthy individuals, but is seen commonly in immunocompromised individuals. Various conditions where this can arise include uncontrolled diabetes mellitus, haematological and other malignancies, organ transplantation, prolonged neutropenia, immunosuppressive and corticosteroid therapy, iron overload or hemochromatosis, deferoxamine therapy, severe burns, acquired immunodeficiency syndrome (AIDS), intravenous drug abusers, malnutrition and open wound following trauma.(6) Uncontrolled diabetes mellitus is the most common predisposing factor.(7) The median age of presentation is 50 years.(8)
Numerous factors, including lymphopenia, exposure to steroids, elevated ferritin levels and a dysregulated immune response can predispose to Mucormycosis in COVID-19.(9)(10,11) Uncontrolled diabetes and steroid use are the most common predisposing factors.(12) The fungus is capable of angioinvasion, leading to blockage of blood vessels and necrosis of structures, and dissemination of the infection.(5)
It can involve nose, paranasal sinuses, orbit, central nervous system, lung, gastrointestinal tract, skin, mandible, joints, heart, kidney, and mediastinum.(6) Of these, involvement of the nose and paranasal sinuses, orbit and CNS (rhino-orbito-cerebral type) is the most common type in India.(5)(6) It should be noted that this term denotes a spectrum ranging from limited sinonasal disease, to naso-orbital disease to an extensive disease extending intracranially.
The management of mucormycosis is based on multiple interventions occurring simultaneously, or with different timing and intensity. Early diagnosis and prompt therapeutic intervention may prevent progressive tissue invasion and its sequelae, may also reduce the need for extensive surgery and subsequent deformity, and may improve survival.(13) Untreated mucormycosis is universally fatal.(2) Amphotericin B and its formulations are the first line antifungal agents in the treatment of Mucormycosis. Posaconazole has mainly been studied and has been used as a salvage therapy.(14)
One of the authors of this issue, Dr Vivekanandan Balakumar has reported on a case series of Mucor mycosis patients (unpublished data) with the following feature . The patient's age of presentation ranged from 33 years to 67 years. All had been hospitalized for COVID-19 infection and had received steroids and humidified oxygen. In this series 3 patients were known diabetics on medications. However, all patients had elevated sugar levels at the time of presentation. One patient was still positive for the COVID-19 at presentation.
The manifestations varied from simple sinusitis to extensive disease involving the orbit and meninges. All patients underwent debridement of the involved structures, including orbital exentration in one of the patients. All patients received a course of Amphotericin B based, following which they were started on Posaconazole. In one patient the disease persisted after antifungal therapy and continued to spread involving the skull base and cranial. In this patient extensive surgical debridement and removal of the involved bones had to be done. In other patients, improvement was seen with treatment with antifungals. However, vision lost could not be recovered, emphasizing the need for early diagnosis and treatment.

Conclusion:

•Mucormycosis is a fulminant disease with high morbidity

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and mortality.

•Early diagnosis and treatment is imperative for the best outcome.

•It is necessary to be vigilant due to the varied presentations.

•Initiation of appropriate antifungals and adequate debridement are necessary.

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References:

1. Neofytos D, Horn D, Anaissie E, Steinbach W, Olyaei A, Fishman J, et al. Epidemiology and outcome of invasive fungal infection in adult hematopoietic stem cell transplant recipients: Analysis of multicenter prospective antifungal therapy (PATH) alliance registry. Clin Infect Dis [Internet]. 2009 Feb 1 [cited 2021 May 29];48(3):265–73. Available from: https://pubmed.ncbi.nlm.nih.gov/19115967/

2. Roden MM, Zaoutis TE, Buchanan WL, Knudsen TA, Sarkisova TA, Schaufele RL, et al. Epidemiology and outcome of zygomycosis: A review of 929 reported cases [Internet]. Vol. 41, Clinical Infectious Diseases. Clin Infect Dis; 2005 [cited 2021 May 29]. p. 634–53. Available from: https://pubmed.ncbi.nlm.nih.gov/16080086/

3. Peterson KL, Wang M, Canalis RF, Abemayor E. Rhinocerebral mucormycosis: Evolution of the disease and treatment options. Laryngoscope [Internet]. 1997 Jul [cited 2021 May 29];107(7):855–62. Available from: https://pubmed.ncbi.nlm.nih.gov/9217119/

4. Sharma S, Grover M, Bhargava S, Samdani S, Kataria T. Post coronavirus disease mucormycosis: A deadly addition to the pandemic spectrum. J Laryngol Otol [Internet]. 2021 [cited 2021 May 29];1. Available from: /pmc/articles/PMC8060545/

5. Frater JL, Hall GS, Procop GW. Histologic Features of Zygomycosis. Arch Pathol Lab Med [Internet]. 2001 Mar 1 [cited 2021 May 30];125(3):375–8. Available from: https://pubmed.ncbi.nlm.nih.gov/11231486/

6. Sugar AM. Mucormycosis. Clin Infect Dis [Internet]. 1992 Mar 1 [cited 2021 May 30];14:S126–9. Available from: https://pubmed.ncbi.nlm.nih.gov/1562684/

7. Patel A, Kaur H, Xess I, Michael JS, Savio J, Rudramurthy S, et al. A multicentre observational study on the epidemiology, risk factors, management and outcomes of mucormycosis in India. Clin Microbiol Infect [Internet]. 2020 Jul 1 [cited 2021 May 30];26(7):944.e9-944.e15. Available from: https://pubmed.ncbi.nlm.nih.gov/31811914/

8. Skiada A, Pagano L, Groll A, Zimmerli S, Dupont B, Lagrou K, et al. Zygomycosis in Europe: Analysis of 230 cases accrued by the registry of the European Confederation of Medical Mycology (ECMM) Working Group on Zygomycosis between 2005 and 2007. Clin Microbiol Infect [Internet]. 2011 [cited 2021 May 30];17(12):1859–67. Available from: https://pubmed.ncbi.nlm.nih.gov/21199154/

9. Krishna V, Morjaria J, Jalandari R, Omar F, Kaul S. Autoptic identification of disseminated mucormycosis in a young male presenting with cerebrovascular event, multi-organ dysfunction and COVID-19 infection. IDCases [Internet]. 2021 May [cited 2021 May 30];e01172. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2214250921001281

10. Ibrahim AS, Spellberg B, Edwards J. Iron acquisition: A novel perspective on mucormycosis pathogenesis and treatment [Internet]. Vol. 21, Current Opinion in Infectious Diseases. NIH Public Access; 2008 [cited 2021 May 30]. p. 620–5. Available from: /pmc/articles/PMC2773686/

11. Artis WM, Fountain JA, Delcher HK, Jones HE. A mechanism of susceptibility to mucormycosis in diabetic ketoacidosis: Transferrin and iron availability. Diabetes [Internet]. 1982 [cited 2021 May 30];31(12):1109–14. Available from: https://pubmed.ncbi.nlm.nih.gov/6816646/

12. Hoenigl M, Seidel D, Carvalho A, Rudramurthy SM, Arastehfar A, Gangneux JP, et al. The Emergence of COVID-19 Associated Mucormycosis: Analysis of Cases From 18 Countries. SSRN Electron J [Internet]. 2021 May 13 [cited 2021 May 30]; Available from: https://papers.ssrn.com/abstract=3844587

13. Walsh TJ, Gamaletsou MN, McGinnis MR, Hayden RT, Kontoyiannis DP. Early clinical and laboratory diagnosis of invasive pulmonary, extrapulmonary, and disseminated mucormycosis (zygomycosis). Clin Infect Dis [Internet]. 2012 Feb 1 [cited 2021 May 30];54(SUPPL. 1). Available from: https://pubmed.ncbi.nlm.nih.gov/22247446/

14. Tissot F, Agrawal S, Pagano L, Petrikkos G, Groll AH, Skiada A, et al. ECIL-6 guidelines for the treatment of invasive candidiasis, aspergillosis and mucormycosis in leukemia and hematopoietic stem cell transplant patients. Haematologica [Internet]. 2017 Feb 28 [cited 2021 May 30];102(3):433–44. Available from: https://pubmed.ncbi.nlm.nih.gov/28011902/

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