



ORIGINAL RESEARCH PAPER

Radiology

SPECTRUM OF MR IMAGING FINDINGS IN MUCORMYCOSIS

KEY WORDS:

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ABSTRACT

Background: Mucormycosis is a severe fungal infection, particularly prevalent among immunocompromised individuals, such as those recovering from COVID-19. Early diagnosis and intervention are crucial for improving patient outcomes. **Objectives:** This study aims to evaluate the role of magnetic resonance imaging (MRI) in assessing mucormycosis and to describe its characteristic imaging findings. **Methods:** A retrospective study was conducted at the Mandya Institute of Medical Sciences from June to September 2021, involving 50 patients diagnosed with mucormycosis. Inclusion criteria included patients with KOH mount-positive non-septate hyphae. MRI findings were analyzed for specific features indicative of rhino-orbital-cerebral mucormycosis (ROCM). **Results:** MRI revealed predominant hypointensity on T2-weighted images, the "black turbinate" sign, preantral fat infiltration, and loss of contrast enhancement of sinonasal mucosa. The majority of patients were elderly males, with diabetes and recent COVID-19 infection as common predisposing factors. Treatment outcomes included endoscopic debridement and antifungal therapy, showing promising results. **Conclusion:** MRI is instrumental in the early identification and assessment of mucormycosis, providing critical information for management. Key imaging findings, such as the black turbinate sign, are essential for diagnosis. Continued awareness and prompt imaging evaluation are necessary to enhance patient prognosis in the context of increasing mucormycosis cases related to COVID-19.

INTRODUCTION

Mucormycosis is a lethal form of zygomycosis. The mode of spread of infection are reactivation of nasal colonization and nasal inoculation of spores which germinate and rapidly spread through various routes. It is more common in immunologically or metabolically compromised such as patients who have developed COVID-19 infection in the recent past. (1) The main clinical features are headache, nasal congestion, ophthalmoplegia, facial edema, proptosis, CNS manifestations etc.

MR is superior to CT owing to its excellent soft tissue resolution and multiplanar capability. CEMRI is useful in differentiating viable from dead necrotic tissue. Early suspicion, rapid diagnosis, and initiation of treatment - determine prognosis in the management of mucormycosis. (2)

Imaging studies are readily available and rapidly give corroborative evidence when the disease is clinically suspected. In patients where biopsy is planned, imaging can be used to help guide the site for biopsy to ensure maximum diagnostic yield. Imaging helps in determining the extent of disease, which is critical in making a decision about further line of management. Radiologists should be familiar with the interpretation of MRI findings in ROCM. (3)

AIMS AND OBJECTIVES

- To study the role of MRI in assessment of cases of mucormycosis
- To describe the spectrum of MR imaging findings of the mucormycosis.

MATERIALS AND METHODS

A purposive sampling retrospective study was conducted by collection of image data set and laboratory examination details from suspected patients of mucormycosis who have undergone MRI PNS examination at the Department of Radiodiagnosis, Mandya institute of medical sciences, Mandya, Karnataka, India.

The study period was from June 2021 to September 2021

during and immediately after the peak time of second COVID-19 infection wave.

A total of 50 patients with mucormycosis identified during the study period. All the patients underwent MRI PNS with contrast.

Inclusion Criteria:

All suspected patients with KOH mount positive for non-septate hyphae are included. The MRI findings considered positive for ROCM are –

- Predominant hypointensity on T2WI of the sinus mucosa
- The black turbinate sign (non enhancing hypointense turbinate)
- Preantral fat infiltration
- Loss of contrast enhancement of the sinonasal mucosa
- Infiltration into orbit and cranial cavity.

Exclusion Criteria:

Cases with significant motion artefacts.

METHOD OF DATA COLLECTION :

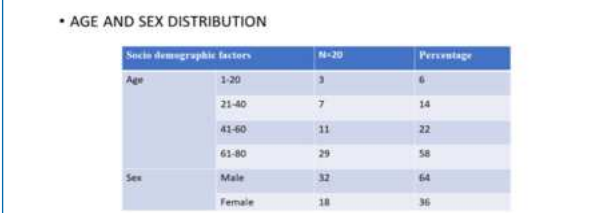
- The MRI of the patients who underwent MRI scan of the PNS with contrast during the study period were selected from the PACS dataset.
- The clinical details of these patients were retrieved from the HIS.
- Data of individuals included in present study were
- Age
- Sex
- The imaging findings.

DATA ANALYSIS:

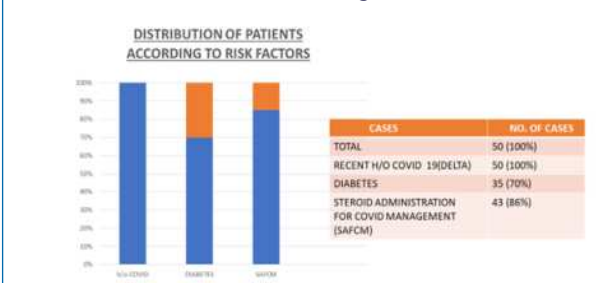
Data were entered and analysed through epi info 7. Categorical variables were expressed with percentages

OBSERVATION AND RESULTS:

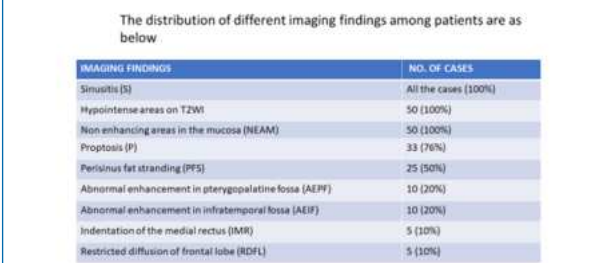
Age And Sex Distribution



Distribution Of Patients According To Risk Factors



Distribution Of Different Imaging Findings Among Patients



DISCUSSION

Mucormycosis is more common in males and 1.8 times common than females. (Males-65% >females -35 %). Most commonly affected seen in elderly people (61-80 years).Diabetes, COVID-19 induced immunomodulation and widespread use of steroid administration in management of severe COVID-19 are the common predisposing factors. (2)

Imaging plays a key role in the early identification of Rhino-Orbital Mucormycosis and delineating the extent of infection. There is possibility that delta virus adversely affects the pancreas- contributing to intense hyperglycemia- Favourable environment for onset of Mucormycosis. (4)

HALL MARK IMAGING FINDINGS-

- Variable intensity within the sinuses on T1WI and T2WI (predominant hypointense on T2WI)
- The black turbinate sign (non enhancing hypointense turbinate)
- Preantral fat infiltration
- Loss of contrast enhancement of the sinonasal mucosa

The extra sinus spread to the orbit, face, infratemporal fossa, skull base, cavernous sinus and intracranial compartment is seen.

OUTCOME:

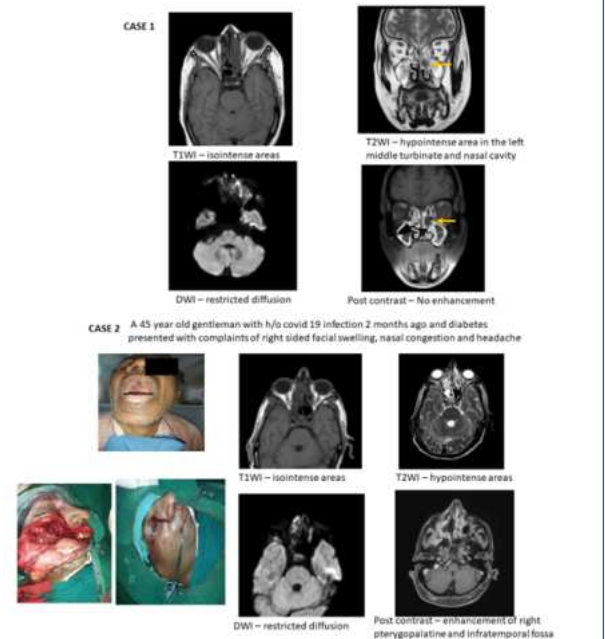
- 40 out of 50 patients underwent only endoscopic debridement of the disease with medical treatment. (Lyophilized Amphotericin B at 3-5 mg/kg/day for 3-6 weeks)
- 10 patients underwent initial endoscopic debridement followed by maxillectomy with medical treatment and retrobulbar amphotericin injection.
- Limitations of the study : small sample size.

lack of long term postoperative imaging follow up

CONCLUSION

- RCOM is most commonly seen in COVID 19 patients treated with steroid injections.
- Among the Imaging features, Black turbinate sign is diagnostic.
- Other imaging findings are Loss of periantral fat, thickening of extra ocular muscles, infiltration into adjacent structures.
- Complications of the mucormycosis are Orbital cellulitis, pachymeningitis, cavernous sinus thrombosis, cerebritis and cerebral abscess .

REPRESENTATIVE CASES



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