ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 05 | May - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

RADIOLOGICAL FEATURES OF MUCORMYCOSIS

Otorhinolaryngology

Dr. Atul Tupe Junior Resident -3, Department of ENT, Government Medical College and Hospital, Miraj

Dr. Reshma P. Chavan Professor and Head of Department, Department of ENT, Government Medical College and Hospital, Miraj

Dr. Wilson Desai Associate Professor , Department of ENT, Government Medical College and Hospital, Miraj

ABSTRACT

To assess the Outcome of Surgery of cases of Rhinocerebral Mucormycosis , On the basis of Radiological features. A prospective observational study was done of 80 patients who are diagnosed cases of ROCM. Patients are with or without COVID-19 infection & underwent contrast-enhanced MRI: brain, orbits & PNS. **Results-** MRI Brain + PNS + Orbit- Most common involved was ethmoid sinus; 57(71.25%) patients, maxillary sinus; 56(70%). Sphenoid sinus in 42 (52.5%) patients, least Frontal sinus: 29 (36.25%). Pansinusitis was seen in 10 (12.5%).Orbital invasion was in 13 (16.25%) of the 80 patients with involvement of orbital fat & extraocular muscle., extension into pterygopalatine fossa was one case. Intracranial involvement was seen in seven (8.75%) patients. On imaging, aggressive sinonasal & orbital changes caused by the disease have been seen. **Conclusion-** Imaging Is Roadmap For Surgical Debridement And Avoid Complications.

KEYWORDS

INTRODUCTION

Mucormycosis is an opportunistic, aggressive, & Angio invasive fungal infection, with a significant increase in rhino-orbito-cerebral mucormycosis (ROCM) infections in post COVID patients. Caused by saprophytic fungi belonging to the genera Mucor, Rhizopus and Absidia [1,2] The disease is seen almost exclusively in immunocompromised patients since normal phagocytic activity in immunocompetent hosts provide an adequate barrier against infection [1,2].The clinical presentation in the early stages is typically with fever, headache, facial pain, nasal discharge, nasal obstruction and Crusting. Imaging helps to confirm clinical suspicion, assessing extent, complications & follow up. Contrast enhanced CT & MRI are the best imaging modalities for the detection of Mucor. (4)

AIMS AND OBJECTIVE

To assess the outcome of surgery of cases of rhinocerebral mucormycosis on the basis of radiological features.

MATERIALS AND METHODS

A prospective observational study was done of 80 patients who are diagnosed cases of ROCM. Patients are with or without COVID-19 infection & underwent contrast-enhanced MRI: brain, orbits & PNS. The sinuses showing opacification on CT or MRI were recorded in each case. On post contrast CT and MRI, the type of contrast enhancement and involvement of any extra sinus structures including orbit, face, Pterygopalatine fossa, masticator space, brain and cavernous sinus were noted. Patients with intracranial extension were evaluated for dural enhancement, presence of extradural collections, infarcts, cerebritis and intracerebral abscess.

RESULTS

All 80 cases are histopathologically and using KOH mount and KOH culture are confirmed.

Table 1 Extent Of Regional Involvement

Stage	Areas involved	Number	%
Stage 1	Nose & paranasal sinuses alone	66	82.5
Stage 2	Paranasal sinuses with immediate adjacent areas which are surgically resectable with minimal morbidity eg. orbit (extraconal), palate & oral cavity	11	13.75
Stage 3	Intracranial extension (extradural/intracerebral) or partially resectable with extension to pterygopalatine fossa, cavernous sinus, cheek and periorbital region	09	11.25

Demographic finding of mucormycosis- 74.7% of mucormycosis patients were males and 25.3% of mucormycosis patients were females- 77.4% of mucormycosis patients were above 40 years of age and no patient was under 20 years of age- diabetes mellitus was the most common risk factor seen in 86.6% of patients with mucormycosis - 84% of patients with mucormycosis had a COVID-19 infection.- The steroid had received in 44% of mucormycosis patients.

Table 2. Sinus Involved In Mucormycosis Infection.

Sinus involved	No.	(%)
Maxillary	56	70
Ethmoid	57	71.25
Sphenoid	42	52.5
Frontal	29	36.25
Maxillary+ethmoid	12	15
Ethmoid+sphenoid	02	2.5
Maxillary+ethmoid+sphenoid	39	48.75
Pansinusitis	10	12.5

- Orbital invasion was in 13 (16.25%) of the 80 patients with involvement of orbital fat & extraocular muscle.-Extension into pterygopalatine fossa was one case. -Intracranial involvement was seen in seven (8.75%) patients.-On imaging, aggressive sinonasal & orbital changes caused by the disease have been seen.

Signal Characteristics And Imaging Appearances

CT- On CT three types of contrast enhancement were seen, with mildenhancement being the most common form. Other types included low density opacification with no post contrast enhancement and heterogeneously enhancing intrasinus abscess like appearance with variable enhancing and non enhancing areas.

Table 3. CT And Mr Features Of Paranasal Sinus Involvement.

CT feature	N	%	MR feature	N	%
Mucosal thickening	34	42.5	T1 W signal Hypointense	07	8.75
Osseous erosion	08	10	2W signal Isointense/Hypointense Heterogenous Hyperintense	10	12.5
Enhancement pattern			Enhancement pattern		
Non enhancing			Intense homogenous enhancement		
Mild enhancement			Heterogeneous enhancement	32	40
Heterogeneous			Central non enhancement with rim enhancement		

Table 4. Involvement Of Extrasinus Structures.

Site of involvement	N	%	Type of involvement
Face			Soft tissue infiltration and fat stranding
Orbit	10	12.5	Orbital cellulitis, optic neuritis
Orbital apex	3	3.75	Soft tissue infiltration and fat stranding
Pterygopalatine fossa	1		Fat stranding
Skull base	7	8.75	Rarefaction, lytic destruction, erosions and sclerosis
Cavernous sinus			Thrombosis
Internal carotid artery			Thrombosis
Brain	07	8.75	Cerebritis (3), infarcts (4), epidural (2) and intracerebral abscess (2)

DISCUSSION

Imaging helps in assessing the extent of disease, identification ofcomplications like ICA thrombosis and is indispensable for surgicalplanning [7]. Mohindra et al. has shown that MRI can detect cavernous sinus invasion and vascular complications such as thrombosis and ischemia [9]. Same was seen in our study. Patients initially present with sinonasal involvement which later spread to the orbits, masticator space, face, pterygopalatine fossa, hard palate, maxillary alveolus, zygomatic process, skull base and intracranial extension. CT predominantly showed minimally enhancing hypodense sinonasal soft tissue which was either isodense or slightly hypodense to surrounding masticator muscles.

CT showed calcification of sinuses, altered density in sinuses. MRI done to see extrasinus involvement as orbital involvement, intracranial extension. MRI of the sinuses and orbits showed iso to hypo intense appearance on T2. Post contrast images showed three patterns, intense enhancement of soft tissue, heterogeneous with variable enhancing and non enhancing areas and complete central non enhancement of the lesion. Fat stranding in the premaxillary, retromaxillary fat, orbital fat and altered fat in pterygopalatine fossa suggest diagnosis of invasive fungal infection.

Many of our patients showed destructive bony changes in the acute phase of the disease suggesting early bone involvement. For patients with palate,maxilla involvement we called maxillofacial surgeon for their surgical management. We have no Neurosurgeon in our institute so we referred patients with intracranial extension to Sassoon Hospital Pune. So that in same sitting patient got operated with Neurosurgeon and ENT surgeon in one GA instead of two GAs. After surgery patient given Amph B injection total of 3 gm per patient and follow up CT done.

CONCLUSION

Imaging is roadmap for surgical debridment and to avoid complications. -Based on our study, imaging of rhinocerebral mucormycosis showheterogeneous variable T2W signal intensity, different enhancementpatterns and involvement of different sinuses. -CT and MRI are invaluable tools which are complementary to clinical evaluation in assessing the extent of disease and diagnosis of complications.

REFERENCES

1] Petrikkos G, Skiada A, Lortholary O, Roilides E, Walsh TJ, Kontoyiannis DP. Epidemiology and clinical manifestations of mucormycosis. Clin Infect Dis 2012;54:S23–34. http://dx.doi.org/10.1093/cid/cir866.

[2] Reddy SS, Rakesh N, Chauhan P, Sharma S. Rhinocerebral mucormycosis among diabetic patients: an emerging trend. Mycopathologia 2015;180:389–96. http://dx.doi.org/10.1007/s11046-015-9934-x.

[3] Prabhu RM. Mucormycosis a review of manifestations, diagnosis & treatment.

[4] Mossa-Basha M, Ilica AT, Maluf F, Karakoç Ö, Izbudak I, Aygün N. The many faces of fungal disease of the paranasal sinuses: CT and MRI findings. Diagn Interv Radiol Ank Turk 2013;19:195–200. http://dx.doi.org/10.5152/dir.2012.003.

[5] Mohindra S, Mohindra S, Gupta R, Bakshi J, Gupta SK. Rhinocerebral mucormycosis: the disease spectrum in 27 patients. Mycoses 2007;50:290–6. http://dx.doi.org/10.1111/j.1439-0507.2007.01364.x.