Associated CT Scan Findings with Proptosis in Patients with Rhino-Orbital Mucormycosis

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ABSTRACT

Proptosis is a remarkable ocular manifestation of mucormycosis that warrants urgent attention. This article showed a higher rate of opacification of the ethmoid sinus in patients with proptosis. By increasing awareness and knowledge in this area, we hope to contribute to improved outcomes, reduced morbidity, and enhanced quality of life for those affected by this devastating condition.

INTRODUCTION

Mucormycosis is a rare opportunistic and life-threatening infection caused by fungi. Understanding the underlying mechanisms of proptosis in patients with mucormycosis is of paramount importance, as timely recognition and intervention are critical. CT scan has been used as the first radiological imaging device for assessing the extent of the disease in which images were evaluated for bone erosion, sinus opacification, and proptosis of the eye. This study focuses on the CT scan findings in patients with rhinologic involvement of the mucormycosis infection and its relation to proptosis.

METHODS AND MATERIALS

This study is a cross-sectional study of patients infected with mucormycosis without previous surgical intervention that was referred to a tertiary otolaryngology hospital. The inclusion criteria were age more than 18 years old, symptoms of sinusitis, and confirmation of mucormycosis in specimens from sinus surgery based on pathologic assessment. Patients infected with mucormycosis but not of rhino-orbital origin and patients with previous sinus surgery were excluded from the study. CT scan was performed by Siemens emotion 16 slice CT scanner (SOMATOM Emotion 16 scanner, Siemens, Erlangen, Germany), using a spiral method, the thickness of 0.6 mm, 110 Kvp, 70 effective mAs, 1.5 pitch factor, and acquisition design 0.75 mm. Reconstruction of axial and coronal views with bone was done.

RESULTS

Of 89 included patients, 47 (52.8%) were male and 42 (47.2%) female with an average age of 56.25±12.42 years. The most common radiologic finding was opacification of the maxillary sinus (87.6%), followed by opacification of the ethmoid sinus (84.3%) and opacification of the sphenoid sinus (69.7%). Proptosis was reported in 21 patients (23.60%). There was a statistically significantly higher rate of opacification of the ethmoid sinus in patients with proptosis (100.0% versus 79.4%, p-value=0.016).

Association of radiologic findings with proptosis.

Variable		Proptosis of eye		P-value*
		Yes (N=21)	No (N=68)	
Gender; N (%)	Male	9 (42.9%)	38 (55.9%)	0.231
	Female	12 (57.1%)	30 (44.1%)	
Erosion in the floor of the anterior cranial fossa; N (%)		2 (9.5%)	3 (4.4%)	0.337
Erosion of cribriform plate; N (%)		8 (38.1%)	25 (36.8%)	0.554
Erosion of ethmoidal air septum; N (%)		8 (38.1%)	31 (45.6%)	0.364
Erosion of lamina papyracea; N (%)		13 (61.9%)	27 (39.7%	0.062
Erosion of pterygopalatine fossa; N (%)		7 (33.3%)	38 (55.9%	0.059
Opacification of maxillary sinus; N (%)		18 (85.7%)	60 (88.2%)	0.507
Opacification of the ethmoid sinus; N (%)		21 (100.0%)	54 (79.4%)	0.016
Opacification of frontal sinus; N (%)		14 (66.7%)	41 (60.3%)	0.398
Opacification of the sphenoid sinus; N (%)		16 (76.2%)	46 (67.6%)	0.324

* Fisher's exact test

CONCLUSIONS

In conclusion, proptosis is a remarkable ocular manifestation of mucormycosis that warrants urgent attention. This article showed a higher rate of opacification of the ethmoid sinus in patients with proptosis.

By increasing awareness and knowledge in this area, we hope to contribute to improved outcomes, reduced morbidity, and enhanced quality of life for those affected by this devastating condition.

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1. Hassan RM, Almalki YE, Basha MAA, et al. Magnetic Resonance Imaging Features of Rhino-Orbito-Cerebral Mucormycosis in Post-COVID-19 Patients: Radio-Pathological Correlation. Diagnostics (Basel). 2023;13.
2. Sen M, Honavar SG, Bansal R, et al. Epidemiology, clinical profile, management, and outcome of COVID-19-associated rhino-orbital-cerebral mucormycosis in 2826 patients in India - Collaborative OPAI-IJO Study on Mucormycosis in COVID-19 (COSMIC), Report 1. Indian J Ophthalmol. 2021;69:1670-92.