Septal Necrosis as Primary Presentation for Mucormycosis in Covid-19 Era

Short Communication

Ahmed Hassan Sweed, Mohamed Mobashir, Ezzeddin ElSheikh, Mohammed Elsayed Elmaghawry

Department of ORL-HNS, Faculty of Medicine, Zagazig University, Egypt.

ABSTRACT

Objectives: To report unusual presentation of sinonasal mucormycosis, To emphasize on importance of MRI sequences in dealing with mucormycosis cases.

Patients and Methods: We reported a case with persistent rhinological symptoms after Covid-19 recovery, presented endoscopically with necrotic eschar/crust on nasal septum with apparently normal lateral nasal mucosa. MRI T2 fat suppression revealed inflammatory process within RT pterygopalatine / infratemporal fossa territory. Endoscopic sinus surgery was done for debridement of necrotic septal nasal mucosa, exploration of RT PPF / ITF shows pus emerging from it with necrosis of posterior feeding vessel of the nose "SPA". Nasal septum is characterized by double vascularity from both side , but sudden interruption from one side could not be compensated from healthy side leading to necrosis.

Conclusion: Any persistent rhinological symptoms after covid-19 infection with necrotic eschar anywhere within rhino-orbital territory should be considered as mucormycosis till prove otherwise.

Key Words: Covid-19, mucormycosis, necrotic septum.

Received: 11 April 2022, **Accepted:** 30 July 2022

Corresponding Author: Ahmed Hassan Sweed, MD, Department of Otorhinolaryngology, Faculty of Medicine, Zagazig University, Egypt. **Tel.:** 00201144703321, **E-mail**: dr.orl.sweed@gmail.com

ISSN: 2090-0740, 2022

INTRODUCTION

Acute invasive fungal sinusitis (AIFS) is a rare form of fungal rhinosinusitis affecting immunocompromised patients with high mortality rate (50-80%).[1]

Mortality rate shows wide range in between studies due to presence of different variables as reversibility of immunocompromised state, virulence of fungi (zygomycetes more virulent in comparison to aspergillus), stage of Rhino-orbito-cerebral mucormycosis (ROCM), initiation of antifungal medications, and surgical debridement[2]. Early diagnosis and initiation of medical treatment, with extensive debridement is the key consideration to minimize mortality rate[3].

Pathogenesis of mucormycosis depends on submucosal blood vessel invasion, endothelial injury and thrombosis (angio-invasion & vasculitis).

Fungal spread pathway could be either centripetal or centrifugal pattern; centripetal spread indicates thrombosis in minute blood vessels in nasal mucosa till reaching main vessel (sphenopalatine vessels) while centrifugal spread denotes reverse condition which means involvement of pterygopalatine fossa then ischemic changes occurs within rhino-orbito-cerebral territory[4]. Some authors considered pterygopalatine fossa as a reservoir site for fungal infection from which infection could spread to facial soft tissue, periantral soft tissue, and inferior orbital tissue to orbit and orbital apex.[5]

Middle turbinate is condemned to be the first affected nasal structure then infection spreads rapidly to other PNS, periantral fat (intraorbital, pterygopalatine fossa, masticatory space, infratemporal fossa), soft tissue beyond PNS, orbit and central nervous system through direct extension or vascular invasion[3-4-5]. Also middle turbinate biopsy was considered as safe effective method in diagnosis of invasive fungal sinusitis with high specificity/sensitivity value (100-75%, respectively)[6].

CASE PRESENTATION:

We presented 63 yrs old female patient, diabetic, 2 months post-covid-19 complaining of nasal obstruction, crustation, headache with normal vision and palate, nasal endoscopy showed apparently normal lateral nasal mucosa with necrotic septum (Fig. 1).

 DOI: 10.21608/ejentas.2022.132793.1502

CT revealed RT sinonasal opacity in anterior sinus group, MRI showed hyperintense RT infratemporal fossa content in T1+G and hyperintense signal in RT PPF-ITF in T2 fat suppression (Fig. 2-3).

ESS was done, debridement of necrotic septum was done with usual sinus work on the right side (MMA-anterior ethmoidectomy), exploration of RT PPF-ITF was done and pus was drained from PPF till complete clearance of PPF. Sphenopalatine artery on the right side showed thrombophelebitic features (Fig. 4).

Biopsy revealed mucormycosis (rhizopus) and antifungal therapy was administrated 16 days postoperatively in form of amphotericin B and 6 weeks in form of posaconazole.

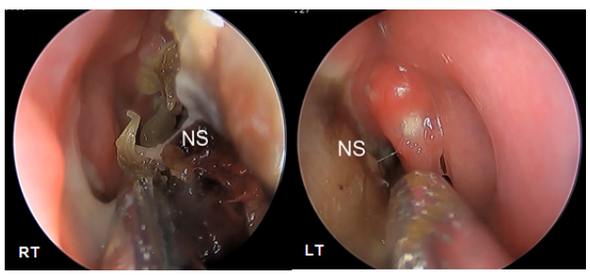

Fig. 1: endoscopic view reveals septal necrosis with apparently normal lateral nasal mucosa

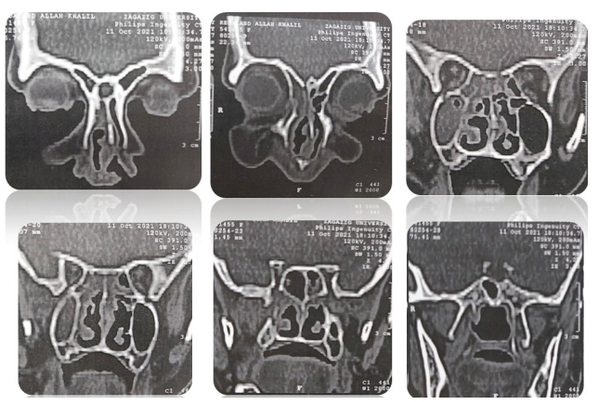

Fig. 2: CT scan coronal view shows RT sided sinus opacity affecting maxillary, ethmoidal sinuses

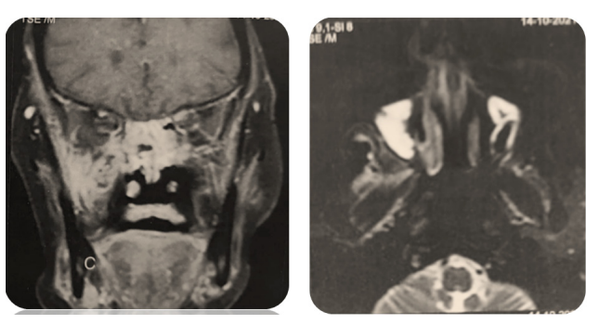

Fig. 3: MRI scan a) T1+C shows hyperintense signals within RT PPF-ITF denoting inflammatory process b) T2 fat suppression shows hyperintense signal within infratemporal muscles and fat planes denoting inflammatory process

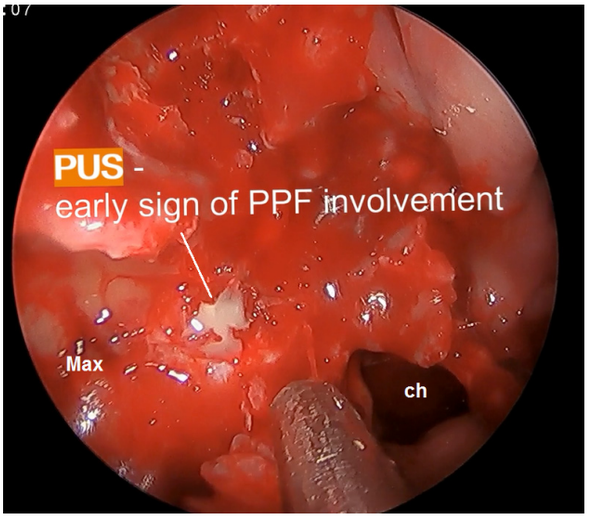

Fig. 4: endoscopic view shows pus emerging from RT PPF. Ch= chona, Max= maxillary sinus.

DISCUSSION

Through fulminant fungal rhinosinusitis has high mortality rate (50-80%), early diagnosis and subsequently management have a great role in increase the survival rate.[1-2]

Diagnosis of mucormycosis is predicted with clinical manifestation, and confirmed by histopathological examination. Classical middle turbinate ischemia/ necrosis is the first sign of sinonasal mucormycosis in nasal endoscopy which raise clinician suspicion towards diagnosis of fulminant fungal rhinosinusitis[3,5]. Subsequently, middle turbinate biopsy in high risk group with persistent rhinological symptoms, even before establishment of necrosis, is considered a good tool to exclude fungal infection with 100% specificity[6].

Pure septal necrosis could be due to different pathology with low suspicious index towards fulminant fungal infection.

In covid-19 era, there is obvious increase in incidence of fulminant fungal infection with different clinical presentation; more extensive situation, more spread, and different pathogenesis. Surgeons should consider fungal infection in any post-covid-19 patient with any persistent nasal symptoms, abnormal nasal mucosa elsewhere during endoscopy. MRI had a great role in assessment periantral area, so any hyperintense signal in T1+contrast was denoting venous congestion around pathology, hyperintense signal in T2 fat suppression was denoting inflammatory reaction. These areas had to be explored surgically to achieve effective debridement till reaching healthy vascular margins[7].

Though nasal mucosa had vascular arbitrary consists of branches from sphenopalatine vessels, anterior – posterior ethmoidal vessels, greater palatine vessels and superior labial vessels, septum had double blood supply from both sides[8]. This vascular anastomosis could not explain ischemic changes within nasal septum despite of one side vascular affection. This could be illustrated by presence of double pathology; local one which is vascular occlusion, and second one which is systemic cause of coagulopathy according to Virchow's law due to Covid -19 affection.

CONCLUSION

Septal necrosis with apparently healthy nasal mucosa could be 1st endoscopic manifestation of mucormycosis in covid-19 era.

CONFLICT OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Gorovoy IR, Kazanjian M, Kersten RC, Kim HJ, Vagefi MR. Fungal rhinosinusitis and imaging modalities. Saudi Journal of Ophthalmology. 2012 Oct 1;26(4):419-26.

2. Walsh TJ, Skiada A, Cornely OA, Roilides E, Ibrahim A, Zaoutis T, Groll A, Lortholary O, Kontoyiannis DP, Petrikkos G. Development of new strategies for early diagnosis of mucormycosis from bench to bedside. Mycoses. 2014 Dec; 57: 2-7.

3. Singh AK, Singh R, Joshi SR, Misra A. Mucormycosis in COVID-19: A systematic review of cases reported worldwide and in India. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2021 May 21

4. Montone KT. Pathology of fungal rhinosinusitis: a review. Head and neck pathology. 2016 Mar 1;10(1):40-6.

5. Hosseini SM, Borghei P. Rhinocerebral mucormycosis: pathways of spread. European Archives of Oto-Rhino-Laryngology and Head & Neck. 2005 Nov;262(11):932-8.

6. Boyd Gillespie M, Huchton DM, O'Malley BW. Role of middle turbinate biopsy in the diagnosis of fulminant invasive fungal rhinosinusitis. The Laryngoscope. 2000 Nov;110(11):1832-6.

7. Sweed AH, Mobashir M, Elnashar I, Anany A, Elmaghawry ME, Ibrahim EM, Eesa M. MRI as a road-map for surgical intervention of acute invasive fungal sinusitis in Covid-19 era. Clinical Otolaryngology. 2021 Dec 25.

8. Elsheikh E, El-Anwar MW. Septal perforation and bilateral partial middle turbinate necrosis after bilateral sphenopalatine artery ligation. The Journal of Laryngology & Otology. 2013 Oct;127(10):1025-7.