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AYURVEDIC MANAGEMENT OF MUCORMYCOSIS: A SINGLE CASE STUDY

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ABSTRACT

Throughout the history of mucormycosis, from the first case in humans reported in 1885 by Paltauf, through publication by Gregory et al of the first observation of rhino-orbital cerebral mucormycosis in 1943, to the report by Harris in 1955 of the first known survivor, little has changed in the diagnosis and outcome of this disease. Although mucormycosis of any form-cerebral, cutaneous, rhinocerebral, intestinal, or pulmonary is still a rarity, left sphenoid, posterior ethmoid, left maxillary sinusitis with proteinaceous contents likely fungal sinusitis. Mucosal thickening also seen in bilateral frontal, right maxillary and ethmoid sinuses. There is extensive phlegmonous inflammatory changes in the intra, extra-conal space of left orbit with extra ocular muscle oedema. Left side proptosis with deformity of walls and acute ischemic changes also noted mild thickening of left cavernous sinus with associated loss of flow of cavernous ICA suggest in cavernous thrombophlebitis changes. The maxilla rarely undergoes necrosis due to its rich vascularity. Maxillary necrosis can occur due to bacterial infections such as osteomyelitis, viral infections such as herpes zoster or fungal infections such as mucormycosis, aspergillosis etc.

Mucormycosis is an opportunistic fulminant fungal infection, which mainly infects immunocompromised patients. The infection begins in the nose and paranasal sinuses due to

inhalation of fungal spores. The infection can spread to orbital and intracranial structures either by direct invasion or through the blood vessels. The fungus invades the arteries leading to thrombosis that subsequently causes necrosis of hard and soft tissues. We report a case of maxillary necrosis by mucormycosis in an uncontrolled diabetic patient to emphasize early diagnosis of this potentially fatal fungal infection. We briefly discuss different diseases which can lead to maxillary necrosis and review the current concepts in management of mucormycosis. Early diagnosis and prompt treatment can reduce the mortality and morbidity of this lethal fungal infection.

KEYWORDS: Maxillary Bone Necrosis, Mucormycosis, Uncontrolled Diabetes, Ayurveda, Infection, Vessels, etc.

INTRODUCTION

Mucormycosis, a serious Angio invasive infection caused by common filamentous fungi, that is, mucormycetes, constitutes the third most common invasive fungal infection following aspergillosis and candidiasis.[1] The disease can be transmitted by inhalation of spores or by direct inoculation of the spores into disrupted skin or mucosa. The etiologic agents can cause infections with high mortality in immunocompromised, mainly diabetic patients,[2] Mucoromycetes are characterized by the presence of broad aseptate hyphae (coenocytic mycelia) and formation of zygospores. The order Mucorales includes several species involved in rhinocerebral, pulmonary, cutaneous, and gastrointestinal and other less frequent infections in immunocompetent and immunocompromised individuals, and all are characterized by tendency to disseminate. Members of the genus *Rhizopus* are by far the most common isolates recovered in a clinical setting with *Rhizopus arrhizus* occurring most frequently.

Members of the genus *Mucor* are second to *Rhizopus* in order of frequency, whereas *Cunninghamella*, *Apophysomyces*, (*Lichtheimia)*, *Saksenaea*, *Rhizomucor* and *Cokeromyces*, *Syncephalastrum*, each constitute a significantly smaller percentage of clinical isolates,[3,4,5] Whatever the route of infection (inhalation of airborne spores, ingestion, or direct skin inoculation), the hyphae invade blood vessels, causing tissue infarction and necrosis. Risk factors include prolonged neutropenia and use of corticosteroids, haematological malignancies (leukaemia, lymphoma, and multiple myeloma) aplastic anaemia, myelodysplastic syndromes, solid organ or hematopoietic stem cell transplantation, human immunodeficiency virus (HIV) infection, diabetic and metabolic acidosis, intravenous drug

abuse, prematurity, and advanced age.[6,7] The widespread use of voriconazole for prophylaxis or treatment of aspergillosis in patients with haematological malignancies has also been linked with rise in the numbers of cases of invasive mucormycosis. The patients with phagocytic dysfunctions caused by neutropenia or ketoacidosis, as well as with high iron serum concentrations, are at higher risk of developing mucormycosis. The rhinocerebral form of presentation is the most frequently reported localized symptom, followed by pulmonary, cutaneous, gastrointestinal, and disseminated infections,[8,9] Most of the studies done on this emerging disease in India, as well as investigations throughout the world, are retrospective. Due to increase in number of cases, diverse risk factors and inclusion of immunocompetent and immunocompromised patients, there is need of prospective study so that suspected cases can be diagnosed in a timely manner, various risk factors can be analysed and accordingly patients appropriately treated, which should result in the increase of patient survival. The present study was carried out to understand the clinical behaviour, natural history, and changes in incidence, epidemiology, clinical course, and outcome of the disease. Depending on the part of the body affected it is classified mainly into five types. Rhino-Orbito-Cerebral Mucormycosis are like *Raktaja Pratishyaya*,[10,11,12] and *Krimija Shiroroga*[13],[14] (unilateral facial swelling, headaches, nasal congestion, nasal discharge, fever etc).

CASE STUDY

- **Center of Study:** Center of study *Shalakya Tantra* IPD & OPD, Sanskriti Ayurvedic Medical College and Hospital 28-km. stone, Mathura-Delhi highway, Chhata, Uttar Pradesh
- **Case Report:** A 63-year-old male patient resident of hodal (Haryana) visited the department of *Shalakya Tantra*, Sanskriti Ayurvedic Medical College and Hospital on 24/03/2022.OPD number 9714 and IPD number 295 with complaint of -

1. Sinusitis
2. Pain in face and eyes
3. Muscular pain (Generalized)
4. Discoloration of skin (necrosis)
5. Nasal congestion
6. Headache

- **History of Present Illness:** The patient was first time mild fever and headache then he was taken allopathic medicine and he is feeling relive for symptoms and after some days gradually developed all these problems for which he was taking allopathic treatment and

admitted in ventilator Medanta Hospital Gurgaon, Haryana. During period PNS Surgery done for mucormycosis but didn't relief. On examination of patient, vital parameters were within normal limits. He was a non-smoker, non-alcoholic, and not having an allergy to any drug or food item. then he come to Sanskriti Ayurvedic Hospital Chhata, Mathura

- **History of Previous Illness:** There was nothing specific in past history.
- **Family History:** No one in the family has ever had such a disease.
- **Personal History**: Personal history of patient is mentioned in table number 1.

Table 1: Personal History of Patient.

1.	Diet	Vegetarian
2.	Micturition	5 -6 times in a day, 2-3 times in night
3.	Bowel	Irregular
4.	Appetite	Moderate
5.	Sleep	Disturbed
6.	Addiction	Nil

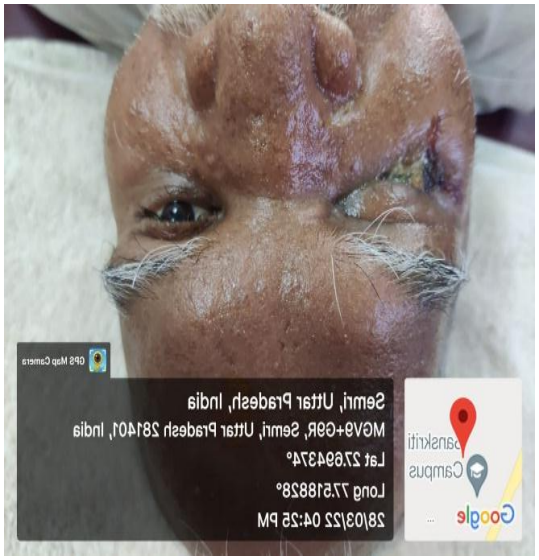
Ashtavidha Pareeksha: *Ashtavidha Pariksha* (eight-fold classifications) has been mentioned in Table No.2

Table 2: Ashtavidha Pariksha of Patient.

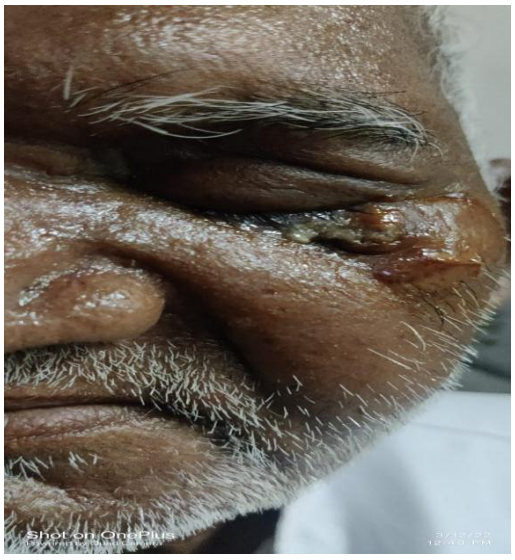
1.	***Nadi* (Pulse)**	**70 /Min**	**5. *Shabda* (Speech)**	***Spashta* (Normal)**
2.	Mutra (Urine)	6-7 times in a day, 2-4 times in night	6. *Sparsha* (Touch)	*Rukshata*
3.	Mala (Stool)	1-2 times per day	7. *Drik* (Eyes)	*Left eye swelling and close*
4.	*Jihva* (Tongue)	*Sama* (Coated)	8. Akriti (Built)	*Madhyama*

MRI PNS AND BRAIN

MRI findings suggestive of Left sphenoid, posterior ethmoid, left maxillary sinusitis with proteinaceous contents likely fungal sinusitis. Mucosal thickening also seen in bilateral frontal, right maxillary and ethmoid sinuses. There is extensive phlegmonous inflammatory changes in the intra, extra-conal space of left orbit with extra ocular muscle oedema. Left side proptosis with deformity of walls and acute ischemic changes also noted mild thickening of left cavernous sinus with associated loss of flow of cavernous ICA suggest in cavernous thrombophlebitis changes.

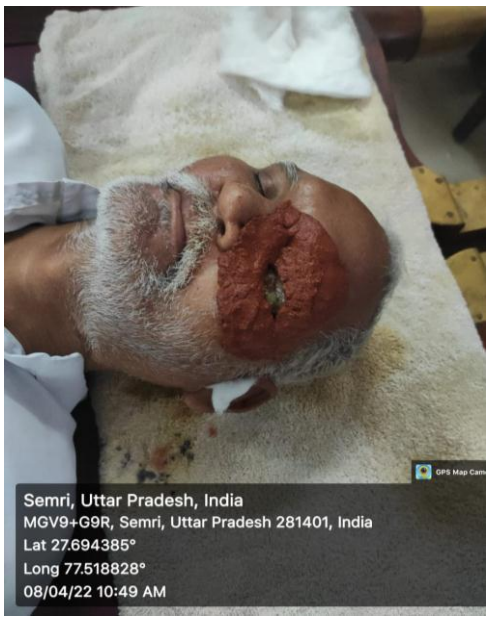


BEFORE TRETMENT

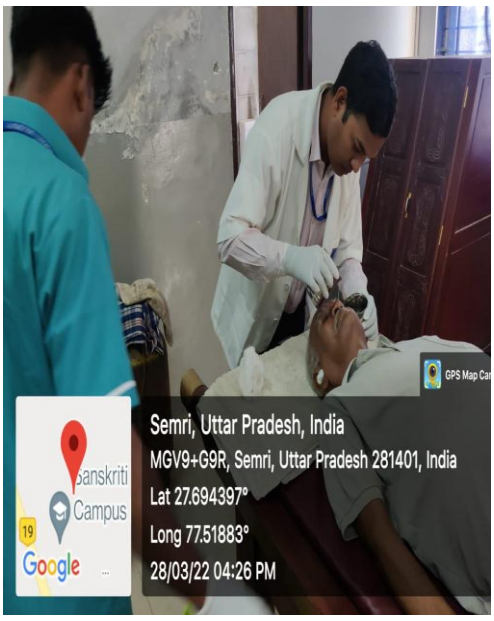


BEFORE TRETMENT

VIDALAKA



NETRASEKA



TREATMENT: - Has been mentioned in Table No-3

Table 3: Treatment of Mucormycosis.

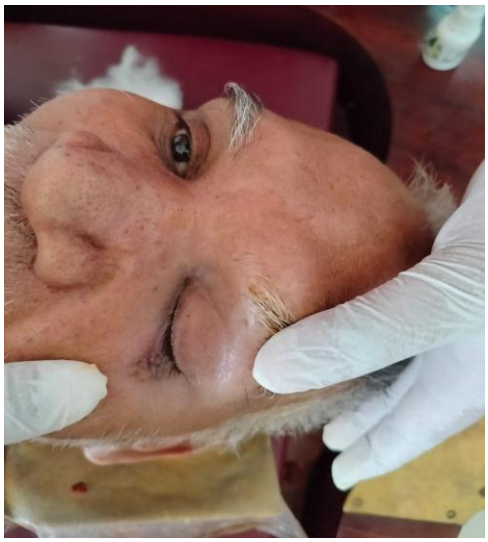
S. No.	Name of the Medicine	Dose	Anupana	Time
1	Gokshuradi Guggulu	1	Lukewarm water	7AM & 7 PM
2	Giloyghana Vati	2	Lukewarm water	7AM & 7 PM
3	Triphala Guggulu	2	Lukewarm water	7AM & 7 PM
4	Punarnabadi Guggulu	2	Lukewarm water	7AM & 7 PM
5	Haridra Khand	3GM	Lukewarm water	7AM & 7PM (30 Minutes before food)
6	Nimbadi Kasyam	15ML	Lukewarm water	8.AM & 8PM (30 Minutes after food)
7	Dashmool Kwath	15ML	Lukewarm water	8.AM & 8PM (30 Minutes

				after food)
8	Panchskar Churna	6GM	Lukewarm water	Sleeping time
9	Jatyadi Ghrita	Local Application		9 AM & 9 PM

KRIYAKALPA: - Has been mentioned in Table No-4

Table 4: Kriyakalpa for Mucormycosis.

S.No	Procedure	Drugs	Duration	Complication
1	Pratimarsha Nasya	Anutailam	12 Days	Nil
2	Vidalaka	Raktachandana, Manjistha, Haridra, Garika, Lodhra	7 Days	Nil
3	Netra Seka	Triphala, Mulethi, Lodhra Kwath	7 Days	Nil



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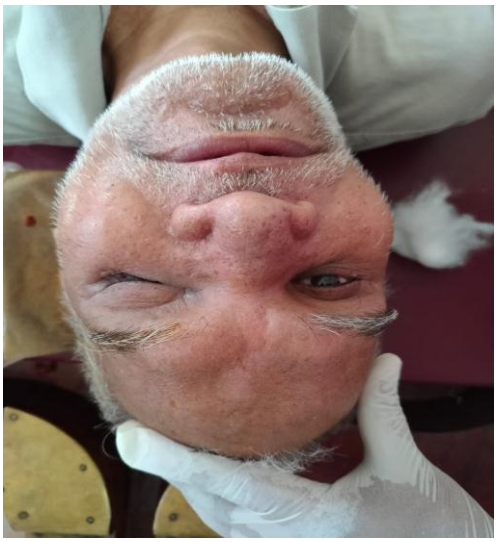

AFTER TRETMENT

RESULTS

After the 15th and 30th days of evaluation, variations in results were found on each symptom associated with mucormycosis. The patient got relief in signs and symptoms with gradual improvements. Assessment of each considering symptom of mucormycosis have been presented in Table No.5.

Table 5: Results for signs and symptoms.

Symptoms of Mucormycosis Signs and Symptoms	1st Day (BT)	15th Day (A.T)	30th Day (A.T)
Sinusitis	+ + + +	+ +	-
Pus discharge in maxillary sinus	+ + + + +	+ + +	+
Pain in face and eyes	+ + + +	+ +	-
Muscular pain and weakness	+ + + +	+ +	-
Discolouration of skin	+ + +	+ +	-
Nasal congestion	+ + + +	+ +	-

DISCUSSION

Purpose of the treatment protocol is to control the progressive symptoms and improve the functional ability of the patient. Here we selected *Shamana aushadies* along with *Kriyakalpa* therapy which help to eliminate the vitiated *Dosha* from the body. *Nasya, Dhupana, Vidalaka and Netra Seka* with suitable medicine are found very effective in this condition, Remarkable improvement was noticed in patient condition.

CONCLUSION

Rhino-Orbito-Cerebral Mucormycosis are like *Raktaja Pratishyaya* and *Krimija Shiroroga* have better result in *Shamana aushadies* along with *Kriyakalpa* therapy over period of 30 days. Throughout the whole course of treatment, there were no adverse reactions, complications, or side effects noted, and the patient's quality of life improved.

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