

Rhinocerebral mucormycosis : Medico-surgical emergency

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Section: Head & neck imaging

Area of Interest: Neuroradiology brain Eyes Head and neck

Procedure: Imaging sequences

Procedure: Diagnostic procedure

Imaging Technique: MR

Imaging Technique: MR-Diffusion/Perfusion

Special Focus: Infection Pathology Acute Case Type: Clinical Cases

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Patient: 32 years, female

Clinical History:

A 32-year-old woman presented in post-partum with inaugural acidoketosis decompensation.

In spite of the improvement of the glycemic figures and the correction of the acidoketosis, the neurological status of the patient did not improve.

On clinical examination an unconscious, febrile (39 degrees) patient was found with pupils in anisocoria, right exophthalmos and plentiful, purulent secretions.

Imaging Findings:

Magnetic resonance imaging (MRI) was performed and revealed extensive necrosis of the right nasal fossa, ethmoidal cells and the inner wall of the right maxillary sinus (Fig. 1), associated with a thrombosis of the right cavernous sinus and ophtalmic vein (Fig. 2).

There are also intracerebral lesions related to encephalitis (Fig. 3) and septation of the subcutaneous fat, and thickening of the underlying superficial fascia in relation with a facial cellulitis (Fig. 4).

Discussion:

Mucormycosis is an infection caused by mycoses of the order of Mucorales. These organisms are anaerobic and thermoresistant [1]. Gateways are multiple: inhalation of spores in the upper aerodigestive tract or inoculation at a vascular entry point or a major wound. These germs have a angioinvasive character [2], they penetrate into vessels thanks to an elastase enzyme, then the mycelian invasion causes a thrombosis of vessels, an infarction and a necrosis of tissues. There is no inter-human contamination, thus it is not necessary to isolate patients affected by mucormycosis [3].

Rhinocerebral mucormycosis is the most frequent (39 %); it manifests clinically as a sinusitis, a cellulitis with signs of parietal necrosis, or as neurological complications [4].

Cerebrofacial CT is the essential examination in rhinocerebral mucormycosis. The most often found radiological signs are osteolysis, nodular thickening of the mucous membrane of the sinus with no enhancement of the affected zones; the preantrol and postantrol fat may become infiltrated.

MRI estimates better the intracranial invasion and the orbital extension. Angio MRI allows to objectify the thrombosis

of cavernous sinuses, internal carotid and its branches. CT or MRI images are not characteristic but highly suggestive in a diabetic in ketoacidosis. Finally, CT and MRI allow to evaluate the evolution of the disease under treatment.

The treatment is medical and surgical. It is based on the intravenous Amphotericin B (1 to 1,5 mg / kg per day), which must be established as soon as the diagnosis is suspected [5]. The treatment duration is 12 weeks at least. The surgical resection of the necrosed tissues is essential and must be associated with medical treatment. The surgical debridement of the lesions allows to reduce the fungal burden, and allows the systemic treatment to reach the infected zones. The treatment of predisposing factors (in particular diabetes control) is essential [6].

Despite therapeutic advances, the prognosis of rhinocerebral forms of mucormycosis remains gloomy because 20 to 50% of patients die, and neurological sequelae are common [7].

This observation emphasizes the particular gravity of mucormycosis in diabetic patients. It shows the diagnostic difficulties related to the absence of specificity of clinical manifestations. It indicates the necessity of a fast confirmation of the diagnosis by the biopsy sample in order to establish adequate treatment which must be begun in the stage of diagnostic suspicion.

Differential Diagnosis List: Rhinocerebral mucormycosis, Aspergillosis, Bacterial cellulitis

Final Diagnosis: Rhinocerebral mucormycosis

References:

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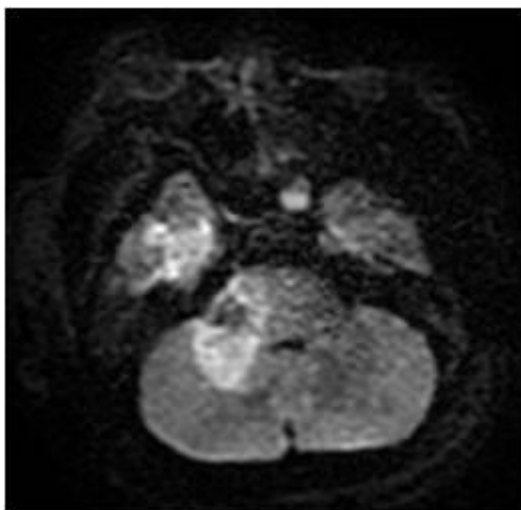
Figure 1

a



Description: Cerebral MRI: axial view T2WI: right temporal and cerebellar encephalitis lesions with hyperintense signal on T2. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

b



Description: Cerebral MRI: diffusion sequence: right temporal and cerebellar lesions with hyperintense signal. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

Figure 2

a



Description: Cerebral MRI: 3DT1C+: thrombosis of the right cavernous sinus (arrow) **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

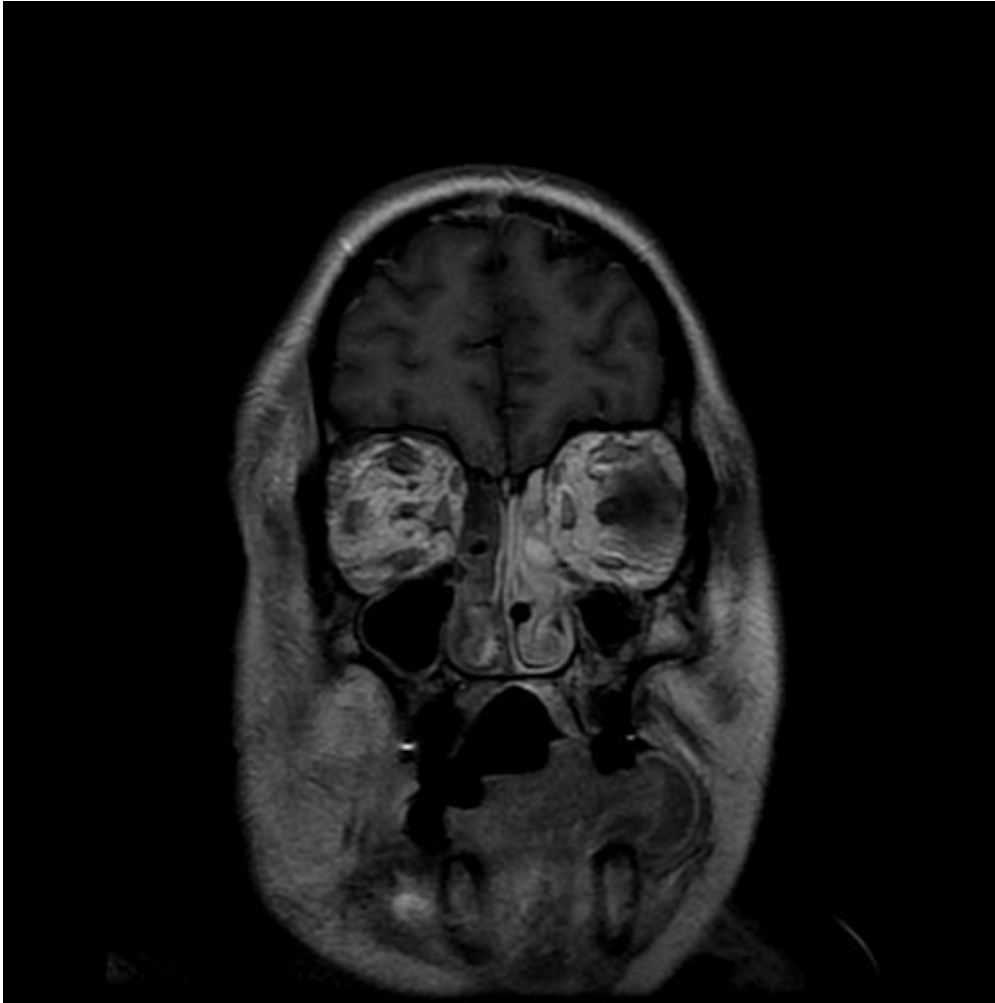
b



Description: Cerebral MRI: 3DT1C+: thrombosis of the right ophtalmic vein (arrow) **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

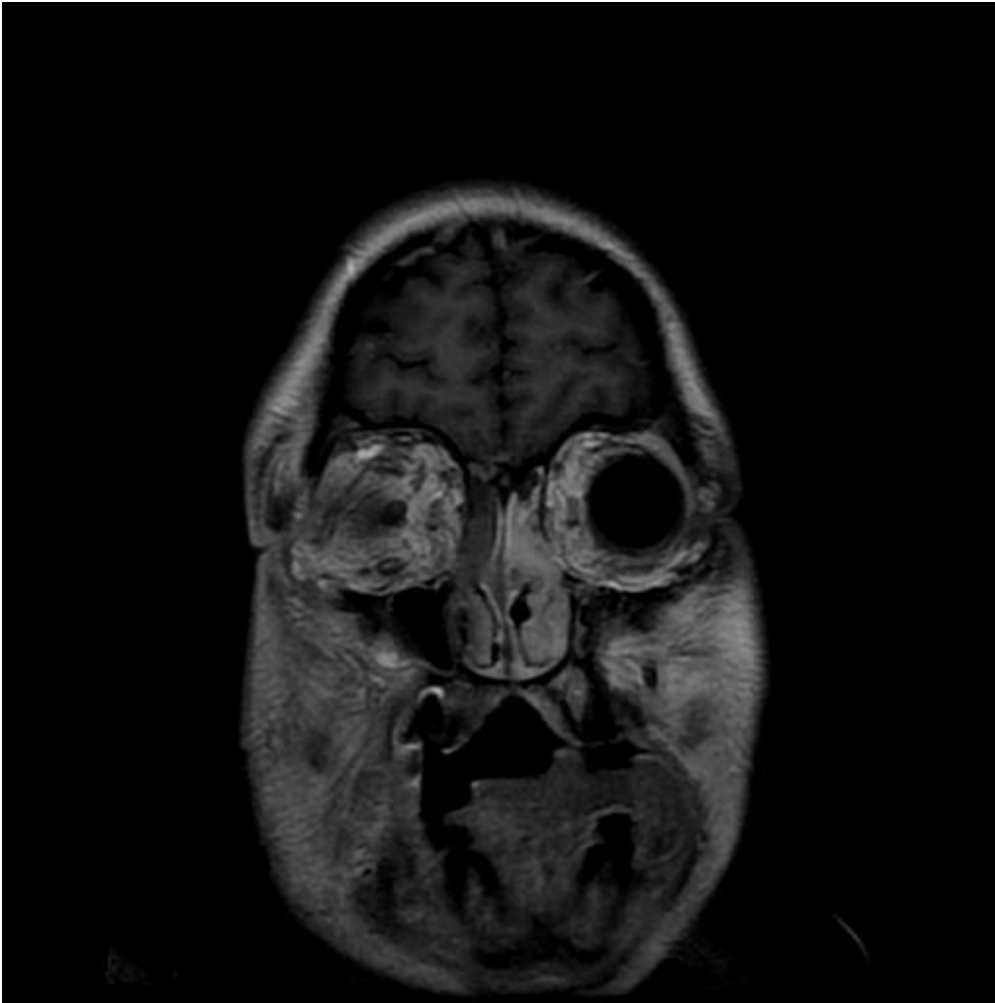
Figure 3

a



Description: MRI coronal view after injection of gadolinium: there is no enhancement of the mucous membrane of the right nasal fossa and the right ethmoidal cells. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

b



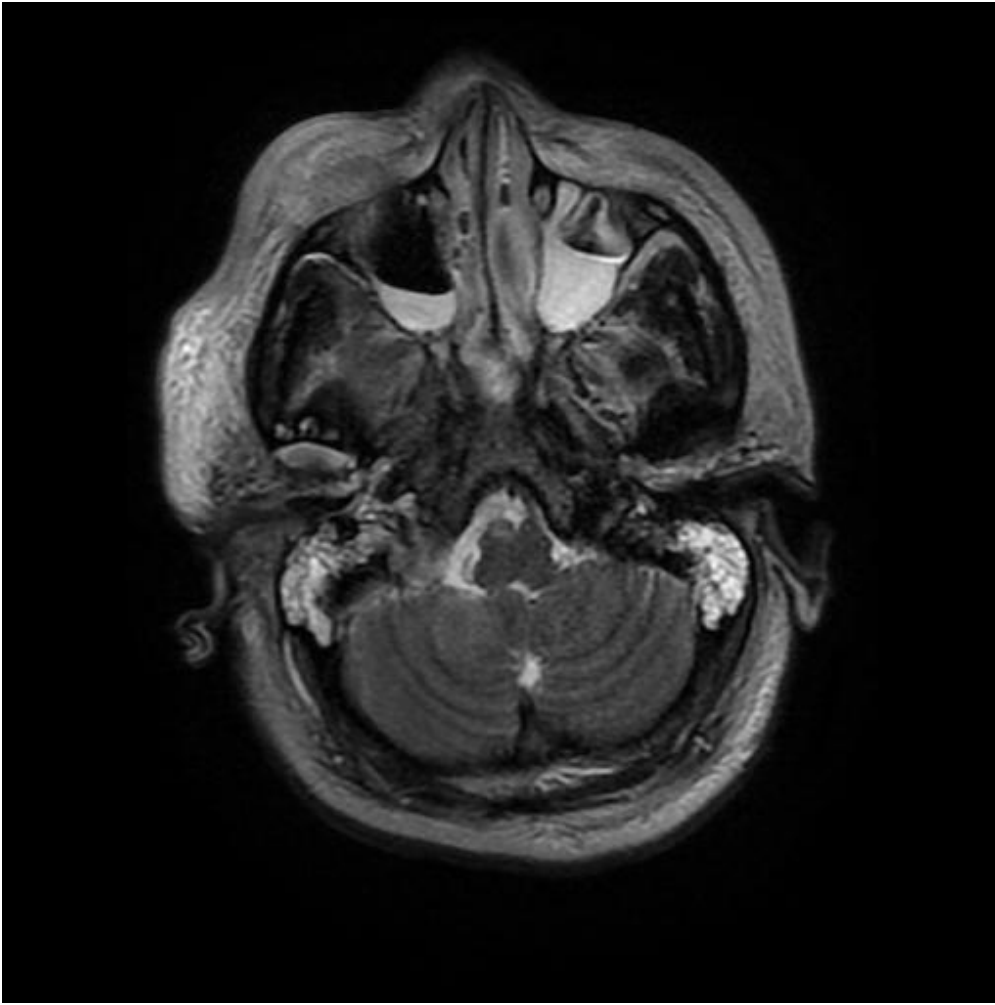
Description: MRI coronal view after injection of gadolinium: there is no enhancement of the mucous membrane of the right nasal fossa. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

c



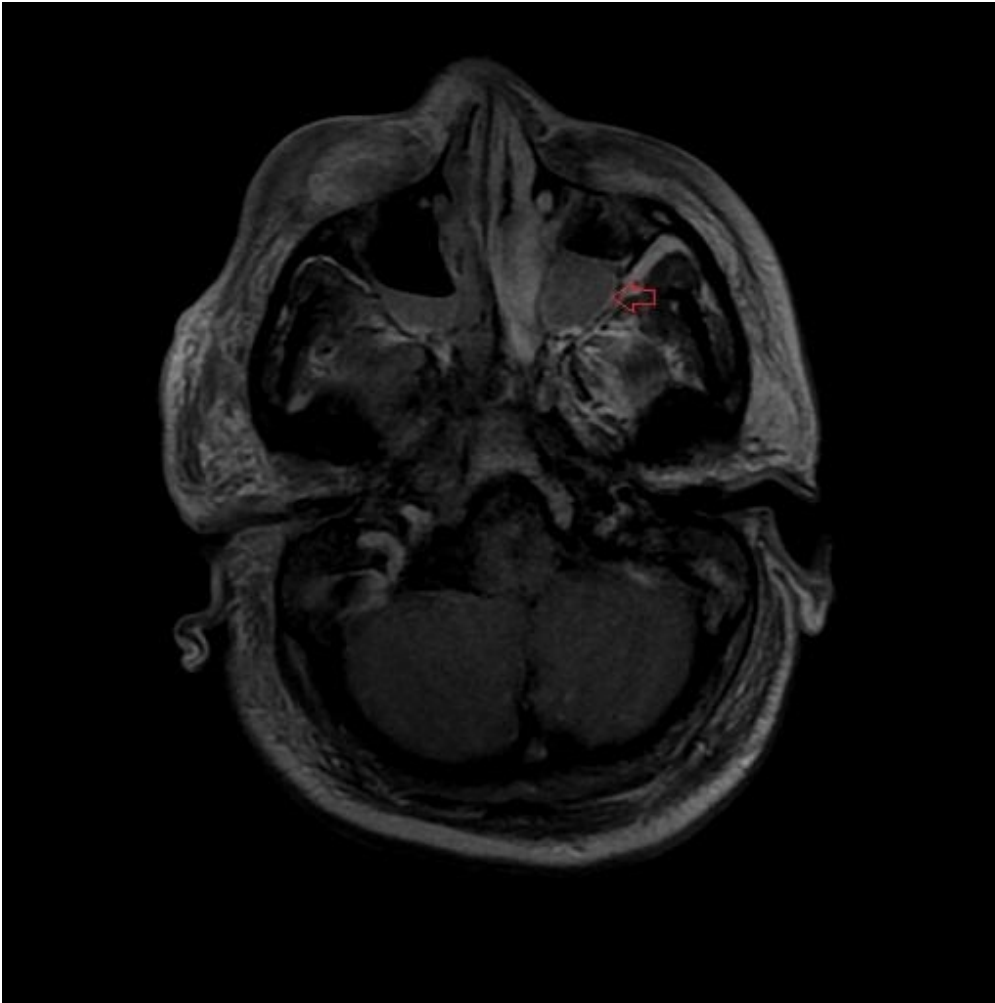
Description: MRI axial view after injection of gadolinium: there is no enhancement of the mucous membrane of the right ethmoidal cells. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

d



Description: MRI axial view T2WI: fluid-filled maxillary sinuses and mastoid cells. **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

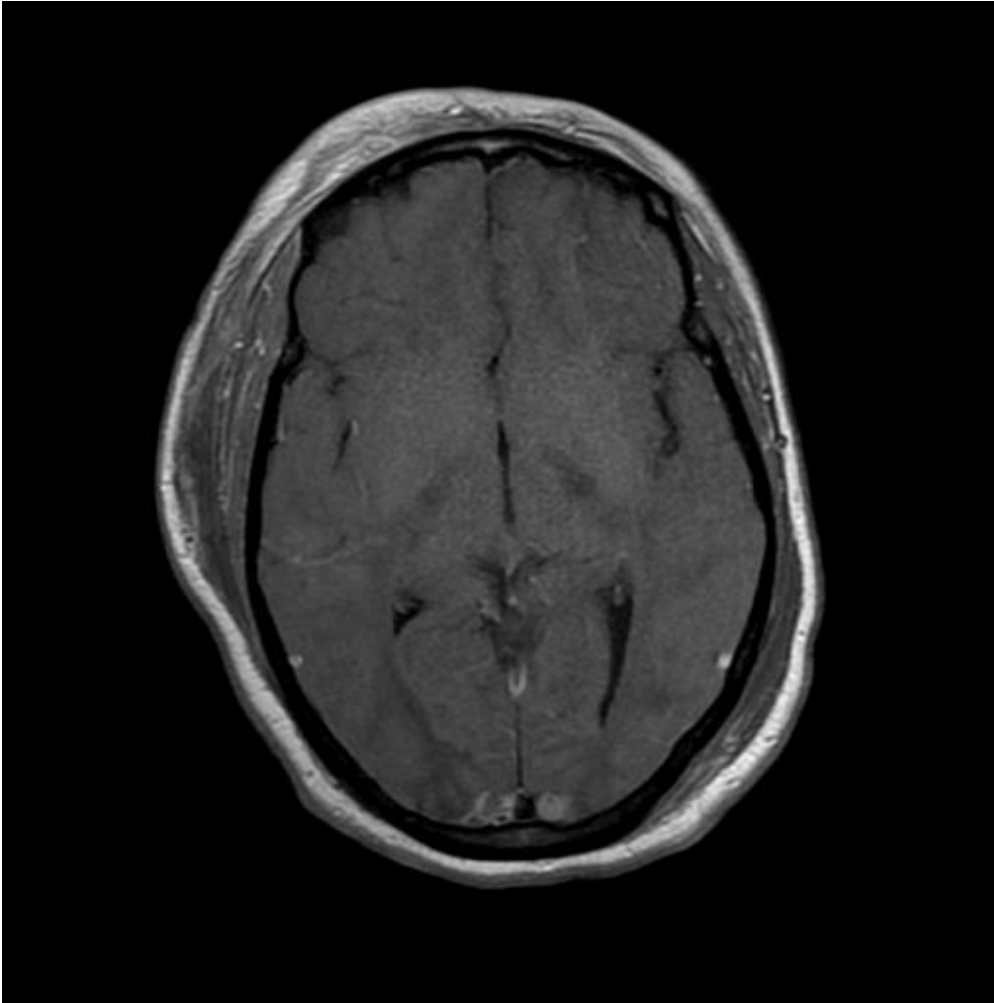
e



Description: MRI axial view after injection of gadolinium: there is no enhancement of the mucous membrane of the right maxillary sinus, the mucous membrane of the left maxillary sinus is well enhanced (red arrow). **Origin:** Tizniti S, Department of radiology, CHU hassan II, FES, Morocco

Figure 4

a



Description: MRI axial view after injection of gadolinium: septation of the right subcutaneous fat, and thickening of the underlying superficial fascia in relation with a facial cellulitis. **Origin:** Tizniti S, Department of radiology, CHU hassan II, Fes, Morocco