



## Mucormycosis in a Patient with Uncontrolled Diabetes: A Case Report

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### Abstract

**Background:** Mucormycosis is an opportunistic infection produced by various fungi in the order Mucorales, which is most commonly seen in people with a defect, especially diabetics. Introduction of this infection can involve processes such as insulin injections and tooth extractions. Mucormycosis mortality is significantly high even with surgical treatment and management of diabetes. In this paper, a case of 28-year-old female with a history of Type 1 Diabetes Mellitus referred to emergency ward 5 days after tooth extraction experiencing a progressive pain and swelling was reported. Patient's examinations showed left orifice edema, left 7th nerve paralysis, and ocular-paralysis of 3rd, 4th and 6th on the left side. The patient was deployed to a more equipped facility in Mashhad (Iran), and after several days she died.

**Keywords:** Mucormycosis, Opportunistic, Mortality, Rhinocerebral, Immunosuppression.

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## Introduction

Mucormycosis is an opportunistic fungal infection and in order to develop an invasive infection, agents must overcome both inherent and acquired immune systems.<sup>1,2</sup> People with uncontrolled diabetes have a higher risk of infection than other people in community, explaining why half of Mycosis's mucus infections occur in people with diabetes.<sup>3</sup> Mucormycosis susceptible predisposing factors in diabetic patients include hyperglycemia and acidosis leading to phagocytic dysfunction, reduced activity of Bronchoalveolar macrophages, neutrophilic impaired function resulting in high mortality, ketoacidosis as well as functional and structural changes in platelets and changes in nitric oxide metabolism associated with an increased risk of infection.<sup>4</sup> Mucormycosis infection in diabetes may result from insulin injections and other procedures such as tooth extraction, intramuscular injection and ophthalmic surgeries.<sup>5-8</sup> Rhinocerebral Mucormycosis is an infection with paranasal sinus origin, caused by inhalation of Mucor's spores followed by spreading to the orbit (sin orbital) or the brain (rhinocerebral).<sup>9</sup> Despite of surgical debridement therapy and antifungal treatment, mortality rate of rhinocerebral mucormycosis is reported as 85%.<sup>10</sup>

### Case Presentation

A 28-year-old female with a history of Type 1 Diabetes Mellitus referred to emergency ward 5 days after tooth extraction experiencing a progressive pain and swelling. The

patient was unable to open his left eye due to swelling. She had referred to a physician before referring to the hospital and had received Dexamethasone and Piroxicam ampules and Amoxicillin capsules.

Patient's examinations showed left orifice edema, left 7th nerve paralysis and ocular-paralysis of 3rd, 4th and 6th on the left side, the left pupil was seen without a reaction to light. The left eye had no red reflex, the patient had little blurred vision. In her mouth, there was a necrotic area on hard palate to the left side and swelling on the left maxillary sinus and nose after tooth extraction in past 5 days figure (1).

Past medical history included Type 1 Diabetes Mellitus, hypertension, and malignant otitis externa few years ago and she had received medications such as Amlodipine, Prazosin, Losartan, NPH insulin (in morning and night) and regular (in morning and night), when questioned about compliance, the patient reported inadequate adherence to her medication due to financial issues.



Figure 1. Necrotic Eschar with a size about 5x6 cm oval or near oval in shape with surrounding edema and exudates on soft and hard palate involving site of extracted tooth

Important issues identified in emergency lab tests included high glucose and high serum creatinine and leukocytosis. Patients' accompanying tests also showed high serum creatinine but had no history of dialysis. Spiral sinus and facial CT scans were performed for the patient as shown in figure 2. Shaldone (central vein catheter) was placed and dialysis took place. Infectious and epidemiological consultation was carried out showing that she needed a large debridement and intracranial and intra-orbit conflict, but due to lack of facilities for

performing the debridement at the center, the patient was deployed to a more equipped facility in Mashhad and after several days she died.



**Figure 2.** Head CT-scan in coronal section showing fluid collections in the left maxillary and ethmoid sinuses

## Discussion

Individuals with uncontrolled diabetes are at greater risk for affection with mucormycosis of the rhinocerebrum.<sup>11</sup> This infection may be caused by abnormal phagocytic immunity and abnormal phagocytic activity.<sup>12</sup> In this patient, the necrotic area was seen on the soft and hard palate of the left side, indicating severity and extent of the disease.<sup>13</sup> The patient referred to dental clinic 5 days after the tooth was removed, and dental instrument could be one of sources of infection.<sup>14</sup> Spiral sinus and facial CT scans were performed to investigate spread of infection, in which infections of the left sinuses were observed.

Tooth extraction is a risk factor in uncontrolled diabetes for development of severe fungal infections and dentists should be fully aware of such complications and request for presenting medical records including recent HbA1c values in all diabetic patients before proceeding with invasive surgeries.

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## Conflict of Interest

The authors declare that they have no conflict of interest.

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