CASE REPORT

Airway Management in a Patient with Palato-Maxillo-Orbital Tract as a Sequel of Rhino-Cerbral Mucormycosis Undergoing Kidney Transplantation

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Mucormycosis is a serious fungal infection caused by the filamentous fungi of the mucorales order of the class of zygomycetes. Mucormycosis is classically defined as an opportunistic fatal infection. In this report we explain a 49 years old woman with palato-orbital tract as a sequel of rhino cerebral mucormycosis and end stage renal disease candidate for kidney transplantation. Difficulties in airway management as well as inducing and maintaining anesthesia was our main concern.
Keywords: **mucormycosis; kidney transplantation; airway management**

A 49 years old woman was admitted to the hospital for her second kidney transplantation. Her illness began 19 years ago and progressed to chronic renal failure. She has had her first kidney transplantation about 16 years ago from a non-related living donor. During the next 13 years she had a normal life style except for an almost always controlled diabetes mellitus and an immunologically suppressed condition due to regular use of immunosuppressor agents. She got a severe rhino cerebral mucormycosis about three years ago which prolonged for about one year, disease began from nasal mucosa and progressed from nasal cavity and maxillary sinus to the orbital cavity which resulted in destruction of all nasal, maxillary sinus and left eye, left eye enucleation and finally tract and cavity formation between oral cavity - hard palate - and orbital cavity despite a prolonged period of severe anti-fungal therapy (Figure 1-2-3).

The patient wears often a handmade prosthesis for covering oral cavity as well as facilitating regular respiration and eating and drinking (Figure 4-5).

Transplanted kidney was rejected 3 months after curing from fungal disease and resulted in regular hemodialysis. She was assigned for second kidney transplantation from a cadaver kidney donor.

On preoperative evaluation she had a muffled voice, an open tract between oral cavity and orbital cavity with difficulty in breathing and hearing breath sounds throughout the tract and a class 3 Mallampaty score (Figure 6). Facial nerve palsy was also noted on left side.

Figure 1- General appearance of the patient on arriving in the operating room

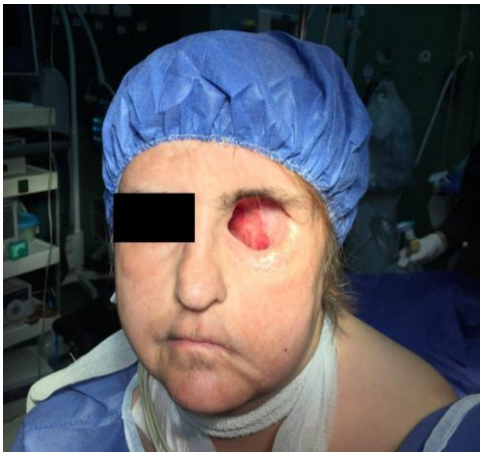

Figure 2- Hard palate destruction as a sequel of mucormycosis. Note the illuminated tract from orbital fossa to hard palate

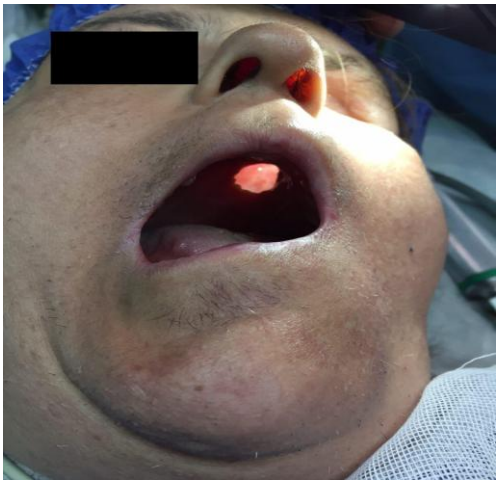

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Figure 3- Destructed maxillary sinus appeared from orbital cavity

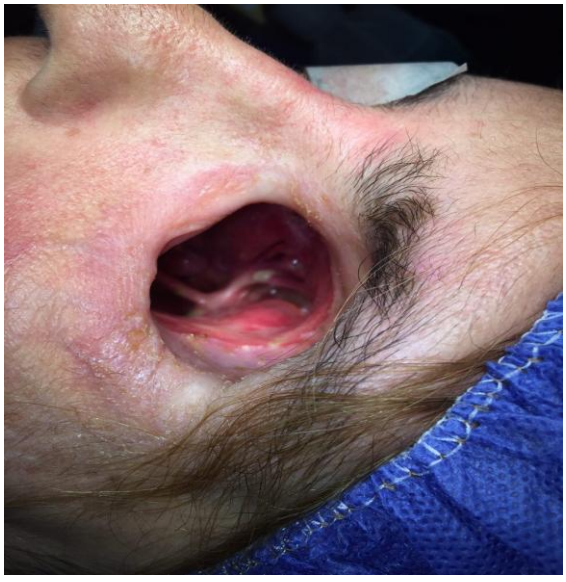


Figure 4. External (facial) part of the handmade prosthesis

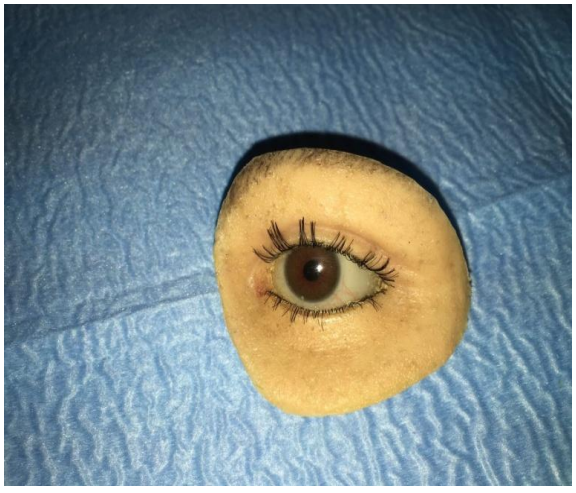


Figure 5. Internal (oral) part of the handmade prosthesis

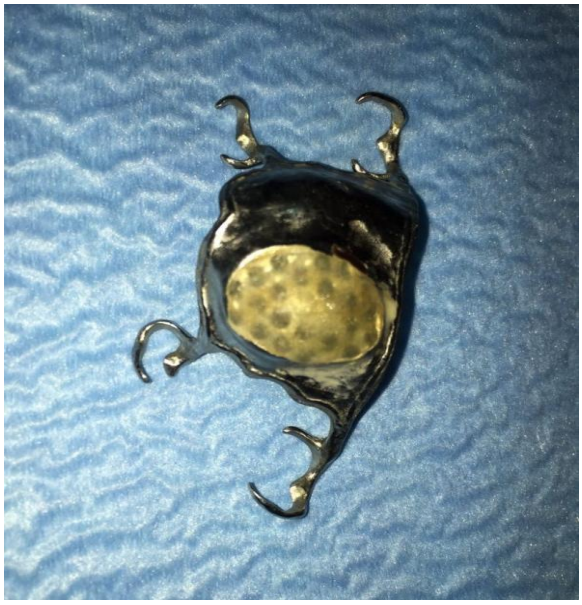
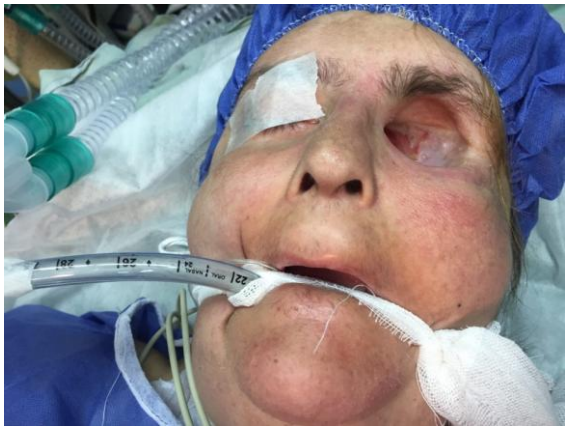


Figure 6. The patient after induction of general anesthesia



Handmade prosthesis was removed before referring the patient to the operating room as a regular rule as well as fear of aspirating them during anesthesia. Pre-oxygenation was impossible and ineffective due to wasting a lot of breathing volume through oral cavity, so oral cavity was filled and packed by regular gauzes to minimize air leak through the cavity. Induction of anesthesia was made by using 2 µg/kg doses of fentanyl, midazolam 1 mg as premedication followed by injecting of 2 mg/kg propofol and 0.12 mg/kg cisatracurium. Airway was secured by inserting a number 7.5 orotracheal tube under the guidance of a video laryngoscope. Maintenance of anesthesia was supported by using 0.05 µg/kg/min remifentanyl, 200 µg/kg/min propofol and cisatracurium. After termination of transplantation procedure, depth of anesthesia lightened slowly by slowly till full awareness. Then tracheal tube was removed at patient's full cooperation and good and normal reflexes and breathing. Patient stayed at operating room for about 30 minutes for ensuring normal general and respiratory conditions and then transported to the post anesthesia care unit.

Discussion

Mucormycosisis, a severe fungal disorder is caused by the filamentous fungi of the mucorales order of the lass of zygomycetes. Mucormycosis has five classic forms including cutaneous, pulmonary, gastro-intestinal disseminated and rhino cerebral. Although it is classically defined as an opportunistic infection, patients with diabetes mellitus, neutropenia, chronic renal failure, immune deficiency syndrome and transplanted patients are more affected. Mucormycosis is a dangerous disease and overall mortality rate differs from 38% to 56.5% according to the site of infection. The primary site of infection has a major role in outcome.

For isolated pulmonary infection mortality ranges from 33% to 60% but 95% when disseminated, 85% to 100% for GI infection, 10% to 17% for cutaneous infection (94% when disseminated) and 31% to 93.3% for rhino cerebral infection (98% when disseminated to the central nervous system) [1-3].

Early diagnosis of rhinocerebral mucormycosis and prompt and effective treatment are very important for good outcome of the patient [4-7]. Symptoms compatible with mucormycosis in a predisposed patient call for prompt initiation of treatment while appropriate steps are taken

towards confirmation of diagnosis [8]. Histopathological examination of surgical specimens can confirm the clinical diagnosis with the appearance of right-branching aseptate hyphae, which are considered typical of mucor species, along with evidence of angioinvasion and tissue necrosis [9]. Fungal cultures provide further confirmation [10].

Rees et al. reported an annual incidence rate of rhinocerabral mucormycosis as 1.7 cases per million people in the United States [11]. The disease is found predominantly associated in patients with poorly controlled diabetes mellitus and diabetic ketoacidosis [1,12]. Other risk factors include immunocompromised state due to organ transplantation, hematologic malignancies, chronic corticosteroid treatment and haemochromatosis [12]. Interestingly though mucormycosis has been noted to be an uncommon occurrence in patients with AIDS [1,13].

From anesthesia important point of view, managing such a patient concerns three important parts: airway management in a compromised and probably difficult airway, anesthesia management in fields of difficult airway, chronic renal failure and immunosuppression and finally the need for special care of the patient in post anesthesia period. Traumatized and damaged airway directly affects anesthesia management in the patient. As palato-maxillo-orbital tract was directly relating to major airways and consequently to respiratory pattern of the patient, it caused pre-oxygenation and mask ventilation almost impossible, so it seems the best way for overcoming the problem was packing the tract by sponge gauzes and removal of them after intubation. Removal of the patient's prosthesis was mandatory because of the fear of untoward separation during induction of anesthesia and probable aspiration and airway obstruction. Khan et al. explain the safe way algorithm for managing the traumatized airway [14]. Walls explain the criteria for decision making in difficult and hazardous conditions [15]. Ensuring the best way for tracheal intubation was the prime importance, due to compromised airway and probable difficult air way, so using an assist device such a video laryngoscope may be very helpful [16]. Return to pre anesthesia conditions and extubating the trachea was also with major difficulties such as fear of hypoxia and probable failure for securing the airway, so it seems re-packing the tract and extubating the patient in a fully awake condition was the safest approach [17].

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