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CASE REPORT

Tuberculosis of the Maxilla and Reconstruction of Midfacial Defect using Temporalis Muscle Flap

Sunil Kumar, HP Singh, SP Agarwal

ABSTRACT

Tuberculosis of the maxillary sinus is a rare entity which may lead to bony erosion and fistula formation. In this case, we have described a patient of tuberculosis of maxilla, a relatively uncommon entity leading to marked bony erosion with fistula formation over face, which was reconstructed using temporalis muscle flap as a reliable and one-stage procedure alternative to more complicated surgical procedures for midfacial defects.

Keywords: Tuberculosis maxilla, Reconstruction of midfacial defect, Temporalis flap.

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INTRODUCTION

Although tubercular involvement of long bones and vertebral column is common, it is quite uncommon in flat bones. Tuberculosis of the maxillary sinus is nearly always secondary to pulmonary or extrapulmonary tuberculosis. The infection reaches the sinus either via the bloodstream or by direct extension.[1] Mainly two types of tubercular lesions of the antrum have been described. The first type features infection of the submucosa only where the antrum is filled with a polypoidal thickened mucosa which has pale and boggy appearance. This form of sinonasal tuberculosis is more common than the second type which is more aggressive and characterized by bony erosion and fistula formation leading to midfacial defect. These defects may also result from tumor excision, severe trauma or other chronic granulomatous diseases and include composite soft tissue defects following maxillectomy.[2] Reconstructive methods for the bony component of midfacial defects range from the use of soft tissue alone to vascularized bone.[3] The surgical options for midfacial defect ranges from skin graft to local and regional flaps and recently to free tissue transfer.[4] Each of these options has its own advantages and disadvantages. Temporalis muscle is one of the regional flaps that can be used to reconstruct midfacial defects as it provides a large amount of well-vascularized soft tissue with minimal donor-site morbidity.[5]

CASE REPORT

We report a case of 30-year-old male presented to department of ENT with complaints of occasional bleeding from right nasal cavity for 2 years with frequent episodes of stuffy nose for which he was taking medication by local practitioner. Approximately 6 months back, patient noticed gradually progressive swelling over right side of face just below eye. Swelling was followed by blackening and gradual sloughing out the facial skin leading to defect (Fig. 1). Patient was also having nasal regurgitation and change in voice for last 6 months. Patient was nondiabetic and there was no history of prolonged use of steroid. There was no history of organ transplantation in the past. On clinical examination, defect over face below right eye with ectropion of lower eyelid was present. Anterior rhinoscopy revealed erosion of lateral nasal wall. Hard palate was eroded on oral cavity examination. Vision was normal in right eye except epiphora. Routine investigations including chest X-rays were normal. CT scan of paranasal sinuses revealed complete loss of all the bony wall of maxilla (Figs 2 and 3). Mucormycosis and tuberculosis of maxillary sinus were suspected. An incisional biopsy from the margin of defect was taken for histopathological examination which was negative for fungal element and definitive diagnosis of tuberculosis was made on the basis of histopathological examination (Fig. 4). Patient was advised standard regimen of tuberculosis and decided to reconstruct the defect after taking 6 months treatment. For reconstruction, temporalis muscle flap was chosen. The temporalis muscle was exposed

Fig. 1: Midfacial defect caused by tuberculosis maxilla

Fig. 2: CT scan of paranasal sinuses axial cuts shows complete erosion of maxilla

Fig. 3: CT scan of paranasal sinuses coronal cuts shows the destruction of all the walls of maxilla

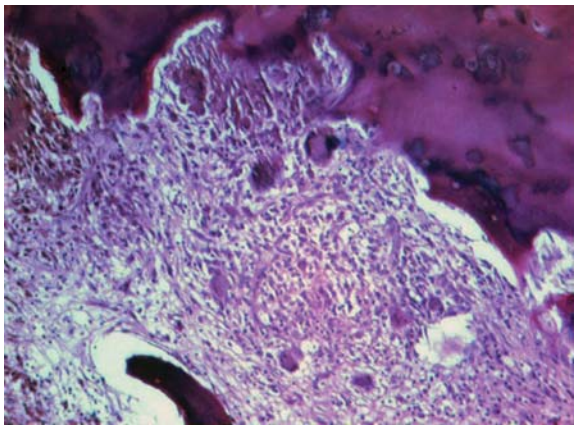

Fig. 4: Microphotograph showing Langhans giant cells, epithelioid cells, lymphocytes and necrosis along with bony trabeculae (magnification 10×s)

through an incision along superior temporal line (Fig. 5). After elevating the flap, the two lamina of the deep temporal fascia were separated from the zygomatic arch up to the

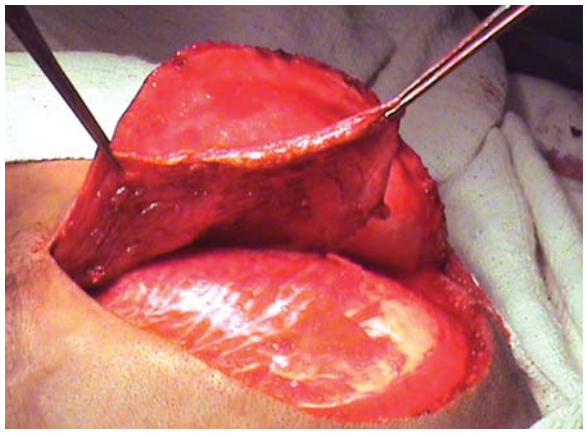

Fig. 5: Elevation of flap after making incision along superior temporal line

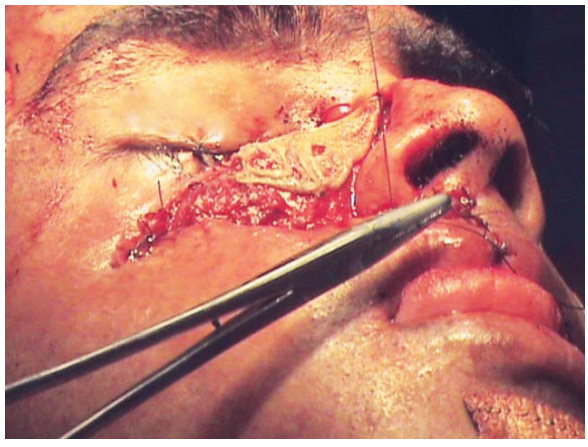

Fig. 6: Facial surface covered by split thickness graft

area of fusion. The zygomatic arch and the coronoid process were divided to rotate the flap over the defects. After freshening, the defect margin facial surface of the flap was sutured as lateral nasal wall and palate. Facial surface was reconstructed by split thickness skin graft (Fig. 6). The temporal fossa was closed after placing a drain. Postoperative period was uneventful.

DISCUSSION

Causes of midfacial defects include excision of maxillary carcinoma, orbital exenteration or trauma.[2,4] Chronic granulomatous diseases like tuberculosis, midline granuloma and fungal infection, mainly mucormycosis, are the other rare causes of midfacial defect. Patient in the above case gave no history of pulmonary tuberculosis, which was confirmed by a chest X-ray, thus it was not kept as a probable diagnosis when the patient first presented to us. Mucormycosis is caused by common fungi, frequently found in the soil and in decaying vegetation. Most individuals are exposed to these fungi, routinely but person with compromised immune systems are more susceptible to infection. Common conditions associated with mucormycosis include uncontrolled diabetes mellitus, prolonged use of steroid and

deferoxamine, organ transplantation, leukemia, lymphoma and acquired immunodeficiency syndrome. As swabs of tissue or discharge are generally unreliable, the diagnosis of mucormycosis is made on the basis of histopathological examination of the involved tissue. Although tuberculosis of the maxillary sinus is a rare entity, it is nearly always secondary to pulmonary or extrapulmonary tuberculosis. The infection reaches the sinus either via the bloodstream or by direct extension.[2] Clinically, the tubercular osteomyelitis is characterized by lack of early symptoms. Appearance of fluctuant swelling, i.e. Pott's Puffy tumor, is usually the first symptom.[6] Skin attachment, discoloration and sinus formation are late features.[7] It presents either as antrum filled with polyps and thickened mucosa having a pale and boggy appearance or by more aggressive form as bony involvement and fistula formation. Soft tissue and bony midfacial defects are associated with cosmetic deformity and functional disability requiring reconstruction. There are various options for reconstruction with its own advantages and disadvantages. Traditional reconstructions include skin grafting and placement of a prosthesis for maxillary defect, and spontaneous granulation or epithelialization of defect with prolonged healing time, poor cosmetic outcome and possibility of developing fistula between the oral cavity and the nasal cavity or the paranasal sinuses.[3,4] Common regional flaps for reconstruction of midfacial defects are cervicofacial rotation flap, forehead flap and temporalis muscle flap.[8] Distant pedicled flaps that are used in reconstruction of midfacial defects include latissimus dorsi, deltopectoral, pectoralis major and trapezius flap. These flaps are based on the trunk and may not have sufficient pedicle to reach the maxilla and the orbit. They may have limited flexibility and tissue volume. Recently, free flaps like latissmus dorsi flap, scapular fasciocutaneous flap, rectus abdominis flap, fibular osteocutaneous flap and radial forearm flap are being used for midfacial defects.[9] Free flaps are reliable and flexible and specially required for extensive soft tissue and bone defects. The main disadvantages of free tissue transfer are the long operative time, expensive cost and the additional morbidity in another operative site.[3] Temporalis muscle is one of the regional flaps that has been used in facial reconstruction with minimal donor-site morbidity. Temporalis muscle flap has been used in the obliteration of the dead space following orbital exenteration, in augmentation of facial contour following major maxillofacial resection[5,11] and in intraoral reconstruction.[12] It has a constant vascular supply from the deep temporal and the middle temporal vessels that are located on the deep surface of muscle. One of the drawbacks of temporalis muscle flap is its short arc of rotation but it can be increased by some modifications in surgical procedure like fenestration of the lateral orbital wall, resection of the coronoid process and division of the zygomatic arch.[11] Temporalis muscle flap can be used as a composite myofascial flap with cranial bone and it supports immediate or delayed free bone graft.[13]

CONCLUSION

There are many causes of midfacial defect including surgical resection of maxillary tumor, trauma or chronic granulomatous diseases. Although rare, tuberculosis is one of the causes of midfacial defect in developing countries. This clinical report describes the midfacial defect caused by tuberculosis and its one-stage reconstruction with temporalis muscle flap. Because of its close anatomical proximity to the midfacial region and to its easy transference, this flap is an excellent choice for reconstruction defects in this region. The flap is reliable as long as its vascular supply is preserved and the operative time is short compared with free tissue transfer. Fascia, in contact with the oral cavity, epithelized in 3 weeks making it resistant to the proteolitic action of saliva.[10] Its dimensions and arc of rotation may be increased by using temporalis muscle and deep temporal fascia myofascial unit and by dividing zygomatic arch and coronoid process. Temporalis muscle flap should be taken into consideration before deciding on more extensive reconstructive procedures, especially for moderate defects.

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