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Case Report

Rehabilitation of a complete maxillectomy patient: A case report of osteomyelitis of maxilla

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E-mail: chalichamalachaithanyasree@gmail.com**Abstract**

Osteomyelitis of the jaws is osteomyelitis (which is inflammation of the bone marrow, sometimes abbreviated to OM) which occurs in the bones of the jaws (i.e. maxilla or the mandible). Historically, osteomyelitis of the jaws was a common complication of odontogenic infection (infections of the teeth). Before the antibiotic era, it was frequently a fatal condition. Today osteomyelitis of facial bones is a rare condition. Maxillary osteomyelitis is rare compared to mandible osteomyelitis because extensive blood supply & strut like bone of the maxilla make it less prone to chronic infection. We report a rare case of Osteomyelitis involving whole of the Maxilla in a 63 year old male patient, diabetic and hypertensive for the past 2 years. He presented to us with anpalatally exposed bone with offensive odour from the nose. Examination revealed a necrotic maxilla involving whole hard palate. A computerized tomography scan confirmed Osteomyelitis of whole Maxilla. Patient underwent complete surgical excision with prosthesis reconstruction. Prosthetic rehabilitation of patients with acquired defects of the maxilla present a challenging task because of inadequate retention and stability of prosthesis and these goals are even more challenging in a complete maxillectomy case. This case report describes the fabrication of prosthesis utilizing soft tissue undercuts for retention using soft liners as one technique and fabrication of a two piece prosthesis utilizing magnets to meet the goals.

Keywords: Diabetes Mellitus, magnets, Osteomyelitis of maxilla, retention, soft liners**1.Introduction**

Osteomyelitis represents an inflammation of the medullary cavity, Haversian system and adjacent cortex of bone.[1] Osteomyelitis was first described by Frenchsurgeon, EdouardChassaignac in 1852. In 1764, John Hunter coined the terms sequestra and involucrum for pockets of dead cortical bone with abscess and new bone formed in response to the sequestra respectively.[2] Osteomyelitis of maxilla was originally described by Rees in 1847.³ Osteomyelitis of the jaws was relativelycommon before the era of antibiotic therapy. Today osteomyelitis of facial bones is a rare condition. Maxillary osteomyelitis is rare compared to mandible osteomyelitis because extensive blood supply & strut like bone of the maxilla make it less prone to chronic infection.

MacBeth classified maxillary osteomyelitis as traumatic (following injury or surgery, the primary site of infection may be antrum, teeth, or lacrimal sac), rhinogenic (spontaneous spread of infection from the antrum and postoperative rhinogenic cases) and odontogenic (dental-root sepsis may progress to osteomyelitis).[4] According to shafer osteomyelitis is mainly of acute and chronic. Suppurative and non-suppurative.[5]

Osteomyelitis typically appears during the 5th and 6th decades of life. OM of the jaws usually occurs in the presence of one or more predisposing factors. These factors are related to compromised vascular perfusion locally, regionally or systemically, causes of immunocompromise and poor wound healing. Specific examples include diabetes,

autoimmune diseases, Agranulocytosis, leukemia, severe anemia, syphilis, chemotherapy, corticosteroid therapy, sickle cell disease, acquired immunodeficiency syndrome, old age, malnutrition, smoking and alcohol consumption, radiotherapy, osteoporosis, Paget's disease of bone, fibrous dysplasia, bone malignancy and causes of bone necrosis such as Bismuth, Mercury or arsenic. Poor compliance or access to health care is also a risk factor.[6] Treatments for osteomyelitis of the jaws include incision and drainage, antibiotics, sequestrectomy, extraction of teeth, saucerisation, decortications, resection of the jaw and hyperbaric oxygen therapy.[7]

Defects of the maxilla may result from trauma, pathological changes, or following surgical resection of oral neoplasms. Maxillectomy defects result in the formation of a communication between the oral cavity and the antrum and/or the nasopharynx. This inevitably results in difficulty in mastication and swallowing, as well as impaired speech and facial aesthetics. Rehabilitation is important here, as functional impairments have a detrimental effect on the quality of life and self esteem.[8][10]

In partially edentulous patients support, stability and retention of a removable obturator prosthesis relies on the remaining hard and soft tissues. The larger the surgical resection, the greater the loss of the mucogingival support, which in turn results in increased unfavourable forces acting on the remaining abutment teeth.[11][13]

This clinical report demonstrates, by utilizing the soft tissue defect and soft liners for retention purpose and fabrication of a two piece obturator prosthesis to attain light weight for a patient with complete maxillectomy, secondary to Osteomyelitis.

2. Case Report

A Male patient by name Appajirao of 63 years old having a weight of 77 kgs and height of 5'7" inches came with a chief complaint of pain in

Fig 1: Patient profile view



upper jaw region and bad breath from mouth since 3 months. History of present illness revealed patient was apparently asymptomatic 3 months back, when he developed pain in the right upper jaw region. Pain was sudden in onset, gradually progressed to cheek region and then to forehead. Later, similar type of pain was also developed on the left side. No aggravating factors present. But the pain relieved on taking medication. Associated symptoms present were multiple teeth loss and bad breath. Patient was on antibiotic coverage since 40 days after which he was referred to Oral and Maxillofacial surgery department, Mamata Dental College. Past medical history revealed patient is a a) known hypertensive since 2 years and is under medication b) Known diabetic since 2 years and is under medication c) Known case of bronchitis and is under medication from past 10 years. Past dental history showed no relevant history. Personal history explained that he was a a) chronic smoker with a habit of smoking 3 cigarettes / day for 35 years and stopped 10 years back. b) Chronic alcoholic with a habit of consuming 180ml/day for 10 years and stopped 4 months back. He was a vegetarian. Vital signs seen are Temperature: afebrile Pulse: 74bpm, Respiratory rate: 18/min, BP: 150/100 mm Hg.

Extra oral examination showed mild facial asymmetry seen due to diffuse swelling with ill defined borders seen bilaterally over zygomatic buttress region. Tenderness elicited over frontal sinus and maxillary sinus region.

Intra oral examination: Necrotic bone seen over the palate and in the maxilla region extending from 18 to 26 regions. Exposure of palate in the midline. Missing teeth are 18 17 15 14 13 12 11 21 22 23 25 28. (FDI System) and Grade I mobility of 24, 26, and 27 are present. Exposed bone seen till the alveoli or portions of the sockets of missing teeth. Tenderness elicited on palpation of the exposed bone area. Patient had difficulty in mastication.

Fig-2 intra oral occlusion



Fig-3 diagnostic impressions and diagnostic casts

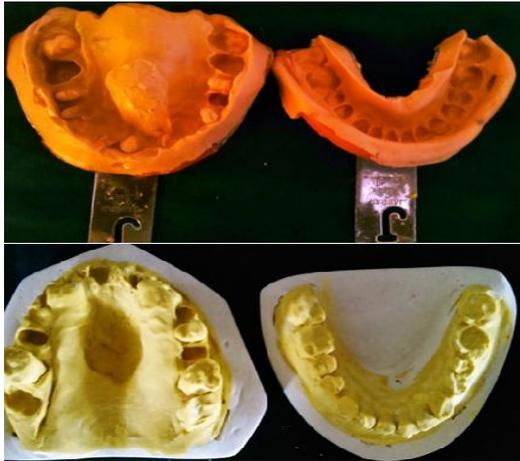


Fig-4 sequestrectomy

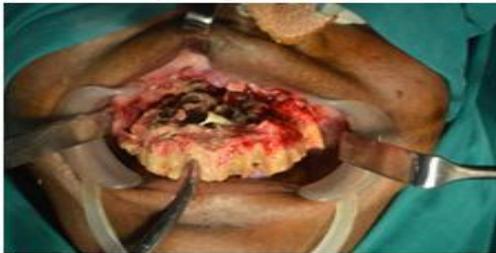


Fig-5 post operative view



Fig-6 suturing



Fig-7 1 week post operative



Fig-8 2 weeks post operative impression



Fig-9 cast with template retained by soft liner in the mouth

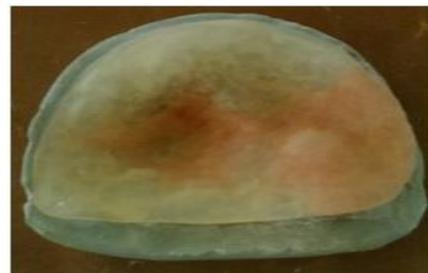


Fig-10 final impression



Fig-11 master cast



Fig-12 one piece prosthesis



Fig-13 jaw relations recorded

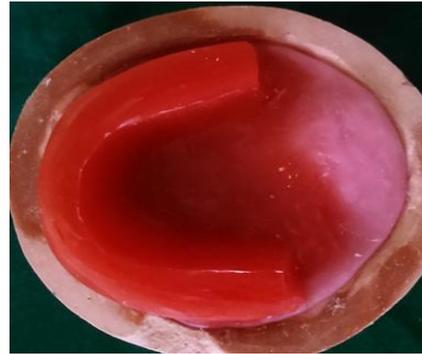


Fig-14 try-in



Fig-15 flasking, curing and deflasking



Fig-16 prosthesis relined by soft liner at intaglio surfaces



Fig-17 prosthesis in the patients mouth



2.1 Second technique using magnets

Fig 19 Magnets on one piece obturator prosthesis towards denture intaglio surface



Fig-20 Magnets on denture intaglio surface



3. Discussion

Total maxillectomy combined with subtotal maxillectomy is a relatively uncommon surgical procedure and usually results a surgical and prosthetic reconstructive challenge. The goals of prosthetic treatment include separation of oral and nasal cavities, which allows for adequate speech and deglutition, along with restoration of esthetics. Lack of support, retention, and stability are common prosthodontic treatment problems for patients who have had a maxillectomy. Factors affecting the prosthetic prognosis for these patients are the size of defect, number of remaining teeth, amount of remaining bony structure, quality of existing mucosa, radiation therapy, and the patient's ability to adapt to the prosthesis.[14]

For patients who receive a total maxillectomy on one side, saving as many of the remaining teeth as possible could be critically important for successful prosthesis design and function. For completely edentulous patients, the maxillectomy procedure usually results in poor prosthetic prognosis because of inadequate denture-bearing area, lack of cross-arch stabilization, and lack of structures for denture retention. Prosthodontic treatment becomes extremely difficult after total resection.[14]

Obturator prostheses are commonly used in the rehabilitation of total or sub-total maxillectomy patients, as it helps in separating the oral and the nasal cavities and restores normal deglutition and speech and further improves the mid-facial aesthetics by supporting the soft tissues.[14][15] The weight of the obturator has a major role in retention and stability. Creating a lighter obturator portion improves the cantilever mechanics of suspension, avoids the overloading of remaining supportive structures, and enhances retention.

Obturator can be classified as immediate surgical obturator (feeding plates), temporary or interim obturator and definitive obturator depending upon the period elapsed from surgical resection of maxilla. An immediate surgical obturator is the first

prosthesis placed and is used to minimize post-operative complications. It supports soft tissue, minimizes scar contracture and disfigurement, reproduces the anatomic integrity of the palate, improves post-operative oral hygiene and protects the surgical packing from food debris contamination. It also allows the patient to resume a normal diet, protect the wound from trauma and maintain adequate pressure on split thickness skin graft. Furthermore, it restores speech to a reasonable level and obviates the use of nasal gastric tubes. It can also be used to correct the contour of the lip and cheek and reduces the flow of fluids into the mouth.

The temporary or interim obturator is fabricated from the cast that has been obtained from a post-surgical impression. The cast has a pseudo palate and alveolar ridge without teeth. The closed bulb extending into the defect area is hollow. The definitive obturator is fabricated about 6 months after surgery from post-surgical maxillary cast, when the surgical site has completely healed, and minimal dimensional changes are unlikely. This obturator has a metal framework, which acts as the palate and supports the teeth and a closed hollow bulb.[16][20]

The retention of the antral part of the obturator is achieved with the help of resilient liners. The use of a resilient liner is a simplified rehabilitative treatment modality, readily modified or repaired, and comparatively inexpensive. It enables the use of soft-tissue undercuts at the level of the meatus, providing for adequate anatomic retention.

Magnets were first introduced for application in dentistry in the year 1953 in the field of orthodontics. In 1976, Federick rehabilitated a patient with large orofacial defect using a two component obturator that was locked to each other with the help of magnets. Coated magnets exhibited, no adverse physiologic effects, favorable bone response, enhanced denture retention and encouraged tissue reaction. Magnets are used because of their small size and strong attractive forces, attributes that allow them to be placed within prostheses without being obtrusive in the mouth. Advantages also

include ease of cleaning, ease of placement for both dentist and patient, automatic reseating, and constant retention with number of cycles. However, over a period of time the magnets used intraorally require replacement due to lack of long-term durability in oral conditions.

4. Conclusion

Obturator is a reliable treatment option to restore maxillectomy defects and improving quality of the patient's life over a very long follow-up period.

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