CASE REPORT

Prosthetic rehabilitation of acquired maxillectomy defect: A case report with 10 years follow-up
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Abstract
Acquired maxillary defects are created by surgical removal of benign or malignant tumors, congenital malformation and by trauma. Surgery is the first choice for some benign tumors, early cancers and for cancers that do not respond to radiation and chemotherapy. Surgery or trauma can result in cosmetic, functional and psychological impairment greatly affecting the patient’s quality of life. Surgical reconstruction of the maxillary defects can be carried out either by using temporal flap or a wide range of microvascularized flaps. Rehabilitation via palatal obturators to obturate a palatal defect in a dentulous or edentulous patient is one of the choices in restoring masticatory function and improving speech, deglutition and cosmetics. Rehabilitation of such patients is quiet challenging and requires a multidisciplinary team for comprehensive care and optimal post-treatment functional outcomes. Hence, it is crucial to work in close collaboration with the team members who makes the prosthesis and who evaluates the case for planning the surgical procedures and obtaining the necessary anatomical and functional information.

Keywords: Acquired defects, maxillectomy, obturators, prosthetic rehabilitation

Introduction
Maxillary defects are created following surgical treatment of patients with congenital defects, trauma, or neoplasm.¹ Prosthetic rehabilitation of maxillectomies is the treatment of choice in most centers over autogenous tissue reconstructions. This kind of rehabilitation gives satisfactory outcomes with regard to aesthetics, speech, and mastication when the collaboration of the prosthodontist begins as early as possible before surgical treatment and the long-term management of the patient is maintained carefully.²

To re-establish the midfacial contour of a maxillectomy patient, the prosthetic rehabilitations sights the separation of oral and nasal cavities to allow sufficient articulation and deglutition, in order to achieve satisfactory aesthetic results and contribute to the patient’s discernment of a better quality of life.³⁴⁵

Acceptable prosthetic care for a patient with acquired maxillary defect should include cautious prosthesis designing, combined with routine maintenance and ample care to provide comfort, function, aesthetics and minimal changes to the remaining compromised structures.⁵

The present case report illustrates the benefits of obturator prosthesis in the management of a patient who had undergone hemimaxillectomy due to central giant cell granuloma. The obturator was fabricated before operation and delivered immediately following surgical procedures until reaching the definitive obturator stage.

Case Report
A 27-year-old female patient presented to Oral and Maxillofacial Surgery Department at King Fahad General Hospital, Jeddah, Saudi Arabia. Extraoral examination showed a firm slightly painful swelling involving the left side of the maxilla [Figure 1]. The swelling is not movable and attached to the underlying tissue with normal overlying skin. Intraoral examination revealed a reddish blue swelling that extended buccally and palatally occupied the area from the midline to the tuberosity with ulcerations on the mucosa due to lower teeth indentations. The panorex radiograph showed a well-defined unilocular radiolucency of the left maxilla. The axial view of the computed tomography scan showed destruction of the left maxillary bone extending from the lateral side to the midline of the nose and upwards to the orbital floor [Figure 2].

An incisional biopsy was taken, and this revealed the mass to be central giant cell granuloma. The first choice to treat this case after team discussion is using systemic calcitonin in order
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to decrease the size of the lesion. 100 IU of calcitonin was administered subcutaneously once daily for 6 months. There was no change in the lesion size and the patient developed delayed allergy to the injected drug. The decision was made to resect the tumor and to use an immediate prosthesis to close the defect. The patient was informed about the treatment steps and the immediate obturation, which would minimize the changes of her appearance.

Prior to surgery, irreversible hydrocolloid (Tropicalgin, Zhermack SpA, Italy) was used to take impressions for the maxilla and mandible. The impressions were poured using dental stone (TecStone, Pearson Dental Supply Company, CA, USA). The models were mounted on a semi-adjustable articulator. The predicted excision was performed on the maxillary model. An immediate obturator with 1 cm extension into the resected side was fabricated with retention wrought wire clasps on the molar teeth in the intact side [Figure 3].

Under general anesthesia, the lesion on the left side of the maxilla was resected [Figure 4]. After removal of the tumor, periopack material covered with Sofra-Tulle was placed over the extension of the immediate obturator to accurately fit the surgical defect, to facilitate post-operative care and to support the split-skin graft and the defected area.

The patient showed good post-operative progress and 3 weeks after the surgical treatment, the immediate prosthesis was subsequently replaced by an interim obturator. The interim obturator was then replaced with a definitive prosthesis after 6 months [Figure 5]. At 10 years recall, the patient showed excellent intraoral healing at the defected side [Figure 6] and excellent facial contour with no radiographic changes [Figure 7].

Discussion
To meet objectives for patients with complex rehabilitative needs, a comprehensive treatment planning is necessary. Hence, it is necessary to facilitate and coordinate treatment planning among team members including surgeons, prosthodontists, and laboratory technicians.

Obturators can be classified as immediate surgical obturator (feeding plates), temporary or interim obturator and definitive

Figure 1: Extraoral swelling of the left side of the maxilla

Figure 2: Axial computed tomography scan showing extension of the tumor laterally to the midline of the nasal septum and up to the orbital floor

Figure 3: Immediate obturator with retention clasps

Figure 4: Resected giant cell granuloma tumor from the left maxilla
obturator depending upon the period elapsed from surgical resection of maxilla.\textsuperscript{[5]} An immediate surgical obturator is the first prosthesis placed and is used to minimize post-operative complications.\textsuperscript{[7]} 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.\textsuperscript{[4]} It also allows the patient to resume a normal diet, protect the wound from trauma and maintain adequate pressure on split thickness skin graft.\textsuperscript{[5]} 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.\textsuperscript{[10]}

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.\textsuperscript{[1]} 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.\textsuperscript{[1]} This obturator has a metal framework, which acts as the palate and supports the teeth and a closed hollow bulb.\textsuperscript{[11]}

After the operation, the patient was able to swallow food more readily and to resume a normal diet at an earlier stage, which leads to shorter recovery period. The obturator allowed mastication of soft foods initially and harder foods several days later. Speech was not altered and remained nearly unchanged. The patient was psychologically better equipped to face the rehabilitation by maintaining facial contour and aesthetics.

**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.

**References**