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Prosthetic Rehabilitation of Partial Maxillectomy by an Obturator prosthesis : A Case Report

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Abstract:

Acquired defects of hard and soft palate may be due to trauma, pathological changes, radiation burns or surgical intervention. Rehabilitation of a maxillectomy defect by an obturator not only closes the opening of oral cavity into the nasal and antral cavities but also prevents reflux of food and fluids, enables mastication and swallowing and improves patient's speech and self confidence. This article describes a case report for one such partial maxillectomy defect restored with an obturator prosthesis.

Keywords: Partial maxillectomy, Adenoid cystic carcinoma, Obturator

1. Introduction

Face is the most prominent and expressive part of human body and its well-being adds to one's personality. The maxillofacial region has a complex anatomy and a lattice-like structure. This region is vulnerable to trauma, cancer, acquired and congenital defects. Acquired defects of hard and soft palate may be due to trauma, pathological changes, radiation burns or surgical intervention. Depending on the extent of the defect, excision of hard palate, soft palate, alveolar ridges and floor of nasal cavity may be required, creating one confluent chamber, resulting in disability in speech and deglutition. Multidisciplinary approach is definitely the most ideal way of treating such defects and a prosthodontist is an important part of this team.

Prosthetic rehabilitation is usually one of the final therapies instituted. Its primary goal should be closure of the defect and separation of oral cavity from nasal cavity and it must attempt to alleviate both anatomical and functional deficiency like restoration of speech, mastication, deglutition, and esthetics.¹ This can be achieved by placing the prosthesis over the defect. Such prosthesis is known as "Obturator".

According to Glossary of Prosthodontics terms "Obturator is defined as a maxillofacial prosthesis used to close a congenital or acquired tissue opening primarily of hard palate or contiguous alveolar bone or soft tissue structure".ⁱⁱ This case report describes the fabrication of an obturator for a patient who underwent partial maxillectomy secondary to adenoid cystic carcinoma of the maxilla.

2. Case Report

A 45-year-old female patient reported to the department of prosthodontics for the prosthetic rehabilitation of palatal defect secondary to surgical resection of left maxilla for adenoid cystic carcinoma. Patient complained of difficulty in mastication, regurgitation of food and fluids and had a noticeable nasal twang in speech. Extra-oral examination showed facial disfigurement on the left side of the face with a depressed left upper lip. Intra-orally the defect extended from buccal mucosa to the palatal midline medially and from the premolar region anteriorly to the third molar region posteriorly. The resection involved only the left half of the hard palate and all the left maxillary teeth (Aramany class I defect). (Figure 1) All the mandibular teeth and teeth on the right half of the maxilla were present. The remaining teeth had good periodontal condition to provide support to the prosthesis. Since the defect was not too large, hollowing of the obturator to reduce the weight of the prosthesis was not necessary and thus a definitive obturator was planned for the patient.

3. Technique

An irreversible hydrocolloid preliminary impression was made to obtain primary casts on which a perforated custom tray was fabricated from autopolymerizing acrylic resin. Mouth preparation was done following the design criteria for Aramany class I defect. The definitive impression was recorded in polyvinyl siloxane with two step putty and light body material. (Figure 2) The master cast was obtained and the metal framework was fabricated in a conventional manner. Its fit was evaluated clinically and necessary adjustments were done. (Figure 3) A record base was fabricated with autopolymerizing resin and wax occlusion rim was constructed over it. Maxilla-mandibular and face bow record was transferred to the semi adjustable articulator. Teeth arrangement was carried out and evaluated intraorally. (Figure 4) After necessary adjustments and patient satisfaction, conventional processing was done to fabricate the definitive obturator in heat cure acrylic resin. (Figure 5) The final prosthesis had slight extension into the defect and was adequately relieved from the neighbouring tissues of the defect area. The prosthesis had good retention and stability and patient was comfortable and satisfied. (Figure 6-9) Instructions for maintenance of prosthesis were given. Patient was recalled for follow up after 1 week, 1 month and 3 months and necessary adjustments were done.



Figure 1: Intra oral view

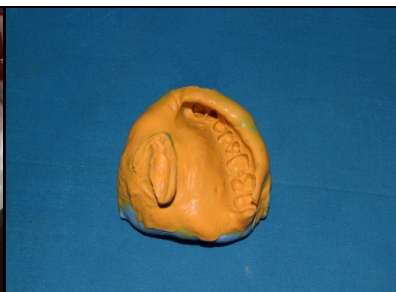


Figure 2: Definitive impression



Figure 3: Cast partial framework



Figure 4: Teeth arrangement (front view)



Figure 5: Definitive obturator



Figure 6: Intra oral front view



Figure 7: Occlusion on left side



Figure 8: Occlusion on right side



Figure 9: Post-operative view

4. Discussion

Obturator prosthesis play an important role in the recovery of oral function in postsurgical maxillectomy patients.ⁱⁱⁱ Inadequate retention, stability and support are common prosthodontics treatment problems for patients who underwent maxillectomy. The Aramany classification system for acquired maxillary defects describes the basic principles to be strictly adhered to in designing removable cast framework on which obturators for partially edentulous patients will be fabricated. It is also a useful tool for teaching and for enhancing communication among prosthodontists. Usually a quadrilateral or tripodal design is favoured over a linear design because this allows a more favourable distribution of forces for enhancing the support, stabilization and retention of the prosthesis.^{iv,v} In dentulous patients, number and distribution of remaining teeth determines the primary retention, support, and stability of the obturator.^{vi-ix} For edentulous patients engaging soft tissue undercuts, including the scar band at the skin graft mucosal junction, might play a significant role.^x In cases of wide surgical resections, sometimes only few teeth remain unilaterally and these remaining teeth when used as abutments are constantly subjected to nonaxial, cantilever forces.^{xi,xii} Although advanced materials have been introduced to cope with the critical areas, there are some limitations in their use. The soft tissues surrounding the defect always need to be relieved of pressure under the prosthesis. Permanent soft liners, provide cushioning effect between the defect margins and the prosthesis and can be used to reduce the pressure on the defect areas. Since its flexible it allows relatively simple placement of obturator in retentive undercut regions. But, as they need frequent replacement, it is better to avoid using them for fabricating a definite maxillofacial prosthesis, thus limiting their use only for fabricating surgical and interim prosthesis.^{xiii} Light-cured resin record bases save clinical and laboratory time thus eliminating the need for heat-processed record bases.^{xiv} This case report discusses a simple method of fabricating a definitive obturator deriving support and retention from the remaining dentition by use of a cast partial metal framework for a hemi maxillectomy patient following the design criteria for Aramany class I defect.

5. Summary

This case report describes the prosthetic rehabilitation of a maxillary defect secondary to surgical excision of a maxillary tumor treated with a cast metal framework retained obturator prosthesis to prevent reflux of food and fluids into the antral cavity, improving the quality of speech and enhance mastication.

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