

Rehabilitation of Maxillectomy Defect with a Flexible Prosthesis - A Case Report

Abstract

Rehabilitation of maxillectomy defect has been well defined as a skillful task for prosthodontist. The primary goal of prosthetic obturation is closure of the defect which may be congenitally present or acquired as a result of trauma or surgery. The success or failure of prosthesis depends on size of the defect, presence of remaining dentition and contiguous structures, degree of malignancy. However, the real success is judged in terms of patient acceptance and effectiveness. Large size and weight of obturator is of concern in retention of the prosthesis. The presence of unwanted factors such as undercuts and limited mouth opening further hinders the successful outcome.

Introduction

"It is the GOD given right of every human being to appear human."

Since the 16th century acquired surgical defects have been restored

by prosthetic replacements constructed from a variety of materials and techniques. (Chalian, et al. 1972)¹. The cosmetic and functional disabilities following radical surgery for oral and para-oral cancer are significant and disabling. Prosthetic planning and rehabilitation, therefore, should be an integral part of patient's treatment plan².

Maxillofacial prosthetic therapy for acquired defects have become more complex and sophisticated with advances in surgical, physical and rehabilitative medicine. Acquired defects of the orofacial structures must be analyzed as to the specific cause and the consequent objectives of rehabilitation. Total patient comfort and function, however, relies on retention and stability of the prosthesis³. Retention of obturators provides a challenge to the prosthodontist because of lack of support and reduced bearing surface⁴. Utilization of surgically created defect for retention often becomes very traumatizing for the patient because of rigidity of polymethyl methacrylate denture base resins.

This clinical report describes rehabilitation of a patient with bi-maxillectomy who was rehabilitated with nylon based flexible prosthesis.

Case report

In May 2004, the patient, a 42-year-old woman, first noticed a swelling on both the sides of face in the cheek region which caused her concern. On consultation with physician a biopsy was performed, and its report mentioned it as a rapidly spreading acute *Pseudomonas* infection. Emergency surgery was planned involving bilateral partial resection of maxillae and all the maxillary teeth were extracted. After undertaking a post-treatment therapeutic regimen, she reported to Govt. Dental College and Hospital, Ahmedabad for prosthetic rehabilitation of upper arch. The patient was prone to fungal infection because of long-term consumption of broad-spectrum antibiotics. Figure 1 shows the intra-oral defect after surgical resection.

Treatment plan

A treatment was planned in which the only source of retention would be the pouch-like recesses present bilaterally. The advent of flexible denture base material can allow engagement of the undercuts in the surgical defect for retention of prosthesis without causing much discomfort to the patient. Hence, the denture base material of choice in this case was a flexible material.

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Method of fabrication

1. A preliminary impression was taken with an impression compound in stock metal tray. The primary cast thus obtained was used for fabrication of custom tray.
2. The periphery of custom tray was border molded with low fusing green impression compound and the final impression was made in light bodied elastomeric material.
3. Routine procedures of recording jaw relationship were undertaken, tooth selection was made and trial was done.
4. The processing of trial base conversion into permanent prosthesis differed from the conventional compression molded technique. Rather, an injection - molded technique was utilized with nylon denture base material in a specially designed flask. After de-waxing, powder-liquid resin mixture was introduced into the mold cavity. As the material polymerized, additional resin was introduced into the mold cavity. This results in less polymerization shrinkage⁵.
5. Denture was recovered, finished, adjusted and delivered to the patient. Figures 2 and 3 follow-up was done. Patient comfort and satisfaction revealed the success of treatment. Definite improvement was seen in appearance and lip support (Figs. 4 [a, b], 5 [a, b]).

Discussion

Any obturator prosthesis should be able to create an effective oral seal to aid in deglutition and speech. It must

contribute to retention and support for intra-oral prosthesis. Besides this, it must be light weight⁶. All these requirements are well fulfilled with thermoplastic nylon denture base material.

Nylon is a generic name for certain types of thermoplastic polymers belonging to a class known as polyamides. These polyamides are produced by condensation reactions between a diamine and a dibasic acid. Thermoplastic resins are stable and resist thermal polymer unzipping. It exhibits high physical strength, heat resistance and chemical resistance. It can easily be modified to increase stiffness and wear resistance by use of short glass fiber reinforcement. Nylon is promoted as a denture base material on the basis of its flexibility, which allows it to engage certain degree of undercuts for retention without these undercuts being blocked⁷. At the same time, it has also been claimed to be a good alternative in patients who have sensitivity or allergy to mandibular-maxillary advancement monomer. They are stable, exhibit high creep resistance, high fatigue endurance, good wear characteristics and solvent resistant. In addition, they have almost no porosity, which reduces biologic material build-up, odors and stains⁸⁻¹⁰. The latter property was an essential factor in this case as the patient was prone to infections, so a material was desirable that would allow minimum adherence and clogging of food debris.

Summary and conclusion

The prosthetic management and rehabilitation of completely edentulous patient with bi-maxillectomy defect is discussed.

Proper extension into the defect and utilization of the favorable undercuts with the bulb portion of flexible obturator provided adequate retention to the obturator prosthesis. The obturator helped patient regain his functional activities, speech and esthetics boosting the social confidence of the patient. The treatment provided was time saving and comfortable for the patient.

References

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