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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/17324
DOI URL: <http://dx.doi.org/10.21474/IJAR01/17324>



RESEARCH ARTICLE

REHABILITATION OF MAXILLARY DEFECTS IN PARTIAL AND COMPLETE EDENTULOUS ARCHES WITH DEFINITIVE OBTURATORS-A CASE SERIES

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Manuscript Info

Manuscript History
Received: 29 May 2023
Final Accepted: 30 June 2023
Published: July 2023

Abstract

Rehabilitation of hemimaxillectomy patients can be challenging. The most common problem with prosthetic treatment in such patients is in getting adequate retention, stability, and support. The size and location of the defect usually influences the amount of impairment and difficulty in prosthetic rehabilitation. The obturator prosthesis is commonly used as an effective means for rehabilitating hemimaxillectomy cases. In this case series prosthetic rehabilitation of a completely edentulous and partially edentulous patients with definitive obturators have been discussed.

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Introduction:-

The maxillary bone plays a significant role in the function of the oral cavity and esthetics of the face. (1) It separates the nasal and oral cavities, forms the upper jaw, and contains the maxillary sinus. (2) Any type of defect in the maxilla can disrupt the function such as speech, mastication, swallowing and esthetics and in turn can affect the patient's social and psychological wellbeing. Maxillary defects are most common intraoral defects which are usually in the form of opening into the antrum and/ or nasopharynx. Maxillary defects may be divided into defects resulting from congenital malformations or acquired defects resulting from surgery for oral neoplasms or from trauma. The opening produced may be small or it may include any portion of the hard and soft palate, the alveolar ridges, and the floor of the nasal cavity. Postsurgical maxillary defects predispose the patient to hypernasal speech, fluid regurgitation, and impaired masticatory function. (2)

A maxillectomy is the removal of part or all of the maxillae. –GPT- 9 (3).

This article presents a case series showing a simple technique to rehabilitate a maxillary defect with definitive palatal obturator.

Case 1:

A 60-year-old male patient came to the Department of Prosthodontics and Crown & Bridge for the prosthetic rehabilitation of post maxillectomy defect due to the surgical resection of squamous cell carcinoma 8 years back. The patient had been using a definitive obturator for 7 years which was broken and wanted to get a new prosthesis. Patient demanded not to give a large bulb covering the entire defect. Intraoral examination revealed well-healed surgical defect in the right side of the maxilla involving part of the hard palate, alveolar ridge, and maxillary tuberosity creating an oroantral communication and the remaining teeth present were 23,24,25,26, 27 and 28. Masticatory and phonetic functions of the patient were affected.

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Treatment plan:

Definitive obturator with a cast metal framework

Material and Methods:-

The defect was blocked with a gauze piece lubricated with petroleum jelly prior to impression making. The primary impression was made using irreversible hydrocolloid and was poured with dental stone and a primary cast were made. The primary cast was then surveyed on a surveyor and the framework was designed. Direct retention was provided by two embrasure circumferential clasp on 24, 25 and 26, 27. Already prepared rest seats were modified on 24, 25, 26, and 27 to receive rest of the cast metal framework and guide plane was prepared on 23 to receive the proximal plate. The impression of the defect was made with admix technique and lined with light body silicone impression material. A pickup impression of the remaining teeth was made with alginate in stock tray. Designs of the cast metal framework were transferred on the cast, and the framework was fabricated and checked intraorally for fit and retention. Occlusion rims were fabricated on the cast metal framework. Jaw relation was recorded, teeth arrangements were done and wax try-in was carried out in patient's mouth. After try-in, waxed up obturator was processed conventionally with flasking, dewaxing, and packing using heat polymerizing acrylic resin. Finishing and polishing of the obturator prosthesis were done. Insertion of the obturator was done and both the esthetics and phonetics was found to be well improved.



Fig 1: -1a. Intraoral view of defect and 1b. Primary cast



Figure 2: -2a. Secondary impression and 2b. master cast.



Figure 3: -3a.Metal framework on cast and 3b.metal framework trial.



Figure 4: -Jaw relation.





Figure 5: - Teeth arrangement and Try-in.



Figure 6: -Acrylized definitive obturator with metal framework.



Figure 7: - Insertion of obturator.



Figure 8: - Pre operative and post operative pictures.

Case 2:

A 58-year-old female patient reported to the Department of Prosthodontics with chief complaint of nasal regurgitation of liquids and food pieces, difficulty in chewing and improper speech. Patient's medical history revealed that she had been operated for "Pleomorphic Adenoma" of right hard palate extending to soft palate posteriorly 6 months back and she was rehabilitated with an interim obturators 2 weeks after the operation. The patient was not subjected to any radiotherapy and chemotherapy. After a span of 6 months the patient revisited the dental hospital seeking definitive rehabilitation. Intra oral examination revealed an existing surgical defect with adequate healing and the presence of a few remaining natural teeth.

Treatment plan:

Hollow bulb obturator prosthesis for the maxillary arch with metal coping in relation to maxillary left canine [23] and mandibular cast partial denture was planned.

Material and Methods:-

The teeth present in the maxillary arch were 22 and 23 of which 22 was periodontally compromised with Grade III mobility that could not be retained and hence were extracted. 23 was also periodontally compromised with Grade I mobility. The preservation of the remaining hard and soft tissues is important for the stability and retention of the prosthesis thus 23 was retained.

Fabrication of metal coping:

23 was endodontically treated and pre and post operative radiographs were taken. The crown was sectioned at the level of gingival 1/3rd to get a favorable crown root ratio and decrease the mobility of the teeth. The tooth was prepared with a chamfer margin. A sectional impression was made using addition silicone elastomeric impression material and a metal coping having chamfer margins was fabricated. The metal coping was cemented in the patient's mouth.

Fabrication of hollow bulb obturator:

A primary impression was made in irreversible hydrocolloid impression material and the primary cast was retrieved. Proper border moulding of the upper arch was done and a final impression of the defect area was made in admix technique followed by wash impression made in light body rubber-based impression material. A master cast was acquired out of it.

The undercuts on the sides of the defect were blocked with wax and also, the internal part of the cavity was painted with a thin layer of wax before making the acrylic record bases [2]. A jaw relation record was made by a conventional method. The selection and the setting of the teeth were done as per the rules of aesthetics. Waxed up dentures were tried and checked for retention, stability and comfort in the mouth. Since, phonetics was one of the main concerns of the patient, the denture movements were re-checked during phonation, and corrections were made accordingly. Finally, a definitive hollow bulb obturator was fabricated using lost salt technique.



Figure 9:- Intra oralimage.



Figure 10:- Interim obturator.



Figure 11:- Metal coping was fabricated and cemented irt 23.



Figure 12: -12a.Primary impression and 12b.cast.



Figure 13: -13a.Secondary impression and 13b.cast.



Figure 14: -14a. Jaw relation and 14b. Try-in.

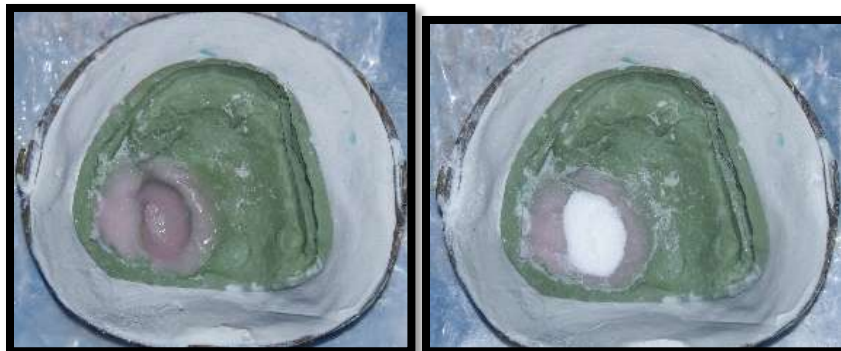


Figure 15: -Fabrication of obturator using lost salt technique.



Figure 16: -Acrylised definitive hollow bulb obturator.



Figure 17: - Intra oral view: pre operative and post operative.



Figure 18: - Extraoral view: Pre operative and post operative.

Discussion:-

Rehabilitation of hemimaxillectomy patients can be challenging. The most common problem with prosthetic treatment in such patients is in getting adequate retention, stability, and support. The size and location of the defect usually influences the amount of impairment and difficulty in prosthetic rehabilitation. The obturator prosthesis is commonly used as an effective means for rehabilitating hemimaxillectomy cases.

A definitive obturator is a maxillofacial prosthesis that replaces a portion or all of one or both maxillae and associated anatomy as a result of surgery or trauma; a definitive obturator is made when tissue changes or recurrence of tumor are unlikely and a more long-term prosthetic rehabilitation can be achieved. – GPT 9 (3)

In this case series prosthetic rehabilitation of a completely edentulous and partially edentulous patients with definitive obturators have been discussed.

Definitive obturator with a cast partial denture framework was planned and fabricated for the partially edentulous patient. All removable cast partial obturator prosthesis should be dictated by basic prosthodontic principles which include broad stress distribution, cross arch stabilization with the use of a rigid major connector, and stabilizing and retaining components at locations within the arch to best minimize dislodging functional forces(4). Complete palate was designed to ensure maximum distribution of the functional load to the tissue. Support of the prosthesis was provided by the remaining teeth, palate, and rest. (5,6). Direct retention was provided by two embrasure circumferential clasp on 24, 25 and 26, 27. Already prepared rest seats were modified on 24, 25, 26, and 27 to receive rest of the cast metal framework and guide plane was prepared on 23 to receive the proximal plate. In dentate patients, the remaining teeth play an important role in providing retention, support, and stability to the obturator. Retention can be achieved from the remaining teeth or ridge, lateral part of the defect, soft tissue undercut, and scar band. Stabilization and indirect retention components must be positioned effectively to retard the movement of the defect extension portion away from its terminal position [9]. Different types of retentive aids such as magnets, snap-on (friction-type) attachments, acrylic buttons, retentive clips, and implants are used for the conventional obturator prosthesis. However, cost, health of the patient, and bone qualities are some of the factors which limit the use of implants(7). The advantages of metal framework obturator prosthesis are the longevity of the prosthesis and thermal conductivity of metal which made it sensitive to temperature change(4).

For the second case, a hollow bulb obturator prosthesis for the maxillary arch with metal coping in relation to maxillary left canine [23] and mandibular cast partial denture was planned.

A full bulb is likely to increase the weight of the prosthesis and therefore, it cannot be used successfully. A hollow bulb prosthesis (either one piece or two piece) is a better choice, as it is lighter in weight and is more hygienic.(8) Therefore, it was planned to fabricate a 'one piece hollow bulb prosthesis' using lost salt technique for the patient. And since the defect was comparatively smaller, a decision to fabricate a one-piece obturator was made. Considering the patient's physiological, physical, psychological and economical conditions, the prosthesis was constructed in accordance to her needs. There was a marked difference in the speech production before and after prosthesis insertion.

The preservation of the remaining hard and soft tissue is important for the stability and retention of the prosthesis. Therefore, 23 was endodontically treated and metal coping was fabricated and cemented so as to prevent resorption of the alveolar bone.

Conclusion:-

The aim of prosthetic rehabilitation is intended to achieve masticatory and functional efficiency along with esthetic harmony. The prosthodontist plays an important role in the complete rehabilitation of the palatal defect. The effective planning, designing and fabrication of prostheses determines the successful recovery of speaking and feeding functions; thereby, contributing to improvement in patient's quality of life.

In this case series, optimal results were obtained in terms of function and esthetics by adequately supporting facial soft tissue to overcome facial disharmony and hence boosting the psychological aspect of the patient.

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