CASE REPORT

PROSTHETIC REHABILITATION OF MAXILLECTOMY PATIENT WITH TELESCOPIC DENTURES

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ABSTRACT

This article describes a technique of management of maxillectomy defect with a complex partial denture in a 33 years old male patient. The purpose of this treatment was to improve the retention and stability of the prosthesis. A telescopic denture was fabricated to rehabilitate the maxillectomy defect. Telescopic removable partial dentures may be considered as an alternative option, combining good retentive and stabilizing properties. With telescopic dentures, the insertion and removal is much easier for the patient. The aesthetic enhancement and functional rigidity provided by telescopic retainers are favourable features to many challenging clinical situations. Telescopic denture has the benefit of secure attachment and increased bearer confidence.

Key words: *Telescopic denture, Telescopic retainer, Complex partial denture*

INTRODUCTION

The retention of partial denture prosthesis in rehabilitation of maxillectomy patient has been an enigma for prosthodontists and patients. The partially edentulous maxillofacial patient, in whom there is extensive loss of bone, undergone extensive surgery for tumour, in such a gross jaw defect, a partial denture would be unmanageable, but a prosthesis stabilized by the remaining teeth would be functionally adequate. In all partial denture patients, one should try to preserve the health of the remaining teeth by not subjecting them to stress exceeding their physiologic limit.[1] Telescoping crowns were introduced in the 20th century. Telescoping refers to the use of a primary full coverage casting luted to the prepared tooth with a secondary casting, which is part of denture framework and is connected by means of interfacial surface tension over the primary casting.[2]

Telescoping crowns have proven more effective than other direct retainers. Their degree of retention can be planned to suit different situations by modifying the design.[3] Telescope crowns are used to retain partial dentures. They provide the best possible force distribution to the abutment teeth and can improve patients oral health-related quality of life.[4,5] In the present case, a Aramany[6] class I maxillectomy defect was treated with a complex partial denture incorporating telescoping crowns to improve the retention and stability of the prosthesis.

CASE REPORT

Here, presenting a prosthetic rehabilitation of maxillectomy patient, a 33 years old male was referred to the Department of Prosthodontics, for prosthetic rehabilitation. His primary concerns were poor facial appearance and inability to chew food. Past medical history revealed that, he underwent left maxillectomy as a treatment plan for adenoid cystic carcinoma of the left palate. On extra-oral examination, the patient had a collapsed mid face and an inappropriate facial contour (Fig 1). Intraoral examination revealed missing teeth

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from maxillary permanent left central incisor upto the third molar. The palatal regions of the defect side were of broad square form and had an oro-nasal fistula in the posterior region of hard palate (Fig: 2). The mandibular anteriors had generalized attrition. The teeth were evaluated clinically to determine their periodontal condition, pockets, mobility and supraeruption. The condition of the tooth closest to the defect plays an essential role in determining prosthetic prognosis because it will bear the greatest stress.[7] Thus, the root form and periodontal condition of teeth are paramount. The patient had good oral hygiene and no dental caries were detected in the remaining teeth. No occlusal interference was found.

Maxillary and mandibular irreversible hydrocolloid [Zhermack Dustfree Thixotropic Tropicalgin] impressions were made taking care to block out undercuts with petrolatum laden gauze, and an inter-occlusal bite registration was taken. The impressions were poured with dental stone [Zhermack Elite Model Stone] and the diagnostic models were mounted on a mean value articulator. A diagnostic surveying of the models was done and a complete radiographic survey was carried out. The OPG revealed good periodontal support of the remaining teeth.

TREATMENT PROTOCOL

- Diagnostic casts
- Preparation of teeth
- Fabrication of fixed parts
- Cementation of fixed parts
- Study model and surveying
- Mouth preparation
- Fabrication of removable parts
- Insertion of removable prosthesis
- Insertion of final prosthesis

TREATMENT PLAN

Considering his functional and esthetic requirements, a telescopic denture for the maxillary arch was planned for the patient. Maxillary right permanent central incisor, lateral incisor and canine were used as telescopic retainers. Conventional embrasure clasp was planned on maxillary right permanent first premolar, second premolar, and first and second molars. Intentional root canal treatments were performed on maxillary right permanent central incisor, lateral incisor and canine. Tooth preparation was done by preparing a shoulder finish line with a taper of approximately 6 degrees (Fig 3). Mesial occlusal rest seat were prepared on maxillary permanent first premolar and first molar. Distal occlusal rest seat were prepared on maxillary second premolar and second molar. Spoon shaped rests seats were prepared using no 6 round bur. Since preparations are usually entirely in enamel, anaesthesia was avoided. The preparation was at least 1.0 mm deep with a slightly deeper portion (0.5 mm) located toward the center of the preparation. The rest seats were flared more dramatically to the facial and lingual line angles to provide additional space for the retentive arms and minor connector.

After the mouth preparation in the maxillary arch, gingival retraction was done and a final impression was made with addition silicone using the putty wash technique. The first master model was prepared from the impression for fabrication of the primary copings. This was followed by making an interocclusal record using putting and a face bow transfer. The wax patterns were prepared for the primary copings on maxillary right permanent central incisor, lateral incisor and canine. The patterns were milled to obtain a frictional surface for retention and then cast in nickel chrome alloy. The primary copings were evaluated for fit (Fig 4) and the copings were luted with temporary cement [zinc oxide eugenol] and an over impression was made using the medium viscosity addition silicone impression material (Fig 5) and the second master model was made. This model was used for the fabrication of cast partial framework. Models with the copings were mounted on a semi-adjustable articulator using the same face bow record.

Copings on the second model were milled with a parellelometer. The second master model along with the primary copings was duplicated and the refractory model was prepared. The cast partial framework with the secondary coping was waxed up, which was then cast using a base metal alloy. The fit of the framework was evaluated intraorally (Fig 6). This framework was used as a carrier for cementing the primary copings.

Fig 1: Preoperative extraoral view

Fig 2: Preoperative intraoral view

Fig 3: Tooth preparation done for primary copings

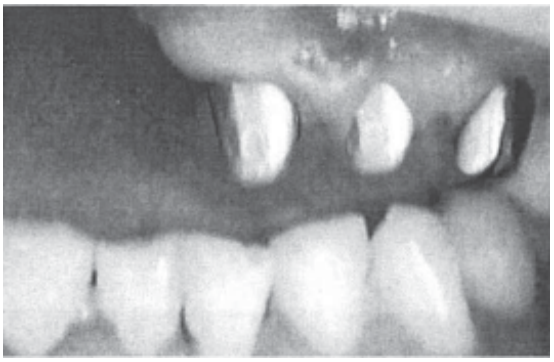

Fig 4: Primary copings evaluated for fit

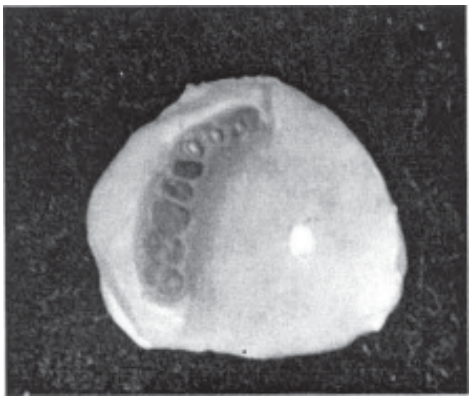

Fig 5: Elastomeric pick up impression

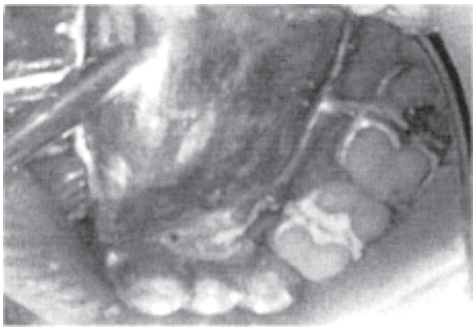

Fig 6: Evaluation of framework intraorally

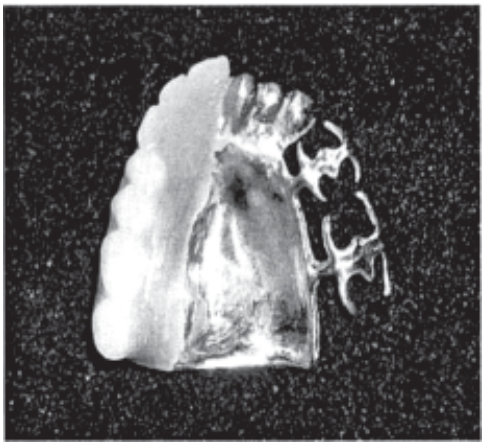

Fig 7: View of the telescopic prosthesis

Fig 8: Insertion of final prosthesis

The primary copings were evaluated for fit and the copings were luted with glass ionomer cement, as it's one among the most popular for luting metallic restorations and posts.[8] Occlusal rim was prepared on the framework and vertical dimension was established. Horizontal jaw relation was recorded and transferred to the articulator for the arrangement of artificial teeth. The trial denture was checked intraorally. Patients esthetics, function were verified followed by the processing of maxillary denture (Fig 8). The secondary copings were fabricated with SR Adoro [microfilled lab composite veneering system] and the final prosthesis was inserted. On delivery, the complex partial denture presented satisfactory occlusion, good retention and stability and the patient reported a feeling of comfort and satisfaction of his demands.

DISCUSSION

Oral restoration based on a combination of fixed removable partial dentures and involved with precision attachments and telescopic procedures represents one of the highest levels of functional and esthetic therapy.[9] Telescopic partial denture was chosen for the maxillary arch, because of its good retentive and stabilizing properties. The other treatment options included a conventional cast partial denture. This option was not taken under consideration due to lack of mucosal support. Implant supported prosthesis was another option, but was not opted because of the cost involved in the treatment plan. Retention, stability and support can be gained from the residual palatal structures and by engaging the defect appropriately. It is axiomatic that the prognosis improves with the availability of the teeth to assist with the retention, support and stability of the complex partial denture. It is essential that the basic principles of clasp design be followed, to allocate, neutralize or control the anticipated functional forces, so that each supporting or retaining element of the oral cavity could be used with maximum effectiveness without being stressed beyond its physiological limits.[1]

In the present situation, a total of three abutments and embrasure clasp were used to support the removable partial denture with the remaining teeth. RPD's must have sufficient supporting ability for proper occlusal rehabilitation. Support ability depends on the fit, size, shape, and location of the occlusal rest.[10] The occlusal rest seats were spoon shaped, to reduce laterally directed forces. Preparation of the double rest and channel going from the lingual to the buccal of the teeth needs to be deep enough for strength and not compromised by the opposing occlusion. In general, increased width and thickness are desirable over rounded or sharp line angles and excessive rest inclination should be avoided.[11]

Functional load is distributed as equally as possible to the remaining natural teeth, palate and any structures in the defect via a rigid major connector, thus a full palatal major connector was used along with embrasure clasp.[12] Moreover, placement of posterior clasps facing in both an anterior and posterior direction will aid in retaining both the anterior and posterior portions of the prosthesis. In addition, a broad square palatal form aids by providing a greater tissue bearing surface to resist the upward forces [occlusal] and a greater potential for tripodization to improve leverage.[12] According to Aramany[6] classification, the design for an class I situation involves taking support and retention from the teeth on the side of the arch, however one disadvantage with this design was single path of insertion, which was difficult to achieve. This modified design allows for a single path of insertion through telescopic attachments.

The alloys preferred for fabrication of copings were predominantly base alloys. Base metal alloys have been used for making partial denture frameworks, gradually replacing high gold-content alloy.[13] They dominate the market, because of the low cost of the metal, ease of casting, high yield strength and modulus of elasticity.[14] With the esthetic demand in mind, SR Adoro (Ivoclar Vivadent) was chosen. It is suitable for the fabrication of metal supported and metal free bridges. It exhibits the property of porcelains but eliminates the cost factor, processing time and technique sensitivity of porcelain. It also eliminates the technique sensitivity of composites and has better physical and optical properties.[15]

With telescopic dentures, the insertion and removal is much easier for the patient and thus improves the prognosis of the complex partial denture. This type of telescopic retainer provides guidance, support, and protection from dislodgement and it transfers bite forces along the long axis of the abutment teeth.[16]

CONCLUSION

The restoration of function and esthetics in the patients with gross defects of the oral cavity is a valuable and often dramatic service provided by the maxillofacial prosthodontist. Patient with maxillectomy demonstrate a unilateral defect, which is to be restored with prosthesis to aid in speech, esthetics and for normal function. Success of dental prosthesis is greatly dependent on its ability to withstand the various forces acting on it. The residual tissues of the defect area help in counteracting these displacing forces, in addition to the properly designed components of the prosthesis. Telescope crowns reduce the destructive horizontal and rotational occlusal forces by directing them more axially and less traumatically than other retainers. Depending on the amount and nature of the residual tissues, the retention and stability achieved in prosthesis could vary from optimum to maximum. In the present case, all the above ingenious methods have been utilized to its maximum, in restoring a partial maxillectomy defect. This improved retention and stability of the prosthesis will bring the patient many years of dental comfort and pleasure.

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