

Technique to Fabricate Transitional Partial Dentures for Patients with Few Remaining Teeth: Cu-Sil Dentures- A Case Report

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Abstract : Preservation Of Remaining Teeth Should Always Be The Paramount Concern For A Dentist, Than Meticulous Replacement Of The Missing Teeth, As Muller De Van Rightly Stated. Following This Indispensable Principle, It Is Feasible To Fabricate A Prosthesis, Which Leaves An Outlet Window For Remaining Natural Teeth To Emerge Out, Without Hampering The Suction Mediated Retention. One Such Novel And Equally Conservative Approach Is Cu Sil Denture. Cu Sil Serving As A Transitional Denture, Has Elastomeric Gasket To Embrace Around The Neck Of Natural Teeth. It Is An Easy And Affordable Treatment Option For Patients, Reluctant To Undergo Extraction Of Remaining Healthy Teeth. Here We Have Thereby Reported A Case Report Of A 63 Years Old Male Patient With Five Naturally Retained Teeth In The Maxillary Arch And Four In The Mandibular Arch, Rehabilitated With Cusil Transitional Dentures.

Keywords: Cu Sils, Silicone Soft Liners, Transitional Dentures, Proprioception.

I. Introduction

Partially edentulous patients who present with few remaining or functionally compromised teeth present a treatment challenge. Even if the teeth are free of caries and active periodontal disease; they may be too few, with unfavourable locations (e.g remaining teeth located on only one side of the arch) or compromised bone support that preclude their ability to offer any advantage in the form of stability, retention and support for a removable/fixed partial prosthesis. One of the most difficult decisions to make for the partially edentulous patient involves making the choice of extractions when no reasonable treatment available would reliably restore the existing dentition. In such cases where extractions are unavoidable, attempts should be made to form a smooth, uneventful transition to edentulousness. De Van has stated a number of physical, physiological and psychological reasons as to why a patient should not be permitted to be partially or completely edentulous for any length of time¹. He insightfully pointed out that just as Nature has injected the fourth dimension, the element of time into the development of the masticatory apparatus; likewise while planning the demolition of the dental arch it may be considered wise to employ the same element of time so that the awareness of 'toothlessness' is not forced into the inner consciousness of the patient¹.

Treatment options for such patients have ranged from simple treatments such as transitional dentures to overdentures /overlay partial dentures requiring significant tooth modification to the more invasive ones like extracting remaining teeth and replacing with conventional immediate dentures or implant supported fixed/removable prosthesis. Overdentures necessitate endodontics and added cost & time². Patient may not be willing or physically fit to undergo total extractions and have immediate dentures.

Staged approaches to establish implant supported fixed and removable prosthesis have been described for cases of terminal dentition^{3,4}. However, implants too may be restricted in their use for economic concerns and for a chronically ill patient unfit for surgical procedures.

The transitional prosthesis is a mainly tissue supported prosthesis. Retention is achieved primarily by adhesion and to a lesser degree by clasps. The neuromuscular mechanism tends to stabilize and retain the appliance during function⁵. Because of the interruption of the remaining natural teeth, the transitional denture unlike a complete denture cannot take advantage of a complete peripheral seal for achieving stability and retention. A relatively newer type of transitional dentures termed Cu-sil partial dentures, have circumvented this disadvantage by employing a design which is essentially a full denture with holes through which natural teeth protrude. These holes are surrounded by gasket of silicone rubber which hugs the natural teeth without destroying the suction which usually holds the denture in place.

This clinical report describes the use of maxillary and mandibular transitional partial dentures based on this design for a patient presenting with few remaining and periodontally compromised teeth in both jaws. The technique presented uses a chair-side acrylic based liner instead of a silicone liner.

II. Clinical Case Report

A 63 year old male patient, reported to the Prosthodontics and Crown & Bridge department, Government Dental College and Hospital, Ahmedabad for replacement of missing teeth. The patient had been partially edentulous since 2 years. Intraoral examination revealed Kennedy's Class II partially edentulous upper arch with 11, 12, 17, 21 and 22 as the remaining teeth; and Kennedy's Class I partially edentulous lower arch with 34, 37, 24, and 26 as the remaining teeth. All teeth were periodontally compromised but were not mobile. The mandibular right molar was tilted distally and advanced gingival recession was present in both premolars. The remaining teeth were unsuitable in terms of periodontal health, number and location for supporting a cast metal removable partial denture. The patient was adamant to deny for extractions or modify his teeth in terms of undergoing intentional root canal treatments for overdentures. A conventional transitional prosthesis would compromise the retention and stability of the prosthesis. Taking all the factors into consideration, it was planned to make upper and lower denture with holes for remaining teeth and complete the seal by incorporating a chair-side soft acrylic based liner, thereby settling for CUsil dentures as a more feasibly definitive treatment option for this case .



Fig 1. Preoperative frontal and intra oral views of upper and lower arches

III. Procedure



Fig 2: Preliminary Diagnostic Impression

- 1) Preliminary Impressions were made with irreversible hydrocolloid impression material (Alginate-Dentsply) and primary casts were obtained.



Fig 3: Final impression recorded using Pick up/dual impression technique

- 2) Custom trays were made with self cure acrylic resin. Border molding was performed with low fusing modeling impression compound (DPI green stick) and final impressions are made with light body elastomeric impression material (Dentsply). An over-impression was then made with alginate.

- 3) Master casts were obtained over which record based were fabricated and jaw relations were recorded.



Fig 4 : Face bow was subsequently done and centric relation was registered and mounted on semi adjustable articulator.

- 4) Teeth were arranged, try in was completed and wax-up was done to enclose the sulcus beyond the remaining teeth.



Fig 5: Try In showing occlusion on the right hand side, left hand side and frontal planes

- 5) A space of 4-5 mm around all teeth was left to be occupied later by the soft liner. The remaining teeth on cast were trimmed away and flasking was done. After de-waxing, packing and curing was done using heat-cured acrylic resin (LUCITONE). The converted dentures, which had windows in the region of abutment teeth, were finished and polished.



Fig 6: Converted finished polished complete dentures showing window like holes in the regions of natural abutment teeth

- 6) During the insertion appointment, the holes underneath the denture surface were scraped to create some space for soft liner application. A chair side acrylic based soft liner (Coe -Soft, GC SOFT LINER) was placed around the perforated windows and placed in patient's mouth and held in position. The denture was alternately inserted and removed until the soft liner shaped up in accordance with the adjacent tissues. The excess liner was then trimmed away with a scalpel. The patient was advised not to brush on the liner and clean it under cold tap water using wet cotton.



Fig 7: Space occurring between denture border and teeth soft tissues is taken up by soft liner and contoured in harmonious accordance with adjacent tissues.



Fig 8: Overhaul of patient's appearance and esthetics after application of soft tissue liner cushioning and splinting natural teeth.

- 7) At the recall appointment (after 7 days), the patient was comfortable and no adjustments were required. As the liner was acrylic based, the patient was recalled at intervals of 3 months to periodically replace the hardened liner. The patient is still successfully using the prosthesis after 2 years of denture delivery.

IV. Discussion

The case report describes a treatment modality for partially edentulous patient with few remaining teeth. It describes the use of an innovative technique for fabrication of transitional partial dentures based on the design for Cu-sil dentures.

The transitional dentures fabricated in this manner are conservative and effective, in they retain the natural teeth without destroying the peripheral seal. The main advantages of such a design have been cited based on these facts. Retaining natural teeth preserves the PDL (which maintains proprioception, naturally regulated jaw reflexes and neuro-muscular control), prevents residual ridge resorption, provides a psychological benefit and maintains the vertical bite. Although, the overdenture treatment also provides benefits of retaining natural teeth; it requires tooth modifications and extra armamentarium which proves both costlier and time consuming.

The soft liner hugs around the natural teeth completing the peripheral seal. It is well known that due to its viscoelastic properties, resilient liners provide a cushion like effect. They serve to distribute forces more evenly by absorbing energy⁶. Thus, the use of soft liner cushions and splints the remaining teeth which provide added stability. Moreover, it is also easy to manage a smooth transition to edentulousness. As teeth are lost, the existing prosthesis can be modified to replace them. It is thereby the simplest, gentlest way to postpone or eliminate total loss of mobile, isolated, elongated or periodontally involved teeth.

However, such transitional partial dentures can be used in select cases only. Its use in patients with too many teeth and/or those exhibiting unfavourable undercuts would hinder with its fabrication and placement. Creating too many holes to accommodate natural teeth would compromise the strength of the denture, especially the mandibular one. Severe undercuts like those surrounding some natural teeth would also warrant the use of a thin denture flange and a resultant weak denture, more prone to fracture. The use of soft liner necessitates frequent replacement, more so with acrylic based liner, and also making the oral hygiene maintenance more imperative due to incessant risk of superimposed fungal infection. Last, but not the least, in patient with retained maxillary anteriors and a high smile line, esthetic needs to be inadvertently compromised. Lip fullness due to the underlying flange can also result in such patients.

V. Conclusion

Cu-sil based designs of transitional partial dentures are an effective service for partially edentulous patients with a few remaining isolated and periodontally involved teeth. They provide for a retentive and a mechanically stable prosthesis that would otherwise be not attained using a conventional design. It also presents a convenient advantage for patients who do not want to undergo extractions or treatment with overdentures. This clinical report describes the steps to fabricate such prosthesis using an acrylic based soft liner. Its indications, advantages and disadvantages have also been discussed.

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