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Case Report

CU-SIL DENTURE AS A TRANSITIONAL PROSTHESIS TO PRESERVE THE REMAINING NATURAL TEETH USING PERMANENT SILICONE LINER

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KEYWORDS

Cu-sil denture, Mollosil, Permanent silicone liner, Soft liners, Transitional denture.

ABSTRACT

The goal of modern dentistry is to be conservative, preserving teeth but also maintaining the stability of the remaining alveolar ridge and the periodontium's proprioceptive capabilities. Cu-sil denture is the simplest approach in the preservation of teeth and maintaining proprioception. It is a type of transitional denture that provides an alternative treatment plan for the patients willing to replace their missing teeth while retaining their remaining natural teeth. It gives potential psychological benefits to the patients by avoiding extractions. It's a tissue-bearing acrylic appliance with a soft viscoelastic wrap that clasps the neck of each dentition, sealing out food and water simultaneously protecting and splinting each remaining tooth from the rigid acrylic denture base. This case reports series describes chairside techniques to fabricate Cu-sil dentures in the usual dental set-up.

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INTRODUCTION

M.M. Devan's golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" still rings true for cu-sil denture. Even though complete or partial denture are the most commonly used prosthetic treatment for edentulous patient it has certain consequences like psychological trauma, lack of stability and retention, residual ridge resorption, unsatisfactory aesthetic appearance, and compromised masticatory function.[1] The preservation of even a single sound tooth in the oral cavity can overcome all the disadvantages of the complete denture and can increases the stability of denture several times.

A Cu-sil denture is a newer type of transitional denture with holes by which remaining natural teeth emerge into the oral cavity through the denture.[2] It aids in the preservation of natural teeth, the regulation of normal jaw reflexes, and the psychological well-being of patients. When the remaining natural teeth are lost in the future, the Cu-sil denture will be modified to fill the missing space.

Cu-sil denture can be fabricated from conventional technique, injection moulding technique and digital technique (CAD/CAM and 3D printing). Soft liners (short and long term) are available used to lines the openings like polymethylmethacrylate, polyethylethcrylate (tissue conditioners), polyvinyl siloxane (silicone) providing a mechanical seal against food and fluid seepage. The elastomeric lining also provides cushioning effect and splints each natural tooth from the hard acrylic denture base.[3]

CASE I

An 81-year-old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in eating food due to missing upper and lower teeth for the past 6 months. The patient presented with four teeth remaining (14, 25, 26, 28, 37, 38, 45, and 47) in each arch, and all other teeth were extracted before 20 years. The remaining tooth are severely attrited but periodontally sound. The patient was a denture wearer for the past 10 years and got fractured after prolonged usage. Patient is diabetic and under medication for the same. On intraoral examination, well-formed maxillary ridge and slightly resorbed mandibular ridge. Since the patient is very old and debilitated, and also considering his socioeconomic status, the maxillary and mandibular Cu-sil denture was planned for the patient.

CASE TREATMENT

1. Maxillary and mandibular primary impression was made with irreversible hydrocolloid impression (Algitex Alginate Impression Material-Dental Product of India). The primary cast was obtained and the special tray was made with spacer wax and auto-polymerizing resin (DPI-RR cold cure; Dental Products of India) covering the remaining natural teeth. Border molding procedure was done with green stick impression compound (Pinnacle Tracing Sticks; Dental Products of India) and the final impression was made with light body addition silicone elastomeric impression material (Avuegum Light body; Dental Avenue). Plaster beading and boxing were done around the secondary impression and the master cast was made. On the master cast, a denture base with occlusal rim was made and jaw relation was done followed by the articulation of both upper and lower cast in which artificial acrylic teeth were arranged. Then the try-in, dewaxing and curing were done like the same as conventional methods and subsequently finishing and polishing of denture was done (Fig 1).

Figure 1: A. Primary impression B. Secondary impression C. Master cast D. Jaw relation E. Try in F. Final cured denture.

2. Prior to the insertion, clearance of 3-4 mm was created around the remaining teeth in the denture. The silicone tray adhesive was applied then the silicone-based long term soft liners (MOLLOSIL chairside soft relining) were placed intraorally around the remaining teeth. The denture was inserted in the patient's mouth and held in position until the material sets. After that, the denture was removed and excess material was trimmed. Finished and polished denture was inserted and evaluation for occlusion and any discomfort to patient. Post-insertion instructions were given to the patient same as conventional complete denture with additional instructions of chances of developing fungal growth on the soft-liner material was explained. Special care was taken regarding maintenance of excellent oral and denture hygiene, and the patient was recalled every 8-12 months for replacing the soft liner. The use of a denture cleanser with antimicrobial agents was recommended (Fig 2, 3).

CASE II

A 68-year-old female patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in chewing food due to missing teeth. The patient presented with four teeth remaining (17, 27, 34, and 44) and all other teeth were extracted. The patient was the denture wearer for past 5 years in which lower denture got fractured hence she wants new replacement. Patient had no medical history and not under any medication. On intraoral examination, well-formed maxillary and mandibular ridges. Considering the patient's economic status and age, the maxillary and mandibular cu-sil denture was planned.

Figure 2: Pre-insertion procedures A. Armamentarium required B. Silicone adhesive application C. Teeth clearance 3-4mm. D&E. Permanent silicone liner applied on teeth and denture placed in position. F. final prosthesis in-situ

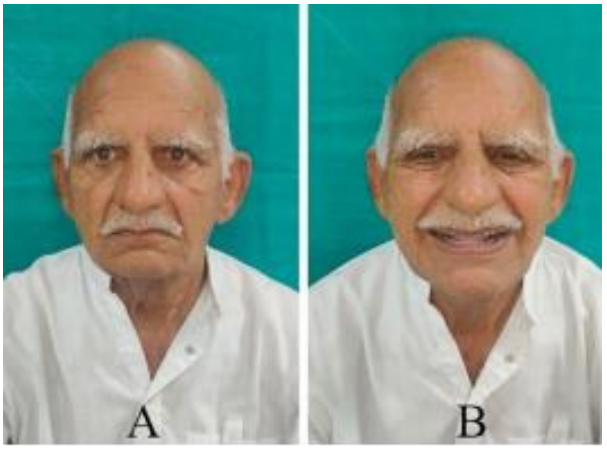

Figure 3: A. Pre-rehabilitative view B. Post-rehabilitative view

CASE TREATMENT

The similar procedure and materials were followed as case 1 (Fig 4, 5, 6).

Figure 4: A. Primary impression B. Secondary impression C. Master cast D. Jaw relation E. Try in F. Final cured denture

Figure 5: Pre rehabilitative procedures A. Armamentarium required B. Silicone adhesive application C. Teeth clearance 3-4mm. D&E. Permanent silicone liner applied on teeth and denture placed in position. F. Final prosthesis in-situ.

Figure 6: A. Pre-rehabilitative view B. Post-rehabilitative view

DISCUSSION

The goal of a Cu-sil denture is to create the prosthesis while preserving the remaining natural teeth. The remaining teeth, in addition to providing retention and stability to the denture, also helps to maintain proprioception.[4]

According to the case reports, both the patients were given the following treatment options: 1. Removable conventional partial dentures were ruled out because the patient reported impingement in the gingiva and buccal mucosa as a result of the clasp's presence, as well as clasp fracture, which leads to loose dentures, 2. Tooth/implant supported overdenture was ruled out due to increased endodontic treatment visits, time consumption, and cost, 3. Conventional complete dentures were ruled out because the patient is unwilling to have his or her remaining natural teeth extracted. Finally, with the patient's medical history in mind, a maxillary and mandibular Cu-sil denture was planned as a better treatment option.

Considering the patient socioeconomic status, Cu-sil denture was fabricated using heat cure polymethacrylate resin in conventional method. Since the short term liners are most commonly used, we tried polyvinyl siloxane long term permanent liner in this case reports in order to avoid frequent replacement and fungal infection.

The advantages of cu-sil dentures includes preserving the remaining few natural teeth and the alveolar bone, preserving the proprioception of the periodontium of the retained teeth, psychological benefit because the patient is not rendered completely edentulous, good retention and stability of the denture, avoids clasp thus aesthetically pleasing and good for patients who are allergic to metal, vertical dimension of the patient is maintained by the remaining natural teeth, time saving and easily prepared with routine steps as a chairside procedure.[5,6]

The disadvantages of a cu-sil denture are that the functional duration of the temporary soft liner is

short, necessitating frequent relining and replacement of the silicone soft liner, increased plaque accumulation because the gingival margin of the retained teeth is covered by the denture, and an increased risk of fungal growth infection.[7,8]

CONCLUSION

Cu-sil denture is the accepted and most viable treatment option to preserve the remaining tooth structures along with providing the best care to the patient. It is an excellent treatment modality in patients having a few retained natural teeth.[9] The permanent silicone liner act as a shock absorber and helps in easy path of insertion for the denture. The elastic gasket around the remaining teeth provides a healthy and stable fit.[10]

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