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Case Report

Cu-sil Denture: An Ingenious Way to Preserve Remaining Natural Teeth

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ABSTRACT

The patient's functional, aesthetic, and emotional needs are all negatively impacted by edentulism, which affects their oral health. Preserving the remaining natural teeth is currently the prime concern in dentistry. In India, there is an increasing need for prosthodontics that employ alternative approaches based on need. New methods for creating complete dentures have emerged as a result of patients' growing needs. Presence of few teeth in the oral cavity maintain the integrity of the alveolar ridge, improve proprioception, and assist the patient psychologically. For patients who wish to replace their lost teeth while keeping the few teeth they still have, a transitional denture offers an alternate course of treatment. A Cu-sil denture is a more recent kind of transitional denture that has perforations lined with a silicone rubber gasket. The holes thus providing space for remaining natural teeth to emerge into the oral cavity through the denture. Because of the reduced dental arches that cannot hold all of the teeth in the arch, pituitary dwarfism is a challenging condition to treat with prosthodontics. For physiological and psychological reasons, it is critical that these people obtain dental care. With two teeth still present in the mandibular arch, this case report describes the prosthodontic therapy of a patient with dwarfism using a Cu-Sil denture.

KEYWORDS: Cu-sil denture, Transitional denture, Microstomia, Dwarfism

INTRODUCTION

According to Muller De van, the preservation of what is left is more significant than the careful replacement of what is lost, which is why modern dentistry places a strong emphasis on maintaining oral tissues. Successful treatment is dependent upon the preservation of residual alveolar ridge. Complete denture wearing after complete tooth loss can have a number of negative effects, including as psychological stress, poor stability and retention, residual ridge resorption, diminished aesthetic appeal, impaired masticatory function, etc.The integrity of the alveolar ridge and the periodontium's proprioceptive capacity are maintained when the remaining natural teeth are kept in place[1,2,3].

Patients who have very few natural teeth left can now choose from a variety of treatment alternatives, including as overdentures, transitional dentures, immediate dentures after all remaining teeth have been extracted, or prosthesis supported by implants. Because of contraindications, the

necessity for antecedent care, the misalignment of the remaining teeth, the need for additional patient visits, and financial considerations, overdentures cannot be a solution in every one of these situations. Thus, transitional dentures serve as treatment option for many of such patients[2,3].

One type of transitional denture is the Cu-sil denture, which is used to preserve the few natural teeth that remain and for patients who do not want to have their remaining natural teeth extracted since it would negatively impact their psychological well-being. They are republicized largely as "transitional" dentures. It is a type of complete denture with holes allowing the remaining natural teeth to emerge through the denture. The peripheral seal is disrupted and the suction is broken when a tooth pokes through a hole. The holes are surrounded by the gasket of silicone rubber which clasps the neck of natural teeth, thereby cushioning and splinting each natural tooth from the hard acrylic denture base, allowing a natural suction to form beneath the denture, and keeping food and liquids out. No further laboratory processes or tooth preparation are needed for the production of a Cu-sil denture. If in future the remaining teeth are lost, then existing denture can be modified to occupy its missing place[2,4].

The pituitary is considered as the master gland of the body. Hypopituitarism is caused by compression of anterior pituitary gland or atrophy of the cells or defect in the hypothalamic control of hormonal secretion. The typical evidences in pituitary dwarfism are diminutive but well-proportioned body, fine silky sparse hair on the head and other hairy regions, wrinkled atrophic skin and often hypogonadism. Adult hypopituitarism is typically caused by "Simmonds disease," which is an infarction of the pituitary gland. It is characterized by loss of weight, diminished sexual function, and decreased basal metabolic rate. Changes in the face include thin eyebrows, loss of eyelashes, sharp features, thin lips and an immobile expression. There is decreased salivary flow which leads to increased caries activity and periodontal disease which is the main cause of teeth loss[5]. Here we are presenting a case report with management of pituitary dwarfism who exhibited with only two remaining natural teeth in mandibular arch.

Indications for the Cu-sil Denture

1. Any patient whose teeth are mobile, isolated, or periodontally problematic and whose immediate full denture appears to be their last option.
2. Fixed or other removable partial dentures are insufficient for treating a patient who does not require extraction of his remaining teeth.
3. A patient with few remaining teeth whose overall health or supporting bone indicates a bad outlook for complete dentures.
4. When a mandibular complete denture is to be placed in opposition to natural maxillary teeth[4].

Contraindications for the Cu-sil Denture

1. Patient who has too many remaining teeth.
2. Periodontally compromised patients with poor oral hygiene.
3. Patients whose remaining teeth exhibit unfavourable undercuts[6].

Advantages of Cu-sil Dentures

1. Chairside and laboratory methods demand less time, effort, and accuracy.
2. Vertical dimension is automatically maintained.
3. More affordable since endodontic therapy is not needed. Extraction costs are also reduced.
4. Previous bone loss is rejuvenated. Denture stability and retention are achieved even only one or two teeth are retained.
5. When a patient is not completely edentulous, proprioception is preserved, possible psychological effects are avoided, and less stress is experienced.
6. Eliminate clasps and preserve dentition. With an elastomeric gasket that promotes retention and keeps food out, they splint, cushion, and support teeth.
7. Prevents tooth wear, stress, and damage brought on by metal partials that induce torque[4].

CASE REPORT

A 52-year-old male patient reported to the Department of Prosthodontics, Darshan Dental College and Hospital, Udaipur. His chief complaint was masticatory insufficiency due to missing teeth. Dental history revealed that the missing teeth were extracted due to periodontal reasons. Medical history revealed that the patient has genetic dwarfism. On general examination, patient has small stature with proportioned body, height 3'5" and weight 33 Kg. The patient presented with only two teeth remaining (36 and 46) and all

other teeth were extracted before 1 year. 36 and 46 are periodontally sound (Figure1). Over denture was planned in the mandibular arch and conventional complete denture in maxillary arch. The patient was advised for root canal treatment in remaining two teeth but was not willing for any other procedures other than replacement of missing teeth. Later, treatment plan was modified from mandibular overdenture to mandibular Cu-sil denture as the patient was not willing for any further treatment for remaining two teeth. After case history and careful examination, Cu-sil denture with certain modifications in impression techniques was planned and denture was fabricated.

PROCEDURE

1. Primary impression of maxillary was recorded with medium fusing impression compound material (Y-Dents impression compound) using stainless steel non perforated edentulous zero sized stock tray and mandibular arch was recorded using irreversible hydrocolloid impression material (Orikam NEOALGIN) using stainless steel perforated edentulous zero sized stock tray [Figure 2a]. The stock trays for both the arches were modified due to microstomia.

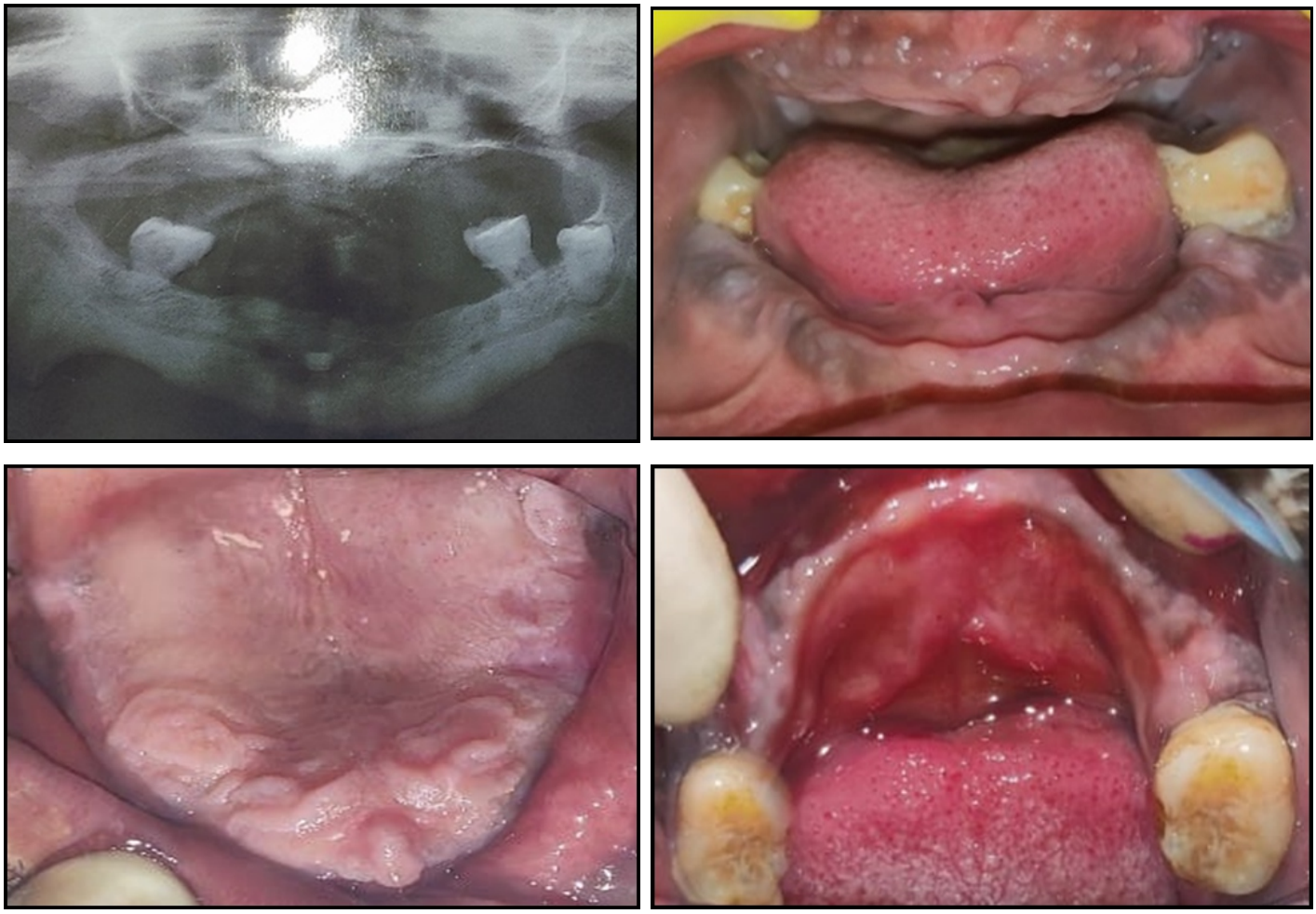

Figure 1: Pre-operative (a) orthopantogram; (b) intraoral view; (c) maxillary arch; (d) mandibular arch

2. The primary cast was poured in dental plaster for maxillary impression and dental stone for mandibular impression [Figure 2b]. The spacer wax was adapted on maxillary and mandibular primary cast. The special tray was fabricated using auto-polymerizing resin with sprinkle on technique.
3. Final impression was made by border moulding with low fusing impression compound (DPI Pinnacle green stick) and wash impression with zinc oxide eugenol impression material (DPI Impression paste) for maxillary arch and monophase impression material (Dentsply Aquasil Ultra) for mandibular arch [Figure 2c]. Master cast was poured in dental stone [Figure 2d].
4. Denture base was constructed and wax rim was prepared. Jaw relation and bite registration was recorded.
5. After the recording of maxillo-mandibular relationship, both casts were mounted on articulator. Artificial teeth arrangement was done with conventional manner and try in [Figure 3a] procedure was performed.
6. The patient's phonetics and aesthetics were evaluated. The wax up of the mandibular denture was done similar to a complete denture except for the holes corresponding to the remaining natural teeth.
7. Before dewaxing mechanical undercuts of the remaining natural teeth were examined with the help of a surveyor and blocked out using dental plaster.
8. The dentures were cured with heat-cure acrylic resin (DPI heat cure). Denture was retrieved consisting of holes in it for emergence of natural teeth and was finished and polished in usual manner [Figure 3b-d].
9. Silicon liner adhesive was applied to the surrounding acrylic neck area of the denture and allowed it to dry for 10 second and inserted in patients mouth [Figure 3c].
10. Silicon liner material (GC soft liner) consisting of base and catalyst was mixed and applied to the space area around the tooth cervical region of denture base, inserted in oral cavity and allowed to set for 3 minutes.
11. Denture with silicon rings was removedand immersed in water for 1 minute.
12. Post-operative instructions were given to patients about use of the denture, maintenance and hygiene [Figure 3e-f]. The use of denture cleanser with antimicrobial agents was recommended, as there were chances of fungal growth on the soft-liner material.

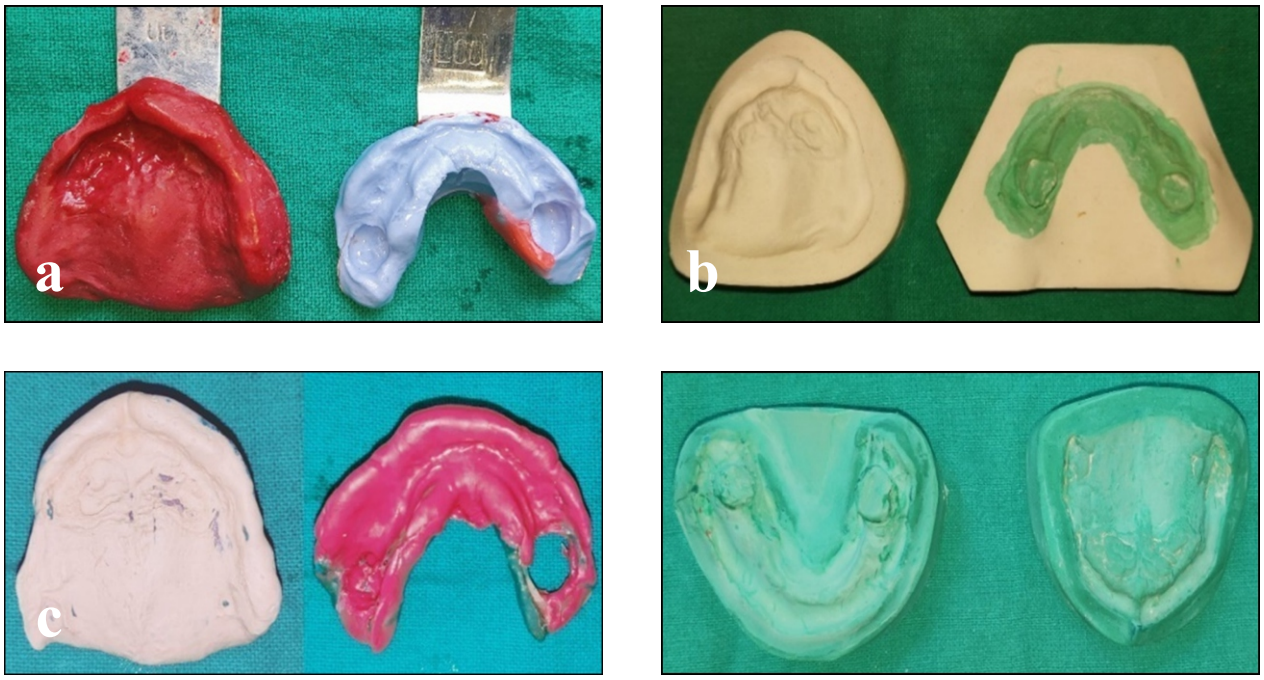

Figure 2: (a) Primary Impression; (b) Primary Cast; (c) Final Impression; (d) Master Cast

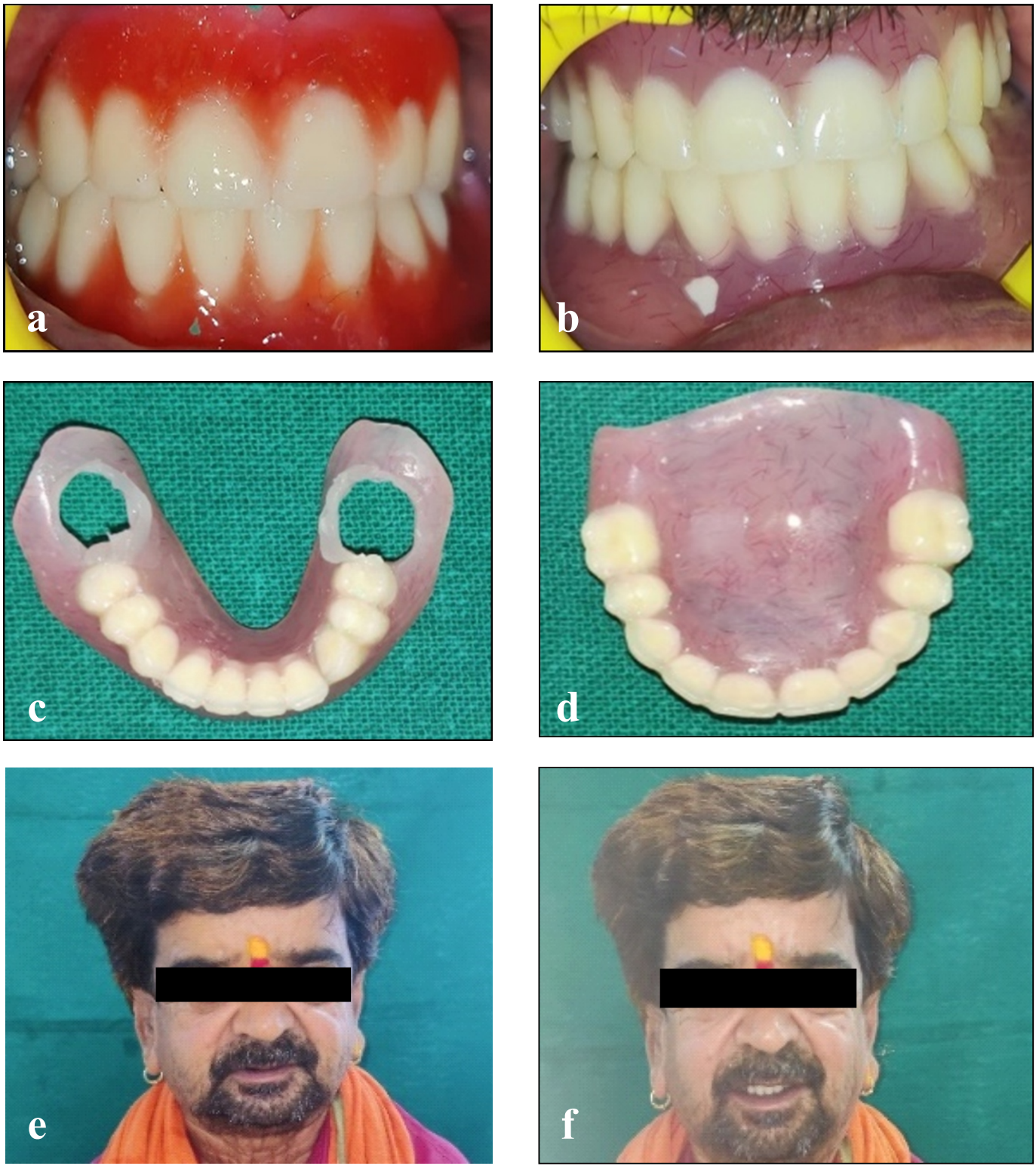

Figure 3: (a) Try In; (b) Denture Insertion; (c) Mandibular Denture with Silicon rings; (d) Maxillary Denture; (e) Pre-operative Frontal View; (f) Post-operative Frontal View

DISCUSSION

The field of prosthodontics focuses on the functional, aesthetic, and psychological rehabilitation of patients. Since total edentulism is a societal shame, patients who have few natural teeth left and a deteriorated periodontal condition suffer psychologically from having those teeth extracted. It was discovered that edentulism significantly affected residual ridge resorption by reducing the height and surface area of alveolar bone, which is necessary for the stability and retention of a full denture. Mandibular dentures in particular have more stability and retention issues than maxillary dentures[1]. Patient with dwarfism poses many difficulties for fabricating a denture due to microstomia and anatomical variations. It's hard to choose proper tray size and thus modified or custom trays are often needed. Gag reflex may be exaggerated in some individuals.

There are numerous alternatives for partially edentulous arches with few natural teeth left, including overdentures, immediate dentures, and transitional dentures. However, certain dental conditions, including as endodontic therapy and strict hygiene maintenance, are necessary for overdentures. Additionally, having multiple teeth extracted at once causes psychological stress for the patient who receives an instant denture. For patients who want to keep their remaining natural teeth, a transitional Cu-sil denture is a very promising option. The remaining teeth in the denture resist lateral displacement, and the elastomeric gasket of the soft liner firmly holds the teeth's neck in place. This creates a seal that allows food to flow over the denture and has a cushion-like effect that can more evenly distribute forces by absorbing energy[1].

It has the advantage of maintaining the patient's vertical dimension, proprioception, aesthetic demand (no metal clasp), and psychological stability. Among its disadvantages are the need for regular soft-liner material repairs and the build-up of plaque due to the complete covering of the tooth's cervical region. In order to replace the missing teeth, this denture can be adjusted to accommodate any future tooth loss.Patients with several evenly spaced natural teeth throughout the dental arch should not wear cu-sil dentures as this will make the appliance weak. They should be avoided in patients with bruxism, severe undercut areas and patient with high smile line[1,7].

CONCLUSION

Patient with pituitary dwarfism not only have difficulties in eating and speaking but can also sense that their appearance is different than others. In this instance, prosthodontic rehabilitation raised the patient's psychological well-being in addition to improving function and appearance. For patients who have very few teeth left, transitional dentures, such as Cu-sil dentures, offer an alternate course of treatment. It increases denture retention without requiring any attachment devices and while preserving the denture's existing vertical dimension. Cu-sil dentures aid in tooth preservation, maintaining the integrity of the alveolar ridge and the periodontium's proprioceptive ability, both of which benefit the patient's psychological state. One of the greatest therapeutic alternatives for preserving the remaining natural teeth in patients who do not choose to have their overdentures or remaining natural teeth extracted is a transitional denture, such as a Cu-sil denture.

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