CASE REPORT

Flexible Denture for Partially Edentulous Arches - A Case Report

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Abstract

Hard and soft tissue undercuts are frequently encountered in the fabrication of prosthesis in partially as well as completely edentulous arches. Though alteration of denture prosthesis, relining by flexible relining material will serve the purpose but the flexible denture base materials stands in superior position compared to other options. This article is an effort to review the various commercially available flexible denture base materials and highlights their indications and special instructions in wearing and maintenance of the same.

Key words: Flexible dentures, Undercuts, Acrylic clasps


Introduction

Unilateral or bilateral undercuts are frequently encountered and may complicate successful fabrication of denture prosthesis. Management of these situations conventionally includes alteration of the denture prosthesis bearing area, adaptation of the denture base, careful planning of the path of insertion and the use of resilient lining material. An alternative denture prosthesis design in which optimal flange height and thickness can be achieved is by using flexible denture base material. It is nylon based thermoplastic material that does not sacrifice function and preserves aesthetics. Soft dentures are an excellent alternative to traditional hard-fitted dentures.

Traditionally relining dentures with a soft base increases comfort at the cost of chewing efficiency. To make up for the loss of chewing efficiency, denture wearers would use dentures adhesive which causes its own problems. A flexible material is now an option that does not trade off the ability to eat.1

Flexible Dentures

Soft dentures are generally only used when traditional dentures cause discomfort to the patient that cannot be solved through relining. Soft dentures are not the same as a soft reline for traditional dentures. Soft relines use a soft putty-like substance to separate gums from the hard acrylic in dentures. Flexible dentures use a special flexible resin that prevents them from chafing the gums, allows the wearer to chew properly. It also
provides a soft base that prevents the gums from being rubbed raw. Some of the commercially available products are Valplast, Duraflex, Flexite, Proflex, Lucitone, Impak whereas valplast and lucitone are monomer free.

Advantages
Flexible dentures have got various advantages over the traditional rigid denture bases. Translucency of the material picks up underlying tissue tones, making it almost impossible to detect in the mouth. No clasping is visible on tooth surfaces (when used in manufacturing of clear clasps), improving aesthetics. The material is exceptionally strong and flexible. Free movement is allowed by the overall flexibility. Complete biocompatibility is achieved because the material is free of monomer and metal, these being the principle causes of allergic reactions in conventional denture materials. Clinicians are able to use areas of the ridge that would not be possible with conventional denture and partial techniques. Patient can wear appliances that would normally not be comfortable. Flexible dentures will not cause sore spots due to negative reaction to acrylic resins and will absorb small amounts of water to make the denture more soft tissue compatible. Flexible dentures may be used as an alternate treatment plan in rehabilitating the anomalies such as ectodermal dysplasia\textsuperscript{1,2,3}

Disadvantages
Flexible dentures generally not used for long-term restorations and is intended only for provisional or temporary applications. Flexible dentures tend to absorb the water content and will discolor often. Metal frame partial dentures remain the “standard” for long-term restorations. When grinding this prosthesis, proper ventilation, masks, and vacuum systems should be used and the procedure is technique sensitive. Extreme caution is necessary when processing to avoid skin contact with the heated sleeve, cartridge, furnace, heating bay, hot cartridge, injection insert, piston head adapter, hot flasks, and heat lamps\textsuperscript{3,4}

Indications
1. as a provisional in lieu of restorative temporaries or a standard acrylic partial
2. as obturators with maxillectomy procedures.
3. In single denture cases
4. The patient prefers not to use a fixed restoration
5. In challenging cases including pediatric patients, cancerous mouths or cleft palates.
6. Cosmetic veneers to mask gingival recession, splints & nesbits.
7. When protuberant bony formations restrict the insertion of an acrylic full denture
8. When the patient is allergic to acrylic
9. A patient with systemic sclerosis & microstomia

Case Report
A 45-year-old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in mastication. General physical examination was normal. Intraoral examination showed presence of teeth no. 11, 21, 22, 31, 32, 33, 34, 35, 36, 41, 42, 43, 44. The teeth were firm with severe attrition (Figs. 1).
Treatment plan

Partial maxillary and mandibular flexible denture was planned.

Procedure

Diagnostic casts were prepared using alginate impressions. Cast were mounted on surveyor and were analyzed on the basis of present undercut. The diagnostic cast were articulated in semi adjustable articulator using centric relation record and face bow transfer to evaluate inter arch space. During the following visit, treatment options were discussed with patient. After considering invasiveness, amount of time and financial aspect the patient elected to have flexible partial denture. After taking consent from the patient, he was sent for oral prophylaxis hygiene instruction and maintenance. 11,21,22,31,32,33,34,35,36,41,42, 43,44.

Impressions were made of both the arches. Primary impressions were made with alginate and primary casts were made and special tray prepared with self cure acrylic resin(fig 2). Definitive impressions were made using custom trays border moulding was done with low fusing compound & final impressions were made using polyvinyl siloxane light body material. Final casts were made. Maxillomandibular relationships were recorded with check bite method, centric relation was reconfirmed by nick and notch method. Definitive casts were mounted on semi – adjustable articulator. Shade selection was done and artificial acrylic resin teeth were arranged. Dentures were tried in patient’s mouth and after approval by patient dentures were processed in injection system. Dentures were finished, polished and inserted (Figs. 3). Occlusion was evaluated and adjusted, postoperative instructions on how to insert the prostheses and also was provided with instruction on adequate oral hygiene maintenance (fig 4). After minor adjustment during post insertion visits, the patient was placed on a 6 month recall.

Discussion

The concept of flexible resins is based on their inherent flexibility and ability to engage hard and soft tissue undercuts for retention. Therefore, for clinical cases such as Kennedy's Class I & II, which involve distal extension, the flexible dentures by engaging the severe soft tissue undercuts and clasping the adjacent teeth provides excellent retention. Flexible dentures absorb small amounts of water to make the denture more soft and tissue compatible. They will not warp or become brittle. These dentures stand aesthetically superior removable dentures with full functionality and comfort. Complete biocompatibility is also achieved because the material is free of monomer and metal, these being the principle causes of allergic reactions in conventional denture materials4.

Valplast

Valplast is a flexible denture base resin that is ideal for partial dentures and unilateral
restorations. The resin is a biocompatible nylon thermoplastic with unique physical and aesthetic properties that provides unlimited design versatility and eliminates the concern about acrylic allergies. The Valplast Flexible Partial allows the restoration to adapt to the constant movement and flexibility in your mouth. The flexibility, combined with strength and light weight, provides total comfort and great looks! The preparation is relatively simple. The Valplast partial is virtually invisible because there are no metal clasps and the material itself blends with the tissue in your mouth. While the cost is often higher than a partial made with visible metal clasps. The Valplast flexible partial involves only non-invasive procedures.

**Special instructions for valplast flexible denture wearer.**

Patients should Clean Valplast flexible dentures regularly. Patients should Soak Valplast dentures in water for 10-15 minutes a day, or overnight at least three times a week. Loose particles can be removed with the use of a sonic denture cleaner, or by placing the appliance under running water. Brushing a Valplast appliance is not recommended as this may remove the polish and roughen the surface over time.

**Sunflex**

Sunflex Partial Dentures are made from a strong biocompatible nylon thermoplastic, and are unbreakable, yet lightweight and translucent... which allows natural tissue to show through. The sunflex flexible denture base materials are virtually Invisible, Unbreakable, Metal-Free, Lightweight and incredibly Comfortable.

**Maxillary sunflex partial denture**

The sunflex flexible denture base materials are exclusively used in partially edentulous arches because of its versatile advantages. Some of the advantages includes are no need of metal clasps - only tissue-colored clasps that blend with natural teeth, these are more stain-resistant than other flexible acrylics, these dentures has the perfect degree of flexibility, these can be relined and repaired, these dentures will not warp or become brittle; these flexible dentures stands aesthetically superior removable partial with full functionality and comfort, these dentures are ideal for patients considering a removable partial and those who do not want metal clasps and these dentures are perfect for patients that are allergic to monomer.

**Conclusion**

Modern dentistry is showing inclination towards flexible material for removable partial dentures (RPDs) because it makes a better and stronger appliance. Flexible material reduces the chair side time, eliminates the invasive procedures and provides a prosthesis which is comparatively less bulky, more retentive, more esthetic and to a large extent clinically unbreakable. The fabrication of the optimum restoration is depending on the clinicians skills in selection of the type of the restorations which is required for the patient. The fabrication of prosthesis for the partially edentulous arches encountered a special challenge where many interferences, various path of placement, tilted teeth and deranged occlusion will complicate the treatment plan. Flexible dentures will stand in a superior position in fulfilling the various patients demand for more retentive and aesthetic treatment needs. Flexible dentures were elective treatment option.

**References**