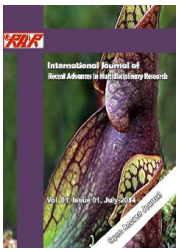

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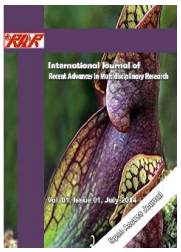

Case Report

FLEXIBLE DENTURE FOR PARTIALLY EDENTULOUS ARCHES - CASE REPORTS

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ABSTRACT

Conventional fixed partial dentures, implant supported Fixed Partial Dentures (FDPs) and removable partial dentures are the most common treatment modalities for the aesthetic and functional rehabilitation of partially edentulous patients. Hard and soft tissue undercuts are frequently encountered in the fabrication of prosthesis in partially as well as completely edentulous arches. Removable cast partial dentures are used as definitive removable prostheses when indicated, but location of clasps may affect aesthetics. So, when patient is concerned about aesthetics, flexible partial dentures which is aesthetically superior to flipper and cast partial dentures, may be considered. 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.

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 (Maurice, 1964; Parvizi, 2004)

Flexible Dentures

Soft dentures are generally 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.

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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. Some of the commercially available products are Valplast, Sunflex, Duraflex, Flexite, Proflex, Lucitone, Impak where as valplast, Sunflex and lucitone are monomer free.

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 the 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 mouth. While the cost is often higher than a partial made with visible metal clasps. The Valplast flexible partial involves only non-invasive procedures (Parvizi, 2004 and Stafford *et al*., 1986).

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. The sunflex flexible denture base materials 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 (Parvizi, 2004 and Yunus *et al*., 2005).

PRO-FLEX

Pro-flex is the flexible denture base material which can be used for Full and Partial Flexible Dentures. Pickett Dental Laboratory has been offering Pro-flex full and partial flexible dentures since 1998. Pro-flex denture material be indicated in some of the Anatomical considerations enables the material to effectively engage tooth and tissue undercuts. Also, Pro-flex is hypo-allergenic recommended for patients with known acrylic or metal sensitivities. Aesthetically the material is semi translucent, allowing the prosthetic to better blend with the colour of the natural gum tissue. With Pro-flex flexible partials, there are no metal clasps. Proflex full and partial flexible dentures are easily adjusted by the dentist. This material is tough, durable and dense, manufactured with thousands of pounds of pressure and vacuformed to fit the model perfectly. The final layer is a flexible resin composite that is firm enough to hold teeth under all occlusal loads, but flexible enough to allow delivery of the dental appliance without adjusting any undercuts. Simply warm the denture with running water to bring it up to body temperature before inserting it. Pro-flex partial and full dentures can be repaired, and the full dentures can be relined here at the laboratory with Pro-flex Soft Line material. Pro-flex flexible dentures are set up with the same quality teeth used in acrylic dentures and cast partials (Parvizi, 2004).

BIO DENTAPLAST

It is a semi-crystalline thermoplastic material with a linear structure characterized by high crystallinity. The material shows good physical and chemical properties such as increased hardness, tensile strength, and good dimensional stability. The material is opaque and prevents glare colour metal. Available shades A2, A3, B2, B3 (similar to vita shade) (Yunus *et al*., 2005 and Keenan *et al*., 2003).

Advantages of flexible dentures

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.

Disadvantages of flexible dentures

- 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.

Indications of flexible dentures

- As a provisional in lieu of restorative temporaries or a standard acrylic partial
- As obturators with maxillectomy procedures.
- In single denture cases.
- The patient prefers not to use a fixed restoration
- In challenging cases including pediatric patients, cancerous mouths or cleft palates.
- Cosmetic veneers to mask gingival recession, splints and nesbits.
- When protuberant bony formations restrict the insertion of an acrylic full denture
- When the patient is allergic to acrylic.
- A patient with systemic sclerosis and microstomia.

Contraindications of flexible dentures

- The fabrication of flexible partial dentures is contraindicated in patients with insufficient interarch space (< 4mm space for placement of teeth), prominent residual ridges where there is less space for placement of teeth.
- Flat flabby ridges with poor soft tissue support which require more rigid prosthesis.

Case Report I

A 55 year old female patient reported to the Department of Prosthodontics, with a chief complaint of multiple missing teeth.

The patient presented with partially edentulous arche with bilaterally missing posterior teeth in maxilla (Kennedy class III, Modification I) as shown in Fig .1. Some of the remaining teeth had carious lesions, cervical abrasions and carious exposures. Carious and cervically abraded teeth were restored and root canal treatment of carious, exposed teeth was done. Flexible partial denture was fabricated for replacing maxillary posterior teeth, because clasps placed on canines with flexible material are aesthetically good and more retentive because of their extensions into undercuts which present lateral to maxillary tuberosity. Fig. 2.3.

Figure 1. Kennedys class III modification I partial arc

Figure 2. Sunflex flexible partial denture

Figure 3. Insertion of flexible partial denture-frontal view

Case report 2

The second patient (35yrs male) presented with Multiple Maxillary anterior missing teeth (Kennedys class IV, modification I) Fig .2. He was very much apprehensive about the appearance of metal clasp and did not want any metal prosthesis in his mouth.

Figure 4. Kennedys class IV modification I partial arch

Figure 5. Fabrication of sunflex partial denture

Maxillary anterior missing teeth were restored with flexible partial dentures Fig. 4.5.6. And he was very much satisfied with aesthetics as well as with function of the prosthesis.

Figure 6. Insertion of flexible partial denture-frontal view

Figure 7. Kennedys class II modification I partial arch

Figure 8: Kennedys class IV partial arch

Figure 9. Insertion of sunflex partial dentures-occlusal and frontal view

Case report 3

The third patient (22yrs female) presented with multiple anterior missing teeth in both maxilla (Kennedys class II modification I) and mandible (Kennedys class IV). Her prime concern was esthetics and economic status, as she was not prepared to afford for fixed prosthesis. Fig. 7.8.9.

Procedure

- Diagnostic casts were prepared using alginate impressions.
- Cast were mounted on surveyor and were analyzed on the basis of present undercut.
- The diagnostic casts were articulated (semi adjustable articulator) using centric relation record and face bow transfer to evaluate inter arch space.
- Final Impressions were made using polyvinyl siloxane light body material of both the arches.
- In case of distal extensions cases Primary impressions were made with alginate and primary casts were made and special tray prepared with self cure acrylic resin. Definitive impressions were made using custom trays border moulding was done with low fusing compound and final impressions were made using polyvinylsiloxane light body material.
- Final casts were made with Type III dental stone
- Maxillomandibular relationships were recorded with check bite 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. Occlusion was evaluated and adjusted.
- Posto perative instructions on how to insert the prostheses and with instruction on adequate oral hygiene maintenance.

The two years follow up of all the three patients showed mild yellow staining of the prostheses due to improper care of the prostheses.

DISCUSSION

Removable partial denture is commonly used for treating the patients who are not good candidates for conventional fixed partial dentures and implant supported prosthesis. These prostheses can be fabricated from metal alloy, acrylic resin and thermoplastic resins. The removable cast partial denture is a definitive prosthesis which has been in use in dental profession since decades for rehabilitation of partially edentulous patients. It consists of a metal base (made up of base metal alloys, commonly with cobalt-chromium alloy), with acrylic teeth attached to it. Metal retentive clasp holds the cast partial denture in place. The metallic appearances of the clasp may be restrictive, treating the patient who are very much concerned about the aesthetics. When maxillary posterior teeth are missing and only anterior teeth are present, placement of metallic clasps on canines may not be acceptable to few patients (Naylor *et al*., 1983). The second type of removable partial denture is all acrylic resin prosthesis, which is also known as temporary, interim removable partial denture or a ''FLIPPER''. It acts as a space maintainer and is usually used to restore the function during the treatment until the definitive prosthesis is fabricated.

Flexible denture material is available in the form of granules in cartridges of varying sizes. It was first introduced by the name of valplast and flexiplast to dentistry in 1956. These are superpolyamides which belong to nylon family. Nylon is a resin derived from dicarboxylic acid, diamine, amino acid and lactams. Injection-molding technique is used for fabrication of flexible denture base prosthesis. The prosthesis fabricated from these materials requires minimum /no mouth preparation, it provides a good retention, it is comfortable for patient (thin and lightweight), it is resistant to fractures and is aesthetically good because translucent and pink shade matches that of natural tissues. Acrylic resin teeth do not bond chemically with flexible denture base resin. They are mechanically retained by making T shaped holes into which denture base resin flows to retain teeth mechanically.

The clasps of flexible removable partial dentures are extensions of denture base into undercut areas, which can be adjusted by dipping the clasp area in boiling water and then bending with the plier in or out to increase or decrease the retention. Flexible prosthesis is difficult to reline and rebase with soft tissue denture liners, acrylic resin and even with the other flexible denture base materials. It is difficult to repair and is prone to staining by various ingredients of food, tea and coffee if it is not polished properly and cleaned by the patient regularly. The patient should be instructed to practice good oral hygiene and clean prosthesis regularly after every meal, in order to maintain appearance and cleanliness of the prosthesis. The prosthesis should be removed during the brushing of the natural teeth, to

avoid the scratching of the prosthesis (Naylor *et al*., 1983; Antonelli and Hottel, 2001 and Lowe, 2004).

Conclusion

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 partial dentures can be a good option for the replacement of missing teeth when patient is concerned about aesthetics. Flexible dentures will stand in a superior position in fulfilling the various patients demand for more retentive and aesthetic treatment needs, but the proper care of prosthesis is required, in order to minimize the staining of the prosthesis, which otherwise affects the aesthetics of the prosthesis later on. Flexible dentures were previously selected by few patients and the clinician but now a days it has become an elective treatment option.

REFERENCES

Antonelli, J.R. and Hottel, T.L 2001. The "flexible augmented flange technique" for fabricating complete denture record bases. Quintessence Int. May; 32(5):361-4.

Keenan, P.L., Radford, D.R. and Clark, R.K. 2003. Dimensional change in complete dentures fabricated by injection molding and microwave processing. *J. Prosthet. Dent.,* Jan; 89(1):37-4.

Lowe, L.G. 2004. Flexible denture flanges for patients exhibiting undercut tuberosities and reduced width of the buccal vestibule: a clinical report. *J. Prosthet Dent*., Aug; 92(2):12831.

Maurice, N., Stern, 1964. Valplast flexible partial dentures. *New York State Journal.* Feb. 30: 123 -36.

Naylor, W.P. and Manor, R.C. 1983. Fabrication of a flexible prosthesis for the edentulous scleroderma patient with microstomia. *J. Prosthet Dent.,* Oct; 50(4):536-8.

Parvizi, A. *et al*. 2004. Comparison of dimensional accuracy of injection-molded denture base materials to that of conventional pressure-pack acrylic resin. *J. Prosthodont.,* 13:83-9

Stafford, G.D., Hugget, T.R., Macgrego, R.A.R. and Graham, J. 1986. The use of nylon as denture base material. *Journal of Dentistry,* 14: 18–22.

Yunus, N., Rashid, A.A., Azmi, L.L. and Abu Hassan, M.I. 2005. Some flexural. Properties of a nylon denture base polymer. *J Oral Rehabil,* 32:65-71.

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