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FLEXIBLE DENTURES IN PROSTHODONTICS

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ABSTRACT:

There is evidence that Dentistry was practised as far back as3000 B.C. in Egypt. Dentures are believed to be the mode oftreatment for replacing missing teeth around 700 BC.Thereafter, a process began towards improvement in the qualityof materials used for fabricating dentures, as the patientsdemanded better aesthetics, function and comfort. This reviewtracks the history of flexible materials used as a denture baseto the present stage and point towards the research anddevelopment in the future. Hard and soft tissue undercuts arefrequently encountered in the fabrication of prosthesis inpartially as well as complete edentulous arches. This article isan effort to review the various commercially available flexibledenture base materials and highlights their indications andspecial instructions in wearing and maintenance of the same.

Keywords: Flexible dentures, undercuts, Acrylic clasps, Fibrereinforced resin.

INTRODUCTION

Flexible dentures are custom-made dental installations that rely on unique products to achieve a less rigid design. These new kinds of dentures are popular for those who struggle with the conventional acrylic base of dentures that may wear, irritate the gums, induce allergic reactions or generally fail to provide acomfortable result. Dentists and their patients are often interested in what these newer and more versatile products can do to better outfit those with a history of tooth decay (Fig. 1 and 2) or who need dental prosthesis to function or who want to avoid the discomfort due to the rigidity of the denture base.

Fexible denture base material (softdentures)

Polymerization shrinkage encountered inconventionally cured Poly(methyl methacrylate) ledto the development of a special injection-moldingtechnique. Initially developed as a Fluoropolymer(1962), Acetal began to be used in 1971. The materialused nowadays is Nylon based plastic (Polyamide).Elastomeric resins can be added to resin polymerformulas to create greater flexibility and can bestrengthened with glass fibres.1 Unique features-thesemi-crystalline nylon composition providesstrength, flexibility, transparency, high impactresistance, colour stability, high creep resistance,high fatigue endurance, excellent wearcharacteristics, good solvent resistance, no porosity,no biological material build up or odours or stains,low water sorption and good dimensional stability,monomer and metal free and the microcrystallinestructure is easy to finish and polish like acrylic.

An alternative denture prosthesis design in which optimal flange height and thickness can beachieved is by using flexible denture base material.2Soft dentures are an excellent alternative totraditional hard-fitted dentures. Traditionallyrelining dentures with a soft base increases comfortat the cost of chewing efficiency. To make up for theloss of chewing efficiency, denture wearers woulduse denture adhesive, which has its own problems.

Advantages:

Flexible dentures have got various advantages over the traditional rigid denture bases.Translucency of the material picks up underlyingtissue tones, making it almost impossible to detectin the mouth. No clasping is visible on tooth surfaces(when used in manufacturing of clear clasps)improving aesthetics. The material is exceptionallystrong and flexible. Free movement is allowed bythe overall flexibility. Complete biocompatibility isachieved because the material is free of monomerand metal, these being the principle causes ofallergic reactions in conventional denture andpartial techniques. Flexible dentures will not causesore spots as seen with rigid acrylic resins. Flexibledentures may be used as an alternative treatmentplan in rehabilitating the anomalies such asEctodermal dysplasia.
It is nearly unbreakable, pink coloured like thegums, can be built quite thin, and can form both thedenture base and the clasps as well. The clasps arebuilt to curl around the necks of the teeth and theyare practically indistinguishable from the gums thatnormally surround the teeth due to its Opalescence.This type of partial denture is extremely stable andretentive, and the elasticity of the flexible plasticclasps keeps them that way indefinitely. It hassuperior aesthetics, no metallic taste and is nonallergic. Free movement is allowed by the overallflexibility and can, therefore, be referred to as “abuilt in stress breaker”. Long term health of tissuesand teeth is maintained due to their gentlemassaging action without adversely loadingabutments.

Disadvantages:

Extreme caution is necessary when processingto avoid skin contact with the heated sleeve,cartridge, furnace, heating bay, hot cartridge,injection insert, piston head adapter, hot flasks andheat lamps. They do discolour due to sorption.
Indications:
Full dentures, partial dentures, Bases andrelines, in cases with bilateral in-operable undercutswhen pre-prosthetic surgery is contraindicated.
Special applications- for TMJ splints, for the
patients allergic to acrylic monomers, as cosmetic veneers/gum veneers to mask gingival recession(Fig. 3), in periodontally involved teeth, sensitiveteeth, cancerous mouths or other conditions in whichthe teeth are compromised, treatments involvinghigh torus or cleft palate conditions, as mouthguards in sports, Bruxisum splints/ Night guards,Bite splints, Space maintainer, Paediatric cases,Obturators, Speech therapy appliances andorthodontic retainers.4
The Flexible dentures in combination with castpartial framework:

Advantages:

This combination eliminates most of thedifficulty of recurrent sore spots, since theframework resists movement and pressure from theclasps, while having the benefit of nearly invisible,gum coloured clasps (Fig. 4 and 5). It also has theadvantage of being tooth supported.

Disadvantages:

Flexibility is not an advantage where there areno undercuts in a complete denture situation, as theretentive peripheral seal can be broken in function.It is difficult to use with less inter-ridge space, asbulk of the tooth is needed for mechanical retention.

Insertion:

Denture is placed in very hot water (150 degreeF) for a minute prior to insertion and allowed tocool to tolerable temperature. This makes the partialas flexible as it would be at body temperature.Grinding is done as a last resort at a low speed ofaround 250-300 rpm using green stones.

Pro-flex: Pro-flex is the flexible denture base material which can be used for Full & Partial flexible denture. Pickett Dental Laboratory has been offering pro-flex full and partial flexible dentures since 1998. Proflex is easy to work with the quality, aesthetics and most importantly the final results. Pro-flex denture material may be indicated in some of the anatomical considerations where tooth and tissue undercuts are a hindrance. It enables the material to effectively engage those undercuts. Also pro-flex being hypoallergenic is 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 nometal clasps. Pro-flex full and partial flexible dentures are easily adjusted by the dentist.

Valplast: Valplast is a flexible denture base resin that isideal for partial dentures and unilateralrestorations. The resin is a biocompatible nylonthermoplastic with unique physical and aestheticproperties that provides unlimited design versatilityand eliminates the concern about acrylic allergies.The valplast flexible partial allows the restorationto adapt to the constant movement and flexibilityin the mouth (Fig. 6,7,8 and 9). The flexibilitycombined with the strength and light weight,provides total comfort and great looks. The valplastpartial is virtually invisible because there are nometal clasps and the material itself blends with thetissue in the mouth. Valplast flexible dentures canbe indicated in case of patients who have acrylicallergies, history of partial frame breakage,alternative to implants or fixed prosthesis andpresence of tori.

Sunflex:

The sunflex flexible denture base materials arevirtually invisible, unbreakable, metal-free, lightweight and incredibly comfortable. They are madefrom a strong biocompatible nylon thermoplasticmaterial.

Advantages:

The sunflex flexible denture base materials areexclusively used in partially edentulous archesbecause of its versatile advantages such as-

- No need of metal clasps-only tissue coloredclasps that blend with natural teeth
- More stain-resistant than other flexible acrylics
- Has the perfect degree of flexibility
- Can be relined and repaired
- Will not warp or become brittle
- Stands aesthetically superior removable partialwith full functionality and comfort
- Ideal for patients considering a removablepartial and those who do not want metal clasps
- Are perfect for patients who are allergic tomonomer.

Unbreakable Flexite Plus Dentures:

The biggest advantage of this sort of denturesis that unlike the hybrid dentures, they areunbreakable (Fig. 10 and 11) like the former fullyflexible denture systems. Like their fully flexiblepredecessors, they also donot have the unsightlyclasps seen in chrome dentures. Flexite Plus is pinkin colour. Flexite Plus plates are not flexible. Thismakes them capable of supporting chewing forcesin long-span dentures. Another possibility withFlexite Plus is the very tiny sectional denture (Fig.12 and 13). Without the plate covering the entireroof of the mouth, these dentures tend to be morecomfortable.

Below is another example of a Flexite Plusdenture. It is a sectional prosthesis that showsremarkably good retention and stability. This wasonly a temporary denture which the patient used while the patient waited for the implant to integrate.No prosthesis beats an implant restoration in termsof function.

Flexible dentures help the patients to avoidsome kind of pain associated with the old styledenture models. A flexible resin coating allows for acustom fit, with hard synthetic teeth still imbeddedin the design to help with chewing food. Flexibledentures help achieve greater stability and comfort.Those who have found, for example, that even thesimple back and forth action of chewing causes gumpain with traditional dentures may be able to findrelief in new and more precise fitting flexiblevarieties of denture products.
In addition to these benefits, flexible denturesare also designed to be porous and to “breathe” betterthan some other kinds of dentures. This helpsprevent the build up of bacteria on the dentures andis another reason that these innovative dentureproducts are so popular.

CONCLUSION

The fabrication of the optimum restoration isdepending on the clinician’s skill in selection of thetype of the restorations which is required for thepatient. The fabrication of prosthesis for thepartially edentulous arches encountered a specialchallenge where many interferences, various pathof placement, tilted teeth and deranged occlusionwill complicate the treatment plan. Flexibledentures will stand in a superior position in fulfillingthe various patients demand for more retentive andaesthetic treatment needs. Flexible dentures werepreviously selected by few patients and the clinicianbut nowadays it has become an elective treatmentoption. No more ugly metal wires. No more brokendenture.

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