



CASE REPORT

A SIMPLE EFFECTIVE FLEXIBLE PARTIAL DENTURE FOR KENNEDY'S CLASS II MODIFICATION I IN MAXILLARY ARCH AND CLASS I MODIFICATION I IN MANDIBULAR ARCH - A CASE REPORT

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ABSTRACT

Partially edentulous patients with challenging conditions like abused ridges, allergy to denture resins, undercuts due to angulated remaining teeth, cancerous lesions and cleft palate pose a great challenge for the fabrication of a successful removable partial denture. In such cases flexible dentures offer a comfortable and affordable option. It was a long thought that removable partial dentures had to be rigid but with innovation of flexible dentures, flexibility combined with strength and light weight provides total comfort and great looks. This article is an effort to review the various commercially available flexible denture base materials, a case presentation and highlights the indications and special instructions in wearing and maintenance of the same.

INTRODUCTION

Modern dentistry offers many options for the restoration of partially edentulous mouth, like removable partial dentures (RPD), fixed bridges and dental implants. Many patients choose removable partial dentures due to factors ranging from cost to physiology. But, nowadays soft dentures are an excellent alternative to traditional hard-fitted dentures due to several advantages (Ashish, R. Jain, 2015). Today, more dentists are advising flexible partial dentures because they make better and stronger appliances that are comfortable and long lasting. While the cost is often higher than a partial made with visible metal clasp, the results are beautiful and patient satisfaction is high. Flexible partial denture involves only non-invasive procedures and gives patient confidence in their restoration while talking, eating and most importantly smiling.

A few words about flexible partial denture

Flexible denture offers a simpler and cost effective treatment for the oral rehabilitation. As flexible denture is a tissue supported denture, it does not require any other metallic components like rests, direct/indirect retention for added retention (Kaira *et al.*, 2012). This makes it non-invasive procedure, less time consumption for fabrication, virtually invisible and also provides optimal retention. It is also very thin and light weight. Economically it is affordable.

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The clinical procedures are simple not requiring any expertise. A cast model prepared from a conventional alginate impression is sent to the laboratory that fabricates the desired prosthesis.

A review of an history

The introduction of Flexible Partial Dentures dated back to the late 1940s. Two young brothers, Arpad and Tibor Nagy, had the vision to experiment with the new polymers of the day (nylon) to create a type of partial denture that was able to address the fundamental requirements of retention, support and stability, at the same time it provides beautiful aesthetics that was far superior to their metal counterparts. Their research gave birth to what is known today as Valplast – a Flexible denture material. The product was introduced in order to improve upon both the aesthetic and functional limitations of conventional removable partial denture. Currently, some of the commercially available products are Valplast, Sunflex, Duraflex, Flexite, Proflex, Lucitone, Impak where as valplast, sunflex and lucitone are monomer free.

Advantages of Flexible Dentures:

- The strong and flexible nature of the material is perfectly suited to the variety of natural conditions in the mouth, simplifying design and enabling the flexible nylon resin to act as a built-in stress-breaker in order to provide superior function and stress distribution in a removable partial denture.

- The flexible base eliminates the need of an occlusal rest since the stress distribution is naturally in balance (Shah Naisargi, 2010).
- 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 making it more superior in aesthetics (Ashish, R. Jain, 2015).
- In case of flexible dentures, 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.
- Flexible dentures use a special flexible resin that prevents them from frictional wearing of gums and allows the wearer to chew properly.
- It also provides a soft base that prevents the gums from being rubbed.
- In cases of undercut due to tilted teeth, flexibility of the material makes it possible to insert the prosthesis over the angulated teeth.
- 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.
- Ease of insertion in the mouth with alveolar undercuts because of the flexibility.

Disadvantages of Flexible dentures

- Being a plastic material, it cannot be made into thin sections like metal. It is likely to break if cut thin sections.
- Since flexible dentures utilize the gaps (because of some missing teeth) for the 'Retento-Grip Tissue-bearing Technique' for retention, the remaining teeth have to be in fairly good periodontal health.
- Flexible dentures tend to absorb the water content and will discolor often.
- Requires special instruments (knives and polishing kit) to make the adjustment (Shah Naisargi).
- A Flexible denture is very hard to repair if fractured. No additions can be made onto it. In such cases, rebasing is recommended (Shah Naisargi).
- Fungal growth has been found around the restoration in few cases.

Indications of Flexible dentures:

- All cases of conventional partial denture indications and also the areas where conventional partials are limited or contraindicated.
- Because of its excellent biocompatibility, it is also an ideal replacement for acrylic when patients are allergic to denture acrylics (since monomer free).
- Flexible partials could be a treatment of choice in cases of patients having a history of repeated partial denture frame breakage (Shah Naisargi).
- Flexible Partial dentures are ideal for people in high-risk situations like,
 - Athletes
 - Police and Firefighters

- Military Personnel
- Prisoners and Prison Officers
- Any person who might be exposed to physical (Shah Naisargi)
- Cosmetic veneers to mask gingival recession, splints and nesbits (Ashish, R. Jain, 2015).
- Obturators with maxillectomy procedures.
- A patient with systemic sclerosis and microstomia (Thakral, 2012).

Contraindications of Flexible dentures

- Contraindications include patients who simply should not or would not wear any type of removable appliance.
- Deep overbites (4mm or more) where anterior teeth can be dislodged in excursive movements.
- Little remaining dentition with minimal undercuts for retention.
- Where there is less than 4 mm of inter-occlusal space in the posterior area.
- Bilateral free-end distal extensions with knifeedge ridges or lingual tori in the mandible.
- Bilateral free-end distal extension on maxilla with extremely atrophied alveolar ridges.

Sunflex flexible dentures

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 (Naylor and Manor, 1983). 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 stand 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).



Fig: 1.a. Kennedy's Class II, Modification area 1 - Maxilla

A Case Report

A 74 year old male patient reported to the Department of Prosthodontics, Tagore Dental College and Hospital, Chennai, India, with a chief complaint of multiple missing teeth. General physical examination was normal. Intraoral

examination revealed presence of teeth no. 11,12,13,21, 26, 33,34,35,44,45. The teeth were firm with severe attrition. The patient presented with partially edentulous arches showing unilaterally missing posteriors (Kennedy's class II, Modification I) in maxilla (Fig: 1.a) and bilaterally missing posteriors (Kennedy's class I, Modification I) in mandible (Fig: 1.b).



Fig: 1.b. Kennedy's Class I, Modification area 1 - Mandible

Treatment plan

On considering the age, severity of attrition, periodontal status and majorly aesthetics (as there is involvement of missing anteriors) of the patient, Partial maxillary and mandibular flexible denture was planned. Patient was given a clear explanation about the treatment plan, amount of time and cost of flexible dentures and consent was taken to continue the treatment.

Procedure

- Diagnostic casts were prepared using alginate impressions.
- Impressions were made of both the arches and primary casts were made using die stone.
- 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 recordface bow transfer to evaluate inter arch space.
- As it is a distal extensions case, 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 and final impressions were made using polyvinylsiloxane light body material.
- Final casts were made with Type III dental stone.
- Maxillo-mandibular relationships were recorded with check bite method using normal modeling wax.
- Definitive casts were mounted on semi adjustable articulator.
- Shade selection was done and artificial acrylic resin teeth were arranged as in conventional techniques.
- Dentures were tried in patient's mouth and after approval by patient dentures were processed in injection system.
- Dentures were finished, polished (Fig: 3.a & 3.b) and inserted. Occlusion was evaluated and adjusted (Fig: 4.a & 4.b).



Fig. 2. Special tray done for flexible denture - Maxilla and Mandible



Fig. 3.a. Sunflex Flexible partial denture - Maxilla



Fig: 3.b - Sunflex Flexible Partial Denture - Mandible



Fig: 4.a. Inserted Flexible denture - Frontal view



Fig. 4.b. Inserted flexible denture - Lateral views

Post operative instructions

Patient was instructed to clean his appliance regularly. He was instructed to soak the appliance in water for 10-15 minutes a day or overnight at least 3 times a week in the commercial denture cleanser. All the loose particles on the denture are removed by placing it under running water. If possible, rinse the appliance after eating to remove any food particles. He was also instructed to keep the denture in water or in denture cleaner whenever it is not been worn to keep the surface hydrated. Brushing a Sunflex appliance is not recommended as this may remove the polish and roughen the surface over time.

DISCUSSION

It was long thought that removable partial dentures had to be rigid to be effective, but the innovation of flexible partials allows the restoration to adapt to the constant movements and flexibility (adjustability) in the mouth⁽²⁾. The concept of flexible resins is based on their inherent flexibility and ability to engage hard and soft tissue undercuts for retention⁽¹⁾. Therefore, for clinical cases such as Kennedy's Class I and 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⁽¹⁾. Flexible denture material is available in the form of granules in cartridges of varying sizes.

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⁽⁵⁾. Because of the flexibility, combined with strength and light weight, and relatively simple and non-invasive preparations, flexible dentures are really provided with total comfort and great looks.

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. So, with the improvisations in the working techniques, adjustments and repair potential of the material, Flexible partials became a simpler answer to complex partially edentulous oral conditions. Also, 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 essential to last longer.

REFERENCES

- Ashish.R.Jain, 2015. Flexible denture for partially edentulous arches-Case reports: International journal of recent advances in multidisciplinary research: january, vol. 02, issue 01, pp.0182-0186.
- Kaira, L.S., Dayakara, H.R. and Singh, R. 2012. Flexible Denture for Partially Edentulous Arches - A Case Report. *www.journalofdentofacialsciences.com*, 1(2): 39-42).
- 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.
- Shah Naisargi, MDS, Deshpande Rajendra MDS, JingadeRanganath Rao, MDS, Maniyar Harsh, BDS. Management of a Partially Edentulous Patient with Bilateral Mandibular Tori -A Case Report. *International Journal Of Dental Clinics*, 2 (1):48-51
- Thakral, G.K. HimanshuAeran, Bhupinder Yadav, *RashmiThakral: Flexible Partial Dentures - A hope for the Challenged Mouth Department of Prosthodontics, *Department of Preventive Dentistry, Seema Dental College and Hospital, Rishikesh.
