

RECENT ADVANCEMENT IN COMPLETE DENTURE

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ABSTRACT

Dentures are prosthetic devices constructed to replace missing teeth and are supported by surrounding soft and hard tissues of the oral cavity. According to the condition and need base of patient different types of dentures are made. Complete denture involves the replacement of the lost natural dentition and is associated with the structures of maxilla and mandible for patients who have lost all their remaining natural teeth. This article throws light on technique of making complete denture, its advantages, complications and contraindications. A review of some patents on complete denture is also provided that summarizes the recent technical advancements taken place in this area.

KEY WORDS: Complete denture, Advantages, Fabrication of denture, Care of denture, Patents

1. INTRODUCTION

Dentures are also known as false teeth and are prosthetic devices constructed to replace missing teeth, and which are supported by surrounding soft and hard tissues of the oral cavity. There are many different denture designs like which rely on bonding or clasping onto teeth or dental implants¹.

Complete Dentures Prosthodontics involves the replacement of the lost natural dentition and is associated structures of the maxilla and mandible for patients who have lost all their remaining natural teeth or roots to provide more favorable support and stability for the resultant dentures, with the preservation of alveolar bone².

There are two main categories of dentures, depending on whether they are used to replace missing teeth on the mandibular arch or the maxillary arch. They are conventional and immediate. A conventional appliance is made and

placed in the patient's mouth after the remaining teeth are removed and tissues have healed and this process can take several months. An immediate appliance is inserted as soon as the remaining teeth are removed. With an immediate appliance, the patient does not have to be without teeth during the healing period. An immediate appliance may require basing or relining to fit properly during the healing period (6-8 weeks) due to bone and gum shrinkage. A conventional appliance is made after the healing period³.

Removable partial dentures are for patients who are missing only some of their teeth on a particular arch. Fixed partial dentures, also known as crowns and bridges, are also for patients missing only some of their teeth, but these are more expensive than removable appliances, and they are contraindicated in certain instances only^{4,5}.

2. TECHNIQUE OF MAKING COMPLETE DENTURE

Before impressions are made, it is necessary to restore the optimum health to oral tissues. Sometimes this may require the patient to go without his or her dentures for several days. Else it is necessary that the tissue be reconditioned by relining the old dentures using special tissue-conditioning resins⁶.

2.1 Rebasing old dentures: The multiple suction cup technique is used to rebase the dentures, if the dentures have the correct occlusion, centric relation and occlusal dimensions. Before rebasing old dentures with this technique, sufficient space must exist under the teeth for both the new silicone liner and new acrylic resin. Also prior to rebasing old dentures, the dentist may have to cut away much of the under impression surface of the denture, and first treat the tissue with a tissue conditioning resin. The borders are corrected with tracking stick- modeling compound to make sure they are nicely rounded and accurate. The soft syringe type, rubber-based impression material is then used for making the final impression directly into the old denture⁷.

2.2 Impression taking for complete dentures⁸

An array of problems may occur if the final impression of the denture is not made properly. The first step in making a new set of dentures is making an accurate set of impression trays. The handle on the tray should be centered directly over the anterior ridge, so that it does not interfere with the movement of the lips. The borders of the tray should be slightly under extended and rounded. Severe under extensions can be corrected by using tracking stick modeling, compounded to the tray, and manipulating

the border tissues, producing a functionally accurate adaptation. The final impression is made in a soft syringe type, rubber-based impression material, free of any voids or air bubbles (Figure1)

2.3 Placement of dentures^{9, 10}: After the processing of the denture, it is returned to the dentist by the laboratory. The new dentures are soaked in the fungicide solution for at least 15 minutes prior to the insertion and then rinsed with distilled water before being placed in the patient's mouth. The patient is asked to maintain a closing pressure on the dentures for several minutes so that the suction cups can flare out and partly settle into the tissue. The occlusion is then checked with articulating paper, to allow for the necessary occlusal adjustments. The patient is recalled within a week for further occlusal adjustments, and again a month later for final adjustments (Figure2).

3. ADVANTAGES^{11, 12, 13, 14, 15}

- Chewing ability is improved by replacing edentulous areas with denture teeth.
- A natural facial appearance is provided by the presence of teeth and wearing a denture to replace missing teeth provides support for the lips and cheeks and corrects the collapsed appearance that occurs after losing teeth.
- By replacing missing teeth, patients are better able to speak by improving pronunciation of those words containing sibilants or fricatives.
- Patients feel better about themselves.
- Improves the appearance and help to prevent lines and wrinkles from forming around the mouth, the cheeks from falling in.
- Dentures will help to maintain the correct alignment between the upper and

lower jaws, and thus prevent jaw joint problems.

4. CONTRAINDICATIONS - ALLERGIC REACTIONS

To date we have had no allergic reactions to the silicone liners. The only possible cause for deferment of denture construction is the presence of moniliasis in the mouth. This organism should be removed because the silicone liners act as a propagating media for fungal growth. The only physical tissue irritation seen has been caused by excessive suction cup height. These sore spots are easily treated by trimming off part of the offending cup using a modified nipper^{16, 17, 18, 19, 20}.

5. PROBLEMS WITH COMPLETE DENTURES^{21, 22,} ^{23, 24, 25}

Some of the problems associated with removable appliances include an overproduction of saliva, sore spots, gagging, gingivitis and movements.

5.1 Saliva: More amount of saliva is produced as the brain senses this appliance as food and sends messages to the salivary glands to secrete it at a higher rate. Patients must become accustomed to having an appliance inside their mouth that is not food.

5.2 Sore Spots: Newly installed appliances may rub and press on the mucus membranes of the mouth cause sore spots in many individuals. Subsequent adjustments for the weeks following their insertion should take care of this problem.

5.3 Gagging: The cause of this may be due to a loose fitting or to an appliance that is too thick or not extended far enough back on the palate.

5.4 Gingivitis: Dental plaque may cause gingivitis underneath the appliance. Gingivitis can involve in reversible condition like gum inflammation and mouth sores. Denture should be cleaned properly and brushing and flossing is required to prevent the recurrence of gingivitis. Anti-bacterial rinses or mouthwash may reduce the swelling and local mouth gels which are usually antiseptic and anesthetic can also help with the problems associated with gingivitis.

5.5 Movement: It further includes Support, Stability and Retention. Support describes how well the underlying oral tissues keep the appliance from moving. Implants can be used for this purpose. Stability describes how well the appliance base is prevented from sliding side to side or front and back. The more the base runs in smooth and continuous contact with the ridge area upon which the teeth used to reside, the better the stability. Retention describes how well the appliance is prevented from moving in the opposite direction of insertion. The better the inside surface of the base to the surface of the underlying mucus membranes, the better the retention will be.

6. CARE OF DENTURES^{26, 27}

Dentures should be cleaned regularly every day to prevent the building up of plaque, stains and food debris that can stick to the dentures. For cleaning, a soft nailbrush or a special denture brush should be used with a mild soap or a special denture tooth paste to freshen the denture. Brushing should be done all over the denture not only around the teeth. Always brush over a basin filled with water or over a damp cloth, as dentures are easily broken if dropped on a hard surface. Chemical denture cleaners are also available like soaking solutions,

creams or pastes. It is important not to let the dentures dry out when they are out of the mouth to avoid change in their shape. Keep them in water or in a soaking cleanser solution (Figure3).

7. CURRENT TRENDS IN COMPLETE DENTURE PROSTHODONTICS^{28, 29, 30}

Current clinical techniques for removable prosthodontics are traditional techniques using newer materials and processing technologies. Those clinicians who have found satisfaction in fabricating complete dentures have generally done so by mastering the classic "five-appointment method" taught to them in school and modified as needed or required for specific patients. The "branching technique" allows for extended treatment and management of more complex patient problems. The accelerated techniques taught by Frush and Smudde allow for clinical efficiency while still managing difficult prosthodontic cases.

Results of recent surveys indicate that improved efficiency in the denture fabrication process is important to most clinicians. All three methods—the traditional five-appointment method, the branching technique and the accelerated technique—require attention to detail and the ability to efficiently fulfill patient expectations. New devices like the Trubyte Alma Gauge (Dentsply Trubyte) allows the clinician to quickly record central incisor tooth position and/or vertical dimension of occlusion in existing dentures for easy and rapid replication or alteration in fabricating new dentures. Success in treatment appears to be attributable to a combination of excellent esthetics, fit and skill in patient management.

8. SOME PATENTS ON COMPLETE DENTURE

8.1 Method of producing and fitting complete dentures: The present invention provides a thermally deformable denture base adapted to be fitted to an edentulous ridge and the surrounding tissue surfaces, it also provide a method of producing and fitting complete dentures incorporating the thermally deformable denture base. The denture base has an inner surface and an outer surface and is formed by a molding process from a doughy mixture of a plasticized liquid monomer and a methyl methacrylate polymer powder in a 1:3-3.5 ratios. When heated to a temperature above about 135° F., the denture base is malleable and may be molded in the mouth of a patient to attain an approximation of the tissue surfaces. The denture base may be incorporated into a complete denture by curing an unpolymerized resin material denture liner to the inner surface of the denture base and affixing teeth to the outer surface of the denture base³¹.

8.2 Composite material armatures for complete denture, and method for making same: The present invention provides an reinforcing frame for removable dental prosthesis made of a composite material with laminated fiber reinforcement of fibers, pre-impregnated with a resin in the state prior to polymerization, characterized in that the frame is composed:- of a base part comprising a layer of woven fabric of said composite material, which is arranged as a support shell in the form of an arch -of an intermediate part extending along the top of the base part to form a beam having a good crushing strength, and forming the limits of the section of the frame and of a surface part forming a cap totally covering the base part and intermediate part, the material of the cap being formed by a laminated fiber reinforcement material having an organic matrix of the same nature as that of the base part, the

assembly made up of the three parts forming after shaping and polymerization a self-supporting profiled exhibiting a good resistance to fracture³².

8.3 Complete denture prostheses and method of fitting: The present invention provides a complete denture is disclosed for both maxillary and mandibular prostheses of the type having a hard base structure formed of acrylic plastic into which prosthetic teeth are set, the hard base structure fused to a deflectable tray layer of thermo plastic material which is deflectable when warm to adapt the denture to the general contours of the maxillary or mandibular ridges, a subsequent coating of auto polymerizing acrylic plastic being applied to the tray providing precise fitting of the denture to the oral contours of the wearer and stabilizing the soft deflectable tray in its newly achieved configuration. In the method of fitting the denture, the segments are laterally adjusted during fitting operation with respect to each other to align the prosthetic teeth with maxillary and mandibular ridges. The resulting denture may be either directly used as prosthesis or used as a model in constructing a final prosthesis³³.

8.4 Implant devices for retaining dentures: The present invention provides an implant device for retaining the dentures comprised of a barrel portion capable of receiving a denture retaining means, mostly a magnet, and a base portion integrally formed with the barrel portion. The base portion is provided with a flange having a plurality of apertures formed therein. The device is capable of being permanently implanted into the mouth of a patient³⁴.

8.5 Throat pack: The present invention provides a throat pack comprising a resilient moulding of polymeric foam

material shaped and adapted for insertion into and occlusion of the oro-pharynx or laryngo-pharynx or both. An exposed region of the foamed material, at least in the anterior surface of the moulding, may be useful in absorbing fluids. One or more safety tapes are incorporated in the pack so as to extend outwards through the mouth³⁵.

CONCLUSION

Complete denture only corrects the missing tooth but also restores the esthetics, phonetics and function of the tooth. Proper method for fabrication should be done to avoid any complications and to make tooth appear more natural. Every treatment should be done according to the particular patient's condition and work should be done in such a way that most portion of natural tooth is protected from damage. Hope this review will be helpful in providing some useful information related to complete denture to dental students.

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Figure 1: An Impression of Mandible Denture



A Removable Complete Denture

Figure 2: A Removable Complete



Figure 3: Denture Brush