

Prosthodontic Rehabilitation of Different Clinical Situation

¹Dr. K. Raghavendra Reddy, ²Dr. Prafulla Thumati

¹Department of Prosthodontics, Sri Sai College Of Dental Surgery
²Department of Prosthodontics, Dayananda Sagar College Of Dental Sciences

Abstract- The goal of dentistry is for patients to keep all of their teeth throughout their lives in health and comfort. If the teeth are lost despite all efforts to save them, a restoration should be made in such a manner as to function efficiently and comfortably in harmony with the stomatognathic system and the temporomandibular joints. Tremendous progress has been made in procedures for rehabilitation over the past few decades. Swift increase in research work in the recent past leaves many options for clinicians, to be updated and to possess optimum knowledge to select the use of materials and techniques that are employed for rehabilitation in proximity to both health as well as comfort.

Index Terms- Metal based dentures, Stomatognathic system, Hollow denture, Anthropoidal pouch technique, Precision attachments, Hemimandibulectomy

I. INTRODUCTION

The success of any Prosthesis depends upon many factors of a purely technological nature, some of which are carried out at the chairside and some in the laboratory. It is dependent also upon the knowledge of the practitioner and technician, and upon the skill with which they each carry out their respective tasks. However, unless the mouth upon which they work presents conditions favourable for denture construction, there is little that their efforts will be successful. The problems that should receive attention before actual Prosthesis construction is commenced, must therefore be considered. The ultimate success or failure of the Prosthesis may well depend upon the initial diagnosis and treatment planning (1).

Consideration must be given not only to the purely dental factors involved but also to the personal factors appertaining to the particular patient, for any one of the following reasons:

- (a) To restore or improve the ability to masticate;
- (b) To restore or improve appearance;
- (c) To maintain the oral tissues in as healthy a condition as possible.

Obviously there will be many situations where a combination of two or all of these requirements are met by the provision of dentures.

When teeth have been lost or it is planned to remove them there are five alternatives:

1. Complete upper and/ or lower dentures.
2. Removable Partial dentures.
3. Fixed Partial Dentures (Bridges).

4. Implant supported prosthesis-Removable or Fixed Prosthesis.
5. Any combination of 1,2,3 and 4.

II. METHODS FOR VARIOUS CLINICAL SITUATIONS

[1] FULL DENTURES: Made Easy, Predictable, and Successful

The life expectancy of the Indian population is steadily increasing, which could lead to a rise in the number of complex complete denture cases. The treatment of these complex cases may need to move away from traditional denture construction. While the copy technique serves an excellent role, there is a need for an alternative approach when continued bone resorption has led to a progressively unsatisfactory denture or in cases where dentures have been lost (2).

A. Immediate and conventional complete dentures

Complete dentures can be either "conventional" or "immediate." Made after the teeth have been removed and the gum tissue has begun to heal, a conventional denture is ready for placement in the mouth about 8 to 12 weeks after the teeth have been removed.

Unlike conventional denture (fig.1), immediate dentures (fig.2) are made in advance and can be positioned as soon as the teeth are removed. As a result, the wearer does not have to be without teeth during the healing period. However, bones and gums shrink over time, especially during the healing period following tooth removal. Therefore a disadvantage of immediate dentures compared with conventional dentures is that they require more adjustments to fit properly during the healing process and generally should only be considered a temporary solution until conventional dentures can be made.

B. Balanced complete dentures

Balanced complete dentures are required for the bilateral, simultaneous anterior and posterior occlusal contacts of the teeth in centric and eccentric positions. To minimize the dislodging forces, the occlusion should be balanced throughout the functional range of movements of the patient (fig.3).

C. Metal-based denture

a. Metal-based denture is one in which a portion of the denture body is made of a substantial metal casting rather than all plastic (acrylic resin). There are two types of metal-based dentures. a. Standard metal-based denture: The metal base portion of the denture is in direct contact with underlying supporting tissues. (fig.4)

b. Modified metal-based denture: The metal base portion of the denture is not in direct contact with underlying supporting tissues. A soft or hard plastic liner may be interposed between the metal and supporting tissues.

The additional weight of a metal base also contributes to lower denture stability by causing the denture to settle down onto a jaw ridge.

Treatment options for Resorbed Ridges

In the highly atrophic mandible muscular control over the denture is the main retentive and stabilising factor during function (3). Dental implants may provide stabilisation of mandibular complete dentures for the atrophic mandible, however there may be situations when it is not possible to provide implants on the grounds of medical, surgical or costs factors. The severely atrophied jaw can have various treatment options such as:

A. Anthropoidal pouch technique

The neutral zone (NZ) technique is an alternative approach for the construction of lower complete dentures. It is most effective for dentures where there is a highly atrophic ridge and a history of denture instability. The technique aims to construct a denture that is shaped by muscle function and is in harmony with the surrounding oral structures (4). The technique is not new but is one that is valuable and yet not often practiced (Fig.5). The dentures will have other advantages: (a) Improved stability and retention (b) Posterior teeth will be correctly positioned allowing sufficient tongue space (c) Reduced food trapping adjacent to the molar teeth (d) Good aesthetics due to facial support.

B. Hollow denture technique

For more than 150 years, it was believed that the weight of the lower denture contributes to both retention and stability. However, studies have shown that retention and stability can be achieved by improving the fit of the denture bases rather than addition of extra weight to the dentures and also the weight of the lower denture may not affect its retention and stability (5).

Hollowing the denture so as to reduce the weight of the denture, thereby enhancing stability and retention, reducing the further resorption of the jaws. (Fig.6)

[2] PARTIAL DENTURES

Basic principles of dental treatment for a partially edentulous arch are 1. to stabilize the individual arch and 2. to organize interarch function by control of interarch contacts (6).

Achieving these conditions requires use of all methods of dental treatment including 1. Periodontal therapy 2. Orthodontic treatment to reposition the teeth 3. Individual tooth restorations to stabilize the arch 4. Fixed partial dentures 5. Orthognathic surgery where indicated 6. Establishment and control of the occlusal plane 7. Removable partial dentures.

A. Interim Removable partial denture or Transitional Removable partial denture

The more common type of removable partial denture is the interim removable partial denture or transitional removable partial denture. Partial denture construction should be relatively

simple in design and should permit the easy addition of further teeth, which may be immediate replacements of condemned teeth. This type of denture has been aptly called the "additive" partial denture by De Van (fig 7).

B. Planned partial dentures/ Cast partial dentures

Proper treatment planning is essential for cast partial denture. The concepts of guiding planes, rigid major and minor connectors, and indirect retention are important components in cast partial denture designs. In addition, the correctable cast impression procedure that maximizes the areas of soft tissue coverage without impinging on movable tissue attachments is also a most important adjunct to the use of cast partial dentures (fig 8).

C. Flexible dentures (Soft dentures)

Polymerization shrinkage encountered in conventionally cured PMMA led to the development of a special injection moulding technique. Soft dentures are an excellent alternative to traditional hard-fitted dentures. It is an alternative denture prosthesis design in which optimal flange height and thickness can be achieved by using flexible denture base material. Flexible dentures use a special flexible resin that prevents them from chafing the gums, allows the wearer to chew properly (7). It also provides a soft base that prevents the gums from being rubbed raw. Some of the commercially available products are Duraflex, Flexite (fig.9), Proflex, Lucitone, Impak, valplast (fig.10).

D. Precision attachments

Misconceptions about the use of attachment retained removable partial dentures have discouraged many practitioners from using these kinds of prostheses in their dental practices. The desire to balance between functional stability and cosmetic appeal in partial dentures gave rise to the development of Precision Attachments. The precision attachment is sometimes said to be a connecting link between fixed and removable partial denture as it incorporates features common to both types of construction.

The decision to use an intracoronal or extracoronal attachment should be based on the size and shape of the abutment teeth. Intracoronal attachments require more tooth preparation and tooth reduction than extracoronal attachments. If intracoronal attachments are used where there is insufficient space, the abutment retainer will be overcontoured on the proximal surface, resulting in a restoration that can create periodontal problems.

When there is adequate space available, intracoronal attachments are preferred to extracoronal attachments because intracoronal attachments more ideally direct the forces of function along the long axis of the abutment teeth. When there is inadequate space, an extracoronal prosthesis (fig 11) may be employed (8).

[3] FIXED PARTIAL DENTURES (BRIDGES)

In many cases a fixed bridge is superior restoration to a partial denture. In many cases more efficient mastication is possible than with any removable type of restoration (9). A fixed bridge will give superior splinting and will prevent increasing

tooth mobility (fig.12.a & 12.b). Metal free ceramic crowns and bridges have high esthetic value where patients “feel natural”.

[4] IMPLANT SUPPORTED PROSTHESIS

Modern Implantology has moved into the mainstream and has lit up the lives of millions of individual across the world.

Implant supported prosthesis can be of following types:

- a. Implant supported crown (Screw or cement retained) (fig.13.a & 13.b)
- b. Implant supported bridge (Screw or cement retained) (fig.14.a & 14.b)
- c. Tooth-Implant supported bridge (fig.15.a & 15.b)
- d. Implant supported overdenture (fig.16.a & 16.b)
- e. Fixed complete denture (fig.17.a & 17.b)

Treatment options for Complex Clinical Situation

Use of a Guide plane for maintaining the residual fragment in partial or Hemimandibulectomy

Mandibular resection leads to altered mandibular movements, disfigurement, difficult in swallowing, impaired speech and articulation, and deviation of the mandible towards the resected site (10). Numerous prosthetic methods employed to reduce or minimize deviation and improve function include maxillomandibular fixation, implant supported prosthesis, palatal based guidance restoration and removable mandibular guide flange prosthesis (fig.18.a & 18.b).

III. DISCUSSION AND SUMMARY

For many years, traditional complete denture designs have been modified to gain additional support and stability from a few retained and suitably prepared natural teeth. The argument was made that, if the prosthesis were inseparable from the patient, it would be perceived as part of the patient and would therefore be the best solution to the problem of unsatisfactory adaptation of the complete denture experience. The biotechnological achievement of osseointegration was justifiably heralded as a major therapeutic breakthrough for edentulous people. Experience and observation had taught prosthodontists that the vast majority of their patient’s early years of denture wearing were without major problems. With the use of implants more stable and retentive dentures can be given to the patient

preserving the underlying alveolar bone and increasing the proprioception.

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AUTHORS

First Author – Dr. K. Raghavendra Reddy M.D.S, Senior Lecturer, Department of Prosthodontics, Sri Sai College of Dental Surgery, Vikarabad, Andhra Pradesh, dr.rajureddy@gmail.com

Second Author – Dr. Prafulla Thumati M.D.S., Ph.D , Professor & HOD, Department of Prosthodontics, Dayananda Sagar College Of Dental Sciences, Bangalore, Karnataka, thumatiprafulla@gmail.com

Correspondence Author – Dr. K. Raghavendra Reddy M.D.S, Senior Lecturer, Department of Prosthodontics, Sri Sai College of Dental Surgery, Vikarabad, Andhra Pradesh, dr.rajureddy@gmail.com, contact no - +91880143156

FIGURES



Fig.1: Conventional complete denture



Fig.2: Immediate complete denture



Fig.3: Extra oral Gothic arch tracers attached to occlusal rims



Fig.4: Standard metal-based denture



Fig.5: Establishing the correct occlusal height



Fig.6: Hollow denture



Fig.7: Removable partial denture



Fig.8: Cast partial denture



Fig.9: Flexite plus sectional partial



Fig.10: Valplast RPD showing thickness and clasps of same material

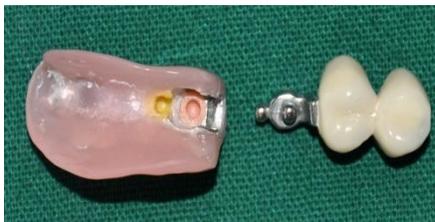


Fig.11: Male and female parts of extracoronal attachment



Fig.12.a: Pre-op without crown and bridge



Fig.12.b: post-op with crown and bridge

Fig.13.a: Missing anterior



Fig. 13.b: Implant supported crown

Fig. 14.a: Abutments placed on implants



Fig.14.b: Implant supported bridge

Fig.15.a: Pre-op (tooth-Implant supported bridge)



Fig.15.b: post-op (tooth-Implant supported bridge)

Fig.16.a: Implant supported overdenture



Fig.16.b: Dentures for Implant supported overdenture



Fig.17.a: Fixed complete denture (screw retained)



Fig.17.b: Fixed complete denture after Ceramic build-up (screw retained)

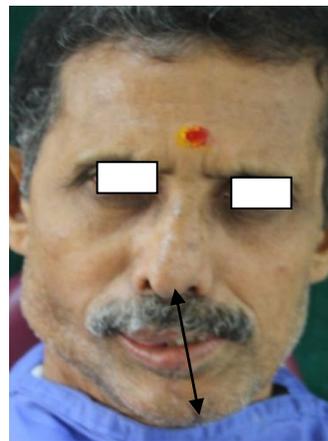


Fig.18.a: Deviated mandible towards left



Fig.18.b: Removable mandibular guide flange prosthesis