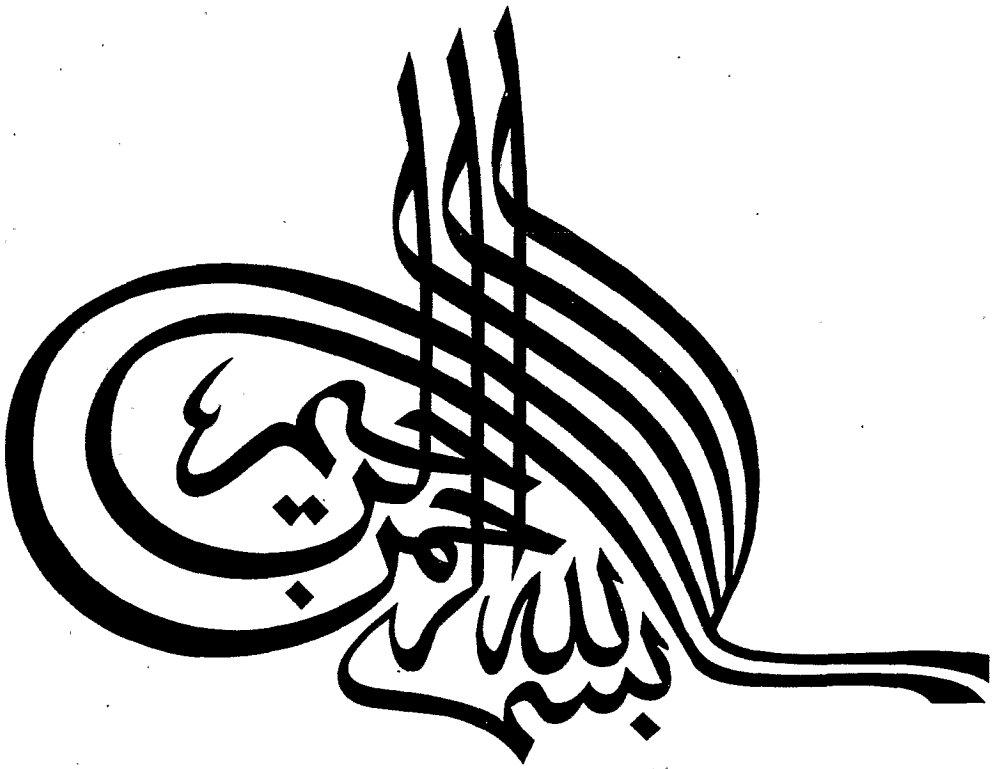

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Removable partial denture with Rotational path of insertion

به راهنمایی : استاد ارجمند خانم دکتر ندا نجابت

نگارش : شهاب فصیحی‌نیا

تابستان ۸۱

پایان نامه شماره .....

تحت عنوان:

Removable partial denture with Rotational path of insertion

تهیه شده توسط شهاب فصیحی نیا در کمیته بررسی پایان نامه مطرح و با درجه / نمره ۱۸/۶۰ به تصویب رسید.

استاد راهنما : خانم دکتر ندا نجابت

اعضای کمیته بررسی :

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با تشکر از کمیته بررسی پایان نامه بخاطر

حوصله و دقت نظر ایشان

با سپاس فراوان از استاد ارجمند خانم دکتر

ندا نجابت که بدون راهنمایی استادانه و

محبت‌های بی‌شائبه ایشان انجام این مهم

مقدور نبود.

تقدیم به:

پدر گرامیم که هستی خویش را فدای تعالی رهروان علم نمود و معنای انسانیت را از او آموختم.

مادر عزیز و مهربانم که با قلبی آکنده از (فروتنی، ایثار، عاطفه، یکرنگی، صفا و صمیمت) عزت زیستن را به من آموخت.

برادران و خواهرم که نور دیدگانم هستند و بی‌وجودشان این پای پیاده را راهی نبود.

همه دوستان و همکاران عزیزم که مایه‌های لذت هستی‌ام هستند و همیشه در قلبم خواهند ماند.

Content

Introduction

Replacement of missing anterior teeth often requires the fabrication of a removable partial denture. A major problem associated with the conventional clasp-type partial denture is the placement of metal components, which become visible when the patient speaks or smiles. An alternative approach incorporating precision or semiprecision attachments can sometimes be used to eliminate this problem. Unfortunately, the use of attachments can introduce certain disadvantages, such as increased expense, the placement of cast restorations on abutments,and a greater potential for breakage or distortion of the retentive elements. Also, many attachments require technique-sensitive procedures, which may increase the likelihood of introducing clinical or laboratory error.

A conventional clasp-type partial denture that incorporates a rotational path of insertion may be used in many esthetically demanding situations. The design concept permits the elimination of certain clasp arms without compromising the basic mechanical requirements of retention, support, and stability (bracing) , which are necessary features of partial denture frameworks. In addition to enhancing esthetics, these designs may contribute to lessening adverse periodontal response by minimizing tooth and tissue coverage.

The basic technique requires that rigid retentive components, such as minor connectors or proximal plates, be substituted for certain

conventional clasp retainers. The customary approach to partial denture design involves the use of a path of insertion that is relatively perpendicular to the existing occlusal plane. A normal straight path of insertion requires that all of the rests be seated simultaneously. Flexible retentive elements engage undercut areas when the prosthesis is seated. This design concept permits rigid retentive components to gain access to the undercut areas of abutment teeth through a rotational path of insertion. The rotational path requires the initial placement of one portion followed by the seating of the remainder of the framework. The objective of this article is to explore the many clinical applications that this technique provides, emphasizing its use in the esthetic replacement of missing teeth. (1)

PART 1:

PRINCIPLE OF REMOVABLE PARTIAL DENTURE DESIGN AND SURVEY

Principle of removable partial denture design and survey.

Authorities in the field of removable partial denture design may differ on their approach in developing the design of each individual prosthesis. There is, however, complete agreement that the correct design incorporates proper use and application of mechanical and biologic principles. These principles enable the supporting teeth and the soft tissues to withstand the forces that will be created by the movement and stress placed on the prosthesis during function.(2)

The strategy of selecting component parts for a partial denture to help control the movement of the prosthesis under functional load has been highlighted as a method to consider for logical partial denture design. There are many factors that affect the movement potential of a partial denture. Factors that are within the same arch and related to both the existing teeth and the mucosa to be used for support can have a significant effect on prosthesis movement and the required design. Also factors related to the opposing arch tooth position the existence and nature of prosthesis support in the opposing arch and the potential for establishing a harmonious occlusion can greatly influence the partial denture design. (3)

Removable partial denture design does not lend itself readily to scientific methods of study because the variables in the partially

edentulous mouth are so many, and the time before true clinical research yields results that can be interpreted as reliable or meaningful is so great.

In considering the design, the dentist should bear in mind the following basic principles of removable partial denture construction . If these principles are acknowledged and adhered to,the many complexities that appear to be present in the field of dentistry will be reduced. The principles were first expounded by A.H Schmidt in 1956. chances are they were not totally original with himv but he did stress them strongly in his teaching. The principles remain as true and unassailable today as the day they were proposed.

1. The dentist must have a thorough knowledge of both the mechanical and biologic factors involved in removable partial denture design. The dentist must have a background in the basic and applied sciences, and a working knowledge of the laws of physics and engineering, particularly as they relate to levers.

2. The treatment plan must be based on a complete examination and diagnosis of the individual patient.

3. The dentist must correlate the pertinent factors and determine a proper plan of treatment. This is an area in which the profession has functioned poorly in the past. The tendency, all too often, has been to submit casts to a laboratory and allow the technician to produce a removable partial denture. The dentist

alone can modify the conditions in the mouth to enhance the success of the treatment.

4. A removable partial denture should restore form and function without injury to the remaining oral structure. In restoring occlusion, the prosthesis should also restore a normal or desirable facial contour and not impede the normal movement of the tongue and other tissues, The prosthesis must be so planned that the remaining oral structures are not stressed beyond their physiologic capability.

5. A removable partial denture is a form of treatment and not a cure. The responsibility of the dentist to the patient does not end with the final placement of the prosthesis in the patient's mouth. Oral tissues never remain static, but are constantly undergoing change reflecting the general health and age of the patient. The patient should be recalled periodically to prevent any deleterious change from taking place. The denture should be planned with the knowledge that future corrections may be required. The design should be such that modifications may be made to compensate for changes that can be expected in oral tissues.

These principles are indeed basic, but if they are referred to as problems arise during the design and planning procedure, the chances of successful treatment will be greatly increased. (2)

FACTORS INFLUENCING DESIGN

As a direct result of examination and diagnosis the design of the removable partial denture must originate on the diagnostic cast so that all mouth preparations may be planned and performed with a specific design in mind. This will be influenced by many factors some of which follow:

1. Which arch is to be restored with the removable partial denture and, if both, a consideration of their relationship to one another, including the following:

   a. Orientation of the occlusal plane

   b. Space available for restoration of missing teeth

   c. Occlusal relationship of remaining teeth

   d. Arch integrity

   e. Tooth morphology

2. Response of oral structures to previous stress, periodontal condition of the remaining teeth, the amount of abutment support remaining, and the need for splinting, which may be accomplished either by the design of the denture framework.

3. Whether the denture will be entirely tooth supported. If one or more distal extension bases are involved the following must be considered:

   a. Clasp designs that will best minimize the forces applied to the abutment teeth during function

b. Secondary impression method to be used

c. Need for indirect retention

d. Need for later rebasing, which will influence the type of base material used

4. need for abutment tooth modification of restorations which may influence the type of clasp arms to be used and their specific design.

5. Type of major connector indicated based if existing and correctable situations.

6. Materials to be used both for the framework and for the bases.

7. Type of replacement teeth to be used, which may be influenced by the opposing dentition.

8. Patients past experience with a removable partial denture and the reasons for making a new denture. If, for example, a lingual bar has been objectionable, was it because of design, fit, of the patients inability to accept it? Frequently an appraisal of these factors alone justifies the use of a contoured lingual plate rather than a lingual bar. If an anterior palatal bar has proved objectionable, was it because of bulk, location, flexibility, or tissue irritation? A design using a thin palatal major connector located more posteriorly may be preferable to an anterior bar or a palatal U-shaped design located anteriorly.

9. Method to be used for replacing single teeth or missing anterior teeth. The decision to use fixed restorations for these spaces rather than replacing them with the removable partial denture must be made at the time of treatment planning. Such a decision will influence the design of the denture framework.(3)

ESSENTIALS OF PARTIAL DENTURE DESIGN

A. Classes I and II

1. Direct retention

a. Retention should not be considered the prime objective design.

(1) The main objectives should be the restoration of function and appearance and the maintenance of comfort, with great emphasis on preservation of the health and integrity of all the oral structures that remain.

b. Close adaptation and proper contour of an adequately extended denture base and aecurate fit of the framework against multiple, properly prepared guide planes should be used to help the retentive clasp arms retain the prosthesis.

2. Clasps

a. The simplest type of clasp that will accomplish the design objectives should be employed.

b. The clasp should have good stabilizing qualities, remain passive until activated by functional stress, and accommodate a minor amount of movement of the base without transmitting a torque to the abutment tooth.

c. Clasps should be strategically positioned in the arch to achieve the greatest possible control of stress.

(1) A Class I prosthesis usually requires only two retentive arms: one on each terminal tooth.

a. If a distobuccal undercut is present, the vertical projection retentive clasp is preferred. A reverse circumferential clasp would be the next best selection.

b. If a mesiobuccal undercut is present, a wrought wire clasp is indicated. A cast circumferential type clasp should not be used.

c. The reciprocal or bracing arm must be rigid. This component of the clasp system can be replaced by lingual plating.

(2) A Class II prosthesis should usually have three retentive clasp arms.

a. The distal extension side should be designed with the same considerations as for a class I prosthesis.

b. The tooth-supported, or modification, side should usually have two retentive clasp arms: one as far posterior and one as far anterior as tooth contours and esthetics permit. If a modification space

is present, it is usually most convenient to clasp a tooth anterior and a tooth posterior to the edentulous space.

(1) The type of clasp and position of the retentive undercut can be selected for convenience.

(2) Rigidity is required for all bracing arms. Lingual plating may be substituted.

3. Rests

a. Teeth should be selected for rest preparation to provide maximum possible support for the prosthesis.

b. Rest seats should be prepared so that stress will be directed along the long axis of the teeth.

c. Rests should be placed next to the edentulous space with few exception

4. Indirect Retention

a. Indirect retention should be employed to neutralize unseating forces.

(1) The indirect retainer should be located as far anterior to the fulcrum line as possible.

(2) Two indirect retainers should generally be used in a Class I design, whereas one placed on the side opposite the distal extension base may be adequate in a Class II design.

(3) The indirect retainers should be positioned in teeth prepared with positive rest seats that will direct forces along the long axis of the tooth.

b. Lingual plating can be used to extend the effectiveness of indirect retention to several teeth. It must always be supported by positive rest seats.

5. Major connector

a. The simplest connector that will accomplish the objectives should be selected.

(1) The major connector must be rigid.

(2) It must not impinge on gingival tissue.

b. Support from the hard palate should be used in the design of the maxillary major connector when it would be beneficial.

c. Extension of the major connector onto the lingual surfaces of the teeth may be employed to increase rigidity, distribute lateral stresses, or eliminate potential food impaction areas. Lingual plating should always be supported by adequate rest seats.

6. Minor Connectors

a. Minor connectors must be rigid

b. Minor connectors should be positioned to enhance comfort, cleanliness, and the placement of artificial teeth.