

Biomechanical Analysis of Esthetic clasps in different cases Of free end saddle

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Introduction

Extension base removable a partial denture is defined as a removable partial denture that is supported and retained by natural teeth only at one end of the denture base segment and in which a portion of the functional load is earned by the residual ridge.⁽¹⁾

Posterior free end edentulous area are more prevalent among population, lack of posterior abutment result in lack of sufficient design of support, retention and stability of the denture base. Uncontrolled movement will thus occur causing the denture base to rotate about its most distal abutment inducing heavy torsional stresses to the abutments and traumatization of ridge.⁽²⁾

Removable partial dentures must be adequately planned and designed following favorable biological and mechanical principles in order to reduce the harmful effects on the supporting structures.⁽³⁾

The residual ridge is twenty-five times more displaceable than the teeth. Distal extension removable partial denture is subjected to vertical, horizontal, oblique and rotational forces. These forces may become adverse during functional and para-functional activities. Rotational components of vertical tissue ward and tissue a way forces result from lack of distal abutment. Horizontal forces are the result of vertical force

applied to one side of the removable partial denture and lateral movement of the mandible during mastication.⁽⁴⁾

The magnitude of stresses transmitted to the abutment teeth depends on the length of the span of the edentulous ridge, the quality of ridge, type and design of the direct retainer and the occlusal pattern.⁽⁵⁾

To achieve the goals of removable partial denture construction, removable partial denture designing should follow static-dynamic concepts, biologic concepts, and esthetic and comfort considerations. The static- dynamic requirement is achieved by proper distribution of vertical and horizontal forces to avoid over loading the abutment teeth⁽⁶⁾

Flexible partial dentures are comfortable and lightweight, generally affordable, non-allergic and cost less than dental implant and dental bridges require no surgery or invasive procedures , It is fits better and more durable.⁽⁷⁾

Duraflex is a flexible denture base resin (nylon resin) which is ideal for partial dentures and unilateral restorations. The resin is a biocompatible nylon thermoplastic with unique physical and aesthetic properties has a semi-crystalline polymer structure, making it both strong and hygienic. It is clinically unbreakable and more durable than acrylic.⁽⁸⁾

Pro-flex is the flexible denture base (acetal resin) material which can be used for Full & Partial Flexible Dentures. Pro flex foil and partial flexible dentures have been offered since 1998. Pro-flex is easy to work with the quality, aesthetics and most importantly, the final results. Pro-Flex dentures are popular because it is easy to mold during the manufacturing process. Dentures made with this material result in an end product that is more flexible, comfortable and attractive. This material used to Professional mouth guards.⁽⁹⁾

Aim of the study

The aim of this In-vivo study will be compare esthetic clasps flexible denture on the stresses transmitted to the supporting structures of unilateral and bilateral distal extension base.



Materials and Method

According to clasps material, the clasps were divided into two equal groups as following:

Group I: Ten patient will provide with flexible designs partial denture (Kennedy class I).

The design include;

- RPI clasp on left second premolar
- I bar clasp on mandibular right canine
- Lingual bar as major **connector**
- Two mesh work saddle on both sides of the design .
- The minor connectors joined the major connector

Group II: Ten patient will provide with flexible designs partial denture (Kennedy class II).

Divided two groups :-

Class II first group

Short saddle , young age , well developed ridge , normal bite , condition of abutment good abutment , mucoperistum fiern and resilient.

Class II second group

Long saddle , old age , condition of abutment weak , flat ridge , heavy bite.



The design include;

- RPI clasp on left second premolar

- I bar clasp on mandibular right canine
- Lingual bar as major connectors
- Ring clasp on mandibular right second molar
- Two mesh work saddle on both sides of the design .
- The minor connectors joined the major connector .

Acrylic resin model represent unilateral free end saddle Kennedy class II mod 2 with remain abutment were used as master model.

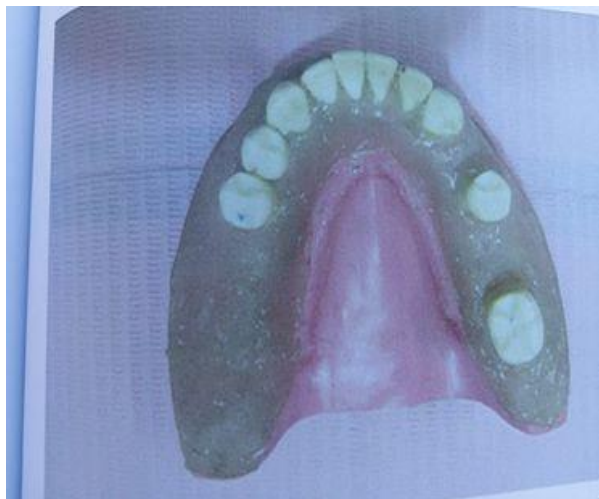
Simulation of oral mucosa the residual ridge was covered with one layer base plate wax 2mm and RMP 4mm

Simulation of periodontal ligament

The premolars on both side and first molar canine in right side were removed from model to make approximately 1mm for all surfaces of the socket by using acrylic stone

One layer of 0.3mm thickness tin foil sheet was brushed against the roots and lubricated separating medium







For two group study, the designs included

- RPI clasp on left second premolar as direct retainer
- I Bar clasp on mand right canine
- Lingual bar as major connector
- Ring clasp on mand right second molar
- Two mash-work saddle on both sides of designs
- The minor connector joined the major connector



According to denture base material, the casts were divided into two equal groups as following

Group I: The model were provided with flexible RPD designs partial denture



Group II: The model were provided with casted RPD designs partial denture



Result

The flexible resin is based inherent flexibility and ability to engage hard and soft tissue undercut for retention.

The flexibility of clasp arm affects retention and functional of RPD

Flexible framework removable *partial* denture can replace number of teeth in dental arch similar to Cast metal removable partial denture

Conclusion

from the result of this study

1- from tissue preservation point view

casted distal extension RPD is a prosthatic approach to minimize stress applied to abutment teeth

2-flexible distal extension RPD is superior and more esthetic than casted distal extension RPD



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