"Simplifying designing of a cast partial denture in Kennedy class 1 partial edentulous situation to enhance its self-cleansing ability"

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Abstract

Removable partial dentures in the form of a cast partial denture are becoming extinct as a treatment option for patients who cannot receive a fixed prosthesis. In most of the cases where a fixed prosthesis is not indicated, they are still the treatment of choice especially in medically compromised patients. However, most of the patients are reluctant to wear because of the maintenance associated with them. Making a complex designed cast partial denture does not solve the problem but rather complicates it. A cast partial denture design should be kept simple. When kept simple, the prosthesis in itself becomes self-cleanable. This article describes a simple design for Kennedy class I partial edentulous situation that would keep the prosthesis self-cleansing.

Introduction

With more than 65,000 possible combinations of partial edentulous situations in either of the dentulous arches, the focus of attention in the field of cast partial denture has been its classification with less emphasis on the treatment outcomes. With advances in the field of fixed partial dentures and implant supported prosthodontics, the field of partial removable prosthodontics has suffered both in research as well application. However, there are situations, when financial, systemic or local conditions preclude the use of fixed Prosthodontics. In such cases a well-designed removable partial denture (RPD) can be an excellent treatment alternative.

One of the drawbacks of an RPD that prevents its use by patients is the change it induces in the quality and quantity of plaque. Many studies have been conducted that have shown the effects of RPD on dental plaque. Some of these studies have concluded that approach to designing of a cast partial denture should be kept simple without compromising the principles of RPD designing. This article in the form of a clinical case report presents a patient with a Kennedy class I situation successfully managed with a simplified conventional design.

Case Report(s)

An adult male patient aged 38 years, came to the department of Prosthodontics of Subharti University with chief complaint of inability to masticate since the loss of his maxillary posterior right sided teeth. Medical history revealed that the patient was hypertensive and was taking medicines regularly as advised. Dental history recorded a loss of maxillary right side first and second molar and left side second molar due to caries. Social, drug and history of habits was not significant. Extra oral functional examination disclosed a low high lip line (smiling line). Intra oral examination revealed a Kennedy class 1 situation with missing first molar on the left side and missing second molars on both sides (Fig.1). Wear facets in relation to posterior teeth were present with loss of anterior guidance in relation to maxillary and mandibular canines. Diagnosis and treatment plan was done after radiographic investigations and a diagnostic mounting on a semi adjustable articulator. After presenting different treatment options, the patient opted for a cast partial denture in relation to maxillary arch.

Primary cast obtained for diagnostic evaluation was surveyed on a dental cast surveyor and four principal factors were evaluated, namely the path of insertion and removal, esthetics, interferences and guiding planes. Mouth preparations were then done in the next appointment following which final impressions were made using different consistencies of Addition polyvinyl siloxane material (Reprosil, Dentsply/Caulk; Milford, DE, USA) on a special tray. The metal framework for the RPD was then tried in the patient’s mouth following which the denture base and the artificial teeth were attached to the RPD (Fig. 2 and 3). The patient was put on a strict follow up protocol for a period 3 months during which he adapted well to the prosthesis.

Discussion

Planning of direct retainers with available and
non-available undercuts that would place the retentive arms in most esthetic location was done first, followed by support and reciprocation. Use of functional impression that would compound the indirect retention was then planned, followed by the design of major connectors. The modifications in designing included a mesially approaching simple circlet clasp in relation to maxillary right second premolar (high lip line in the patient did not expose the mesial aspect of the second premolar because of long maxillary lip inherent to the patient), and a similar clasp on the maxillary left first molar with reciprocal arm attached to minor connector. An indirect retainer was located on the left side of the maxillary arch on the mesial side of the first premolar and major connector was simplified to a palatal type with anterior borders placed 8-10 mm away from marginal gingiva (Fig.2).

Areas of concern in a Kennedy partial denture designing that need to be self-cleansing are surfaces of framework near the proximal surfaces of abutment, area under the major connector and interproximal areas. During the course of follow up, the partial denture was evaluated at these three places to check the efficiency of both self-cleansing ability and patient care, by recording denture plaque index.  

Conclusion

Simple but well-designed removable partial denture is an excellent choice for patients who cannot receive a fixed prosthesis. Proper contours and contacts of different components of the direct retainer and major connector are key to incorporate self-cleansing action of the partial denture.

References

Illustrations

Illustration 1

Intra oral view of maxillary partially edentulous arch

Illustration 2

Cast partial framework fitted on master cast
Illustration 3

A self cleansing cast partial denture in place