Conventional semi-rigid frame and stress breaker designs on the same partial denture for a mandibular Kennedy Class I: A case report.


Abstract

A removable partial denture (RPD) intended to restore physiological and esthetic functions must be integrated in the masticatory system to protect oral supporting tissues. In Kennedy’s Class I and II situations, the specific problem of RPD metal frame is the duality of hard and soft tissues when dentures are supported by both remaining teeth and soft tissues covering edentulous ridges. This problem is usually resolved at impression level (altered cast technique) or at design level (stress breakers).

This case report addresses a clinical situation where two different designs (conventional semi-rigid frame and stress breaker design) were used on the same partial denture (Kennedy Class I, mandibular). A recall visit after one year showed that the stress breaker design was better than the semi-rigid one.

INTRODUCTION

Edward Kennedy’s classification is most commonly used when designing partial dentures; Kennedy Class I indicates a patient with bilateral free-end saddles (edentulous posterior areas bilaterally).

In the mandible, Kennedy’s Class I situations are problematic due to the difference in displacement between mucosa and teeth. The amount of mucosal displacement can be up to 20 times more than that of teeth¹. Indeed, the majority of authors agree on the disharmonic physiological behavior of these two tissues; periodontal ligament allows axial movement more or less close to the tenth of a millimeter, while compressibility of oral mucosa ranges from 0.4 to 1 millimeter². When an occlusal load is applied, displacement of oral soft tissues is 13 times higher than abutment teeth¹.

Several techniques are used to compensate for this difference and reduce the damage on remaining teeth: at the impression level when making an altered cast technique⁴ or at the design phase with many possibilities (such as using a stress breaker partial denture⁵).

In cases of free-end saddles, the use of a non-rigid mechanism is advocated in order to distribute forces between abutment teeth and tissue-supporting prosthetic saddles⁶,⁹

The stress breaker design of Tourtet¹⁰,¹⁴ is another option to treat partially edentulous cases; its principle is based on the disjunction of the saddle relative to the frame of the prosthesis; this is, in fact, an evolution of the rigid frame, and it is characterized by distal shifting of the point of connection between frame and saddle¹¹.

According to Jourda⁶,⁹,¹⁴, stress breaker design improves preservation of abutment teeth, vertical dimension of occlusion, and alveolar and basal bone heights; consequently, denture relining is avoided¹²,¹³.

Published studies¹²-¹⁸ were inspired by produced stress breaker design without comparison with conventional one. This article addresses a case report where two different designs (conventional semi-rigid frame and stress breaker design) were used on the same partial denture (Kennedy Class I mandibular).

CASE REPORT

A 40-year-old female with no medical problems, having all her natural teeth in the maxilla and a Kennedy Class I edentulism in the mandible, consulted us for a removable partial denture (RPD) to replace her missing teeth (Fig. 1). After obtaining her consent, it was...
decided to try an experimental type of RPD in which we implemented two techniques in order to reduce the leverage effects of the mandibular Kennedy Class I. An RPD was fabricated with a conventional semi-rigid partial denture on the right side and a “Tourtet stress breaking framework” on the other side (Fig. 2).

The originality of Tourtet’s concept is due to the particular design of the framework with the shape of a safety pin where the loop is located distally and the free part mesially (Fig. 3). The stress breaker framework allows the disconnection between saddle and framework (Fig. 4): displacement of saddle takes place only when masticatory forces are applied on prosthetic teeth.6,19

This clinical technique allows the patient to try both systems at the same time and comment on the difference in terms of comfort and masticatory efficiency between right and left sides.10,20-24

On the first year recall visit, patient claimed that both designs were satisfactory; however, she reported that Tourtet’s shape proved to be more comfortable and more efficient than the conventional one.

Acknowledgment:
We thank Mr. Georges Sayegh* who performed the laboratory work.

REFERENCES

Fig. 1. Clinical presentation at first appointment.

Fig. 2. Removable partial denture with a semi-rigid design on right side of the RPD and a stress breaker design on its left one.

Fig. 3. Tourtet’s stress breaker design
1: Tourtet’s stress breaker shape
2: Distal loop with free mesial end
3: Acrylic resin embedded inside the Tourtet’s shape (no contact between acrylic saddle and the premolar’s clasp).

Fig. 4. The disconnexion between the Nally-Martinet clasp and the saddle on buccal and lingual sides.

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