

Overlay Removable Partial Denture - Case Report

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Abstract:

Tooth wear in elderly individuals may occur due to physiologic and pathologic processes. Consequently, it is possible to observe loss of the occlusal vertical dimension (OVD), occlusal instability and absence of an effective anterior guide, due to excessive dental wear, damaging function and aesthetics. Overlay removable partial dentures are presented in this case report as economic alternatives to extensive full mouth rehabilitation fixed prosthodontics. Apart from the economy of treatment the partial overlay dentures also offer reversibility as an advantage when compared to full mouth rehabilitation with fixed bridge work. This article reports a case of severe occlusal wear managed with maxillary and mandibular cast partial overlay dentures.

Keywords: Overlay Partial Dentures (ORPDS), tooth wear, Vertical dimension, Occlusal splint.

Key Message: *The overlay denture is a simple, inexpensive and minimally invasive form of treatment modality offering the advantages of preservation of tooth structure, hygiene, shorter and lesser number of clinical appointments, all together translating into an economically viable alternative option for the elderly.*

Introduction

Prolonged tooth retention by the aging population increases the likelihood that clinicians may treat patients with advanced levels of wear. Tooth wear occurs as a natural physiological process; the average wear rates on occlusal contact areas were estimated to be 29 mm per year for molars and 15 mm per year for premolars.¹ Consequently, it is possible to observe loss of the occlusal vertical dimension (OVD), occlusal instability and absence of an effective anterior guide, due to excessive dental wear, damaging function and aesthetics. The rate of wear may be greater depending on factors such as: age, gender (the rate of tooth wear varies between men and women), occlusal conditions, parafunction,

gastrointestinal disturbances, excessive intake of citrus fruits or beverages with a low pH, environmental and salivary factors, congenital anomalies such as amelogenesis imperfecta and dentinogenesis imperfecta.² In situations where the tooth wear is excessive, evaluation of the vertical dimension of occlusion (VDO) is necessary. In some cases, the VDO is maintained by means of some compensatory mechanisms (continuous tooth eruption and alveolar bone growth). Treatment options obviously vary depending on the extent and nature of tooth wear.

This article reports the management of tooth wear in an elderly female by means of cast metal partial overlay dentures.

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Case Report

A 65yr old lady reported difficulty in chewing and speaking due to worn out teeth and a few missing teeth. She also complained of occasional cheek biting. Her general health was good and there was no significant medical history. She was not aware of any clenching/grinding habit. She never consumed soft drinks or carbonated beverages nor did she have any symptoms of reflux.

On examination, the maxillary and mandibular arches were partially edentulous with teeth#1,2 missing in the maxillary arch and tooth# 18 missing in the mandibular arch. Generalised attrition was evident from attrition facets on all teeth (Fig. 1,2). Most of her teeth had occlusal restorations showing wear. She presented an anterior deep bite which compounded the attrition of anteriors, wearing out the lingual surfaces of maxillary anteriors.



Fig. 1: Generalised attrition



Fig. 2: Severe attrition in mandibular arch

During TMJ examination it was observed that her jaw deviated to the left upon closure and the midline was shifted by 3mm. There was no click in the TMJ and masticatory muscle palpation elicited no pain. The vertical dimension at rest (VDR) and at occlusion (VDO) was assessed using facial measurements and phonetics. The difference between them was 5mm. She was diagnosed as a case of occlusal wear with non-compensated tooth surface loss (TSL). Full mouth rehabilitation with fixed restorations was indicated here. Upon the patient's request for an economical alternative, a cast metal overlay denture was suggested as a treatment option.³ Maxillary and mandibular overlay partial dentures were planned to address the attrition as well as the replacement of missing teeth. Primary impressions were made in alginate (Tropicalgin, Zhermack) and diagnostic casts were mounted using a centric relation record at an increased vertical dimension. An interim acrylic occlusal splint was given to assess her adaptability to an increase in the VDO, which she was advised to wear for three weeks prior to commencement of the mouth preparation for final impressions. Mouth preparation consisted of minimal occlusal reduction and beveling of functional cusps of all posterior teeth. Maxillary and mandibular elastomeric impressions were made after mouth preparation (Express, 3M ESPE) A bite registration record was made in bite registration elastomer (Futar Occlusion, Kettenbach GmbH) at the required vertical dimension.

Design of the Partial Overlay Dentures

Maxillary Arch (Fig. 3): Kennedy Class II - open horse shoe major connector, with the major connector plate overlying the occlusal

surfaces of maxillary posteriors and the lingual surfaces of maxillary anteriors.



Fig. 3: Cast metal ORPD in maxillary arch

Mandibular arch (Fig. 4,5) Kennedy Class III – The chrome –cobalt framework was designed to cover the occlusal aspect of mandibular premolars and molars. A lingual bar major connector was planned. Metal pontics were designed as part of the overlay denture to replace the missing premolars.



Fig. 4: Cast metal ORPD in mandibular arch



Fig. 5: Post-op intra-oral view

The metal frameworks were tried and adjusted to fit without rocking on the occlusal surfaces. An interocclusal wax record was made. Maxillary posteriors were arranged and the framework was acrylised. The occlusion was adjusted using an articulating paper (Bausch Artifol 12 micron). The anterior teeth made light contact against the palatal metal. She was placed on monthly recall for 3 months and the result was satisfactory following the increase in vertical dimension.

Discussion

Occlusal overlay splints have been used in diagnostic and treatment phases of excessive occlusal wear since many decades. Overlay RPDs when used for diagnostic purposes have the same function as that of an occlusal splint but, provide an immediate improvement in esthetics and function. Apart from the economy of treatment the partial overlay dentures also offer reversibility as an advantage when compared to full mouth rehabilitation with fixed bridge work. While ORPDs are used widely there is not much scientific evidence on ORPDs in the literature. Unlike tooth-retained conventional overdentures or implant-retained overdentures, there are virtually no longitudinal studies or clinical trials of ORPDs. The only evidences in the literature on ORPDs are mostly in textbooks, narrative reviews, and clinical reports. Patel M and Bencharit S briefly reviewed indications for ORPD in current literature and presented a clinical report on the use of ORPDs as an interim and a permanent prosthesis in a patient with severely worn dentition.⁴ According to them the three main indications of ORPDs are:

- As interim prostheses⁵
- To correct severe malocclusions like skeletal class III, open bites⁶

- As an alternative treatment option in cases where medical or financial limitations contraindicate extensive fixed restorations.^{7,8}

In the case presented here surgical crown lengthening and fixed crowns were suggested to correct occlusal plane and restore the occlusion. But the patient insisted on an alternative economic option.

The minimal mouth preparation offered the obvious advantage of tooth preservation. The simplicity of the treatment modality allowed the procedure to be completed within a short time frame while the gingival surgery and fixed restorations would have involved considerable time and a number of visits.

Some authors have successfully treated cases of localized wear with the traditional or modified Dahl appliance and even direct composite restorations.^{9,10} But these methods were less relevant in the present case as the attrition was generalized and also the absence of posterior occlusion warranted replacement of posterior teeth.

Conclusion

The overlay denture is a simple, inexpensive and minimally invasive form of treatment modality offering the advantages of preservation of tooth structure, hygiene, shorter and lesser number of clinical appointments all together translating into an economically viable alternative option for the elderly. The reversible nature of this treatment also lends it to be utilized for diagnostic purpose and as an esthetic interim restoration for cases requiring extensive fixed prosthetics.

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