

Full Maxillary Arch Rehabilitation of a Severely Worn Dentition with Collapsed Bite Using Metal-Ceramic Fixed Prosthesis: A Case Report

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Introduction

Tooth wear is a multifactorial and progressive condition that becomes increasingly prevalent with advancing age. Excessive loss of tooth structure due to attrition, abrasion, erosion, or a combination of these factors can result in a reduction of the vertical dimension of occlusion (VDO), compromised masticatory efficiency, altered esthetics, and functional impairment. In severe cases, the loss of posterior support and extensive occlusal wear may lead to a collapsed bite, presenting a significant restorative challenge¹.

The rehabilitation of patients with collapsed occlusion requires a comprehensive assessment of the existing dentition, occlusal relationships, available restorative space, and the patient's functional and esthetic needs. Restoration of the vertical dimension should be carefully planned, as inappropriate alteration may adversely affect the stomatognathic system. Successful treatment aims to re-establish harmonious occlusion, improve facial esthetics, restore function, and enhance the patient's quality of life¹⁻⁵.

Full-mouth rehabilitation using fixed dental prostheses remains a predictable treatment modality for managing severely worn dentition and collapsed bite cases. Metal-ceramic restorations continue to be widely utilized because of their favorable combination of strength, durability, esthetics, and long-term clinical performance, particularly in elderly patients with high functional demands.

This case report describes the prosthodontic rehabilitation of an elderly patient presenting with a severely worn maxillary dentition and collapsed bite. A full maxillary arch rehabilitation was performed using metal-ceramic crown and bridge restorations to restore the vertical dimension of occlusion, improve esthetics, and re-establish functional occlusion.

An 85-year-old woman reported for the treatment of her severely worn dentition and chief complaint was that she could not eat anything because her teeth were worn too much, were hypersensitive and had an unesthetic appearance. Patient had no relevant medical history. Intraoral examination revealed a generalized loss of tooth structure that was greater in the maxillary posteriors. The anterior teeth had sharp enamel edges, dentinal craters and attritional wear due to the loss of posterior support. 11, 14, 15, 25, 31, 32, 46 and 47 were missing. The facial type of patient was square and her lip was hypertonic. Patient did not have temporomandibular disorders, but a discrepancy between centric occlusion (CO) and maximum intercuspal position was found when she was guided to centric relation (CR) with bimanual technique.

Treatment options

The options presented to the patient were removable partial dentures and full mouth rehabilitation with metal ceramic restoration with or without crown lengthening procedure and implant retained replacement of missing teeth. The patient was anxious about implant surgery, so this option was excluded. As there was clinical evidence of reduced VDO, full mouth rehabilitation with increasing VDO was planned.

Treatment planning

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Pre-treatment phase

Patient's casts were mounted on a semi-adjustable articulator (Hanau™ Modular Articulator; Whip Mix Corp., Louisville, USA) using a face-bow record and an interocclusal record was made with the aid of a Lucia jig and polyvinylsiloxane occlusal registration material (Exabite II; GC Corp., Tokyo, Japan).

The existing VDO was increased by mm using the incisal guidance pin of the articulator to a new VDO of 65 mm. The anterior guidance disoccluded the posterior teeth in all jaw positions except CR.

The adaptation of the patient to the increased VDO was evaluated during a 1-month period using the occlusal splint. No muscle tenderness or temporomandibular discomfort was found. Increasing the VDO was mandatory. It permitted the entire temporomandibular joint (TMJ) complex to attain an improved functional health and allowed the posterior avoidance patterns of occlusion to wane and a new vertical dimension to be established.

After recording the CR, diagnostic wax-up was performed.

Treatment procedure

All existing teeth were prepared to accept full veneer metal ceramic restorations with equigingival chamfer margins. The provisional fixed restorations were cemented with temporary cement (Freegenol Temporary Pack; GC Corp., Tokyo, Japan) and esthetics and emergence profile was evaluated. It was noticed that the crown height was insufficient and the patient had a collapsed bite. The provisional were temporarily removed. Bite was taken at the same height as the previous height of teeth.

A 3 week period was given for the healing and adjustment of the patient.

Intraoral Scan was taken at the same height as that of temporary crowns but at retruded position of mandible so as to compensate the insufficient height of anteriors.

Follow up was done after 1 week

Final restoration was placed.

Patient is on regular follow up and is functioning well from past 2 month.

Discussion

The management of severely worn dentition with loss of vertical dimension of occlusion (VDO) is a challenging aspect of prosthodontic rehabilitation, particularly in elderly patients. Excessive tooth wear can compromise esthetics, masticatory efficiency, phonetics, and overall quality of life. Therefore, a comprehensive treatment approach is essential to restore function while maintaining patient comfort and long-term occlusal stability⁷⁻⁹.

In the present case, the patient exhibited generalized attritional wear with a collapsed bite and loss of posterior support. Restoration of the VDO was considered necessary to provide adequate restorative space and to re-establish harmonious occlusal relationships. The increased VDO was evaluated using provisional restorations over a period of one month, during which the patient adapted satisfactorily without any signs of temporomandibular discomfort or muscle tenderness. This observation is in agreement with previous studies that have reported that a carefully planned increase in VDO is generally well tolerated by patients¹⁰⁻¹².

Metal-ceramic restorations were selected because they provide an optimal combination of strength, durability, and esthetics. In elderly patients with high functional demands and severely worn dentition, metal-

ceramic fixed prostheses continue to demonstrate predictable long-term clinical performance. The use of provisional restorations before definitive treatment aided in assessing esthetics, phonetics, occlusal relationships, and patient adaptation, thereby minimizing the risk of complications associated with alteration of the occlusal scheme¹²⁻¹⁴.

The successful outcome of this case can be attributed to meticulous diagnosis, accurate recording of centric relation, gradual adaptation to the increased VDO, and careful execution of the prosthodontic procedures. The treatment not only restored the patient's esthetics and masticatory function but also improved facial appearance and overall quality of life. Nevertheless, long-term follow-up is necessary to monitor the stability of the occlusion and the longevity of the restorations¹⁴⁻¹⁵.

Conclusion

Rehabilitation of severely worn dentition associated with collapsed bite requires careful diagnosis and a multidisciplinary treatment approach. This case demonstrates that full maxillary arch rehabilitation with metal-ceramic crown and bridge restorations can be a predictable and effective treatment modality for elderly patients with reduced vertical dimension of occlusion. Restoration of the VDO, combined with an appropriately designed occlusal scheme, successfully improved esthetics, masticatory efficiency, and functional harmony. Careful assessment of patient adaptation using provisional restorations and regular follow-up are essential to achieve favorable long-term outcomes.



Pre operative intraoral picture



Crown preparation for metal ceramic restoration irt maxillary arch



Provisional crown



After placement of metal ceramic restoration irt maxillary arch



Post operative extra oral picture



Pre-operative



Post - operative

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