Comprehensive occlusal reconstruction in a patient with severe periodontitis: A case report

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ABSTRACT

Occlusal collapse caused by advanced periodontitis and long-standing tooth loss presents a significant challenge in dental rehabilitation. This report describes the case of a 64-year-old male patient with severe generalized chronic periodontitis (Stage IV, Grade B) who exhibited loss of occlusal support and functional impairment. A comprehensive treatment plan was implemented, including extraction of hopeless teeth, periodontal therapy, endodontic procedures, and provisional restorations to re-establish the occlusal vertical dimension and mandibular stability, followed by definitive prosthodontic rehabilitation. This case highlights the clinical value of a staged, interdisciplinary approach for restoring function and occlusal stability in patients with advanced periodontal disease.

Key Words: Periodontitis; Occlusal collapse; Occlusal reconstruction; Prosthodontic rehabilitation

INTRODUCTION

Periodontal disease is a leading cause of tooth loss in adults [1]. When combined with prolonged neglect of missing teeth, it may result in occlusal collapse, functional impairment, esthetic deterioration, and an increased risk of temporomandibular joint dysfunction [2]. Management of such cases requires a comprehensive interdisciplinary approach. Periodontal therapy alone is insufficient; integration with prosthodontic rehabilitation is essential to restore both function and stability [3]. Provisional restorations and therapeutic dentures play a pivotal role in evaluating the Occlusal Vertical Dimension (OVD) and mandibular position prior to definitive prosthetic reconstruction [4].

This report presents a case of severe generalized chronic periodontitis with occlusal collapse managed through a coordinated periodontal–prosthodontic approach, emphasizing the role of transitional prostheses in establishing functional stability before definitive treatment.

CASE PRESENTATION

A 64-year-old male patient presented with the chief complaint of inability to chew due to mobile teeth. His medical history was significant only for well-controlled hypertension.

Clinical findings

Intraoral examination (Figure 1) revealed severe gingival inflammation, deep periodontal pockets, and generalized tooth mobility. Tooth mobility ranged from Miller class I to III, with severe mobility observed in the maxillary anterior bridge. Periodontal probing depths ranged from 4 to 7 mm with localized bleeding on probing. Multiple posterior teeth were missing, resulting in loss of occlusal support and mandibular deviation during closure. The mandibular premolars were extruded, and the anterior teeth were flared, producing an irregular occlusal plane. The patient reported no symptoms related to temporomandibular disorders.

Figure 1) *Initial intraoral photograph*

Panoramic radiography (Figure 2) demonstrated generalized horizontal alveolar bone loss extending to approximately one-third to one-half of the root length, with severe vertical bone resorption approaching the root apices in the maxillary anterior region. Several posterior teeth exhibited an unfavorable crown-to-root ratio.

Figure 2) *Panoramic radiograph*

Treatment procedure

Hopeless teeth were extracted, and a maxillary therapeutic complete denture was fabricated to restore mastication at an early stage. The occlusal plane of the denture was determined using Camper's plane and the interpupillary line. The OVD was established by assessing freeway space and was adjusted

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in conjunction with treatment of the mandibular premolars, which required endodontic therapy.

Even after adjustment of the OVD, no occlusal contact was present in the anterior region. Therefore, the existing mandibular anterior prostheses were removed, and provisional restorations were fabricated to establish a stable occlusion against the maxillary complete denture (Figure 3).

Figure 3) *Provisional restoration*

The provisional restorations were adjusted over a three-month period while monitoring muscle tenderness, temporomandibular joint comfort, mastication, swallowing, and speech. Concurrently, periodontal therapy consisting of scaling and root planning was performed.

After confirming patient tolerance to the new mandibular position and OVD, definitive tooth preparations and impressions were made. A facebow transfer (Slidematic Facebow, Yoshida) was performed prior to mounting the diagnostic casts on a semi-adjustable articulator (Denar Mark II Articulator, Yoshida). Centric relation was determined using the Gothic arch tracing method (Figure 4). Intraocclusal records were obtained using a silicone-based bite registration material (EXABITE II, GC), and condylar guidance was determined using protrusive records.

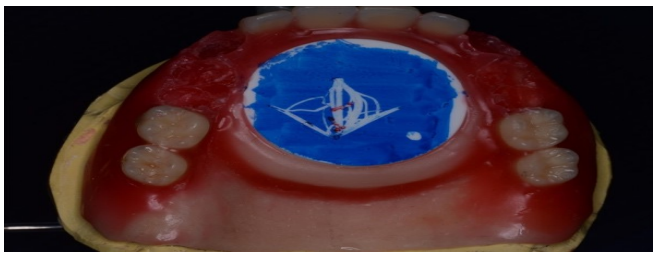

Figure 4) *Bite registration with Gothic arch*

Coupling crowns in the mandible and a maxillary overdenture were fabricated first, followed by a definitive mandibular removable partial denture. The definitive prostheses were designed to provide group function occlusion, allowing even distribution of occlusal forces during lateral excursions. The patient achieved stable occlusion, improved mastication, and satisfactory esthetics (Figure 5). Oral hygiene instruction and supportive periodontal therapy were emphasized for long-term maintenance.

Figure 5) *Definitive restoration*

RESULTS AND DISCUSSION

This case demonstrates the importance of a comprehensive treatment plan for patients with severe periodontal breakdown and occlusal collapse. Loss of anterior prosthetic support compromised esthetics and destabilized mandibular position, contributing to functional impairment.

Several treatment principles were critical to the successful outcome. Strategic extraction of hopeless teeth reduced the microbial burden and facilitated rehabilitation. Retention of salvageable roots through endodontic treatment provided abutments for overdenture support, improving prosthesis stability and proprioception. Long-term studies have reported favorable survival rates for treated abutment teeth in periodontally compromised patients receiving supportive periodontal care [5].

The use of treatment dentures and provisional restorations enabled controlled evaluation of the OVD and mandibular position before definitive rehabilitation. This step ensured patient tolerance with respect to comfort, speech, swallowing, and temporomandibular joint health, consistent with established occlusal reconstruction protocols [4].

Long-term success in such cases depends heavily on strict supportive periodontal care. Inadequate maintenance significantly increases the risk of prosthetic failure and tooth loss. Previous reports have demonstrated that with continuous periodontal maintenance, the majority of abutment teeth in compromised patients can remain functional over extended follow-up periods [5].

From a prosthodontic perspective, removable prostheses may be preferable to fixed reconstructions in patients with advanced periodontal disease and extensive bone loss. Group function occlusion can help distribute occlusal forces more evenly, reducing the risk of overload [6]. Although full-arch fixed prostheses may be considered in selected patients with stage IV periodontitis, biological and technical complications are more frequent compared with removable approaches [7].

Interdisciplinary treatment, including orthodontic intervention, may further improve occlusal plane relationships and force distribution in selected cases. While orthodontic treatment was not employed in this patient, previous reports suggest that combined orthodontic–periodontal–prosthodontic approaches can achieve favorable functional and esthetic outcomes in periodontally compromised patients [8].

CONCLUSION

Occlusal reconstruction in patients with advanced periodontitis requires a staged, multidisciplinary approach. Transitional prostheses play a crucial role in re-establishing mandibular stability and occlusal support prior to definitive prosthetic rehabilitation. Long-term success depends on continuous periodontal management and careful monitoring of occlusal function.

ETHICAL CONSIDERATIONS

Ethical approval was not required for this case report. Written informed consent was obtained from the patient for publication of this case report and accompanying images. This case report was prepared in accordance with the CARE guidelines.

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