

Management of Limited Prosthetic Space: A Clinical Report

Mami Wafa^{1*}, Bembli Wadii¹, Charfi Nihel¹, Bibi Rim¹, Frih Nadia¹

¹University Hospital Charles Nicole, Tunis, Tunisia

DOI: [10.36347/sasjs.2024.v10i04.019](https://doi.org/10.36347/sasjs.2024.v10i04.019)

| Received: 08.03.2024 | Accepted: 16.04.2024 | Published: 22.04.2024

*Corresponding author: Mami Wafa

University Hospital Charles Nicole, Tunis, Tunisia

Abstract

Case Report

Uncompensated loss of teeth leads to an occlusal disorder that cause functional and esthetic damage. These disturbances include the egression of opposing teeth, resulting in a reduction of the available prosthetic space. The management of these complications requires a meticulous analysis, which is materialized by the prosthetic project that visualizes the final result of the rehabilitation. The fixed prosthesis seems to be an interesting therapeutic option to restore the disturbed occlusion plane. Preparation guided by the prospective model is essential to create the necessary space for the future prosthesis. This article describes a clinical case of managing limited prosthetic space using fixed restoration.

Keywords: Occlusion plane, partial edentulism, prosthetic project, fixed prostheses.

Copyright © 2024 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

The loss of posterior teeth due to decay, fracture, periodontal disease or other causes is generally not without consequences, especially if this partial edentulism is not restored by prosthetic rehabilitation.

If antagonistic molars are present, they will not be spared from changes. They may undergo continuous eruption, seeking vertical and transversal wedging, which will destabilize the intra- and inter-arch relationships [1].

In fact, in 1787, the Scottish anatomist John Hunter was the first to assert that human teeth do not grow continuously, but rather undergo continuous axial eruption when they are no longer opposed by antagonistic teeth [2].

This dental egression reduces the available prosthetic space, which compromises the design of the prosthesis restoring the partial edentulism and hinders its functional integration.

As part of the prosthetic space management, several interventions may be indicated. In simple cases, it may be possible to restore the necessary prosthetic space with an enameloplasty.

In more advanced cases, this solution would require extensive preparation of the opposing tooth and restoration of a crown [3].

The clinician must then take an appropriate approach to treating these cases of occlusal disturbances.

The purpose of this article is to illustrate, through a clinical case, a simple prosthetic solution using fixed prostheses to recreate a suitable prosthetic space for rehabilitation with a metal removable partial denture.

CASE PRESENTATION

This is a 42-year-old female patient in good health who presented for prosthetic rehabilitation.

Clinical examination revealed a dentate maxillary arch and Applegate Kennedy class I partial edentulism in the mandible.

Occlusal examination associated to models mounted in an articulator revealed the presence of occlusal disturbances: the egression of 26 and 27, Fig 1 & 2.

A complementary intraoral periapical radiograph showed sufficient endodontic treatment and adequate bone support in relation to 26 and 27 with a report: radiographic crown/radiographic root less than 1 (RC/RR < 1), Fig 3.

The diagnostic phase with the materialization of the prosthetic project is a key step in prosthetic management.

The articulator analysis allows us to diagnose the reduction of the available prosthetic space and to precisely quantify the degree of egression: 3 mm for tooth 26 and a slight egression of 1 mm for tooth 27.

After this preprosthetic study, the following adjustments were made:

- Correction of the egression of tooth 26 with a fixed crown combined with a coronal elongation.
- A simple enameloplasty to rectify the minor egression of tooth 27.

These modifications are reflected in the wax-up and the teeth arrangement, Fig 4. This prospective model is used to materialize the prosthetic project, facilitate the patient's understanding and aid in the fabrication of provisional prostheses [4].

The intraoral preparation of tooth 26 is guided by the mandibular occlusal pattern to ensure a harmonious preparation based on the occlusal relationships previously restored during the prosthetic project phase, Fig 5.

Following this preparation, we encountered insufficient crown height, which compromised the prosthetic reconstruction. Therefore, surgical elongation of the clinical crown was necessary to restore proper

periodontal-prosthetic relationships that respect the longevity of the biological space, Fig 6 [5].

The temporary crown derived from the wax-up was then fabricated to stabilize the results of the periodontal therapy and to guide the fabrication of the final prosthesis.

After the final cementation of the crown Fig 7, the prosthetic phase began with the completion of the coronoplasties related to the mandibular metal framework.

A final impression was taken with the peripheral joint compound and the polysulfure regular body in order to apprehend the difference in compressibility between the periodontal ligaments of the abutment teeth and the mucosa of the residual alveolar ridge.

The removable partial denture framework was then fabricated in the laboratory and tried in the mouth to check the occlusion and record the jaw relationships.

The prosthetic teeth were placed. The removable partial denture was then polymerized, placed in the mouth and occlusal equilibration was performed. Instructions for proper denture hygiene are given to the patient, Fig 8.



Fig 1: Initial clinical situation: egression of 26 and 27



Fig 2: Analysis of the articulator: insufficient prosthetic space



Fig 3: Periapical radiograph



Fig 4: Prospective model



Fig 5: Preparation of the 26



Fig 6: Coronal elongation of the 26



Fig 7: Sealing of the definitive crown



Fig 8: Placement of the removable partial denture in the patient's mouth

DISCUSSION

The management of occlusal problems due to edentulism requires an analysis phase and a prosthetic project to guide the treatment plan and all rehabilitation's steps.

Vertical prosthetic space reduction is primarily diagnosed by analyzing study casts placed on an articulator. It is important to note that an accurate diagnosis leads to effective and well-founded treatment decisions and plans.

In fact, a detailed clinical examination must be performed during the initial consultation in order to determine the cause of the tooth loss and the duration of the edentulism that has led to this situation. The vertical dimension of the occlusion must also be evaluated. In addition, the complementary but essential radiological examination should not be ignored to evaluate the radiographic crown/root ratio (CR/RR) of the egressed teeth, which influences our therapeutic decision [6].

Several interventions may be indicated to restore the prosthetic space, either on the antagonist tooth and/or by surgical reshaping of the edentulous ridge. The therapeutic approach will therefore depend on the degree of egression, which will be quantified based on the articulator analyses.

If the recession of a non-antagonist tooth is less than 1 mm, occlusal tissue management, also known as enameloplasty, may be sufficient to resolve the problem.

In this clinical case, the egression of tooth 26 was 3 mm, so we resorted to adjusting the prosthetic

space with a fixed prosthesis combined with crown elongation. The disadvantage of this procedure is that it involves a mutilating preparation of the tooth, possibly leading to its devitalization, with a reserved long-term prognosis. However, it is a more economical solution for the patient and requires fewer sessions [3].

To avoid the mutilating restoration of the egressed tooth, new orthodontic anchorage techniques have been proposed. In fact, the advent of intraosseous anchorage devices such as miniscrews in orthodontics has contributed significantly to the evolution of the therapeutic management of prosthetic space problems. They allow intrusion movements without involving other teeth, thus allowing a conservative restoration of the prosthetic space and, consequently, of occlusion and function, with a good long-term prognosis [7].

CONCLUSION

The use of fixed prostheses to restore the occlusal plane is a treatment option that meets both esthetic and functional requirements. However, the success of this type of treatment depends on an appropriate conceptual diagnostic approach, with a valid prosthetic project to materialize the adjustments, respect for the biological space and the fabrication of a quality prosthesis [8].

REFERENCES

1. Compagnon, D., & Woda, A. (1991). Supraeruption of the unopposed maxillary first molar. *The Journal of Prosthetic Dentistry*, 66(1), 29-34.
2. Lindskog-Stokland, B., Hansen, K., Tomasi, C., Hakeberg, M., & Wennström, J. L. (2012). Changes in

- molar position associated with missing opposed and/or adjacent tooth: a 12-year study in women. *Journal of oral rehabilitation*, 39(2), 136-143.
3. Myriam, D., Adrien, M., & Frédéric, P. (2017) Aménagement orthodontique préprothétique: Présentation d'un cas clinique. *Quintessence dentisterie restauratrice et prothèse*, 11(2).
 4. Alloh Ammichia, Y. C., LeGuehennec, L., & Le Bars, P. (2010) Prothèse transitoire et montage directeur en prothèse adjointe subtotale. *Clinic*, (9).
 5. Viargues, P., & Meyer, J. (2009). Allongement chirurgical de la couronne clinique. *Actualités odonto-stomatologiques*, (247), 255-265.
 6. Esclassan, R., Esclassan-Noirrit, E., Lacoste-Ferré, M. H., & Guyonnet, J. J. (2004). Prothèse adjointe partielle: occlusion, choix et montage des dents. Polymérisation des bases. *EMC-Dentisterie*, 1(1), 2-24.
 7. Iwai, H., Motoyoshi, M., Uchida, Y., Matsuoka, M., & Shimizu, N. (2015). Effects of tooth root contact on the stability of orthodontic anchor screws in the maxilla: comparison between self-drilling and self-tapping methods. *American Journal of Orthodontics and Dentofacial Orthopedics*, 147(4), 483-491.
 8. Fajri, L., Hamzaoui, S., Berzouk, N., & Elmohtarim, B. (2021). La réhabilitation par prothèse amovible partielle: de l'analyse à la réalisation. *Journal de la médecine dentaire*, (61).