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Case Report

The Role of Occluso-Tissue Conditioning in Prosthetic Management of Complete Denture Patients: A Case Report

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Abstract: The success of complete removable dentures (CRDs) has traditionally been based on retention and stability. However, in the long term, occlusal balance plays a decisive role in preserving the integrity of the supporting tissues and ensuring functional comfort in the completely edentulous patient. Defective occlusion may lead to sometimes severe mucosal lesions, thereby compromising the longevity of prosthetic rehabilitation. To describe, through a clinical case, the repercussions of defective occlusion on the supporting tissues in a completely edentulous patient, and to illustrate the interest of occluso-tissue conditioning particularly through the use of the Tench articulation prior to the fabrication of new complete dentures. A completely edentulous patient, a long-term wearer of unstable and painful complete dentures, presented with functional discomfort and mandibular mucosal lesions. Clinical and occlusal examination revealed an underestimated vertical dimension, an incorrect centric relation, and anterior locking. A transitional phase of occluso-tissue conditioning using the existing dentures was implemented, combining occlusal rehabilitation through the Tench articulation with tissue conditioning. The gradual correction of occlusion and the improvement of the mucosal condition resulted in satisfactory tissue healing, restoration of occlusal parameters, and successful functional integration of the new complete dentures. Occluso-tissue conditioning represents a key step in the management of completely edentulous patients wearing defective complete dentures. The Tench articulation constitutes a reliable and conservative approach for restoring the vertical dimension and centric relation while using existing dentures as therapeutic tools.

Keywords: Complete Removable Denture, Tissue Conditioning, Occlusion, Tench Articulation, Completely Edentulous Patient.

INTRODUCTION

Retention and stability are essential prerequisites for the success of complete removable dentures. However, these mechanical parameters alone are insufficient to ensure the clinical success and longevity of rehabilitation in completely edentulous patients. When properly designed and executed, occlusal balance plays a fundamental role in the harmonious distribution of functional loads and in the preservation of the supporting tissues' integrity [2, 3].

Defective occlusion may generate excessive and misdirected stresses on the supporting surfaces, promoting the development of mucosal lesions such as denture stomatitis, traumatic ulcerations, or inflammatory hyperplasias like epulis fissuratum [1-5]. These tissue alterations are often associated with changes in the vertical dimension of occlusion (VDO) and

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functional disorders, leading the clinician to consider denture replacement.

Prior to any new rehabilitation, a transitional therapeutic phase is frequently necessary. Occluso-tissue conditioning aims to improve the histological and anatomical characteristics of the supporting tissues and to restore disturbed physiological functions. It allows a gradual transition from a pathological state to clinical health while preparing the oral environment for the definitive prosthesis [1-5].

The objective of this work is to present, through a clinical case, the consequences of defective occlusion on the supporting tissues in a completely edentulous patient and to discuss the therapeutic approach adopted, emphasizing the value of the Tench articulation and the role of existing dentures during the conditioning phase.

CLINICAL CASE

A patient in good general health, a long-term wearer of complete removable dentures, presented with significant functional discomfort, particularly during mastication, associated with denture instability at rest.

Clinical Examination

Extraoral Examination

The extraoral examination revealed an underestimated vertical dimension of occlusion (VDO), accompanied by angular cheilitis, deepening of the nasolabial folds, and accentuation of perioral wrinkles (Figure 1).

Intraoral Examination

Intraorally, a mucosal lesion was observed in the anterior mandibular vestibule, characterized by hyperplasia with associated ulcerations. The peripheral borders of the lower denture appeared adequately extended (Figure 2).

Figure 1: Extraoral examination

A: Frontal view B: Profile view

Figure 2: A: Mucosal lesion in the mandibular region B: Relationship between the denture borders and the lesion

Occlusal Examination

Occlusal analysis showed:

- Incorrect centric relation
- Underestimated VDO
- Anterior locking with exaggerated vertical overlap (Figure 3)

Figure 3: Exaggerated vertical overlap (overbite)

Assessment of Existing Dentures

The patient's existing dentures exhibited poor hygiene, roughened surface textures, and worn prosthetic teeth, reflecting a long-standing occlusal imbalance.

Therapeutic Decision

It was decided to redo the prosthetic rehabilitation, preceded by a transitional phase of occluso-tissue conditioning using the existing dentures.

Conditioning Phase

Tissue Conditioning

The intaglio surface of the mandibular denture was lined with a tissue conditioner (Fit®, Kerr) to improve retention and stability, while promoting regression of mucosal lesions through the material's therapeutic properties.

Occlusal Rehabilitation: Tench Articulation

Occlusal correction was performed according to the Tench articulation technique, allowing a gradual and controlled restoration of the VDO and centric relation.

Wax rims were fabricated in the mandibular premolar-molar regions. After guiding the patient into correct VDO and centric relation, the wax was gradually replaced with a slow-setting resin, ensuring progressive and reversible correction (Figure 4).

Fabrication of New Dentures

Once occlusal balance and tissue condition were restored, new complete dentures were fabricated following conventional steps, resulting in a satisfactory functional and aesthetic outcome (Figure 5).

Figure 4: Steps in performing the Tench articulation

Figure 5: Steps in the fabrication of new complete dentures
A: Primary impressions
B and C: Secondary impressions

D: Occlusal registration
E: Wax try-in of teeth
F: Insertion and patient satisfaction

DISCUSSION

Complete removable dentures (CRDs) represent a major functional and aesthetic therapy for completely edentulous patients. However, their clinical success does not depend solely on the quality of impressions or the extension of the denture bases; it relies on a delicate balance between mechanical, biological, and functional parameters. Among these, occlusion plays a central role, as it directly governs the distribution of masticatory loads and the integrity of the supporting tissues in both the short and long term [2, 3].

Repercussions of Defective Occlusion on Supporting Tissues

Inadequate occlusion, characterized by incorrect centric relation, underestimated vertical dimension, or anterior locking, leads to excessive concentration of occlusal forces on limited areas of the supporting mucosa. This repeated mechanical overload causes chronic tissue distress, resulting in inflammatory or hyperplastic lesions [1-5].

The literature reports that type II denture stomatitis is frequently associated with poorly balanced dentures, especially when prosthetic surfaces are rough and hygiene is insufficient. This diffuse inflammation is promoted by microbial stagnation, constant moisture, and repeated microtraumas induced by unstable occlusion [5-8]. Fortunately, this lesion is reversible if etiological factors are eliminated, particularly through occlusal correction and tissue conditioning.

In contrast, epulis fissuratum represents an exaggerated adaptive response of the soft tissues to chronic irritation, often linked to over- or under-contoured prostheses combined with unbalanced occlusion. This inflammatory hyperplasia is considered irreversible, requiring pre-prosthetic surgery followed by meticulous tissue conditioning to guide healing and prevent recurrence [4-8].

In the present case, the underestimated VDO combined with anterior locking led to altered mandibular dynamics, increasing stress on the anterior mandibular vestibule a structurally fragile area explaining the development of the observed lesion.

Biological Basis and Objectives of Tissue Conditioning

Tissue conditioning encompasses therapeutic procedures aimed at restoring the normal histological and anatomical characteristics of supporting tissues while reestablishing physiological functions disrupted by inadequate prostheses [1-4].

Biologically, tissue conditioners act by:

- Reducing mechanical stresses through their viscoelastic behavior
- Improving the distribution of functional pressures
- Decreasing hyperemia and chronic inflammation
- Indirectly stimulating mucosal healing after pre-prosthetic surgery [5-8]

Thus, they enable a gradual and controlled transition from a pathological state to clinical health, avoiding abrupt aggression to already compromised tissues. This gradual approach represents a major advantage over immediate fabrication of new dentures on inflamed tissues.

Materials for Tissue Conditioning: Benefits and Limitations

Materials commonly used for tissue conditioning include slow-setting resins with plastic or elastic properties. Their low modulus of elasticity allows intimate adaptation to tissues while absorbing part of the occlusal forces [8].

However, several authors note clinical limitations:

- Rapid material aging
- Loss of plasticity
- Increased microbial colonization, particularly by *Candida albicans*
- Necessity for frequent replacement [5,8]

These constraints require strict clinical monitoring, meticulous hygiene, and limited duration of use, generally from a few days to several weeks depending on the indication.

Clinical Importance of Existing Dentures

The therapeutic use of existing dentures is a key aspect of management. Far from being merely obsolete devices, they serve as valuable diagnostic and treatment tools [1-4].

They allow:

- Gradual restoration of supporting structures (fibro-mucosal and bony)
- Neuromuscular readaptation
- Articular stabilization through progressive restoration of occlusal parameters
- Clinical validation of VDO and centric relation before definitive fabrication [2, 3]

This approach significantly reduces the risk of failure of new dentures and improves their long-term functional integration.

Specific Contribution of the Tench Articulation in Occlusal Conditioning

The Tench articulation represents a technique for progressive occlusal correction, particularly indicated in completely edentulous patients with collapsed VDO and long-standing occlusal imbalances. Unlike abrupt correction, this method respects the patient's neuromuscular and joint adaptation capacities [3].

Its main advantages include:

- Gradual restoration of VDO
- Neuromuscular reprogramming in centric relation
- Reversible and conservative technique
- Progressive adaptation of supporting tissues to new functional stresses [2, 3]

Millet *et al*., demonstrated that the Tench articulation allows reliable occlusal correction while limiting secondary inflammatory reactions, making it a pertinent choice in complex pre-prosthetic phases [3].

In the present case, this technique enabled simultaneous correction of VDO, centric relation, and anterior locking while improving tissue condition prior to the fabrication of new dentures.

Therapeutic Alternatives and Limitations

Immediate fabrication of new dentures is an alternative when existing prostheses are unusable. However, several authors agree that this option carries an increased risk of failure when supporting tissues are inflamed or unstable [4, 5].

Therefore, occluso-tissue conditioning appears to be an indispensable step in complex clinical situations, determining the long-term success of prosthetic treatment.

CONCLUSION

Occluso-tissue conditioning constitutes an essential step in the pre-prosthetic management of completely edentulous patients wearing defective dentures. It governs functional success and the durability of prosthetic rehabilitation.

Active patient participation during this phase is crucial, as any reluctance may compromise outcomes and the long-term stability of new complete removable dentures.

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