Staged Implant-Retained Overdenture Rehabilitation in Patient with Poor Neuromuscular Control

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ABSTRACT

Tardive dyskinesia (TD) is a severe, involuntary neurological movement disorder primarily induced by the prolonged use of dopamine receptor-blocking medications, such as antipsychotics and metoclopramide. Clinically, it manifests as repetitive, uncontrollable movements of the tongue, lips, jaw, and facial musculature. While these hyperactive involuntary movements present extensive challenges across daily functions, their impact on the oral cavity creates a highly hostile environment for prosthodontic rehabilitation.

The Staged Strategic Approach

- **The Problem:** Immediate transition to full edentulism and interim complete dentures disrupts fragile neuromuscular adaptation, increasing patient distress and prosthesis instability.
- **The Solution:** This case report demonstrates a **sequential, staged implant-retained overdenture protocol** for a patient with a failing dentition and hyperactive tongue movements.
- **Clinical Execution:** Phased extractions and strategic implant placement preserve existing teeth and modified provisional units to maintain stable vertical dimension and occlusal pairs throughout treatment.
- **Objective:** To outline a protocol that eliminates interim complete dentures, facilitating a gradual, well-tolerated transition that maximizes functional adaptation and patient comfort.

Lumetti S, Ghiacci G, Macaluso GM, Amore M, Galli C, Calciolari E, Manfredi E. Tardive Dyskinesia, Oral Parafunction, and Implant-Supported Rehabilitation. Case Rep Dent. 2016;2016:7167452. doi: 10.1155/2016/7167452. Epub 2016 Dec 6. PMID: 28050290; PMCID: PMC5168480.
Kelleher, M. G. D., Scott, B. J. J., & Djemal, S. (1996). Case report: Complications of rehabilitation using osseointegrated implants - tardive dyskinesia. *European Transactions on Electrical Power*, *6*(4), 133–136.
Blanchet PJ, Rompré PH, Lavigne GJ, Lamarche C. Oral dyskinesia: a clinical overview. Int J Prosthodont. 2005 Jan-Feb;18(1):10-9. PMID: 15754887.
Lobbezoo F, Naeije M. Dental implications of some common movement disorders: a concise review. Arch Oral Biol. 2007 Apr;52(4):395-8. doi: 10.1016/j.archoralbio.2006.09.005. Epub 2006 Nov 27. PMID: 17125732.

CHIEF CONCERN

79-year old female ASA II patient presents with chief concern of difficulty speaking and functioning due to a suboptimal removable mandibular prosthesis. Case is characterized by non-physiologic occlusion, reduced OVD, and active caries. Complicating factors include a strong tongue thrust due to Tardive Dyskinesia and severe residual ridge resorption.

Chief Concerns:

1. Function: “I can’t eat anything hard, only soft foods” ; “People cannot understand me”

2. Comfort: “My bottom denture is loose”; “It hurts when I chew”

ORAL STATUS

Non-physiologic occlusion characterized by:

- Compromised chewing function and speech due to suboptimal prostheses
- Compromised esthetics due to worn prosthetic teeth
- Reduced OVD
- Irregular occlusal planes

Sub-optimally restored partial edentulism:

- Mx- Kennedy class II
- Md- Kennedy class I

Malocclusion:

- Class III malocclusion, prognathic mandible

Soft tissues:

- Healthy on reduced periodontium
- Residual ridge resorption Siebert class 3 in posterior mandible bilaterally

Recurrent caries

Strong tongue thrust

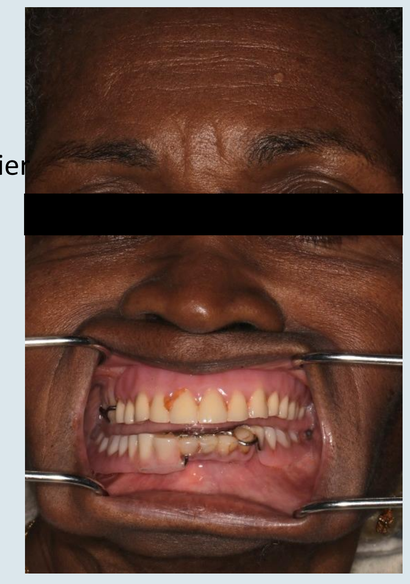
FIGURE 1. PRE-TREATMENT RADIOGRAPH

FIGURE 2. EXTRAORAL RECORDS

FIGURE 3. INTRAORAL RECORDS

TREATMENT PLAN SUMMARY

- Place implants at sites 34 and 44 and allow for complete healing.
- Once healing is complete, begin fabrication of a mandibular complete overdenture to accommodate locators at sites 34 and 44. The use of locators provides improved retention, stability, and patient comfort while facilitating easier insertion and removal of the prosthesis.
- The next phase would involve extraction of the hopeless teeth from 33–41, followed by insertion of an immediate overdenture retained by the locator attachments.
- Two additional implants would then be placed at sites 32 and 42 with cover screws and allowed to heal completely.
- Following osseointegration, the definitive mesh-reinforced locator-retained overdenture would be adjusted to engage all four locator attachments.



CONCLUSION

This treatment plan provides the patient with a locator-retained overdenture using a familiar and user-friendly attachment system (locator attachments). The design facilitates ease of cleaning and maintenance should the patient experience further loss of neuromuscular control with aging, while also minimizing the amount of time spent functioning with a conventional complete denture.

CLINICAL SIGNIFICANCE

This case highlights the importance of treatment planning and surgical sequencing to limit the time with complete denture in patients with poor neuromuscular control.