International Journal of Enhanced Research in Medicines & Dental Care (IJERMDC),
ISSN: 2349-1590, Vol. 13 Issue 2, February 2026

Complete Denture Rehabilitation in an Edentulous Patient with Asymptomatic Mandibular Ridge Leukoplakia: A Modified Prosthodontic Approach

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ABSTRACT

Statement of problem: Fabrication of complete dentures in patients with oral potentially malignant disorders such as leukoplakia presents a clinical challenge, as chronic mechanical irritation from dentures may contribute to lesion progression or malignant transformation.

Purpose: To describe a modified complete denture rehabilitation protocol in an edentulous elderly patient presenting with asymptomatic leukoplakia on the mandibular ridge.

Case description: A 78-year-old edentulous male patient reported for complete denture fabrication. Routine intraoral examination revealed an asymptomatic, homogeneous leukoplakic lesion on the mandibular alveolar ridge. After interdisciplinary evaluation and clearance, complete denture treatment was planned with specific prosthodontic modifications aimed at minimizing mucosal trauma. Primary impressions were made using impression compound, border molding was performed with green stick compound, and final impressions were recorded using zinc oxide eugenol impression paste following a mucostatic approach. Relief was provided over the leukoplakic area throughout impression making and denture fabrication. Jaw relations were recorded, waxed-up dentures were tried in, and definitive dentures were processed and inserted. The patient was followed for six months.

Results: The dentures demonstrated satisfactory retention, stability, esthetics, and function. No ulceration, discomfort, or progression of the leukoplakic lesion was observed during the follow-up period.

Conclusion: Complete denture rehabilitation in patients with asymptomatic leukoplakia can be successfully accomplished using modified clinical techniques that prioritize mucosal safety. Careful impression philosophy, pressure control, and long-term monitoring are essential for achieving favourable functional and biological outcomes.

Clinical implications: Prosthodontists play a critical role in the early identification and safe management of potentially malignant oral lesions during routine denture therapy.

Keywords: Complete denture, Oral leukoplakia, potentially malignant disorder, Geriatric prosthodontics, Modified impression technique, Mucosal protection.

INTRODUCTION

Edentulism is a prevalent condition among the geriatric population and is frequently associated with compromised mastication, impaired phonetics, and diminished quality of life[1]. Complete dentures remain the most commonly prescribed treatment for edentulous patients; however, successful rehabilitation requires careful evaluation of the denture-bearing tissues to prevent iatrogenic trauma[2].

Oral leukoplakia is defined as a predominantly white plaque of questionable risk that cannot be characterized clinically or histopathologically as any other definable disease[3]. It is the most common oral potentially malignant disorder, with a reported malignant transformation rate ranging from 1% to 10%, depending on clinical and histopathologic features[4]. Leukoplakia may remain asymptomatic and is often detected incidentally during routine oral examinations, particularly in edentulous patients seeking prosthodontic care[5].

Fabrication of complete dentures in patients with leukoplakia presents a unique challenge. Chronic mechanical irritation from ill-fitting dentures, excessive occlusal load, or improper flange extension may contribute to progression or malignant transformation of the lesion[6]. Therefore, modification of conventional prosthodontic techniques is essential to minimize mucosal trauma while ensuring acceptable denture function[7].

Several authors have emphasized the importance of interdisciplinary management, careful impression techniques, selective pressure distribution, and long-term monitoring when providing dentures for patients with potentially malignant oral lesions[8],[9]. However, literature describing detailed prosthodontic modifications in such cases remains limited.

This case report describes the complete denture rehabilitation of a 78-year-old edentulous patient with asymptomatic leukoplakia on the mandibular ridge, highlighting specific clinical modifications undertaken during impression making, denture fabrication, and post-insertion care to ensure mucosal safety and long-term prosthesis success.

CASE REPORT

Patient History and Clinical Examination

A 78-year-old male patient reported to the Department of Prosthodontics with the chief complaint of difficulty in mastication due to missing teeth and requested fabrication of complete dentures. The patient had been edentulous for approximately 5 years and was not using any prosthesis.

Medical history was non-contributory. The patient reported a past history of smokeless tobacco use, which had been discontinued several years earlier.

Intraoral examination revealed completely edentulous maxillary and mandibular arches. A well-defined, homogeneous, non-scrapable white patch measuring approximately 1.5 × 1 cm was noted on the left mandibular alveolar ridge in the premolar region. The lesion was asymptomatic, non-tender, and firm on palpation.

The patient was referred to the Department of Oral Medicine and Radiology. Based on clinical evaluation and histopathologic confirmation, the lesion was diagnosed as asymptomatic homogeneous leukoplakia without dysplasia. Written clearance for denture fabrication was obtained with the recommendation to avoid chronic mechanical irritation and to maintain periodic follow-up[10].

Treatment Planning

Considering the patient's age, asymptomatic nature of the lesion, absence of dysplasia, and clearance from Oral Medicine, fabrication of conventional complete dentures with specific prosthodontic modifications was planned. The primary objective was to minimize pressure and friction over the leukoplakic area while maintaining acceptable retention, stability, and function[11].

Clinical Procedure

Primary Impression

Primary impressions of both arches were made using impression compound in stock trays[12]. Impression compound was selected for its rigidity and ability to record the edentulous foundation accurately. Care was taken to avoid excessive pressure over the leukoplakic area. The impressions were evaluated for coverage and poured in dental plaster to obtain primary casts.

Custom Tray Design and Border Molding

Custom trays were fabricated using autopolymerizing acrylic resin with additional relief provided over the leukoplakic region by placing two layers of wax spacer. Border molding was performed using green stick impression compound[13]. Border molding adjacent to the lesion was deliberately conservative to prevent compression of the affected mucosa.

Final Impression

Final impressions were recorded using zinc oxide eugenol impression paste following a mucostatic impression philosophy[14]. Zinc oxide eugenol was chosen due to its excellent flow, dimensional stability, and minimal tissue displacement. The leukoplakic area was intentionally excluded from load-bearing during impression making. Master casts were poured in Type III dental stone.

Jaw Relation Records

Record bases and occlusal rims were fabricated. Vertical dimension was determined using facial measurements, phonetics, and patient comfort. Centric relation was recorded and verified intraorally. The casts were mounted on a semi-adjustable articulator[15].

Teeth Arrangement and Wax Try-In
Artificial teeth were arranged in lingualized balanced occlusion to reduce lateral forces on the mandibular ridge[16]. Wax try-in was carried out to evaluate esthetics, phonetics, vertical dimension, and occlusion. Patient approval was obtained.

Processing, Denture Insertion, and Post-Insertion Care
The dentures were processed using heat-polymerized acrylic resin, finished, and polished. At insertion, pressure-indicating paste was used to verify complete relief over the leukoplakic area[17]. Borders adjacent to the lesion were rounded and highly polished.

Post-insertion instructions included:

- Removal of dentures at night
- Strict oral and denture hygiene
- Avoidance of tobacco
- Immediate reporting of any ulceration or discomfort

Follow-up visits were scheduled at 24 hours, 1 week, 1 month, 3 months, and 6 months. At 6-month review, the lesion remained asymptomatic with no change in size or appearance.

DISCUSSION

Oral leukoplakia is the most prevalent potentially malignant disorder of the oral cavity and requires careful long-term surveillance[3]. In edentulous patients, such lesions may go unnoticed until prosthodontic evaluation, highlighting the importance of thorough mucosal examination[5].

Chronic mechanical irritation from dentures has been implicated as a contributing factor in the progression of leukoplakia and other potentially malignant disorders[6]. Therefore, prosthodontic intervention must prioritize mucosal safety over maximal retention in such cases[11].

Impression compound remains a reliable material for primary impressions in geriatric patients, especially when ridge anatomy is compromised[12]. Zinc oxide eugenol impression paste continues to be considered the gold standard for final impressions in complete dentures due to its mucostatic properties[14].

Providing relief over the leukoplakic area and redistributing occlusal forces to stress-bearing areas helps reduce localized trauma and friction[7]. Intentional compromise of retention may be justified to enhance tissue protection[8].

Occlusal scheme selection plays a crucial role in minimizing lateral stresses. Lingualized occlusion offers improved esthetics and stability while reducing horizontal forces on the mandibular ridge[16].

Highly polished tissue and polished surfaces reduce plaque accumulation and frictional irritation, which is particularly important in patients with potentially malignant lesions[18].

Regular follow-up is essential, as leukoplakia carries a lifelong risk of malignant transformation even in the absence of dysplasia[4]. Dentists play a critical role in early detection of changes during recall visits[9].

This case demonstrates that complete denture fabrication is feasible in patients with asymptomatic leukoplakia when appropriate modifications and interdisciplinary coordination are implemented.

CONCLUSION

Complete denture rehabilitation in patients with asymptomatic leukoplakia requires meticulous clinical planning, modified impression techniques, and long-term monitoring. With appropriate prosthodontic modifications and interdisciplinary management, functional and biologically safe outcomes can be achieved.

ACKNOWLEDGMENTS

The author sincerely acknowledges Dr. Ajay Gaikwad for his invaluable guidance, clinical supervision, and academic support throughout the diagnosis, management, and documentation of this case.

Author Biography
Shravani Sunil Tembre is a fourth-year undergraduate student in the Department of Prosthodontics, School of Dental Sciences, Karad, with academic interest in complete denture prosthodontics and geriatric oral rehabilitation.

Dr. Ajay Gaikwad contributed to the conceptualization of the case management plan, clinical supervision during diagnosis and treatment procedures, and critical review of the manuscript for intellectual content. He provided guidance throughout the preparation and refinement of the case report and approved the final version for submission.

Conflict of Interest
The author declares no conflict of interest.

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Photographs:

Edentulous Patient

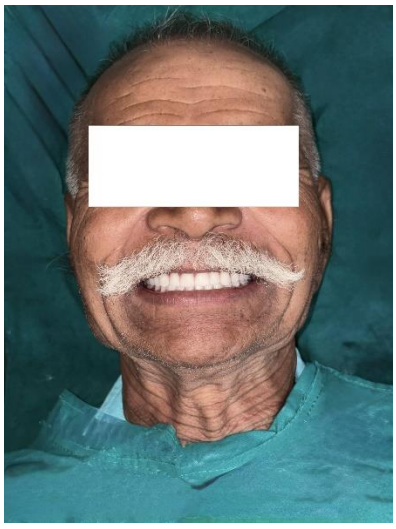
Leukoplakia in Mandibular Ridge

Relief in Leukoplakic Region

Final Impressions

Jaw Relationship Recording

Try-In of Waxed-up Dentures



Denture Insertion

Patient Photos- Before and After Denture Insertion