Journal of Pioneering Medical Sciences
Received: February 17, 2026 | Accepted: March 24, 2026 | Published: April 15, 2026
Volume 15, Issue S01, Pages 82-85

DOI https://doi.org/10.47310/jpms202515S0116

Prosthetic Rehabilitation with Removable Prostheses in Oral Submucous Fibrosis: Influence of Disease Severity on Functional Outcomes and Patient Satisfaction

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Abstract **Objectives:** Oral submucous fibrosis (OSMF) is a chronic fibrotic oral potentially malignant disorder that compromises tissue resilience, sulcular depth, denture border extension, retention and oral function. Evidence describing how pathological severity affects short-term prosthetic outcomes remains limited. **Methods:** This prospective clinical follow-up study enrolled 45 clinically and histopathologically diagnosed OSMF patients requiring removable prosthetic rehabilitation. Patients were classified according to the Khanna and Andrade staging system into mild, moderate and severe groups (n = 15 each). Individualized prosthetic rehabilitation was performed using modified impression approaches and flexible denture-base materials when required. Maximum mouth opening (MMO), masticatory efficiency (ME), speech intelligibility, comfort and patient satisfaction were assessed at baseline, 1 month and 3 months. **Results:** Mean baseline MMO in Groups I, II and III was 23.5±4.2 mm, 18.9±3.7 mm and 14.1±2.9 mm, respectively; values increased to 28.7±3.8 mm, 24.2±3.4 mm and 19.3±2.7 mm at 3 months (all within-group $p < 0.001$). ME improved by 38%, 31% and 24%, respectively. Satisfaction at 3 months remained highest in mild disease (8.6±0.7), followed by moderate disease (7.8±0.9) and severe disease (6.9±1.1). Retention and adaptation remained the weakest domains in severe fibrosis. **Conclusion:** Removable prosthetic rehabilitation improved oral function and patient-reported satisfaction across all OSMF severity grades over 3 months. Outcomes were most favourable in mild disease, whereas severe fibrosis continued to limit retention and adaptation; therefore, patient counselling, physiotherapy and severity-based prosthetic modification remain essential.

Key Words Oral Submucous Fibrosis, Removable Prosthesis, Maximum Mouth Opening, Masticatory Efficiency, Patient Satisfaction, Prosthodontic Rehabilitation

INTRODUCTION

Oral submucous fibrosis (OSMF) is a chronic progressive disorder characterized by epithelial atrophy, juxta-epithelial inflammation and dense collagen deposition that produces mucosal rigidity, burning sensation, restricted mouth opening and progressive impairment of oral function [1-5]. Because OSMF is also associated with malignant transformation risk, patients require long-term surveillance in addition to symptom-directed care [1,4,10].

From a prosthodontic standpoint, OSMF presents distinctive difficulties. Fibrosis reduces tissue resilience, decreases vestibular depth, limits border moulding, restricts tray insertion, compromises peripheral seal and makes both insertion and removal of removable prostheses more difficult than in conventional edentulous patients [6,13]. These limitations can reduce retention, stability, comfort and adaptation, especially in severe disease.

Functional impairment in OSMF extends beyond mouth opening alone. Chewing difficulty, altered speech, pain during oral function and inability to tolerate prostheses may adversely affect nutrition, social confidence and oral health-related quality of life [9,17]. For this reason, prosthetic rehabilitation in OSMF should be judged not only by mouth opening but also by masticatory performance, speech, comfort, adaptation and patient satisfaction.

Published literature on OSMF has focused predominantly on pathogenesis, malignant potential, medical therapy, physiotherapy and surgery [1-10]. By comparison, prosthodontic outcome data remain limited and most reports describe isolated techniques such as sectional

impressions, flexible dentures, oral screens or modified complete dentures rather than comparative outcomes across disease severity [13,18].

Therefore, the present study aimed to evaluate the effect of OSMF pathological severity on short-term outcomes after individualized removable prosthetic rehabilitation. The primary functional outcomes were maximum mouth opening (MMO) and masticatory efficiency (ME), while secondary outcomes included speech intelligibility, comfort, retention/adaptation trends and patient satisfaction at baseline, 1 month and 3 months.

METHODS

Study Design and Setting

This study was designed as a prospective single-centre clinical follow-up study conducted in OSMF patients requiring removable prosthetic rehabilitation.

Sampling and Participants

Forty-five patients were recruited by purposive sampling and allocated into three severity-based groups of 15 each. Inclusion criteria were age 25–60 years, clinical and histopathological diagnosis of OSMF, partial or complete edentulism requiring prosthetic rehabilitation, absence of active oral ulceration and willingness to comply with follow-up. Exclusion criteria were temporomandibular disorders, systemic conditions affecting oral tissues, prior oral malignancy, current chemotherapy or radiotherapy and poor oral hygiene status.

Severity Classification

Patients were categorized using the Khanna and Andrade classification into Group I (mild), Group II (moderate) and Group III (severe). In the original study records, the groups were defined according to interincisal opening and clinical severity and this classification was retained for analysis and reporting.

Prosthetic Protocol

All patients underwent oral examination, radiographic assessment and necessary mouth preparation before prosthetic treatment. Preliminary impressions were made using modified stock trays and alginate. In patients with marked restriction in mouth opening, sectional impression techniques were used. Final impressions were made with medium-body polyvinyl siloxane using a selective-pressure approach. Jaw relations and insertion procedures were modified as needed to accommodate restricted mandibular movements. In severe disease, thermoplastic/flexible denture-base materials were used when required to reduce tissue trauma during insertion and function.

Outcome Assessment

MMO was measured with digital callipers between the incisal edges of the maxillary and mandibular central incisors at maximum opening. ME was assessed using a standardized two-colour chewing gum test with digital image analysis on a 0–100 scale. Speech intelligibility was evaluated using standardized phonetic testing and rated on a 10-point scale by three evaluators. Patient satisfaction and comfort were assessed using a 100-mm visual analogue scale at baseline, 1 month and 3 months. Retention adequacy and adaptation difficulty were recorded clinically during follow-up; however, the original dataset did not contain a standardized validated retention scale and this is acknowledged as a reporting limitation.

Follow-up and Safety

Patients were reviewed at 1 month and 3 months after prosthetic rehabilitation. The source file reported no major adverse events related to prosthetic therapy during the study period. Because the original manuscript did not specify whether physiotherapy was standardized or merely advised, this point should be clarified by the authors before submission.

Statistical Analysis

Descriptive data are presented as mean±standard deviation. Intergroup comparisons were performed using one-way analysis of variance with Tukey post hoc testing and intragroup change over time was assessed using paired t-tests. As repeated measures were collected, repeated-measures analysis would be preferable in a future revised dataset; however, the present manuscript reports the statistical approach used in the original study. The exact statistical software version and details of assumption testing should be inserted from the original analysis records before journal submission.

RESULTS

Participant Profile

The study population comprised 28 males (62.2%) and 17 females (37.8%), with an overall mean age of 42.3±8.6 years. Mean duration of OSMF was 5.8±2.4 years (range, 2–11 years). All patients reported areca nut use and 73.3% reported concurrent tobacco use.

The uploaded dataset provided aggregate demographic characteristics but did not include a complete group-wise baseline comparability table for age, duration of disease or habit history. This information should be added from the original case records if available.

Maximum Mouth Opening

Significant within-group improvements in MMO were observed across all severity categories over 3 months. Although severe cases started with the lowest baseline mouth opening, all groups showed an absolute improvement of approximately 5.2–5.3 mm (Table 1).

Masticatory Efficiency

Masticatory efficiency improved in all groups after rehabilitation, with the greatest percentage gain in mild disease and the lowest in severe disease, indicating that fibrosis severity continued to influence functional adaptation.

Table 1: Maximum mouth opening (mm) before and after prosthetic rehabilitation

Group	Pre-treatment	1 month	3 months	Mean change	p-value
Group I (Mild)	23.5±4.2	26.8±3.9	28.7±3.8	5.2±1.1	<0.001
Group II (Moderate)	18.9±3.7	22.1±3.5	24.2±3.4	5.3±1.3	<0.001
Group III (Severe)	14.1±2.9	17.3±2.8	19.3±2.7	5.2±1.2	<0.001
Between-group p-value	<0.001	<0.001	<0.001	0.892	-

Table 2: Masticatory efficiency scores (0–100 scale)

Group	Pre-treatment	1 month	3 months	Improvement	p-value
Group I (Mild)	52.3±6.8	65.4±5.9	72.1±5.2	38%	<0.001
Group II (Moderate)	43.7±7.2	52.8±6.4	57.3±5.8	31%	<0.001
Group III (Severe)	31.2±8.1	36.9±7.3	38.7±6.9	24%	<0.001
Between-group p-value	<0.001	<0.001	<0.001	<0.05	-

Table 3: Patient satisfaction scores (VAS 0–10 equivalent reporting from original dataset)

Group	Baseline	1 month	3 months	Mean change	p-value
Group I (Mild)	4.2±1.1	7.3±0.8	8.6±0.7	4.4±0.9	<0.001
Group II (Moderate)	3.8±1.3	6.5±1.0	7.8±0.9	4.0±1.1	<0.001
Group III (Severe)	3.1±1.4	5.4±1.2	6.9±1.1	3.8±1.2	<0.001
Between-group p-value	0.067	<0.001	<0.001	0.234	-

Patient Satisfaction, Speech and Adaptation

Patient-reported satisfaction increased significantly in all groups, but a clear severity gradient persisted at 3 months. Speech intelligibility improved from 6.2±1.3 to 8.4±0.9 in Group I, from 5.4±1.5 to 7.6±1.1 in Group II and from 4.1±1.7 to 6.2±1.4 in Group III (all $p < 0.001$).

Retention adequacy was reported as excellent in 86.7% of Group I patients, 66.7% of Group II patients and 40.0% of Group III patients. Adaptation difficulties during the first month were observed in 13.3%, 26.7% and 46.7% of patients, respectively. Because these outcomes were not captured with a validated ordinal scale in the source manuscript, they are presented descriptively.

No major prosthesis-related adverse events were reported in the uploaded manuscript. Minor mucosal soreness, ulceration or adjustment visits should be added if documented in the original records, as these outcomes are clinically relevant in fibrotic mucosa.

DISCUSSION

This study demonstrates that individualized removable prosthetic rehabilitation can improve oral function and patient-reported outcomes in OSMF across mild, moderate and severe disease categories over short-term follow-up. Improvements were seen consistently in MMO, masticatory efficiency, speech intelligibility, comfort and satisfaction, supporting the role of prosthodontic rehabilitation as part of comprehensive OSMF care.

A notable finding was that all groups showed a similar absolute increase in MMO, despite markedly different baseline mouth opening. This suggests that prosthetic intervention, together with functional use and associated rehabilitation measures, may help patients maintain or improve oral opening even in advanced fibrosis. At the same time, severe disease remained disadvantaged because lower baseline opening and greater mucosal rigidity limited final functional levels.

The masticatory findings provide a more nuanced interpretation than MMO alone. Although severe cases improved, the percentage gain in chewing performance was smaller than in mild and moderate disease. This likely reflects persistent anatomical and biomechanical constraints, including reduced tissue flexibility, shallow sulci, limited prosthesis extension and poorer adaptation to occlusal function in heavily fibrosed tissues.

The patient-satisfaction pattern closely paralleled disease severity. Mild cases achieved the highest 3-month satisfaction scores, whereas severe cases, although improved, remained lower. This discrepancy is clinically important because it indicates that measurable functional gain does not fully eliminate the day-to-day burden of retention difficulties, insertion challenges, tissue tenderness and adaptation problems in advanced disease. The manuscript should therefore avoid absolute claims that prosthetic rehabilitation is equally successful regardless of severity.

Our findings are broadly consistent with the literature describing OSMF prosthetic rehabilitation as a patient-specific process that often requires modified impression procedures, sectional techniques, flexible denture designs, physiotherapy and sustained follow-up [13,18]. Reports focusing on OHRQoL in OSMF further support the importance of patient-centred outcomes rather than relying only on clinical measurements [17].

The present study has practical value because it moves beyond isolated case descriptions and offers short-term comparative outcome data across pathology severity groups. Such data can assist in counselling. Patients with mild disease can be advised that functional and satisfaction outcomes are generally favourable, whereas those with severe disease should be informed that meaningful improvement is possible but retention, comfort and adaptation may remain suboptimal and require additional visits or adjunctive measures.

This study also has important limitations. The sample size was modest, recruitment was purposive and the study was conducted at a single centre, which limits generalizability. Follow-up was restricted to 3 months, so

long-term tolerance, maintenance requirements, progression of fibrosis and durability of functional gains cannot be established. In addition, group-wise baseline comparability data, effect-size reporting, assumption testing, standardized retention scoring and full adverse-event reporting were not available in the uploaded source version.

Future studies should include larger multicentre cohorts, longer follow-up, validated retention and oral health-related quality-of-life tools and comparative evaluation of different prosthetic designs or adjunctive rehabilitation strategies. Standardized reporting of physiotherapy protocols, habit cessation counselling and post-insertion adjustments would also improve interpretation.

CONCLUSIONS

Individualized removable prosthetic rehabilitation improved MMO, masticatory efficiency, speech and patient satisfaction in OSMF patients across all severity grades during 3 months of follow-up.

Clinical outcomes were most favourable in mild OSMF, while severe fibrosis remained associated with weaker retention and greater adaptation difficulty despite measurable improvement.

Early diagnosis, habit cessation, physiotherapy and severity-based prosthetic modification should be emphasized when planning rehabilitation and counselling patients with OSMF.

Strengths and Limitations

Strengths of the study include severity-based grouping, inclusion of both objective and patient-reported outcomes and practical emphasis on modified prosthetic techniques relevant to OSMF.

Limitations include purposive single-centre sampling, modest sample size, short follow-up, absence of validated retention scoring and incomplete reporting of some methodological details in the source manuscript.

Ethical Statement

The manuscript states that ethical approval and informed consent were obtained. The exact institutional review number and approval date should be inserted in the final submission version.

REFERENCES

[1] Rao, N.R. *et al.* "Oral submucous fibrosis: a contemporary narrative review with a proposed inter-professional approach for an early diagnosis and clinical management." *Journal of Otolaryngology - Head and Neck Surgery*, vol. 49, no. 1, 2020, pp. 3. https://doi.org/10.1186/s40463-020-0399-7.

[2] Shih, Y.H. *et al.* "Oral submucous fibrosis: a review on etiopathogenesis, diagnosis and therapy." *International Journal of Molecular Sciences*, vol. 20, no. 12, 2019, pp. 2940. https://doi.org/10.3390/ijms20122940.

[3] Shen, Y.W. *et al.* "Oral submucous fibrosis: a review on biomarkers, pathogenic mechanisms and treatments." *International Journal of Molecular Sciences*, vol. 21, no. 19, 2020, pp. 7231. https://doi.org/10.3390/ijms21197231.

[4] Warnakulasuriya, S. and A.R. Kerr. "Oral submucous fibrosis: a review of the current management and possible directions for novel therapies." *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, vol. 122, no. 2, 2016, pp. 232-241. https://doi.org/10.1016/j.oooo.2016.02.020.

[5] Arakeri, G. *et al.* "Oral submucous fibrosis: an update on current theories of pathogenesis." *Journal of Oral Pathology and Medicine*, vol. 46, no. 6, 2017, pp. 406-412. https://doi.org/10.1111/jop.12581.

[6] Patil, S. *et al.* "Prosthetic rehabilitation of oral submucous fibrosis patients: a systematic review of published case reports and case series." *PLoS One*, vol. 12, no. 9, 2017, pp. e0184041. https://doi.org/10.1371/journal.pone.0184041.

[7] Chole, R.H. *et al.* "Review of drug treatment of oral submucous fibrosis." *Oral Oncology*, vol. 48, no. 5, 2012, pp. 393-398. https://doi.org/10.1016/j.oraloncology.2011.11.021.

[8] Gondivkar, S.M. *et al.* "Clinical efficacy of mouth exercising devices in oral submucous fibrosis: a systematic review." *Journal of Oral Rehabilitation*, vol. 46, no. 11, 2019, pp. 1065-1080. https://doi.org/10.1111/joor.12845.

[9] Gondivkar, S.M. *et al.* "Development and validation of oral health-related quality of life measure in oral submucous fibrosis." *Oral Diseases*, vol. 24, no. 6, 2018, pp. 1020-1028. https://doi.org/10.1111/odi.12857.

[10] Murthy, V. *et al.* "Malignant transformation rate of oral submucous fibrosis: a systematic review and meta-analysis." *Journal of Clinical Medicine*, vol. 11, no. 7, 2022, pp. 1793. https://doi.org/10.3390/jcm11071793.

[11] Passi, D. *et al.* "Oral submucous fibrosis: newer proposed classification with critical updates in pathogenesis and management strategies." *National Journal of Maxillofacial Surgery*, vol. 8, no. 2, 2017, pp. 89-94. https://doi.org/10.4103/njms.NJMS_32_17.

[12] More, C.B. and N.R. Rao. "Proposed clinical definition for oral submucous fibrosis." *Journal of Oral Biology and Craniofacial Research*, vol. 9, no. 4, 2019, pp. 311-314. https://doi.org/10.1016/j.jobcr.2019.06.016.

[13] Kumar, S.M. *et al.* "A sectional impression tray technique for an oral submucous fibrosis patient with limited mouth opening." *Journal of Orofacial Research*, vol. 6, no. 2, 2014. https://journals.lww.com/jorr/fulltext/2014/06020/a_sectional_impression_tray_technique_for_an_oral.6.aspx.

[14] Kumar, L.B. *et al.* "Evaluation of mouth exercising devices in oral submucous fibrosis – a prospective randomized controlled multicentric trial." *Journal of Maxillofacial and Oral Surgery*, vol. 21, no. 1, 2022, pp. 203-210. https://doi.org/10.1007/s12663-021-01629-7.

[15] Arakeri, G. *et al.* "Oral submucous fibrosis: an update on pathophysiology of malignant transformation." *Journal of Oral Pathology and Medicine*, vol. 46, no. 6, 2017, pp. 413-417. https://doi.org/10.1111/jop.12582.

[16] Gupta, S. and M.K. Jawanda. "Oral submucous fibrosis: an overview of a challenging entity." *Indian Journal of Dermatology, Venereology and Leprology*, vol. 87, no. 6, 2021, pp. 768-777. https://doi.org/10.25259/IJDVL_371_20.

[17] Gondivkar, S.M. *et al.* "Quality of life-related patient-reported outcome measures in oral submucous fibrosis." *Oral Diseases*, 2018. https://pubmed.ncbi.nlm.nih.gov/29603708/.

[18] Ray, J.G. *et al.* "Oral submucous fibrosis: a global challenge—rising prevalence, risk factors, management and research priorities." *Periodontology 2000*, vol. 80, no. 1, 2019, pp. 200-212. https://doi.org/10.1111/prd.12277.