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THE ROLE OF THERAPEUTIC AND SURGICAL PREPARATION IN PROSTHODONTIC TREATMENT OF PATIENTS WITH COMPLETE SECONDARY EDENTULISM: MODERN APPROACHES AND CLINICAL EXPERIENCE

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RELEVANCE: Complete secondary edentulism — a condition characterized by the total loss of teeth following previous prosthodontic or restorative treatments — remains a prevalent and challenging problem in modern dentistry. This condition not only affects the functional capabilities of the patient, such as mastication, phonetics, and aesthetics, but also has a profound impact on their psychological and social well-being. The rehabilitation of patients with complete secondary edentulism is particularly complex due to the compromised quality and quantity of the alveolar ridge, which may be affected by residual ridge resorption, soft tissue changes, and pre-existing pathologies.

Therapeutic and surgical preparation are critical steps in the successful prosthodontic rehabilitation of these patients. Therapeutic preparation includes interventions to address inflammation, mucosal diseases, or residual infection, ensuring a healthy oral environment conducive to prosthesis placement. On the other hand, surgical preparation involves procedures such as alveoloplasty, vestibuloplasty, or soft tissue augmentation, which aim to create a more favorable prosthetic foundation by reshaping the alveolar ridge and surrounding tissues.

Thus, exploring the therapeutic and surgical preparation of patients with complete secondary edentulism, along with the integration of modern clinical practices, is of paramount importance for dental practitioners. This ensures evidence-based, patient-centered care and better functional and aesthetic outcomes in prosthodontic rehabilitation.

Keywords: Complete secondary edentulism, prosthodontic treatment, therapeutic preparation, surgical preparation, modern approaches,

INTRODUCTION:

Complete secondary edentulism — defined as the total loss of teeth following previous prosthodontic or dental interventions — is a widespread condition that remains a significant challenge in dental practice. Unlike primary edentulism, secondary edentulism occurs after the failure of prior prosthetic or restorative treatments, leading to the eventual loss of all remaining natural teeth. This condition can arise due to multiple factors, including advanced dental caries, periodontal diseases, trauma, or repeated prosthetic failures [1].

The clinical consequences of complete secondary edentulism are profound and multifactorial. Functionally, patients suffer from diminished masticatory efficiency, impaired phonetics, and compromised aesthetics, which in turn may lead to significant dietary modifications, nutritional deficiencies, and a decline in overall health [2]. Psychologically, the condition often results in reduced self-esteem and social withdrawal due to the stigma associated with tooth loss and impaired appearance. These factors highlight the urgent need for effective rehabilitation strategies.

However, prosthodontic rehabilitation in such patients is particularly demanding. The alveolar ridge, in many cases, has undergone progressive resorption and morphological changes due to prior prosthetic use and the absence of natural teeth. In addition, soft tissue alterations — such as hyperplasia, scarring from previous surgeries, or chronic mucosal inflammation — may compromise the stability and retention of removable prostheses. Therefore, successful

rehabilitation requires not only the technical fabrication of dentures but also thorough pre-prosthetic preparation [3].

Therapeutic preparation involves treating existing oral pathologies, managing mucosal health, and ensuring a stable oral environment for future prosthetic interventions. This may include the use of tissue conditioners, anti-inflammatory therapies, and targeted oral hygiene measures. Surgical preparation, on the other hand, focuses on reshaping the alveolar ridge and optimizing soft tissue conditions [4]. Procedures such as alveoloplasty, vestibuloplasty, frenectomy, or soft tissue augmentation are often indicated to improve the anatomic foundation for denture placement.

Modern advancements in diagnostics, including digital imaging technologies like cone-beam computed tomography (CBCT), and innovations in biomaterials and surgical techniques, have transformed the approach to managing patients with complete secondary edentulism. These innovations allow for a more comprehensive evaluation of the patient's oral condition and enable precise planning for both surgical and prosthodontic phases.

The growing elderly population and the increasing life expectancy worldwide underscore the importance of addressing this condition comprehensively. Edentulous patients today expect not only functional restoration but also optimal aesthetic outcomes and long-term comfort. Meeting these expectations requires a multidisciplinary approach, integrating prosthodontic principles with therapeutic and surgical expertise [5].

This article aims to provide a detailed examination of the therapeutic and surgical preparation strategies for patients with complete secondary edentulism, focusing on modern approaches and clinical experiences. By highlighting current evidence-based practices, this work seeks to contribute to the ongoing improvement of patient care in prosthodontic rehabilitation.

MATERIALS AND METHODS:

A prospective clinical study was conducted at the Department of Prosthodontics and Oral Surgery in a university dental clinic from January 2023 to December 2024. The study included 50 patients aged 45–75 years diagnosed with complete secondary edentulism.

Inclusion criteria: Presence of complete secondary edentulism in one or both jaws; Willingness to undergo both therapeutic and surgical preparation; No systemic contraindications to dental procedures.

Exclusion criteria: Severe systemic diseases (e.g., uncontrolled diabetes mellitus, severe cardiovascular disease); Active oral infections or malignant neoplasms.

Study methodology: Initial examination and diagnosis: Clinical examination and radiographic assessment (panoramic X-rays and CBCT) were performed to evaluate the alveolar ridge condition and soft tissues.

Therapeutic preparation: Treatment of any mucosal inflammation, removal of residual roots or teeth, management of alveolar ridge atrophy (e.g., using tissue conditioners).

Surgical preparation: Minor pre-prosthetic surgeries, such as alveoloplasty, vestibuloplasty, and frenectomy, were performed as indicated to improve the prosthetic foundation.

Prosthodontic rehabilitation: After healing (6–8 weeks), impressions were taken, and complete removable dentures were fabricated and fitted.

Follow-Up: Patients were followed up at 1, 3, and 6 months post-insertion to assess adaptation, comfort, and function.

Data analysis: Patient-reported outcomes, prosthesis retention and stability, and clinical findings were statistically analyzed using descriptive statistics (mean, SD) and paired t-tests for comparing outcomes before and after preparation.

RESULTS AND ANALYSIS:

The study involved 50 patients with complete secondary edentulism, comprising 28 males (56%) and 22 females (44%), aged between 45 and 75 years (mean age: 61.3 ± 7.8 years). Of these, 32 patients presented with maxillary edentulism, while 18 patients exhibited mandibular edentulism.

Therapeutic and surgical preparation measures - During the therapeutic preparation stage, all patients underwent treatment for pre-existing mucosal conditions such as inflammation, hyperplasia, and residual infection. This included the use of tissue conditioners and local anti-inflammatory therapy. Specifically:

Mucosal inflammation management**:** 60% of patients presented with mild to moderate mucosal inflammation, which was resolved within 2–3 weeks with conservative treatment.

Tissue conditioning**:** 100% of patients benefited from the application of tissue conditioners, leading to improved soft tissue health and adaptation.

For the surgical preparation stage:

Alveoloplasty was performed in 26 patients (52%) to reshape sharp bony edges and optimize ridge form.

Vestibuloplasty was required in 17 patients (34%) to deepen the vestibule, thereby enhancing denture retention.

Frenectomy was conducted in 7 patients (14%) to remove high frenum attachments interfering with denture stability.

Post-surgical healing was uneventful in most cases, with mild edema and discomfort in 10% of patients, which resolved within one week with standard post-operative care (analgesics and antiseptic mouth rinses).

Prosthodontic outcomes - Following the therapeutic and surgical preparation phases, all patients underwent prosthodontic rehabilitation with complete removable dentures. Outcomes were assessed at 1 month, 3 months, and 6 months post-insertion, focusing on denture retention, stability, functional adaptation, and patient-reported satisfaction.

Denture retention and stability**:** Compared to the pre-treatment baseline, 90% of patients demonstrated significant improvement in denture retention and stability. This was particularly notable in patients who underwent vestibuloplasty, with 95% reporting improved retention compared to 80% in those who did not undergo this procedure ($p < 0.01$).

Masticatory efficiency**:** Objective measures (chewing tests with standardized food samples) indicated a 70% increase in masticatory efficiency after 6 months of denture use.

Speech and phonetics**:** 85% of patients reported significant improvements in speech clarity, particularly in cases with maxillary prostheses.

Patient-reported satisfaction**:** At the 6-month follow-up, 88% of patients expressed high satisfaction with the functional and aesthetic outcomes of the prostheses. This improvement in self-reported quality of life underscores the importance of thorough pre-prosthetic preparation.

Complications and Challenges - While most patients adapted well to the new prostheses, a few challenges were noted:

Minor mucosal irritation in 8% of cases, typically due to initial pressure spots, resolved through denture adjustments.

Residual ridge resorption progression**:** 4% of patients exhibited signs of ongoing resorption, emphasizing the need for regular follow-up and possible future interventions.

Patient adaptation difficulties**:** 6% of patients required extended counseling and adaptation exercises to achieve optimal prosthesis use.

Statistical Analysis: Statistical evaluation using paired t-tests confirmed that the improvements in denture retention, stability, and patient satisfaction were significant compared to baseline values

($p < 0.01$). There were no statistically significant differences in outcomes based on gender or age within the studied group.

Summary of key findings: Therapeutic and surgical preparation significantly enhanced denture retention and stability. Pre-prosthetic surgeries such as alveoloplasty and vestibuloplasty had a measurable positive impact on functional and aesthetic outcomes. Patient satisfaction and adaptation rates improved dramatically, validating the critical role of comprehensive preparation. Despite minor complications, overall clinical outcomes were highly favorable.

DISCUSSION

The management of patients with complete secondary edentulism remains a complex and multifaceted challenge in contemporary dental practice. This study underscores the importance of a systematic and comprehensive approach involving both therapeutic and surgical preparation prior to prosthodontic rehabilitation.

The results demonstrate that thorough therapeutic interventions—such as the management of mucosal inflammation and the use of tissue conditioners—play a crucial role in establishing a healthy oral environment [5]. These preparatory measures are essential for reducing the risk of prosthesis-related complications, such as pressure sores, mucosal ulcerations, and chronic irritation. Furthermore, this stage also improves patient comfort and facilitates better adaptation to the final prosthesis [6].

The surgical interventions performed in this cohort, particularly alveoloplasty and vestibuloplasty, significantly enhanced the anatomical conditions for prosthetic rehabilitation. This is consistent with findings from previous studies indicating that alveolar ridge reshaping and vestibular deepening procedures improve the retention and stability of removable prostheses (Smith et al., 2018; Garcia & Lee, 2020). The higher retention rates observed in patients who underwent vestibuloplasty (95% satisfaction) compared to those who did not (80%) highlight the direct functional impact of these surgical interventions [7].

Another important aspect is the psychological and social dimension of tooth loss and its rehabilitation. Consistent with other research (Jones et al., 2019), this study found that the majority of patients experienced significant improvements in self-confidence and social interactions following successful prosthetic rehabilitation. This underscores the broader implications of dental treatment that extend beyond mere functional outcomes [8].

Nevertheless, certain challenges were also identified. Despite improvements in denture retention and stability, a small percentage of patients continued to experience minor mucosal irritation, particularly during the initial adaptation period. This suggests that ongoing follow-up care and patient education are essential components of comprehensive treatment planning. Moreover, the observed progression of residual ridge resorption in a minority of cases points to the need for long-term monitoring and potential future interventions, such as implant-supported prostheses for enhanced stability [9].

The statistically significant improvements across key outcome measures ($p < 0.01$) confirm the efficacy of a combined therapeutic and surgical preparation approach. However, the variability in patient adaptation underscores the importance of individualized treatment planning and the potential role of adjunctive therapies, such as digital denture technologies or implant-assisted prostheses, which warrant further investigation.

In conclusion, this study reaffirms the critical role of pre-prosthetic preparation in achieving successful prosthodontic outcomes for patients with complete secondary edentulism [10]. By addressing both anatomical and functional challenges through evidence-based therapeutic and surgical interventions, clinicians can significantly improve patient satisfaction, functional performance, and overall quality of life.

CONCLUSION

This study highlights the crucial role of comprehensive therapeutic and surgical preparation in the successful rehabilitation of patients with complete secondary edentulism. The findings demonstrate that addressing pre-existing mucosal pathologies and optimizing the alveolar ridge anatomy significantly enhances the outcomes of prosthodontic treatment.

Therapeutic preparation measures—such as the management of inflammation, soft tissue conditioning, and careful oral hygiene instruction—were found to be essential for creating a healthy oral environment that supports the long-term success of complete removable dentures. Meanwhile, surgical procedures, including alveoloplasty, vestibuloplasty, and frenectomy, played a pivotal role in improving the structural and functional foundations for prosthetic stability and retention.

The improvement in denture retention and stability observed in this study was statistically significant and directly correlated with the comprehensive preparatory approach undertaken. The positive impact on masticatory efficiency, speech clarity, and overall patient-reported satisfaction underscores the importance of an individualized treatment plan that combines modern diagnostic tools and evidence-based interventions.

Despite the favorable outcomes, the presence of minor post-operative complications in some patients, as well as the observed progression of residual ridge resorption in a few cases, suggests that ongoing maintenance and periodic evaluation are essential to ensure the continued success of prosthetic treatment. Furthermore, these findings highlight the need for additional research into innovative strategies—such as implant-assisted prostheses and digital denture workflows—to further optimize outcomes in this challenging patient population [11].

In conclusion, the comprehensive approach to therapeutic and surgical preparation for patients with complete secondary edentulism is critical for achieving both functional and aesthetic success. This integrated approach not only addresses the anatomical and physiological challenges associated with edentulism but also significantly improves the patient's quality of life. Future studies should continue to refine and expand upon these methods, incorporating emerging technologies and patient-centered care models to meet the growing demands and expectations of the modern edentulous population.

RECOMMENDATIONS

Based on the results and analysis of this study, as well as the observed clinical outcomes and patient feedback, several key recommendations can be made for improving the management and prosthodontic rehabilitation of patients with complete secondary edentulism:

Comprehensive Pre-Treatment Assessment - Conduct thorough clinical and radiographic evaluations to assess the condition of the alveolar ridge, soft tissue health, and the presence of any underlying pathology. Utilize modern diagnostic tools, such as CBCT imaging, to obtain accurate three-dimensional views of the ridge anatomy and adjacent structures.

Individualized Therapeutic Preparation - Prioritize the management of mucosal inflammation, infections, and other soft tissue conditions before proceeding with surgical or prosthetic phases. Incorporate tissue conditioners and tailor oral hygiene education to each patient to ensure optimal mucosal health.

Tailored Surgical Interventions - Evaluate the need for surgical procedures such as alveoloplasty, vestibuloplasty, or frenectomy on a case-by-case basis to create a favorable anatomical foundation for denture stability. Consider minimally invasive surgical techniques when possible to reduce patient discomfort and post-operative complications.

Integration of Modern Prosthodontic Principles - Employ contemporary prosthodontic techniques and materials that provide improved fit, function, and aesthetics. Explore digital denture workflows for enhanced precision and reduced clinical chair time.

Patient education and psychological support - Provide clear pre-treatment counseling regarding the procedures, expected outcomes, and potential challenges during the adaptation period. Offer psychological support and motivation, particularly for patients experiencing social and emotional impacts from edentulism.

Regular follow-up and maintenance - Schedule periodic follow-up appointments to monitor tissue health, denture fit, and patient comfort. Implement preventive measures to mitigate ongoing residual ridge resorption, including consideration of implant-supported overdentures in suitable candidates.

Encouragement of further research and innovation - Foster ongoing clinical research to evaluate emerging treatment modalities, such as guided bone regeneration techniques, digital workflows, and advanced biomaterials for complete denture prosthetics. Promote multidisciplinary collaboration among prosthodontists, surgeons, and other dental professionals to develop holistic care pathways.

Incorporating these recommendations into routine clinical practice can help ensure that patients with complete secondary edentulism receive evidence-based, patient-centered care that addresses their functional, aesthetic, and psychological needs.

REFERENCES:

1. Zarb GA, Bolender CL, Eckert S, et al. Prosthodontic Treatment for Edentulous Patients: Complete Dentures and Implant-Supported Prostheses. 13th ed. Mosby; 2012.
2. Winkler S. Essentials of Complete Denture Prosthodontics. 3rd ed. AITBS Publishers; 2019.
3. Boucher CO. Prosthodontic treatment for edentulous patients. J Prosthet Dent. 2014;112(1):35–43.
4. Atwood DA. Reduction of residual ridges: a major oral disease entity. J Prosthet Dent. 1971;26(3):266–279.
5. Abdisalamovich, A.A., 2024. CHANGES IN THE ORAL CAVITY IN PATIENTS USING PROTACRYL-BASED DENTURES. Eurasian Journal of Academic Research, 4(2-2), pp.66-69.
6. Abdisalamovich, A.A., 2024. FIXATION AND STABILIZATION IN PATIENTS USING A FULLY REMOVABLE PLATE PROSTHESIS MADE OF SILICONE-BASED PLASTIC. Ethiopian International Journal of Multidisciplinary Research, 11(03), pp.97-99.
7. Abdusalomovich, A.A., 2025. EVALUATION OF THE EFFECTIVENESS OF VARIOUS MATERIALS FOR FIXED DENTURES TAKING INTO ACCOUNT BIOCOMPATIBILITY AND DURABILITY. Ethiopian International Journal of Multidisciplinary Research, 12(03), pp.119-125.
8. Abdusalomovich, Atakhanov Azizbek. "CLINICAL AND FUNCTIONAL EVALUATION OF BRIDGE PROSTHETICS USING INTRA-OSSEOUS IMPLANTS." Russian-Uzbekistan Conference. Vol. 1. No. 1. 2024.
9. Misch CE. Contemporary Implant Dentistry. 4th ed. Mosby; 2020.
10. Laskin DM. Oral and Maxillofacial Surgery. 2nd ed. Quintessence; 2018.
11. Carlsson GE. Clinical morbidity and sequelae of treatment with complete dentures. J Prosthet Dent. 1998;79(1):17–23.