

THE RELATIONSHIP BETWEEN POSTERIOR TOOTH LOSS AND FUNCTIONAL ORAL REHABILITATION

A RELAÇÃO ENTRE A PERDA DE DENTES POSTERIORES E A REABILITAÇÃO ORAL FUNCIONAL

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ABSTRACT

The loss of posterior teeth significantly impairs masticatory function, occlusion, and patients' quality of life, potentially leading to bone resorption and nutritional difficulties. Oral rehabilitation is essential to restore these functions. Various techniques have been employed, such as fixed, removable, and implant-supported prostheses. The choice of approach depends on factors such as the extent of tooth loss, bone condition, and patient needs. This study aimed to analyze the clinical implications of posterior tooth loss and the main available oral rehabilitation techniques. A descriptive and qualitative literature review was conducted based on the analysis of recent scientific articles on the subject. Results showed that the absence of posterior teeth overloads the remaining teeth, causes progressive bone resorption, and impairs aesthetics and function. Among rehabilitation techniques, dental implants demonstrated superior efficacy in bone preservation and functional stability, whereas removable prostheses remain widely used due to their accessibility and applicability in patients with bone or financial restrictions. The choice of rehabilitation technique should be individualized considering clinical and socioeconomic factors. Advances in materials and dental technologies have enabled more efficient rehabilitations, contributing to the improvement of patients' quality of life.

Keywords: Tooth loss; Dental prosthesis; Dental implant; Chewing; Chewing function; Oral health.

RESUMO

A perda de dentes posteriores compromete significativamente a função mastigatória, a oclusão e a qualidade de vida dos pacientes, podendo levar a reabsorção óssea e dificuldades nutricionais. A reabilitação oral é essencial para restaurar essas funções, e diferentes técnicas têm sido aplicadas, como próteses fixas, removíveis e implantossuportadas. A escolha da abordagem depende de fatores como a extensão da perda dentária, a condição óssea e as necessidades do paciente. Este estudo teve como objetivo avaliar as implicações clínicas da ausência de dentes posteriores e identificar as principais técnicas de reabilitação oral utilizadas para restabelecer a função mastigatória e o bem-estar do paciente. Para isso, foi realizada uma revisão bibliográfica descritiva e qualitativa, baseada na análise de artigos científicos recentes sobre o tema. Os resultados demonstraram que a ausência de dentes posteriores acarreta sobrecarga nos dentes remanescentes, reabsorção óssea progressiva e comprometimento estético e funcional. Entre as técnicas de reabilitação, os implantes dentários apresentaram maior eficácia em termos de preservação óssea e estabilidade funcional, enquanto as próteses removíveis continuam sendo amplamente utilizadas por sua acessibilidade e aplicabilidade em pacientes com restrições ósseas ou financeiras. Concluiu-se que a escolha da técnica reabilitadora deve ser individualizada, considerando fatores clínicos e socioeconômicos. A evolução dos materiais e das tecnologias odontológicas tem possibilitado reabilitações mais eficientes, contribuindo para a melhoria da qualidade de vida dos pacientes.

Palavras-chave: Perda dentária; Prótese dentária; Implante dentário; Mastigação; Função mastigatória; Saúde bucal.

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INTRODUCTION

Tooth loss is a common condition that can significantly compromise patients' functional capacity and quality of life (1), especially when involving posterior teeth (2). These structures are essential for efficient chewing, occlusal stability, and alveolar bone preservation (3). Oral rehabilitation using fixed or removable prostheses or implant-supported prostheses is a fundamental strategy to restore masticatory function and prevent complications associated with posterior tooth loss (2,4). The loss of posterior teeth can overload the remaining teeth, leading to wear, unwanted movements, and even temporomandibular joint disorders (5,6). In addition, it may affect smile aesthetics, directly impacting self-esteem and the ability to eat well (1,5,7).

Tooth loss, particularly of posterior teeth, has significant effects on general health and individuals' quality of life (8). Research indicates that edentulous individuals have a higher prevalence of nutritional deficits, as inadequate chewing not only impairs food breakdown but also negatively affects digestion and nutrient absorption (7). The influence of posterior tooth loss on the functioning of the stomatognathic system is also widely recognized in literature. The absence of these structures alters the distribution of masticatory forces, which may contribute to the development of temporomandibular disorders, overload on remaining teeth, and even postural changes (2,4).

Moreover, studies show that the loss of posterior teeth can directly interfere with speech and phonetics, hindering speech articulation and affecting communication, thereby impacting self-confidence and quality of life (9). The absence of these teeth may cause chewing difficulties, occlusal changes, and bone loss, requiring careful consideration of the best treatment options (10). To prevent such consequences, the use of prostheses—removable or fixed, supported by teeth or implants—has proven to be an effective solution for restoring masticatory function and facial harmony (11,12). Early rehabilitation also helps prevent bone loss and maintain the dental arch structure (3,13).

The choice of the most appropriate treatment in oral rehabilitation must consider a series of clinical and individual factors, such as gingival condition, remaining bone volume, and each patient's functional and aesthetic needs (13). More than simply replacing missing teeth, oral rehabilitation represents a fundamental strategy for maintaining oral health throughout life, promoting functional balance, comfort, and quality of life (6).

The rehabilitation of partially or fully edentulous patients has received increasing attention in scientific literature, especially due to the impact of posterior tooth loss on occlusal dynamics, arch stability, and possible systemic repercussions associated with compromised masticatory function (9,10,11,14).

In this context, geriatric dentistry highlights the importance of oral rehabilitation as an essential component of older adults' oral health care, contributing to the maintenance of self-esteem, communication, and social integration (2,15). Thus, well-conducted rehabilitative interventions play a decisive role in preventing functional imbalances, restoring masticatory efficiency, and promoting greater occlusal stability and patient comfort. The psychological impact of oral rehabilitation should also be emphasized, as tooth loss can impact patients' self-esteem and social interaction (5,12). Studies indicate that partially edentulous individuals using ill-fitting or inadequate prostheses may develop insecurity when speaking and eating in public, directly reflecting on their quality of life (12).

Adapting to a new prosthetic device can be challenging, but well-planned rehabilitation can restore not only masticatory function but also patients' confidence and psychological well-being (10). This study stems from the importance of functional oral rehabilitation in preserving the oral and general health of patients who have lost posterior teeth. Thus, the research seeks to contribute to clinical practice, reinforcing the importance of individualized planning in restorative and prosthetic dentistry.

MATERIALS AND METHODS

This study is characterized as a descriptive literature review with a qualitative approach, aimed at gathering and critically analyzing the scientific literature on functional oral rehabilitation and the effects of posterior tooth loss on quality of life, chewing, and oral health. The publications were selected from the scientific databases PubMed and the Biblioteca Virtual em Saúde (BVS), both internationally recognized for their breadth of health-related articles. The following descriptors and their corresponding English and Brazilian Portuguese versions were used, combined with Boolean operators ("AND" and "OR"): Perda dentária / Tooth loss, Prótese dentária / Dental prosthesis, Implante dentário / Dental implant, Mastigação / Chewing, Função mastigatória / Masticatory function, Saúde bucal / Oral health.

The initial search yielded 578 articles. Titles and abstracts were screened according to the inclusion criteria: articles with full-text access; publications from the last 10 years (with occasional exceptions of theoretical relevance); clinical studies, systematic reviews, qualitative studies, and case reports; and works addressing aspects related to tooth loss, masticatory function, or rehabilitation with dental prostheses (fixed or removable) or implants. Exclusion criteria included duplicate articles across databases; works not directly relevant to the subject; publications unavailable in full text; and studies with insufficiently described methodology or limited practical relevance.

Data collection involved full-text reading of the selected studies, prioritizing information on the functional effects of posterior tooth loss, masticatory performance, types of prosthetic rehabilitation (conventional or implant-supported), and impact on patients' oral health and quality of life. The analysis was qualitative and interpretative, seeking to identify patterns, clinical evidence, knowledge gaps, and relevant contributions to dental practice. The selected literature was critically interpreted to support a well-founded and updated discussion, promoting reflections on more effective, patient-centered clinical approaches. This methodology ensures the consistency and scientific relevance of the material used, integrating different levels of evidence and broadening the understanding of challenges and opportunities in contemporary functional oral rehabilitation.

DISCUSSION

Impacts of posterior tooth loss on masticatory function, aesthetics, and quality of life

Posterior tooth loss is a significant concern in dentistry, as it compromises not only masticatory function but also occlusal stability, aesthetics, and patient quality of life (2,5). Masticatory efficiency is one of the main aspects impacted by tooth loss, considering that posterior teeth, including premolars and molars, play an essential role in food breakdown, ensuring proper digestion and efficient nutrient absorption. Therefore, the absence of these elements has a negative impact on patients' nutrition (4,5) and can lead to a series of undesirable adaptations in the stomatognathic system, resulting in overload of the remaining teeth and changes in the temporomandibular joint (4,6,7).

The lack of posterior support in occlusion may favor the collapse of the occlusal relationship,

contributing to tooth migration and imbalance in the distribution of masticatory forces (6,13). This imbalance can cause overload on anterior teeth, increasing the risk of fractures and pathological wear (2,6). The relationship between posterior tooth loss and temporomandibular disorders (TMD) has been widely studied. The lack of posterior support can lead to compensatory mandibular movements, predisposing patients to pain and discomfort in the temporomandibular joint (TMJ) region. The most common symptoms include headaches, joint clicking, and limited mouth opening, directly impacting patient quality of life (6,10).

Bone atrophy associated with tooth loss is another important factor. The lack of adequate masticatory stimulation due to the absence of posterior teeth results in progressive resorption of the alveolar bone, making future prosthetic or implant-supported rehabilitations more difficult. This phenomenon is particularly concerning in elderly patients, where bone loss is more accelerated due to physiological and systemic factors. The impact of bone resorption can be seen in the stability of removable prostheses and in the success of dental implants, making the choice of rehabilitation therapy a clinical challenge (13,16,17). Beyond functional aspects, posterior tooth loss significantly impacts aesthetics and facial harmony. Progressive bone resorption compromises adjacent soft tissues, potentially leading to changes in facial contour and a more aged appearance over time (3).

Such changes may result in dissatisfaction with one's appearance, affecting self-esteem and psychological well-being. Partially edentulous patients often report discomfort while speaking and smiling, potentially leading to progressive social isolation (9). Another relevant aspect is the influence of posterior tooth loss on quality of life. Research indicates that partially edentulous patients have a poorer perception of their oral health and report greater difficulty in eating properly. The discomfort caused by the absence of teeth may lead to inadequate eating habits, with excessive consumption of processed and easily chewed foods, which in turn may contribute to systemic diseases such as diabetes and obesity (5).

The impacts of tooth loss can also be observed in speech and phonetics. The absence of posterior teeth may compromise phoneme articulation, resulting in difficulties in oral communication. This issue can be particularly significant for professionals who rely on speech, such as teaching or lecturing, further increasing the need for adequate oral rehabilitation (9). Therefore,

posterior tooth loss represents a multifactorial issue that impacts not only chewing ability but also bone health, occlusal stability, phonetics, and patients' emotional well-being (1,5-7). Proper planning of oral rehabilitation for these individuals is essential to restore lost function and minimize the adverse effects of posterior tooth loss. Thus, early and well-planned dental interventions are crucial to ensure better quality of life and preserve patients' oral and systemic health (10).

Main oral rehabilitation techniques to restore posterior tooth function and the effectiveness of fixed, removable, and implant-supported prostheses

Oral rehabilitation is essential to restore masticatory function and prevent complications arising from posterior tooth loss. The choice of the most appropriate technique depends on factors such as the extent of tooth loss, the patient's bone condition, occlusal stability, and individual functional and aesthetic needs (8,11,12). The main treatment options include fixed and removable prostheses, conventional or implant-supported, each with its specific indications and clinical benefits. Fixed prostheses are widely used in the rehabilitation of single or multiple tooth losses, supported by remaining teeth or implants. These prostheses offer greater stability and patient comfort, providing satisfactory functional and aesthetic outcomes (18). However, for a fixed prosthesis to be feasible, the adjacent teeth must have good support structure, which may limit its indication in cases of multiple tooth losses without adequate abutments (13).

Removable prostheses, on the other hand, represent a viable alternative for patients who are not candidates for implants or who present extensive tooth loss. These prostheses may be partial or complete and are indicated mainly for older adult patients and those requiring a more affordable rehabilitative solution (5,7,8). Despite their popularity, removable prostheses present challenges such as patient adaptation and the need for frequent maintenance to prevent complications like bone resorption and denture stomatitis (19). Dental implants represent the most advanced and effective solution for posterior tooth rehabilitation, as they provide superior stability, bone preservation, and greater patient comfort, being a primary therapeutic choice due to their high success rates. Implant placement can prevent bone resorption, ensuring balanced distribution of masticatory forces (3,8). This technique enables the replacement of

lost teeth without the need to prepare adjacent teeth for support, offering a stable and functional solution (3,13). However, implant success depends on several factors, including the quality of the recipient bone, the surgical technique used, and patients' postoperative care (20).

The choice among these techniques must consider patients' individual conditions, financial feasibility, and expectations regarding oral rehabilitation (10). Patients with good bone density seeking a definitive solution generally opt for dental implants, while those with bone or financial limitations may resort to removable prostheses (13). Studies show that the longevity of rehabilitations is directly related to the quality of the materials used and patients' adherence to maintenance protocols. Fixed prostheses made of all-ceramic or zirconia provide greater durability and aesthetics compared to metal-ceramic ones and are widely recommended in complex rehabilitations (21-24).

In addition to the choice of rehabilitation technique, it is essential to consider long-term follow-up to ensure treatment success. Patients rehabilitated with fixed, removable, or implant-supported prostheses should undergo regular dental visits for adjustments and evaluations, as well as maintain strict oral hygiene to prevent complications such as peri-implantitis (13,19,25). Given the wide range of available options, oral rehabilitation should be planned individually, considering patients' anatomical, functional, and psychological factors (5,10,12,13). Advances in dental materials and surgical techniques have enabled increasingly effective treatments, ensuring better quality of life and greater predictability of rehabilitation outcomes (8,11,18).

The main rehabilitation options include fixed, removable, and implant-supported prostheses, each with benefits and limitations that must be considered to achieve a functional and long-lasting outcome. Choosing the best rehabilitative approach often involves challenges related to patients' bone condition and adaptation to new prosthetic structures (3,13). Fixed prostheses, for example, are widely recommended for patients who still have healthy remaining teeth, as they provide greater stability and comfort compared to removable prostheses (8). However, their installation may require preparation of adjacent teeth for support, which can compromise dental structure over time (26). On the other hand, removable prostheses, while being a more affordable alternative, require an adaptation period and may present limitations regarding stability and retention (8,10).

One of the most significant advances in oral rehabilitation has been the development and refinement of dental implants, which enabled more predictable and long-lasting rehabilitation (24). Implants promote alveolar bone preservation, preventing the resorption that frequently occurs in edentulous patients (3). In addition, they provide greater patient comfort and eliminate the need to prepare healthy teeth for prosthetic support (6,25). However, implant success is directly linked to bone availability and the need for an appropriate surgical protocol, which may be challenging in patients with severe bone resorption (10,13,26). The advancement of dental materials also plays a key role in improving the durability and aesthetics of prosthetic rehabilitations (21,24). Currently, ceramic and zirconia-based materials offer superior strength and better aesthetic adaptation, and they are widely used in fixed and implant-supported rehabilitations.

The digitalization of dental processes, via CAD/CAM technology, has enabled the fabrication of prostheses with greater precision and predictability, reducing treatment time and optimizing clinical outcomes (21,27,14,28). Beyond technological advances, patient adaptation to oral rehabilitation must also be considered. Studies show that individuals rehabilitated with removable prostheses experience greater functional and psychological adaptation difficulties, reporting discomfort when speaking and chewing during the first months of use (5,7,8). In contrast, patients treated with dental implants demonstrate greater satisfaction with treatment stability and functionality, although the time required for healing and osseointegration still poses challenges in some clinical cases (6,8,13,18,14).

Another relevant point concerns the maintenance and longevity of rehabilitations. Regardless of the technique used, treatment longevity depends on strict oral hygiene and regular dental visits for adjustments and evaluations (28). Patients rehabilitated with implant-supported prostheses, for instance, must be monitored periodically to prevent complications such as peri-implantitis, which can compromise implant stability in the long term (13,20,25,29).

CONCLUSION

The rehabilitation of posterior teeth goes beyond merely replacing lost structures, playing a fundamental role in restoring patients' masticatory function, aesthetics, and quality of life. Achieving satisfactory

clinical outcomes requires individualized planning, careful selection of the rehabilitative technique, and continuous follow-up. Advances in materials, clinical techniques, and digital technologies have contributed to increasingly personalized, predictable, and accessible treatments, aligning dental care with individuals' functional, aesthetic, and psychosocial needs. In this way, oral rehabilitation has become an indispensable component of contemporary dentistry, with a significant impact on oral health, well-being, and patients' social reintegration.

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REFERENCES

1. Cavalcante FT, Moura C, Perazzo PAT, Cavalcante FT, Cavalcante MT. Prevalência de dificuldade na mastigação e fatores associados em adultos de 20 a 59 anos em Patos, Paraíba, Brasil. *Ciênc Saúde Colet.* 2019;24(3):1015-024
2. Bitencourt FV, Corrêa HW, Toassi RFC. Experiências de perda dentária em adultos e idosos usuários da Atenção Primária à Saúde. *Ciênc Saúde Colet.* 2019;24(1):169-80.
3. Souza HLF, Souza Neto HF, Almeida RAC. Preservação alveolar e instalação tardia de implante dentário: relato de caso clínico. *Rev Cir Traumatol Buco-Maxilo-Fac.* 2022;22(3):32-9.
4. Antelo OM, Caballero GC, Amadi AK, Schneider NA, Tanaka OM. Abordagem interdisciplinar do tratamento em paciente adulto com múltiplas perdas dentárias. *Orthod Sci Pract.* 2019;12(47):94-102.
5. Silva BF, Moretti ABS, Gasque KCS, Neto RTM. Avaliação da performance mastigatória e nível de satisfação de usuários de prótese parcial removível: ênfase na importância das PPRs na era da implantodontia. *Re Soc Dev.* 2022;11(7):e1811729550.
6. Sette LCF. Princípios fisiológicos da oclusão aplicados em reabilitação oral: relato de caso [monografia]. Belo Horizonte: Universidade Federal de Minas Gerais; 2018.
7. Chen F, Chen JH, Jeng JH, Akifusa S, Liu HY. Association and relevant factors between objective masticatory performance and subjective masticatory ability among community-dwelling older adults. *J Dent Sci.* 2025;20(1):69-76.
8. Homsí G, Karlsson A, Almotairy N, Trulsson M, Kumar A, Grigoriadis A. Subjective and objective

- assessment of masticatory function in patients with implant-supported bimaxillary prostheses. *J Oral Rehabil.* 2023;50(2):140-49.
9. Souza JGS, Lages VA, Sampaio AA, Souza TCS, Martins AMEBL. A falta de dentição funcional está associada ao comprometimento das funções bucais entre adultos brasileiros. *Ciênc Saúde Colet.* 2019;24(1):253-9.
10. Garcia AAMN, Fioravanti KS, Rangel BT, Sugio CYC, Porto VC, Soares S, Neppelenbroek KH. Reabilitação oral com próteses parciais removíveis após restabelecimento de dimensão vertical de oclusão e tratamento multidisciplinar: relato de caso. *Rev Odontol Araçatuba.* 2023;44(2):24-9.
11. Lopez-Cordon MA, Khoury-Ribas L, Rovira-Lastra B, Ayuso-Montero R, Martinez-Gomis J. Improved Masticatory Performance in the Partially Edentulous Rehabilitated with Conventional Dental Prostheses. *Medicina.* 2024;60(11):1790.
12. Cristiano DP, Collodel A, Ceretta LB, Simões PW, Ceretta RA, Sônego FGF. Avaliação do desempenho e satisfação dos usuários de próteses totais mucossuportadas fornecidas pelo Sistema Único de Saúde em município catarinense. *Rev Odontol Univ Cid São Paulo.* 2018;30(2):116-31.
13. Raffat EM, Shady M, Elkashty AAR, El Syad M. Comparative analysis of implant survival, peri-implant health, and patient satisfaction among three treatment modalities in atrophic posterior mandibles: a randomized clinical study. *BMC Oral Health.* 2025 Jun 7;25(1):939.
14. Qiu A, Xu L, Zhang Y, Chen K, Fang S, Zhang Y, Zhong L, He R. Digital-assisted multidisciplinary treatment for complex occlusal rehabilitation: an 18-month follow-up case report. *BMC Oral Health.* 2024 Jul 18;24(1):818.
15. Silva ET, Oliveira RT, Leles CR. Fatores associados ao edentulismo funcional em idosos brasileiros. *Comun Ciências Saúde.* 2016;27(2):129-38.
16. Lima ALO. Avaliação da performance mastigatória, força máxima de mordida e fluxo salivar em pacientes idosos edentados reabilitados com dois tipos de próteses [tese de doutorado]. Araraquara (SP): Universidade Estadual Paulista "Júlio de Mesquita Filho"; 2022.
17. Silva MES, Magalhães CS, Ferreira EF. Perda dentária e expectativa da reposição protética: estudo qualitativo. *Ciênc Saúde Colet.* 2010;15(3):813-20.
18. Thieu MKL, Mauland EK, Verket A. Satisfaction and preferences among patients with both implant-supported single crown and tooth-supported fixed dental prosthesis: a pilot study. *Acta Odontol Scand.* 2023;81(5):358-62.
19. Possebon APR, Schuster AJ, Chagas-Júnior OL, Pinto LR, Faot F. Prosthetic aftercare, mastication, and quality of life in mandibular overdenture wearers with narrow implants: a 3-year cohort study. *J Dent.* 2021 Dec;115:103880.
20. Nickenig HJ, Terheyden H, Reich RH, Kreppel M, Linz C, Lentzen MP. Oral health-related quality of life and implant therapy: a cross-sectional evaluation. *J Craniomaxillofac Surg.* 2016 Jun;44(6):753-7.
21. Piva JSS. Novos materiais livres de metal para restaurações estéticas em reabilitação oral [tese de doutorado]. São José dos Campos: Universidade Estadual Paulista "Júlio de Mesquita Filho"; 2024.
22. Azevedo FP. Incidência de fraturas em próteses fixas: estudo retrospectivo. Análise da sobrevivência de próteses metalocerâmicas após um período mínimo de quatro anos em função [tese de doutorado]. Bauru: Universidade de São Paulo; 2017.
23. Arefnia B, Fakheran O, Jakse N, Payer M. Patient-reported outcomes of zirconia dental implants: a systematic review and future directions. *J Patient Rep Outcomes.* 2025 Jan 14;9(1):7.
24. Țap MD, Bicleșanu FC, Honțaru O-S, Radu A-C. Patient Centricity—An Empirical Research on Titanium Dental Implants and Their Adverse Effects on Health Condition. *Healthcare.* 2024;12(22):2207.
25. Nickenig HJ, Wichmann M, Terheyden H, Kreppel M. Oral health-related quality of life and implant therapy: a prospective multicenter study of preoperative, intermediate, and posttreatment assessment. *J Craniomaxillofac Surg.* 2016 Jun;44(6):753-7.
26. Stavropoulos A, Bertl K, Isidor F, von Steyern PV. Implantoplasty and the risk of fracture of narrow implants with advanced bone loss: a laboratory study. *Clin Oral Implants Res.* 2023 Oct;34(10):1038-46.
27. Amer DM, Abdellatif AM. In vivo evaluation of the enamel wear of primary molar against four types of crowns using the intra-oral scanner. *BMC Oral Health.* 2024 Nov 27;24(1):1438.
28. Vogt L, Pretzl B, Eickholz P, Ramich T, Nickles K, Petsos H. Oral health-related quality of life and patient-reported outcome measures after 10 years of supportive periodontal care. *Clin Oral Investig.* 2023 Jun;27(6):2851-64.
29. Van de Winkel T, Delfos F, van Oirschot B, Maal T, Adang E, Meijer G. Budget impact analysis: digital workflow significantly reduces costs of implant supported overdentures (IODs). *Clin Implant Dent Relat Res.* 2025 Feb;27(1):e13413.