BRAZILIAN JOURNAL OF IMPLANTOLOGY AND HEALTH SCIENCES

ISSN 2674-8169

Clinical Case Report: Immediate Post-Extraction Implant Placement in the Aesthetic Zone.

Jefferson David Melo de Matos [1], Mariana Santos Borges [2], Samantha de Almeida Ferreira Oliveira [3], Antonio Augusto Galbin [4], Tales Cyríaco Morais [5], Daher Antonio Queiroz [5], Guilherme da Rocha Scalzer Lopes [6]

https://doi.org/10.36557/2674-8169.2025v7n2p1603-1613
Artigo publicado em 15 de Fevereiro de 2025

Short Communication

ABSTRACT

Oral rehabilitation in dentistry, particularly implantology, offers significant advantages over removable prostheses. As a result, dental implants have become increasingly sought after by patients due to their high success rates in both aesthetic and functional aspects. One of the main challenges in implantology is the placement of implants in esthetic zones. However, the integration of digital dentistry with implantology has further increased the success rates. Moreover, immediate implant placement following tooth extraction has demonstrated higher osseointegration success, contributing to effective primary stability. This study aims to present a clinical case report utilizing the immediate post-extraction implant technique with a 3D-printed implant for the rehabilitation of tooth #12, along with the need for a connective tissue graft. To support the discussion on extraction and immediate implant placement, a literature review was conducted using articles published in the last four years in English and Portuguese from databases such as PubMed, Scielo, and Google Scholar. As a final consideration, the patient reported no functional or aesthetic complaints, and the rehabilitation outcome was deemed successful.

Keywords: Dental Implants, Aesthetic Zone, Dental Ceramics.

Relato de Caso Clínico: Instalação Imediata de Implante Pós-Exodontia na Zona Estética.

RESUMO

A reabilitação oral por meio de implantes dentários apresenta vantagens significativas em relação às próteses removíveis, sendo cada vez mais procurada pelos pacientes devido ao alto índice de sucesso estético e funcional. Um dos principais desafios da implantodontia é a instalação de implantes em áreas estéticas. No entanto, a integração com a odontologia digital tem contribuído para melhores resultados. A instalação imediata do implante após a extração dentária favorece a osseointegração e proporciona maior estabilidade primária. Este estudo apresenta um relato de caso clínico utilizando a técnica de implante imediato pós-exodontia com um implante impresso em 3D para a reabilitação do dente 12, associada à necessidade de enxerto conjuntivo. Para fundamentar a discussão, foi realizada uma revisão da literatura com artigos publicados nos últimos quatro anos em inglês e português, nas bases PubMed, Scielo e Google Acadêmico. O paciente não apresentou queixas funcionais ou estéticas, e a reabilitação foi considerada satisfatória.
.

Palavras-chave: Implantes Dentários, Zona Estética, Cerâmicas Odontológicas.

Instituição afiliada –

1. Department of Multidisciplinary Health,University Center Mauricio de Nassau(UNINASSAU), Juazeiro do Norte - CE,Brazil.
2. Department of Dentistry, University Center Leao Sampaio (UNILEAO), Juazeiro do Norte - CE, Brazil.
3. Carminato Prosthodontics Lab, São Paulo - SP, Brazil.
4. RM Advanced Center for Cosmetic Dentistry, Saint Petersburg - FL, USA.
5. Department of Dentistry, Clínica Tales Cyríaco, Gurupi – TO, Brazil.
6. Department of Restorative Dentistry& Prosthodontics, The University of Texas Health Science Center at Houston (UTHealth) School of Dentistry, Houston -TX, USA.
7. Department of Prosthodontics, São Paulo State University (Unesp), São José dos Campos - SP, Brazil.

Autor correspondente*:* Jefferson David Melo de Matos - *jefferson.matos@uninassau.edu.br*

INTRODUCTION

For a long time, oral rehabilitation in dentistry was limited to complete and partial dentures (MENEZES et al., 2019). However, with extensive research and advancements in the field, dental implant-based rehabilitation has become more sought after than conventional dent mucosal-supported prostheses, as implants have demonstrated satisfactory functional and aesthetic outcomes (ORTEGA et al., 2020). Studies in implantology have revealed the integration between titanium and the bone tissue in the oral cavity, leading to the adoption of titanium as the material of choice for implant-supported rehabilitations (BRÅNEMARK et al., 1987).

Numerous studies have explored immediate implant placement and its installation in post-extraction alveolar sockets. This protocol, which involves a single surgical stage, has significantly reduced treatment time, making the procedure more comfortable for patients (DE SOUZA JÚNIOR et al., 2020). Atraumatic extraction has been shown to be crucial, as it preserves alveolar bone height and thickness, as well as the adjacent soft tissue, promoting optimal bone-to-implant contact and enhancing rehabilitation success (BOTELHO et al., 2023).

Another key factor in the success of oral rehabilitation with dental implants is reverse planning, which facilitates discussion and collaboration among dental professionals and between the implantologist and the patient regarding the surgical and prosthetic stages (DE ALMEIDA et al., 2022). Several preoperative factors must be carefully evaluated to ensure a favorable prognosis and proper treatment planning. These include bone quantity and quality, the patient's oral health status, and medical history, all of which contribute positively to the correct surgical and prosthetic indication. Furthermore, atraumatic extraction has proven essential for the preservation of adjacent tissues and the remaining alveolar bone (BEZERRA et al., 2022).

Recently, 3D-printed titanium implants have gained attention due to their advantages in promoting bone neoformation on the implant surface, as well as their biomechanical properties, which closely resemble natural bone behavior (LOPES et al., 2022).

This study presents a literature-based discussion on immediate post-extraction

implant rehabilitation through a clinical case report of a 3D-printed titanium immediate implant following the extraction of the upper right lateral incisor (tooth #12). The indications and advantages of this approach are explored, demonstrating its contribution to successful oral rehabilitation.

CASE REPORT

Patient S.M.X, a 41-year-old male, leucodermic, systemically healthy, non-smoker, with no systemic comorbidities, presented to the Guilherme Scalzer Institute for an evaluation of the maxillary lateral incisor, tooth #12. During the initial anamnesis and examination of the odontogram, it was determined that no teeth were missing, and all present restorations were in good condition. Following a thorough anamnesis, a complete medical and dental history review, and an initial extraoral and intraoral clinical examination, it was observed that tooth #12 exhibited mobility due to trauma sustained during martial arts practice.

To establish a precise diagnosis, the patient was advised to undergo complementary imaging exams, including a Cone Beam Computed Tomography (CBCT) scan and a periapical radiograph. Additionally, laboratory tests were requested, including a Complete Blood Count (CBC), Coagulation Profile, and Fasting Blood Glucose.

During the subsequent clinical session, after analyzing the results of the requested exams, it was determined that extraction of tooth #12 was necessary, followed by immediate post-extraction implant placement for oral rehabilitation. The laboratory tests indicated normal physiological parameters. With a definitive diagnosis, an optimal treatment plan was formulated, incorporating both implantology and digital dentistry techniques. The selected implant was a 3D-printed titanium implant from Plenum.

Preoperative measures included oral hygiene instructions, dietary guidance, prophylaxis, and full-mouth scaling and root planing. Additionally, as preoperative medication, the patient was prescribed 1g of amoxicillin (two 500mg tablets) to be taken one hour before the surgical procedure. Following proper aseptic preparation and instrument setup, intraoral antisepsis was performed using 0.12% chlorhexidine, while extraoral antisepsis was conducted with 2% chlorhexidine. A sterile surgical field was

established before commencing the procedure.

Local infiltrative anesthesia was administered using four carpules of articaine with epinephrine at a 1:100,000 concentration. After achieving profound anesthesia, an incision was made using a 15C scalpel blade attached to a #3 scalpel handle, following a linear and intrasulcular pattern. A full-thickness flap was elevated using a Molt 2/4 periosteal elevator.

For an atraumatic extraction, a straight periotome (Supremo) was used, ensuring proper removal of the tooth while preserving the integrity of the alveolus. After extraction, immediate implant placement was performed using a 3D-printed titanium implant (3.75 x 11.5mm) from Plenum Bioengineering (Plenum®, Jundiaí-SP, Brazil).

Upon implant insertion, no significant gaps were observed between the implant and the alveolar bone. However, a connective tissue graft was deemed necessary to enhance periodontal aesthetics and function, preventing postoperative esthetic or functional compromise while maintaining gingival coloration like the surrounding tissues.

Figure. 1 - The extraction of the dental element was accompanied by procedures to restore and optimize the bone and soft tissue architecture in the region designated for implant placement. The connective tissue graft was placed internally to the flap and secured using 6.0 monofilament polypropylene sutures. The final appearance of the fixed restoration on implant after the surgical procedure.

The connective tissue graft was harvested from the posterior palatal region via a rectangular linear incision, ensuring a broader base than height while preserving the keratinized tissue band. A #3 scalpel handle and a 15C blade were used for this procedure. The harvested graft was then placed in the vestibular region of site #12 to enhance the periodontal phenotype, particularly given the patient's thin gingival biotype and significant gingival recession, which could have led to metal exposure from either the implant or the abutment.

Following the grafting procedure, a provisional coping was fabricated using a 3D printer. Since the implant achieved adequate primary stability with a torque value of approximately 40N, immediate loading was applied. The provisional crown was 3D-printed in lithium disilicate to ensure greater precision and an improved prognosis.

Postoperatively, the patient was instructed to consume cold, soft, or liquid foods and to avoid hard foods in the surgical region. Physical exertion was discouraged, and oral rinses with 0.12% chlorhexidine (Periogard) were recommended for oral hygiene.

The prescribed postoperative medications included: Amoxicillin 500mg, one tablet every 8 hours for 7 days, Dexamethasone (Decadron) 4mg, one tablet every 12 hours for 5 days, and Lisador Dip 1g, one tablet every 8 hours for 3 days. At the 13-day follow-up, the patient reported no esthetic or functional complaints, and healing was progressing favorably.

DISCUSSION

Oral rehabilitation through dental implants has significantly evolved over the past decades, providing satisfactory functional and aesthetic outcomes. Within this context, the technique of immediate post-extraction implant placement has been extensively studied and applied, particularly in aesthetic regions. This approach presents both advantages and challenges that must be considered to ensure treatment predictability.

The immediate placement of an implant following tooth extraction minimizes alveolar bone resorption, preserves gingival architecture, and reduces overall treatment time (Araújo & Lindhe, 2005). Furthermore, maintaining the peri-implant tissue contour enhances aesthetic outcomes, which is crucial in high-demand aesthetic areas such as the maxillary central incisors (Schropp et al., 2003).

Despite its benefits, the predictability of immediate implant placement in aesthetic zones depends on factors such as the quantity and quality of the remaining bone, primary implant stability, and soft tissue management. Studies indicate that vestibular bone resorption can compromise the aesthetic profile of the restoration, making the use of biomaterials for alveolar gap filling and connective tissue grafts advisable to optimize tissue thickness (Buser et al., 2009).

The choice of surgical approach and implant type is crucial for the success of the procedure. Tapered implants and treated surfaces promote better osseointegration and initial stability (Esposito et al., 2011). Additionally, immediate loading can be considered in well-selected cases with adequate primary stability and no local infection (Degidi & Piattelli, 2003).

FINAL CONSIDERATIONS

It is concluded that immediate post-extraction implant placement in aesthetic areas is a viable and advantageous technique when properly indicated and executed, providing predictable and satisfactory rehabilitation. However, it requires a meticulous approach that considers the biology of peri-implant tissues and the adoption of adjunctive techniques to optimize long-term aesthetic and functional outcomes.

DATA AVAILABILITY

All data analyzed during this study are available from the corresponding author upon reasonable request.

DISCLAIMER OF LIABILITY AND DISCLOSURE

All data analyzed during this study are available from the corresponding author upon reasonable request. The authors report no conflicts of interest regarding any of the products or companies discussed in this article.

REFERENCES

1. Bezerra LS, Rodrigues TS, Silva GJ, et al. Instalação de implante imediato após exodontia do elemento 21: relato de caso clínico. 2022.
2. Brånemark P-I, Engstrand P, Ohrnell LO, et al. Brånemark Novum®: a new treatment concept for rehabilitation of the edentulous mandible. Preliminary results from a prospective clinical follow-up study. Clin Implant Dent Relat Res.

1999;1(1):2-16.

3. Da Silva LM, Oliveira TC, Corrêa MB. Implante mediato x implante imediato: vantagens/desvantagens/indicação/contraindicação. Facit Bus Technol J. 2021;1(28).
4. Das Posses Bride M, Reis WN, de Oliveira K, et al. Uso da técnica de tomografia computadorizada cone Beam modificada para avaliação padronizada dos tecidos ósseo e gengival em implantodontia. Braz J Dev. 2021;7(6):63295-312.
5. De Souza Júnior GR, Dantas RMX. Implante imediato após exodontia em molar superior. Sci Clin Odontol. 2020.
6. Lopes GRS, da Silva AJ, Medeiros MS, et al. Posterior rehabilitation using 3D-printed dental implants and synthetic regenerative biomaterials. Braz Dent Sci. 2022;1-9.
7. Menezes FRDD, da Silva ABP, Brigido JA. Técnica de planejamento reverso de prótese fixa sobre implantes dentários: relato de caso. Rev AcBO. 2019;9(1).
8. Medeiros MS, da Silva AJ, Lopes GRS, et al. Exodontia atraumática e implante imediato em área estética: relato de caso. Res Soc Dev. 2020;9(9):e880997997.
9. Ortega EV, Mourelo JP, Castro JML, Valinño JMC, Ferrera MP. Treatment with dental implants after extraction. BJIHS. 2020;2(3):49-63.
10. Reis LWM, Farias AC, Gomes MD, et al. Cirurgia de implante imediato: uma alternativa benéfica no tratamento cirúrgico-odontológico. Facit Bus Technol J. 2021;1(31).
11. Araújo MG, Lindhe J. Dimensional ridge alterations following tooth extraction. J Clin Periodontol. 2005;32(2):212-8.
12. Buser D, Chappuis V, Belser UC, Chen S. Implant placement post-extraction in esthetic single-tooth sites: Critical analysis and guidelines. Int J Periodontics Restorative Dent. 2009;29(1):30-41.
13. Degidi M, Piattelli A. Immediate functional and non-functional loading of dental implants: A 2 to 60-month follow-up study of 646 titanium implants. J Periodontol. 2003;74(2):225-41.
14. Esposito M, Grusovin MG, Willings M, Coulthard P, Worthington HV. The effectiveness of immediate, early, and conventional loading of dental implants: A Cochrane systematic review of randomized controlled clinical trials. Int J Oral

Maxillofac Implants. 2011;26(3):525-52.

15. Schropp L, Wenzel A, Kostopoulos L, Karring T. Bone healing and soft tissue contour changes following single-tooth extraction: A clinical and radiographic 12-month prospective study. Int J Periodontics Restorative Dent. 2003;23(4):313-23.