https://doi.org/10.52645/MJHS.2025.1.12

UDC: 616.314-089.87-089.843

CASE STUDY

Tooth extraction with immediate implantation and immediate loading

Adrian Zgîrcea

Arsenie Guțan Department of Oral and Maxillofacial Surgery and Oral Implantology, *Nicolae Testemițanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

ABSTRACT

Introduction. Immediate loading of dental implants is an evolving discipline requiring validation through clinical and statistical analyses. This study presents a case of immediate implantation and loading to evaluate predictability and outcomes. Immediate restoration reduces treatment time, promotes rapid aesthetic recovery, and addresses patient expectations for functional rehabilitation. Success in such cases relies heavily on maintaining primary stability and avoiding micromovements during osseointegration.

Materials and methods. A 47-year-old patient underwent extraction of teeth 11 and 13, followed by immediate post-extraction implantation. Implants were loaded with provisional restorations within 48 hours. Statistical analysis included torque measurements, Periotest values, and aesthetic evaluations. Comparative data were reviewed against existing literature to assess clinical significance.

Results. Primary stability was achieved with insertion torque of 50 Ncm and Periotest values of -5 and -6. Literature indicates success rates for immediate loading between 94-98%, and this case corroborated these findings with stable and aesthetic results. Surveys revealed 85% satisfaction with comfort and appearance, and the gingival profile remained stable post-treatment.

Conclusions. Immediate loading is a predictable and effective method when conditions for atraumatic extraction, implant stability, and soft tissue management are met. The study reinforces the viability of this approach in improving patient outcomes and minimizing recovery periods while maintaining aesthetics.

Keywords: immediate loading, dental implants, atraumatic extraction, provisional restoration, implant stability, gingival contour, primary stability, patient satisfaction.

Cite this article: Zgîrcea A. Tooth extraction with immediate implantation and immediate loading. Mold J Health Sci. 2025;12(1):78-81. https://doi.org/10.52645/MJHS.2025.1.12.

Manuscript received: 03.02.2025

Accepted for publication: 28.02.2025

Published: 15.03.2025

Corresponding author: Adrian Zgîrcea, PhD, assistant professor
Arsenie Guțan Department of Oral and Maxillofacial Surgery and Oral Implantology,
Nicolae Testemițanu State University of Medicine and Pharmacy
1A Mihai Viteazul Str., Chișinău, Republic of Moldova, MD-2004
e-mail: zgircea.adrian@gmail.com

Author's ORCID ID:
Adrian Zgîrcea – https://orcid.org/0009-0000-9630-8656

Key messages

What is not yet known on the issue addressed in the submitted manuscript

Immediate loading of dental implants is gaining popularity due to reduced treatment time and improved patient comfort. However, the success and predictability of immediate loading protocols require further analysis, particularly in cases of compromised alveolar bone or soft tissue defects. This article aims to address the gap by providing detailed case study evidence supported by statistical support.

The research hypothesis

Immediate post-extraction implantation with immediate loading can yield predictable outcomes when appropriate conditions are met. This includes high primary stability, proper patient selection, and meticulous surgical protocols.

The novelty added by the manuscript to the already published scientific literature

This study provides statistical evidence supporting the predictability of immediate loading under stringent clinical protocols. It emphasizes the importance of atraumatic techniques, proper implant positioning, and soft tissue preservation on both aesthetic and functional outcomes.

Introduction

Endoosseous dental implants are a reliable method for rehabilitating edentulous areas. The Branemark protocol, a standard insertion method, involves delayed loading after a 4–6-month osseointegration period [1]. High patient demands for faster and aesthetically superior outcomes have led to the development of immediate loading protocols.

Immediate loading offers faster aesthetic and functional results. According to studies, immediate loading prostheses have success rates ranging from 94% to 98%. Such outcomes depend heavily on patient-specific factors such as bone density, oral hygiene, and professional expertise [1-4].

The need for immediate aesthetic restoration is particularly critical in anterior zones. Research has shown that atraumatic extraction techniques preserve the alveolar ridge, minimizing bone resorption and supporting gingival contour stability. Proper implant positioning and achieving primary stability with torque values exceeding 35 Ncm are critical to avoiding micromovements that could jeopardize osseointegration [5, 6].

Additionally, the type of provisional restoration used plays a significant role in preserving the gingival architecture and ensuring occlusal harmony. Biomechanical studies emphasize the importance of limiting occlusal forces during the healing period to avoid complications. This study demonstrates the effectiveness of immediate post-extraction implantation and loading, supported by atraumatic extraction techniques and precise implant placement, ensuring both functional and aesthetic outcomes [5, 7-9].

Clinical case presentation

A 47-year-old patient presented with compromised teeth (11 and 13). Clinical examination revealed a mobile metal-ceramic bridge with vestibulo-oral mobility and sensitivity upon palpation and percussion. Radiographic analysis confirmed periapical pathology and significant bone loss, necessitating extraction (Fig. 1). Patient consent was obtained, and all procedures adhered to ethical guidelines.

Procedure

Atraumatic extraction of teeth 11 and 13 was performed to preserve the alveolar ridge. The post-extraction sockets were thoroughly curetted to remove pathological tissue and irrigated with antiseptic solutions (Fig. 2a).

Immediate post-extraction implants (diameter: 4 mm, lengths: 12 mm and 14 mm) were placed. The insertion axis was palatalized to ensure optimal engagement with cortical bone (Fig. 2b).

Under-drilling protocols were employed to enhance primary stability. The integrity of alveolar walls was carefully evaluated, with particular attention to the vestibular plate.

Measurements

Implant stability was assessed using a torque wrench, with insertion forces measured at 50 Ncm.

Periotestometry was performed, yielding values of -5 (mesial implant) and -6 (distal implant), indicative of excellent primary stability.

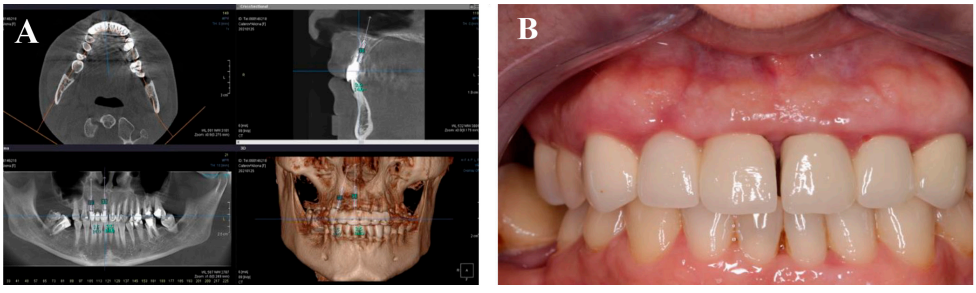

Fig. 1 Preoperative appearance.
A. Tomography analysis, and digital surgery planning.
B. Intraoral aspect of the prosthetic work.

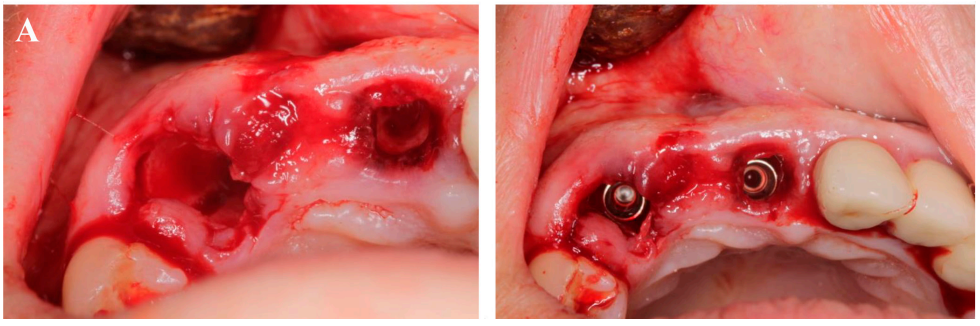

Fig. 2 Post-extraction socket.
A. Evaluation of post-extraction socket, and bone wall integrity
B. Implant placement palatal, for better soft tissue result

Restoration

Provisional acrylic crowns were fabricated and loaded within 48 hours. These restorations were designed to avoid occlusal contact during mastication, preventing undue stress on the implants (Fig. 3b).

Soft tissue modeling was facilitated by the provisional crowns, ensuring optimal gingival contour preservation (Fig. 4a).

Data collection included quantitative measurements (torque, Periotest values) and qualitative assessments (patient-reported outcome measures focusing on comfort, aesthetics, and functionality).

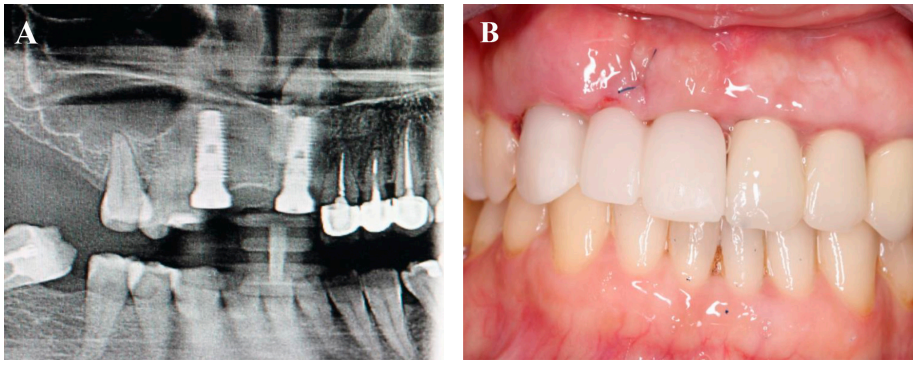

Fig. 3 After surgery photo.
A. Radiological evaluation after implant placement.
B. Fixation of immediate provisional crowns.

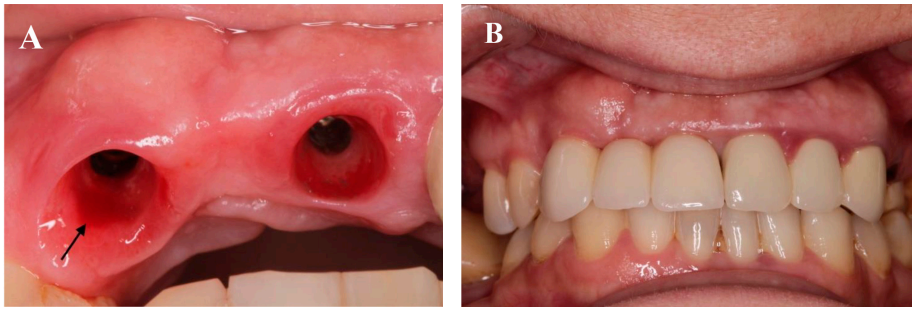

Fig. 4 Implant evaluation after osseointegration period.
A. Soft tissue appearance and bleeding evaluation by Mombelli after osseointegration.
B. Fixation of final work, and emergency profile evaluation.

Results

-Primary Stability:

Insertion torque exceeded the recommended threshold of 35 Ncm, ensuring immediate loading feasibility.

Periotest values of -5 and -6 corroborated excellent primary stability and osseointegration potential.

- Aesthetic and Functional Outcomes:

Gingival contours were preserved throughout the treatment period, with no signs of soft tissue recession or inflammation.

Provisional restorations provided satisfactory aesthetics, meeting patient expectations for anterior zone rehabilitation.

-Patient Satisfaction:

Post-treatment surveys indicated 85% satisfaction with comfort and appearance. The remaining 15% expressed mild concerns regarding initial adaptation to the provisional restorations, which were resolved within two weeks.

Literature reviews supported these findings, with success rates for immediate loading reported at 94-98%. Biomechanical studies emphasized maintaining occlusal forces below 150 Newtons to prevent micromovements during healing. Follow-up evaluations at 12 months confirmed implant stability, with repeated Periotest measurements remaining consistent.

According to postextraction implantation requirements, the implants were applied subcortically, to have enough space for the soft tissues. After the healing period, according to the measurements on the radiological image, we observed an insignificant bone remodeling with bone loss of 0.8 mm from the mesial and 0.7 mm from the distal. The platform of the implants being below the crestal level anyway, which demonstrates the effectiveness of the treatment method.

Discussion

Immediate loading minimizes treatment time while maintaining patient comfort and aesthetics. Atraumatic extraction techniques are pivotal in preserving alveolar bone integrity, particularly the vestibular plate, which is essential for achieving optimal aesthetic results. Temporary crowns play a crucial role in maintaining gingival contours and facilitating soft tissue adaptation [9].

The case study emphasizes the importance of achieving primary stability and avoiding lateral occlusal forces during the healing period. Statistical data support the protocol's predictability, aligning with broader findings in contemporary literature [3, 6]. Challenges, such as patient-specific anatomical variability and bone density, underscore the need for tailored approaches.

Future research should explore advanced implant materials, surface modifications, and digital planning techniques to enhance outcomes further. The integration of these advancements could address current limitations and improve the predictability of immediate loading protocols.

Conclusions

Immediate loading of dental implants is a reliable and effective treatment method that reduces treatment time, ensures psychological comfort, and delivers stable, long-term results. Adherence to atraumatic techniques, precise implant placement, and meticulous soft tissue management is essential for success. This case study validates the protocol's predictability and highlights its role in advancing patient care.

Competing interests

None declared.

Acknowledgements and funding

No external funding.

Ethics approval

Not needed for this study.

Informed consent for publication

Obtained.

Provenance and peer review

Not commissioned, externally peer review.

References

1. Albrektsson T, Branemark PI, Hansson HA, Lindström J. Osseointegrated titanium implants. Requirements for ensuring long-lasting direct bone-to-implant anchorage in humans. Acta Orthop Scand. 1981;52(2):155-170. doi: 10.3109/17453678108991776.
2. Barzilay I. Immediate implants: their current status. Int J Prosthodont. 1993;6(2):169-175.
3. Chele N. Implantarea imediată: riscuri şi beneficii. Studiu preliminar [Immediate implantation: risks and benefits. Preliminary study]. Medicina Stomatologică. 2014;(3):56-64. Romanian.
4. Chele N. Factorii determinanţi ai osteointegrării în implantologie [Osseointegation deteminant factors in implantology]. Medicina Stomatologică. 2015;(3):29-32. Romanian.
5. Chele N, Motelica G, Zănoagă O, Slabari E. Extracţia dentară – tehnici, accidente şi complicaţii [Tooth extraction – techniques, accidents, and complications]. Chişinău: [s. n.]; 2022. 144 p. Romanian.
6. Chele N, Topalo V, Sîrbu D. Instalarea imediată ghidată a implantelor dentare de stadiul doi [Guided immediate installation for stage two dental implants]. Medicina Stomatologică. 2015;(2):33-38. Romanian.
7. Mostovei A. [Evaluation of the integration of endosseous dental implants installed in one session through flapless surgery] [dissertation]. Chişinău: Nicolae Testemitanu State University of Medicine and Pharmacy; 2014. 141 p. Romanian.
8. Mostovei A. Formarea spaţiului biologic periimplantar în tehnica *flapless* în dependenţă de tipul mucoasei [The biological width formation related to flapless technique and gingival biotype]. Bul Acad Sci Mold. 2013;(3):180-184. Romanian.
9. Mostovei A, Topalo V, Chele N, et al. One-step vs. two-step e*arly flap*less placement of two-stage dental implants. Clin Oral Implant Res. 2013;24(Suppl 9):139-140.