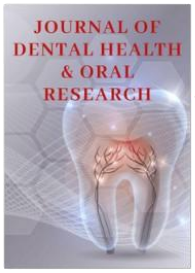

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Case Report

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Chairside Customisation of a Socket-Sealing Abutment Using a Preformed Gingiva Former After Immediate Molar Implant Placement: A Case Report

Bruno Viana Reis[1*], Renan Lana Devita[1]

[1]Unique Dental, Dublin, Ireland

***Correspondence author:** Bruno Viana Reis, DDS, MSc, Unique Dental, Dublin, Ireland; E-mail: brunovianareis@gmail.com

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Abstract

Immediate implant placement in posterior extraction sockets may reduce treatment time, but maintaining the peri-implant soft-tissue contour remains challenging. This case report describes a 42-year-old female patient treated with extraction and immediate implant placement in the maxillary right first molar region, tooth 16. After cone-beam computed tomography-based planning, a 4.2 x 8 mm ROOTT implant was placed on 26 February 2026 with 45 Ncm insertion torque. The residual peri-implant socket gap was grafted with QualyLive QualyBone biphasic calcium phosphate particulate graft material with 0.5 mm granulation. A selected preformed ROOTT Gingiva Former was adapted onto the manufacturer-supplied ZBL abutment to create a customised socket-sealing abutment. The tissue-facing printed surface was refined with light-cured flowable resin composite and polished before insertion and an absorbable haemostatic gelatin sponge layer was incorporated during adaptation. The customised component sealed the socket and supported the peri-implant mucosa during healing. At definitive restoration, the treated site showed a clinically harmonious emergence profile and soft-tissue contour compared descriptively with an adjacent implant previously restored using a conventional healing abutment. Within the limitations of a single case report, this preformed Gingiva Former-based chairside approach may provide a practical method for socket sealing and emergence-profile maintenance after posterior immediate implant placement. Further controlled studies with standardised measurements and longer follow-up are required.

Keywords: Immediate Implant Placement; Customised Healing Abutment; Socket-Sealing Abutment; Emergence Profile; Posterior Maxilla

Introduction

Immediate implant placement has become an established treatment option in selected extraction sockets because it may reduce the number of surgical interventions and shorten the overall rehabilitation time. However, systematic reviews have shown that clinical outcomes depend on case selection, socket morphology, primary stability and the ability to manage hard- and soft-tissue changes after extraction [1-4]. In posterior maxillary sites, immediate implant therapy remains technique-sensitive. Molar sockets are usually wider than implant diameters, contain multiple root compartments and may present limited apical bone because of the proximity of the maxillary sinus. These anatomical features make implant positioning, primary stability, socket graft containment and soft-tissue preservation clinically demanding [2,3].

A central challenge in posterior immediate implant therapy is the management of the transmucosal zone. After tooth extraction, the alveolar ridge undergoes measurable horizontal and vertical dimensional changes, particularly during the early healing

phase [5-7]. Immediate implant placement does not completely prevent post-extraction bone remodelling and dimensional alterations may still occur around implants placed into fresh sockets [8]. Conventional prefabricated circular healing abutments rarely reproduce the cervical anatomy of the extracted tooth; as a result, the soft tissue may collapse toward the implant platform, the extraction socket may remain partially open and the definitive crown may require a compromised emergence contour [9-13].

Customised healing abutments and socket-sealing abutments have therefore been proposed to support peri-implant tissues, seal extraction sockets, stabilise graft or socket contents and maintain an anatomic emergence profile during the healing phase [9-13]. The Anatomic Harmony Abutment concept was introduced for immediate molar implant placement to preserve the anatomic emergence form and provide sutureless sealing of the implant site [14]. Digital and CAD/CAM-based sealing socket abutments have also been described as strategies to optimise hard- and soft-tissue healing after immediate implant placement and socket filling [15]. Chairside customised healing abutments have been reported as practical alternatives for immediate and delayed implant cases, particularly when soft-tissue maturation around an anatomic cervical contour is desired [16].

Recent clinical evidence indicates that customised healing abutments may improve peri-implant soft-tissue volume preservation, emergence-profile development and aesthetic outcomes compared with prefabricated healing abutments in immediate implant sites [17,18]. Retrospective and case-report evidence has further suggested that customised healing components may be useful in compromised or periodontally affected sockets and may contribute to favourable medium-term tissue stability when used as part of immediate implant protocols [19,20]. In molar sockets, abutment design and diameter appear to influence buccolingual tissue-volume preservation, reinforcing the importance of the coronal transmucosal component in posterior immediate implant treatment [21].

The aim of this case report is to describe a simplified chairside protocol for fabricating a customised socket-sealing abutment using a preformed Gingiva Former adapted onto an abutment after immediate implant placement at tooth 16. An adjacent implant at tooth 15, previously restored without customised emergence-profile preservation, is presented as an intraoral visual reference to illustrate the clinical relevance of maintaining the peri-implant soft-tissue contour during healing.

Case Presentation

A 42-year-old female patient presented for implant rehabilitation in the posterior maxilla, specifically in the region of tooth 16. The patient was a non-smoker and reported no systemic health conditions, no continuous medication use and no relevant medical contraindication to implant therapy. Periodontal assessment did not reveal periodontal disease or deep periodontal pockets and no bruxism or relevant parafunctional risk was reported.

Tooth 16 had previously been restored with a crown and post. The restoration failed and the remaining root/foundation was considered unsuitable for the placement of a new post-retained restoration or a new definitive crown. For this reason, extraction of tooth 16 followed by immediate implant placement was indicated.

The patient also had a previously restored implant in the adjacent region of tooth 15. This Titaniumfix external-hex implant had been placed in 2020 using an immediate implant approach. The residual peri-implant socket gap was grafted with QualyLive QualyBone biphasic calcium phosphate particulate graft material with 0.5 mm granulation and a conventional 4 mm healing abutment was installed. The definitive crown was placed approximately 4 months later. No customised socket-sealing abutment or specific emergence-profile maintenance protocol had been used at that earlier implant site.

Patient-specific identifiers were removed from this report. The implant in the region of tooth 15 (UR5) was used only as a descriptive intraoral reference for clinical comparison of the peri-implant soft-tissue contour and prosthetic emergence profile and this observation should not be interpreted as controlled evidence.

Diagnostic Assessment and Treatment Planning

Preoperative radiographic assessment was performed using Cone-Beam Computed Tomography (CBCT). The use of CBCT in implant dentistry is supported when three-dimensional information is expected to improve diagnosis, risk assessment or implant positioning, provided that radiation

exposure is justified and optimized [22-24]. In the present case, CBCT allowed assessment of the posterior maxillary anatomy, available bone, prosthetic axis and relationship with the maxillary sinus for planning immediate implant placement in the region of tooth 16.

The treatment objective was to extract tooth 16, place an implant immediately, graft the residual socket gap and maintain the peri-implant tissue contour using a customised transmucosal component fabricated from a preformed Gingiva Former.

Therapeutic Intervention

On 26 February 2026, tooth 16 was extracted and an implant was placed immediately in the extraction socket. Osteotomy preparation was performed with osseodensification burs to compact and expand the remaining socket walls rather than remove bone excessively. A 4.2 x 8 mm ROOTT implant was placed according to the preoperative three-dimensional plan and achieved an insertion torque of 45 Ncm. The manufacturer-supplied ZBL abutment was used as the central transmucosal component for the customised socket-sealing abutment.

After implant placement, the residual peri-implant socket gap was grafted with QualyLive QualyBone biphasic calcium phosphate particulate graft material with 0.5 mm granulation to support socket fill and help maintain the peri-implant hard-tissue contour.

A preformed Gingiva Former was selected from a printed set designed to approximate different posterior socket anatomies. A thin layer of light-cured flowable resin composite was applied extraorally to the lower tissue-facing surface to round minor printing-related irregularities, reduce sharp edges and create a smoother polished surface. The composite was fully polymerised and polished before insertion.

The selected component was adapted around the ZBL abutment to create an anatomic cervical contour for coronal socket closure and mucosal support. An absorbable haemostatic gelatin sponge layer was incorporated during assembly to assist socket protection and adaptation of the customised component to the post-extraction defect.

After extraoral fabrication, the customised abutment was inserted onto the implant. The component sealed the socket coronally, supported the surrounding soft tissue, protected the grafted area and guided the peri-implant mucosa toward an anatomic emergence profile during healing.

Follow-up and Outcomes

The definitive impression was made on 18 May 2026, slightly more than 3 months after implant placement and crown fitting was performed on 27 May 2026. At the prosthetic phase, the peri-implant mucosa around tooth 16 appeared supported and anatomically contoured. The adjacent implant at tooth 15, restored after a conventional healing-abutment protocol, showed a less favourable prosthetic emergence relationship in the clinical comparison image.

This comparison should be interpreted cautiously. Both tooth 15 and tooth 16 sites were treated with immediate implant placement and socket grafting; however, they differed in treatment timing, implant system, healing-abutment design, prosthetic workflow, socket anatomy and follow-up conditions. Therefore, the comparison cannot isolate the effect of the customised Gingiva Former-based socket-sealing abutment.

No adverse or unexpected events were documented. At crown fitting, the definitive crown was adjusted for patient comfort and no functional discomfort or occlusal concerns were reported. The patient expressed high satisfaction with the aesthetic outcome of the tooth 16 crown and perceived it as more natural and harmonious than the adjacent implant-supported crown at tooth 15; this patient-reported comparison remains observational (Fig. 1-11).

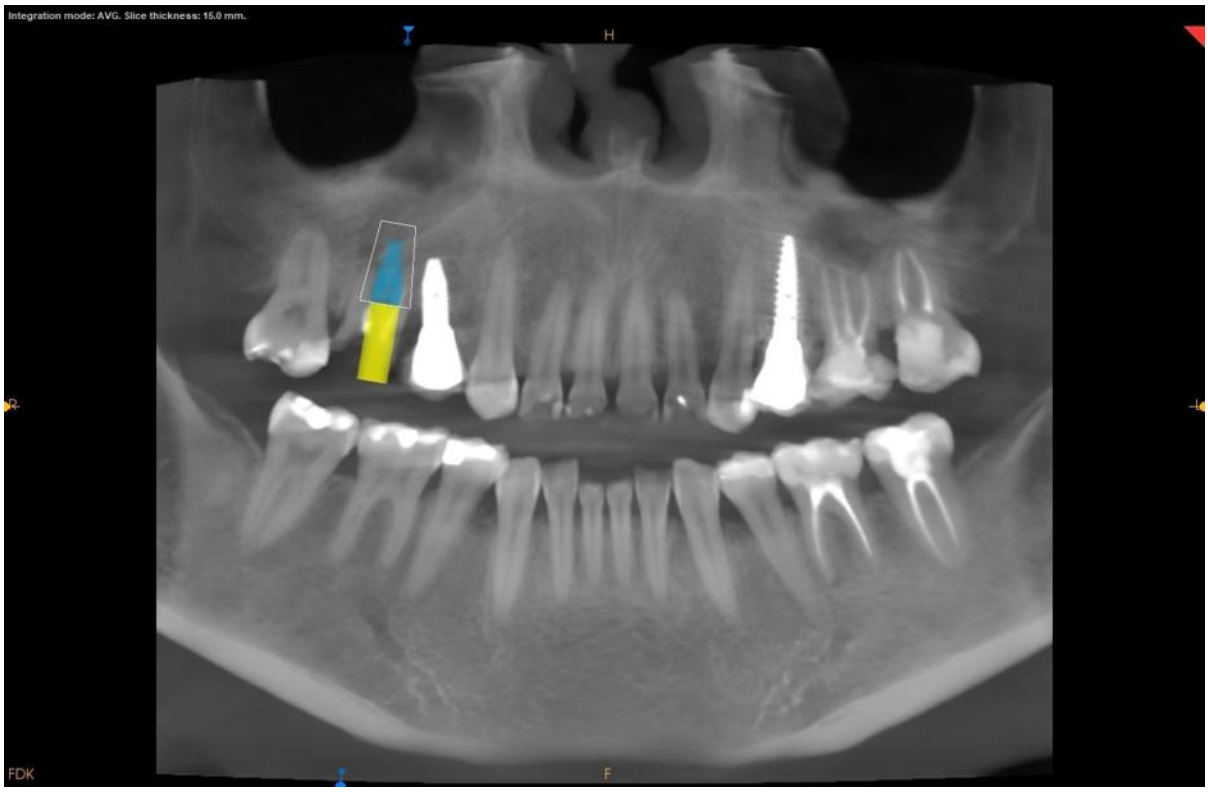

Figure 1: CBCT panoramic reconstruction showing virtual implant planning for tooth 16 (UR6).

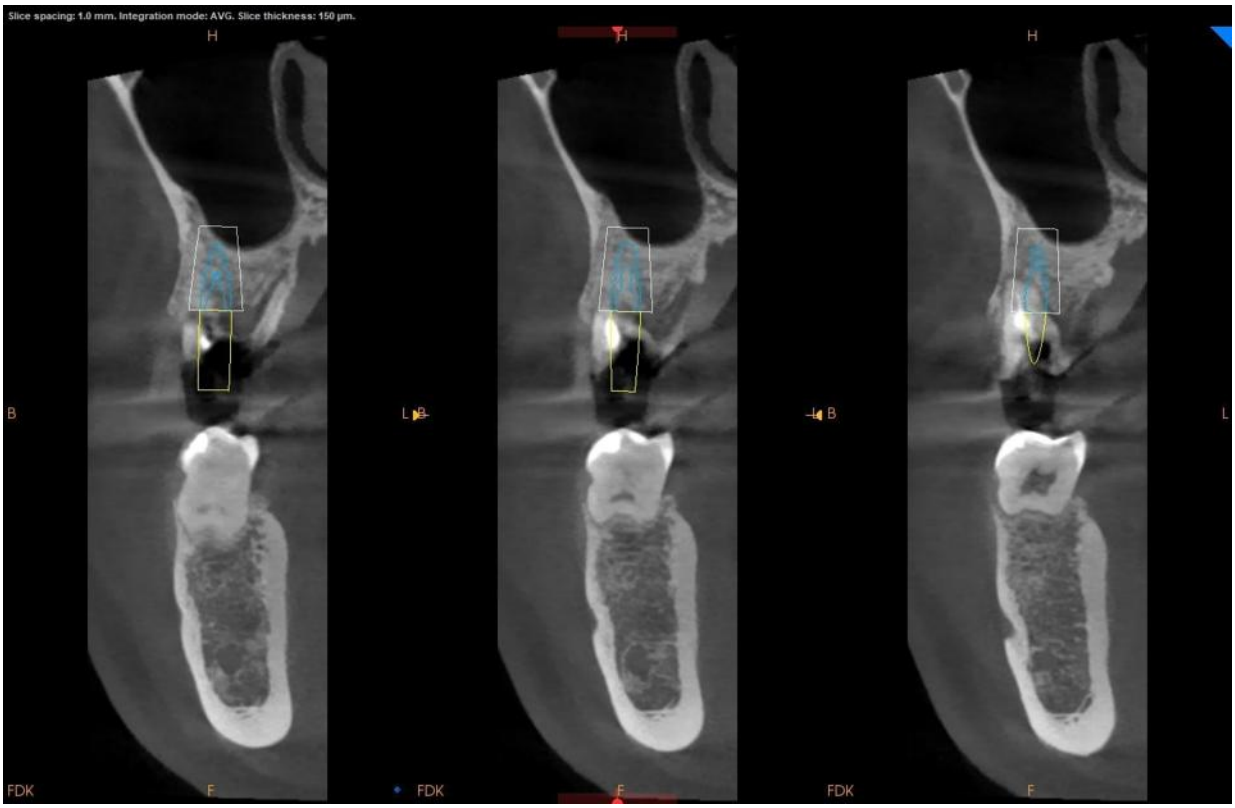

Figure 2: Cross-sectional CBCT views of the tooth 16 extraction site and planned implant position.

Figure 3: Postoperative panoramic CBCT reconstruction showing the tooth 16 implant and adjacent tooth 15 implant.

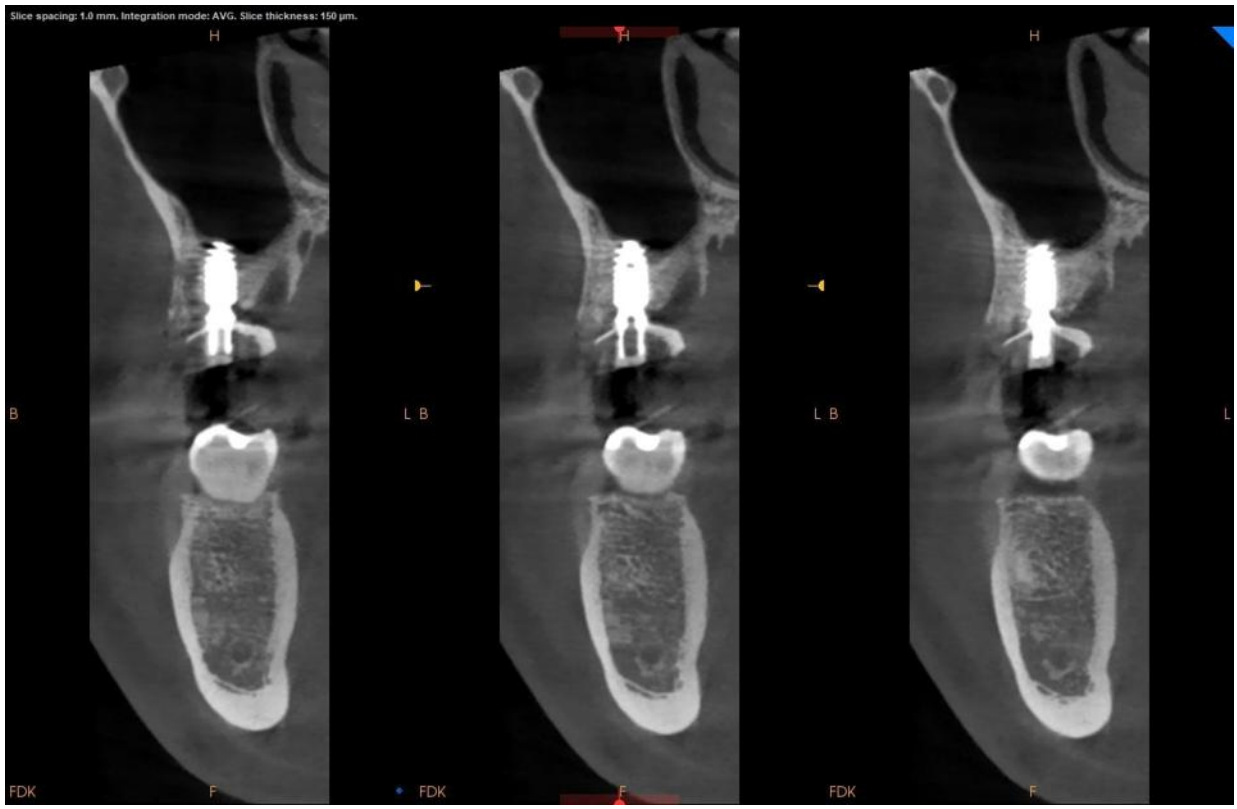

Figure 4: Postoperative cross-sectional CBCT views showing implant position relative to residual bone and the maxillary sinus.

Figure 5: Occlusal view of the immediate post-extraction implant socket at tooth 16. Fig 6. Preformed ROOTT Gingiva Formers used for component selection.

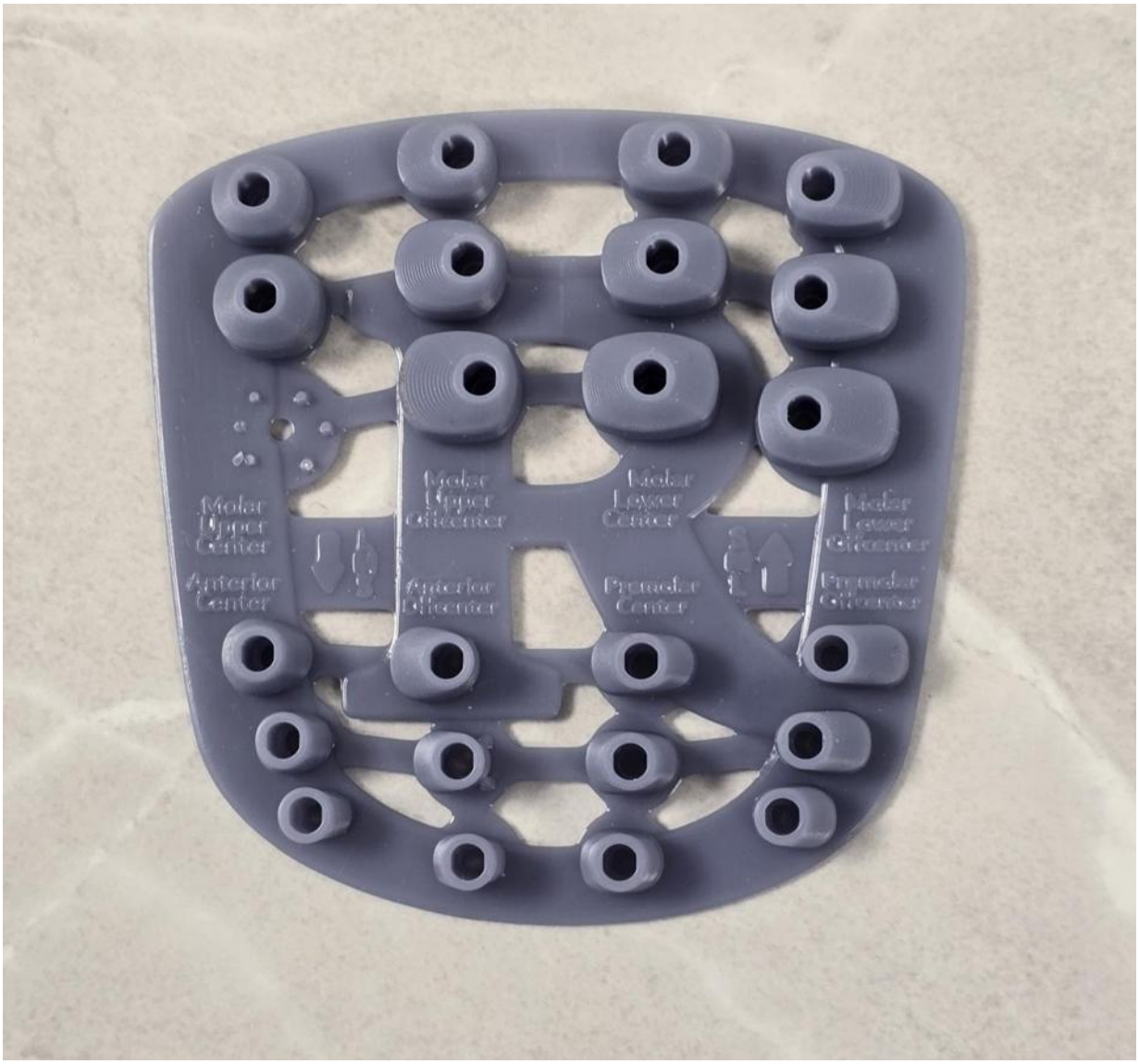

Figure 6: Preformed ROOTT Gingiva Formers used for component selection.

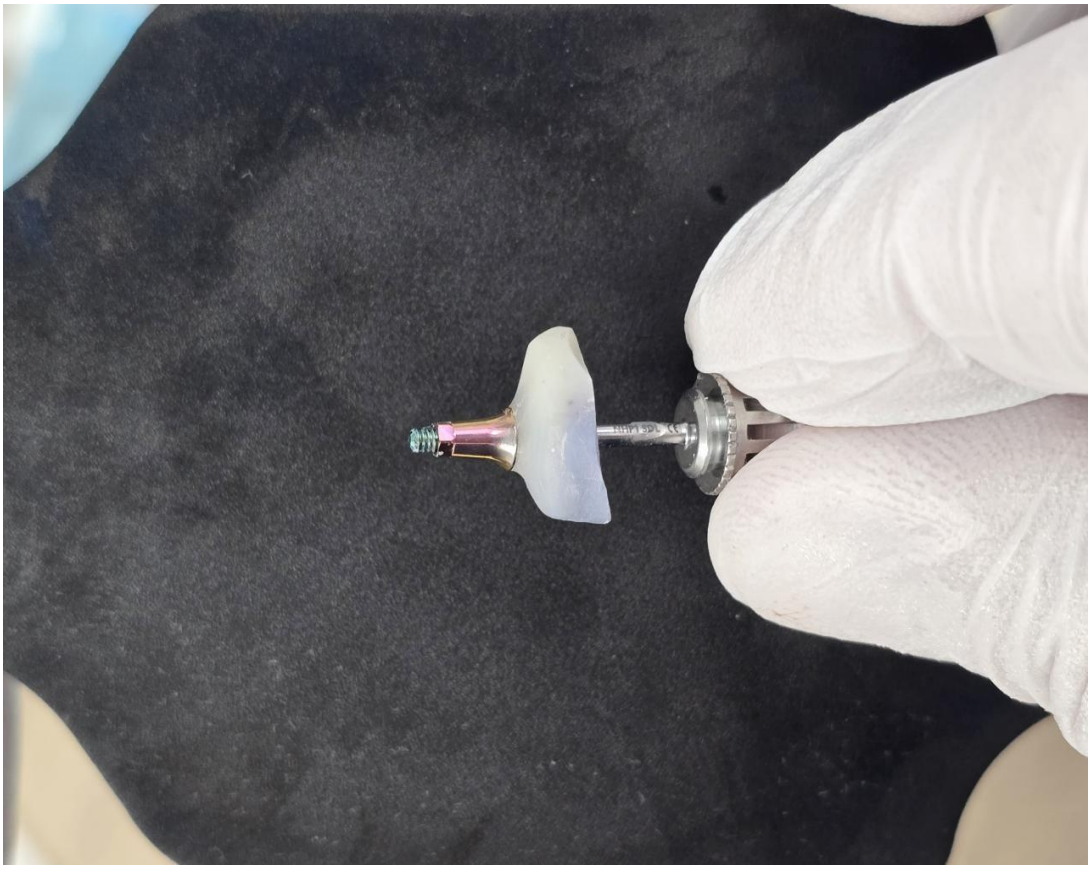

Figure 7: Extraoral view of the customised socket-sealing abutment after adaptation.

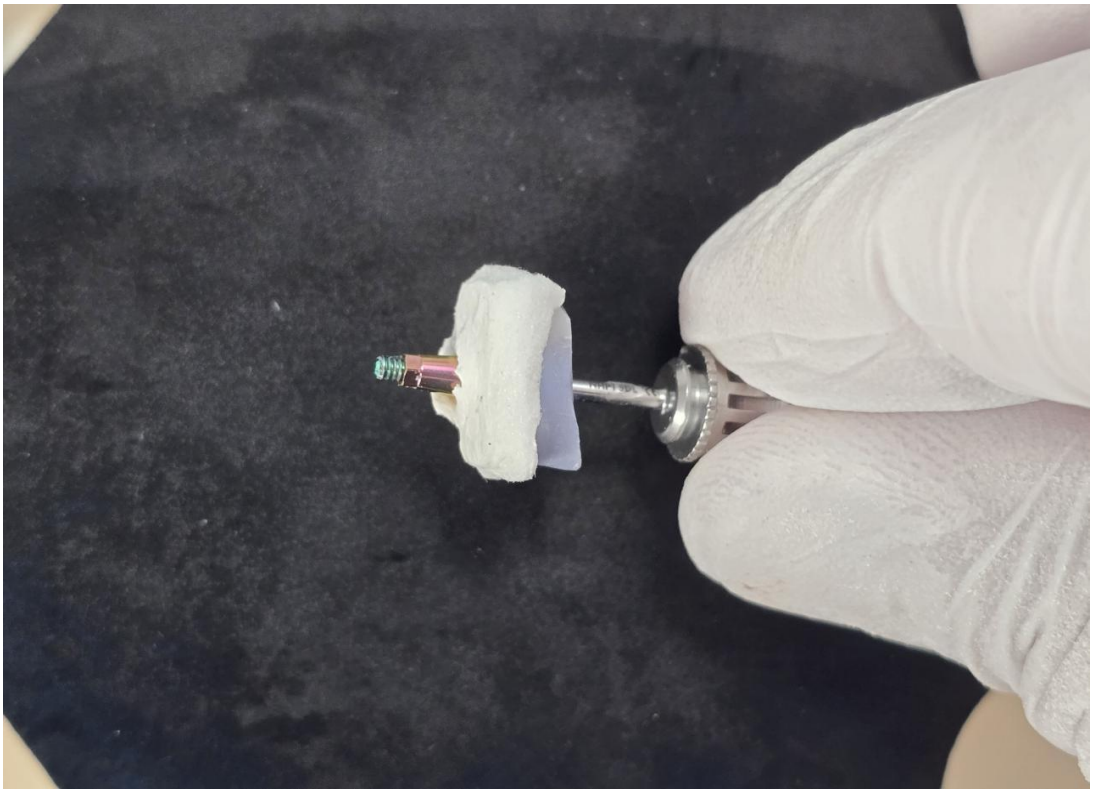

Figure 8: ZBL abutment, selected Gingiva Former and haemostatic gelatin sponge layer during extraoral assembly.

Figure 9: Intraoral occlusal view of the customised abutment sealing the socket after implant placement.

Figure 10: Clinical comparison of tooth 15 and tooth 16 implant-supported crowns after definitive restoration.

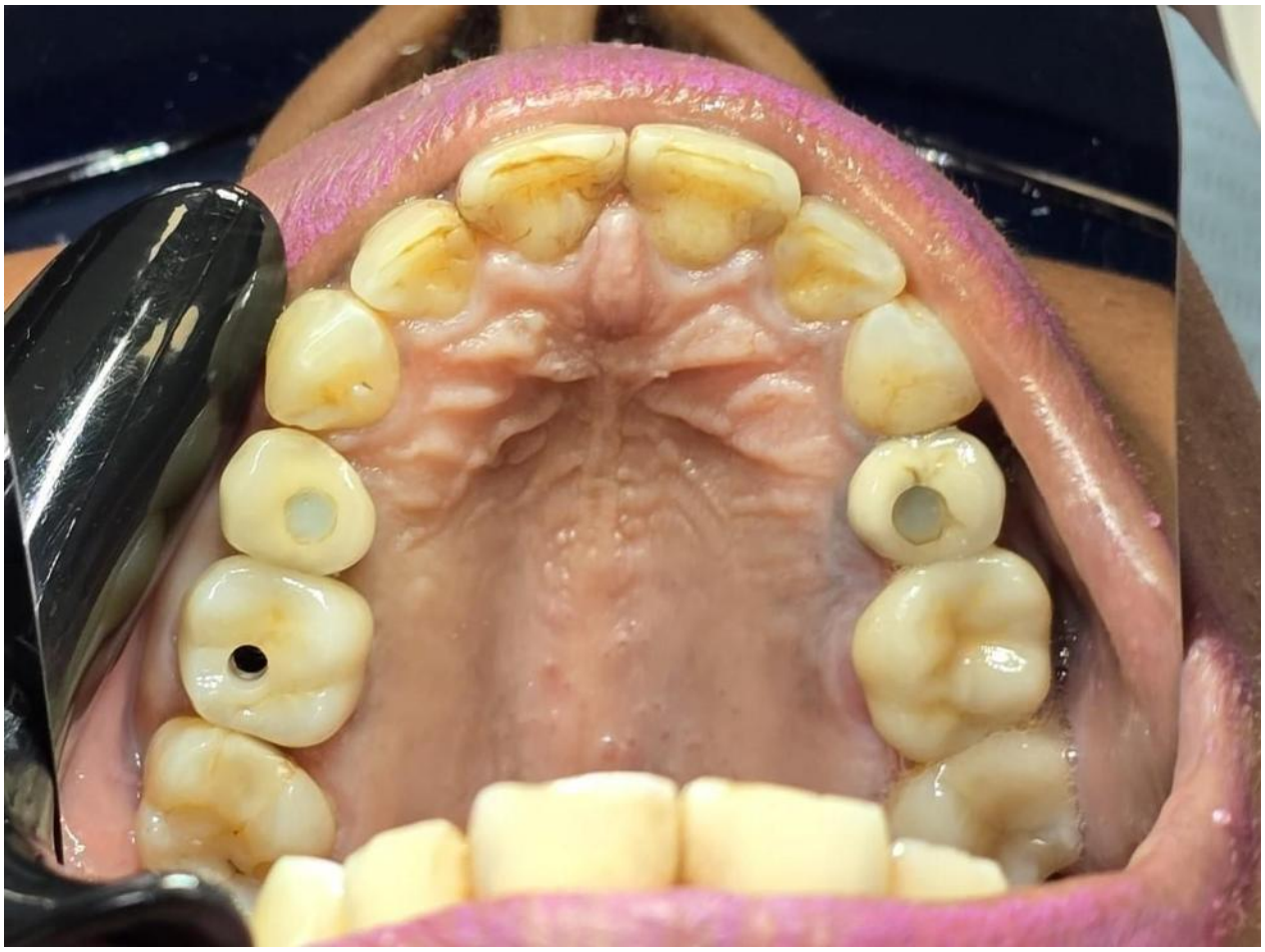

Figure 11: Occlusal view after definitive crown placement at tooth 16, showing the emergence profile and surrounding gingival contour.

Discussion

This report presents a posterior immediate implant case in which a preformed Gingiva Former was used to fabricate a customised socket-sealing abutment immediately after extraction and implant placement. The key clinical feature of the approach is that the transmucosal portion of the healing component is not limited to the circular geometry of a stock abutment; instead, it approximates the cervical anatomy of the extracted molar and supports the surrounding soft tissue during healing.

The biological rationale is consistent with the broader literature on post-extraction remodelling and customised healing abutments. After tooth extraction, the alveolar ridge undergoes dimensional changes that may influence the restorative contour and hygiene access of implant-supported crowns [5-7]. When immediate implant placement is performed, the implant platform usually occupies only part of the extraction socket, leaving a circumferential gap between the implant and the socket walls. In posterior sites, this discrepancy may be especially pronounced and immediate placement alone should not be assumed to eliminate the need for socket management [2,8].

Customised healing abutments attempt to address this problem by closing the socket coronally, stabilising the soft-tissue margin and guiding the development of a more favourable restorative emergence profile [9-11]. Akin described the Anatomic Harmony Abutment for immediate molar implant placement as a sutureless implant-site sealing approach that preserves anatomic emergence form [14]. Finelle and Lee described a digitally planned immediate implant approach combined with CAD/CAM fabrication of a sealing socket abutment after bone grafting [15]. Stumpel and Wadhwani described a chairside method for precisely contoured customised healing abutments and soft-tissue maturation around an anatomic root-like form [16].

Clinical studies and reviews support the relevance of customised healing components, although the evidence base remains heterogeneous. Lertwongpaisan, et al., evaluated customised titanium healing abutments in posterior immediate implant

placement and reported limited dimensional soft-tissue changes over 6 months [17]. Chokaree, et al., compared customised and prefabricated

healing abutments in immediate implant sites and found more favourable peri-implant soft-tissue and aesthetic outcomes with customised abutments [18]. Systematic reviews have similarly concluded that customised healing abutments may offer advantages for peri-implant tissue support, while emphasising limitations in study design, sample size and outcome standardization [11,12].

The present technique has practical advantages. Because the Gingiva Former is selected from an available printed set, the clinician may reduce the time required for fully digital design and milling of an individualised abutment. The component can be adapted chairside to the stock abutment supplied with the implant system, potentially simplifying immediate socket sealing in routine practice.

In the present case, the tissue-facing surface of the printed component was refined with flowable resin composite to reduce printing-related irregularities before insertion, while the residual peri-implant gap was grafted and protected with an absorbable haemostatic gelatin sponge layer. Similar socket-sealing concepts have been reported for posterior immediate implant placement and clinical reports have associated customised healing components with favourable tissue stability in selected immediate implant cases [13,19,20]. Healing-abutment design and dimension may also influence molar socket tissue-volume preservation [21]. Nevertheless, the independent contribution of grafting, sponge placement, surface refinement and customised transmucosal contour cannot be determined from this single case.

Several limitations must be acknowledged. First, this is a single case report without quantitative volumetric analysis, periodontal indices, standardised aesthetic scoring or long-term radiographic follow-up. Second, the comparison with the adjacent implant is observational and non-controlled. Both implant sites were treated with immediate placement and socket grafting using QualyLive QualyBone particulate graft material, but they differed in treatment timing, implant system, healing-abutment design, prosthetic workflow, socket anatomy and follow-up conditions.

Despite these limitations, the case is clinically relevant because it demonstrates a simplified implementation of the socket-sealing abutment concept in a posterior immediate implant site. The comparison with an adjacent implant restored without customised tissue conditioning provides a visual teaching point only when framed as an illustrative observation rather than as proof of superiority. The report follows the general principles of CARE case reporting, including transparent presentation of patient information, intervention, outcomes, limitations and patient consent for publication [25].

Conclusion

The use of a preformed Gingiva Former to create a customised socket-sealing abutment on a manufacturer-supplied ZBL abutment provided immediate coronal closure of a maxillary molar extraction socket and supported the peri-implant soft-tissue margins after immediate implant placement. In this case, the technique was associated with a clinically favourable emergence profile when compared descriptively with an adjacent implant site that had also received immediate implant placement and socket grafting, but had been restored using a conventional healing abutment without customised tissue conditioning. Further controlled clinical studies with standardised soft-tissue measurements and long-term follow-up are required to determine the predictability and magnitude of benefit of this simplified approach.

Conflict of Interest

Bruno Viana Reis serves as Clinical Supervisor for ROOTT Ireland. The clinical treatment described in this case report was performed as part of routine patient care. No external funding was received for this report and no financial support, writing assistance or publication support was provided by ROOTT, Titanium Fix or any other product manufacturer. The authors declare no other conflicts of interest.

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The authors have no acknowledgments to declare.

Data Availability Statement
Clinical photographs, radiographic images, intraoral scans and supporting documentation are available from the corresponding author upon reasonable request, subject to patient confidentiality, written consent and applicable data protection regulations.

Ethical Statement
This article describes routine clinical care in a single patient and was prepared as an anonymised case report. Local requirements for case-report publication should be checked before submission.

Informed Consent Statement
Written informed consent was obtained from the patient for the proposed treatment, clinical documentation and publication of anonymised clinical and radiographic images for scientific and educational purposes. The clinical data supporting this case report are not publicly available due to patient privacy and confidentiality, but relevant anonymised information is included within the article.

Authors' Contributions
All authors reviewed and approved the final version of the manuscript before submission.

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