

Epikut^s

SCIENTIFIC JOURNAL



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PREFACE

The development of solutions in Implant Dentistry requires a deep understanding of real clinical challenges, combined with rigorous engineering, biomechanics, and long-term predictability criteria. The **Epikut** line was conceived based on this premise: to objectively respond to contemporary clinical demands, especially in more complex scenarios.

Through the recurring analysis of rehabilitations in **atrophic maxillae**, situations involving low bone density, and the need to achieve **high primary stability**, the opportunity was identified to expand the line with an implant capable of broadening surgical possibilities without compromising prosthetic consistency. Thus, **Epikut S** was created an implant designed to promote efficient primary anchorage, featuring a **narrow apex** that enables and optimizes the **bicorticalization** technique, frequently indicated in cases of limited bone availability.

The adoption of the **16-degree Morse taper connection** reflects a strategic decision in the system's development, with a direct impact on prosthetic standardization and rehabilitation predictability. This connection facilitates approaches such as **full-arch** rehabilitations, reduces clinical variables, and allows integration with other S.I.N. solutions, such as **Zygomatic and PTG** implants, promoting greater consistency in treatment workflows.

More than just an implant, Epikut S was developed as part of an **integrated rehabilitation system** in which planning, surgical execution, and prosthetic rehabilitation are conceived in a complementary manner. Every implant characteristic was defined based on technical and clinical criteria, prioritizing safety, reproducibility, and long-term results.

This clinical journal aims to present and illustrate the application of **Epikut S** through **clinical cases**, highlighting its performance in different therapeutic contexts.

SCIENTIFIC ARTICLES

THE IMPACT OF BIOACTIVE SURFACES ON THE INITIAL STAGES OF OSSEOINTEGRATION: AN IN VITRO COMPARATIVE STUDY EVALUATING HANANO® AND SLACTIVE® HYDROPHILIC SURFACES

BIOMED RESEARCH INTERNATIONAL

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There is a growing effort in the development of active and innovative surfaces aimed at accelerating osseointegration, such as nanosized crystalline hydroxyapatite coating (HANano®). To better understand the biological behavior of osteoblasts cultured on the HANano® surface, the data were compared with SLActive®, a titanium surface treated with sandblasting. Methodologically, osteoblasts were cultured on both surfaces for up to 72 hours to evaluate cell adhesion, viability, and the set of genes encoding proteins related to adhesion, proliferation, and differentiation. Our data show that HANano® provides an interesting substrate to support cell adhesion, with cells exhibiting a typically spread morphology, while cells adhered to SLActive® display a spindle-shaped morphology. Our findings indicate that the cell adhesion mechanism was accompanied by the upstream expression of integrin B1, Fak, and Src, favoring the assembly of

focal adhesion platforms and coupling cell cycle progression (upregulation of the Cdk2, Cdk4, and Cdk6 genes) in response to HANano®. In addition, both bioactive surfaces promoted osteoblastic differentiation stimulation through activation of the Runx2, Osterix, and Alp genes. Although both surfaces promoted the expression of Rankl genes, the expression of Opg genes was higher on SLActive®, and this difference was reflected in the Rankl/Opg ratio. Finally, the Caspase-1 gene was significantly upregulated in response to HANano®, suggesting the involvement of the inflammasome complex. Overall, this study provides sufficient evidence to confirm that the nanohydroxyapatite-coated surface provides the necessary microenvironment to enhance osteoblast performance in dental implants, and it is expected that these osteogenesis phases occur during the initial stages of osseointegration.



FULL ARTICLE

THE INFLUENCE OF NANOSTRUCTURED HYDROXYAPATITE SURFACE ON THE INITIAL STAGES OF OSSEOINTEGRATION: A MULTIPARAMETRIC STUDY IN LOW-DENSITY BONE IN ANIMALS

INTERNATIONAL JOURNAL OF NANOMEDICINE

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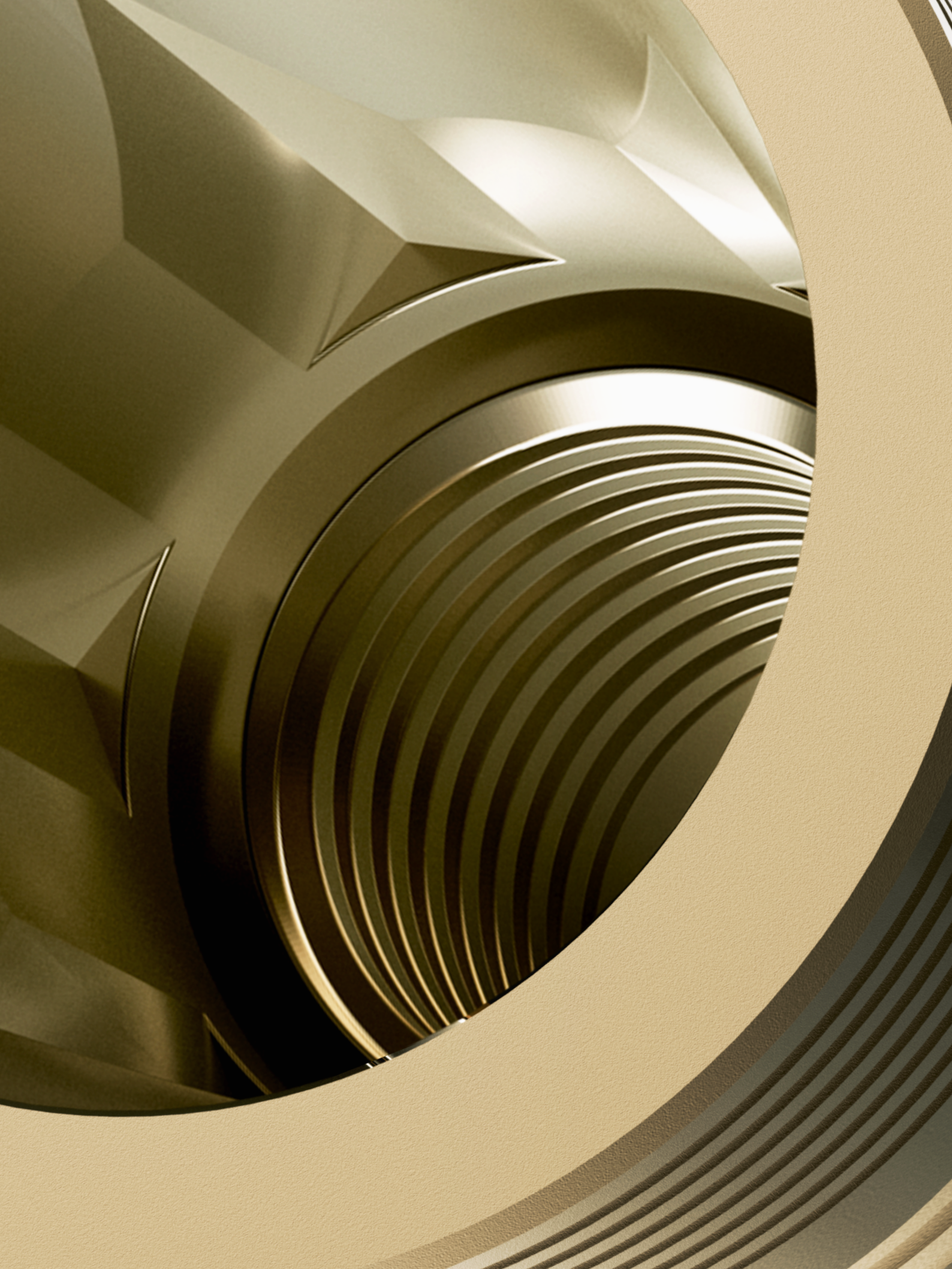
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Dental implants in partially or fully edentulous patients are a predictable treatment with high long-term success rates¹. However, early osseointegration is still considered a challenge in areas with more trabecular bone (type IV bone)², together with thinner cortical bone and lower density, which are generally considered less suitable for supporting dental implants. In recent years, new implant surface technologies with micro- to nanotopography, new chemical compositions, new loading protocols, and new surgical techniques have been introduced to improve osseointegration and reduce treatment time, enabling immediate or early functional loading in patients with reduced bone density.³⁻⁵ Several approaches to improving dental implant surfaces have been studied, including mechanical, chemical, and physical techniques⁶. Calcium phosphate has been widely used as a bone substitute⁷⁻⁸; as a coating for dental implants⁹; and as a carrier for proteins¹⁰, growth factors¹¹, and antimicrobials^{12,14} due to its similarity to the mineral fraction of bone tissue and its suitable cell adhesion capacity. Among calcium phosphates, hydroxyapatite in particular has been favored

due to its biocompatibility, safety, predictability, unlimited availability, lower patient morbidity, and cost-effectiveness, offering significant advantages and making it a suitable choice for dental implant surface coatings.¹⁵ The use of nanostructured hydroxyapatite to coat titanium implant surfaces increases the bond strength between titanium and bone, enhances the osseointegration rate, and reduces treatment duration, especially in patients with poor bone quality.⁹ There has been a continuous increase in research focused on the development of new bioactive surfaces to reduce the osseointegration period in low-density bone. This study aimed to compare the bone response of the HANano® coated surface (S.I.N., São Paulo, Brazil) with well-known hydrophilic surfaces such as SLActive® (Straumann, Basel, Switzerland) and TiUnite® (Nobel Biocare, Gothenburg, Sweden) through histomorphometric analysis of bone-to-implant contact (BIC) and bone area fraction occupancy (BAFO) in a sheep iliac crest model with low bone density.



FULL ARTICLE



CLINICAL CASES

ATRAUMATIC EXTRACTION AND IMMEDIATE IMPLANT PLACEMENT IN THE POSTERIOR MAXILLARY REGION USING A POLYPROPYLENE BARRIER



**BY DR. BRENNO MARCONDES NEGRI
AND DR. PABLO ENRICO MONTEIRO MARTINS**

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Dr. Pablo Enrico Monteiro Martins - S.I.N. Ambassador; Specialist in Implant Dentistry and Prosthodontics; Master's/ PhD Candidate in Implant Dentistry; Coordinator of the Implant Dentistry Specialization Program at IEO Baurio; International Specialist in the Research and Development (R&D) Department at S.I.N.; Member of the Implant Dentistry Specialization Programs at ABO - Presidente Prudente and FGPós - São José do Rio Preto/SP - S.I.N. Ambassador.

CASE INTRODUCTION

The patient presented tooth #17 with extensive inflammatory-related bone loss, associated with tomographic findings suggestive of root fracture, compromising the predictability of tooth preservation. The clinical and radiographic condition indicated the need for surgical intervention focused on preserving the regional architecture.

Given this scenario, a surgical approach was adopted to allow tooth extraction and immediate rehabilitation of the area, aiming for biological control, primary stability, and preservation of the remaining bone volume.

TREATMENT EXPLANATION

The surgical planning was directed toward the treatment of tooth #17, which presented pain during mastication associated with an extensive inflammatory-related bone lesion, compromising the alveolar bone and showing tomographic findings suggestive of root fracture. Given the impossibility of preserving the tooth, the therapeutic approach aimed to eliminate the infectious focus while maximizing the preservation of the remaining anatomical structures.

The surgical approach included atraumatic extraction followed by immediate implant placement, associated with the use of a polypropylene barrier, aiming to protect the socket, provide biological control of the surgical area, and maintain bone volume. This strategy allowed adequate control of the implant's three-dimensional positioning, favoring the predictability of osseointegration and future prosthetic rehabilitation.

PATIENT RECORD

Patient: Female, 57 years old.

Chief Complaint: Pain during mastication in the upper right posterior region.

Medical History: Previous endodontic treatment on tooth #17, progressing to pain during mastication. Imaging exams revealed a periapical osteolytic lesion associated with bone loss and findings suggestive of root fracture, indicating the need for surgical intervention.

Treatment Plan: Atraumatic extraction of tooth #17 followed by immediate placement of an osseointegrated implant, associated with the use of a polypropylene barrier, focusing on the preservation of bone structures, control of the regenerative process, and predictability of functional rehabilitation.

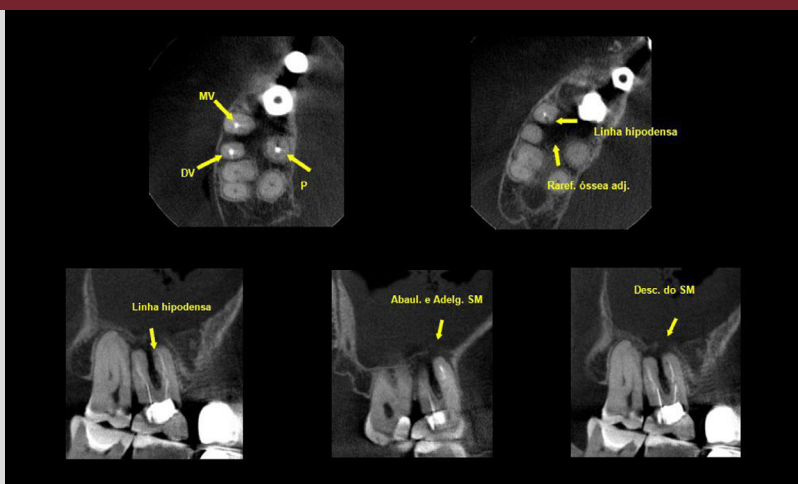
BEFORE

Clinical appearance of tooth 17 showing coronal and gingival involvement, consistent with a local inflammatory condition associated with pain during mastication and loss of predictability for tooth preservation.



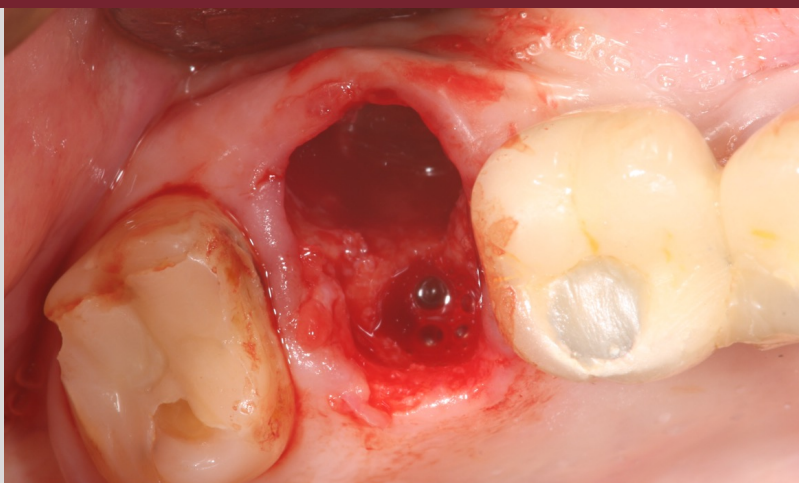
RADIOGRAPH / TOMOGRAPHY

The tomographic images reveal extensive periapical bone rarefaction associated with the roots of tooth #17, with involvement of the alveolar bone, bulging, thinning, and discontinuity of the maxillary sinus floor, in addition to a hypodense line suggestive of root fracture, confirming the indication for tooth extraction and implant rehabilitation.



INTRAOPERATIVE

Atraumatic extraction of tooth 17 was performed, followed by meticulous curettage of the periapical lesion, revealing bone loss in the buccal sockets, confirming the compromise of bone support and the need for an associated regenerative approach.



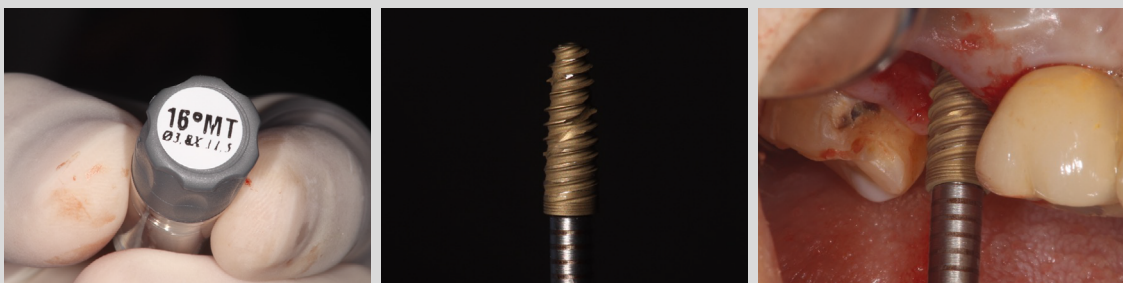
INTRAOPERATIVE

The implant site preparation was performed without the use of drills, employing exclusively Summers osteotomes, with the aim of preserving the remaining bone and optimizing primary stability. A direction indicator was used throughout the sequence to verify adequate three-dimensional positioning and the correct prosthetically oriented axis.



INTRAOPERATIVE

The S.I.N. Epikut S Plus implant $\varnothing 3.8 \times 11.5$ mm was selected, captured, and inserted into the prepared site, respecting the previously defined three-dimensional positioning, with a focus on achieving adequate primary stability.



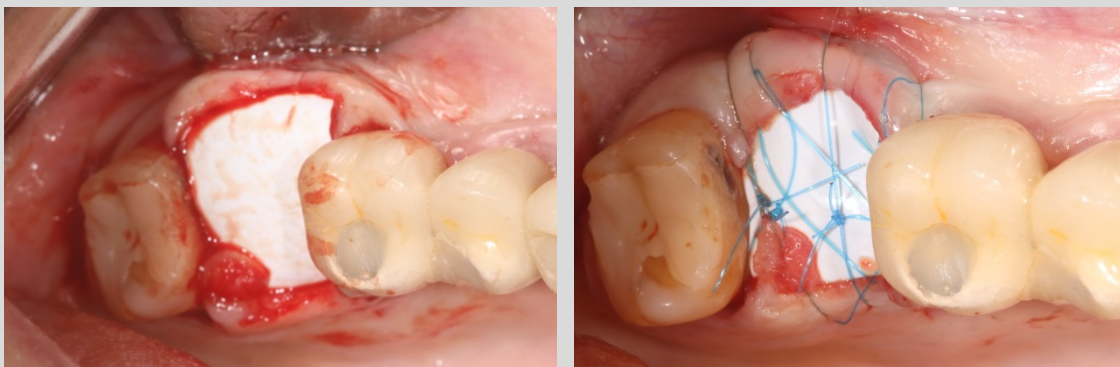
INTRAOPERATIVE

Despite the low local bone density, the implant achieved satisfactory primary stability, with a final torque of approximately 32 N·cm. Subsequently, a healing abutment was installed to assist in the organization of the tissue framework and allow proper adaptation of the polypropylene barrier over the surgical area.



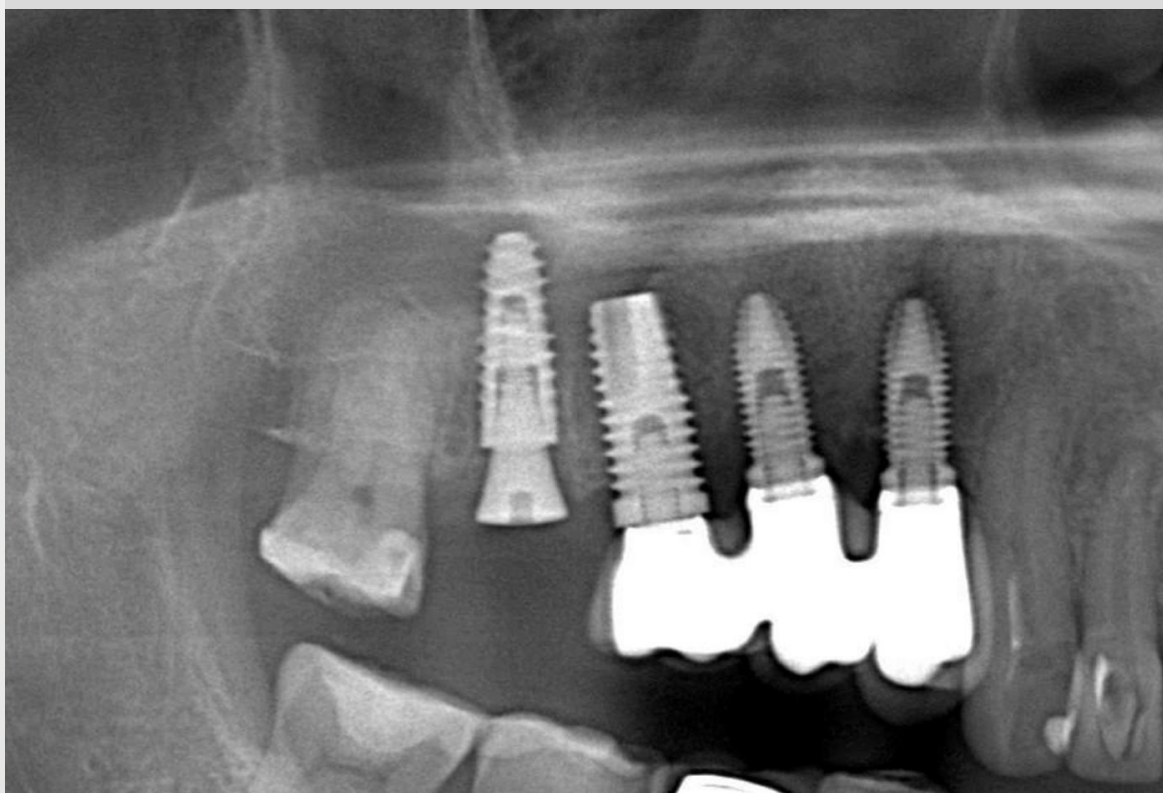
INTRAOPERATIVE

The polypropylene barrier was positioned over the bone defect, promoting socket protection and clot stabilization, followed by suturing for tissue containment and maintenance of the framework necessary for the regenerative process.



FINAL RADIOGRAPH

Immediate radiographic appearance showing the implant well positioned, finalized with a healing abutment, and with preservation of the remaining socket, confirming the proper execution of the technique and the predictability of the adopted surgical approach.



IMMEDIATE IMPLANT PLACEMENT IN THE ESTHETIC AREA (11 AND 21), COMBINED WITH CROWNS ON TEETH 12 AND 22.



BY DR FÁBIO AZEVEDO, DR. BRENNO NEGRI
AND FERNANDO AZEVEDO

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Fernando Azevedo - Dentistry Undergraduate Student at the University of Guarulhos - UNG. Technical Degree in Machining Mechanics from SENAI - SP. Research and Development Analyst at S.I.N.

CASE INTRODUCTION

Patient with no history of previous diseases or underlying pathologies.

Underwent treatment in the esthetic area from teeth 12 to 22 more than 15 years ago and was dissatisfied with the esthetic outcome.

TREATMENT EXPLANATION

Teeth 12 and 22 presented Grade I mobility and regular bone support.

Tooth 11 presented Grade III mobility and severe bone loss, especially of the buccal cortical plate.

Tooth 21 was a pontic.

PATIENT RECORD

Patient: Female, 37 years old.

Chief Complaint: Esthetic dissatisfaction, mild pain, and lack of confidence when smiling and chewing. The patient reported a feeling of "movement" in the fixed prosthesis.

Medical History: Good medical history. Nothing significant to note.

Treatment Plan: Extraction of tooth 11 followed by immediate implant placement, together with implant placement in tooth 21, associated with bone regeneration and immediate esthetics. Teeth 12 and 22 underwent individualization with reparation and new provisional restorations.

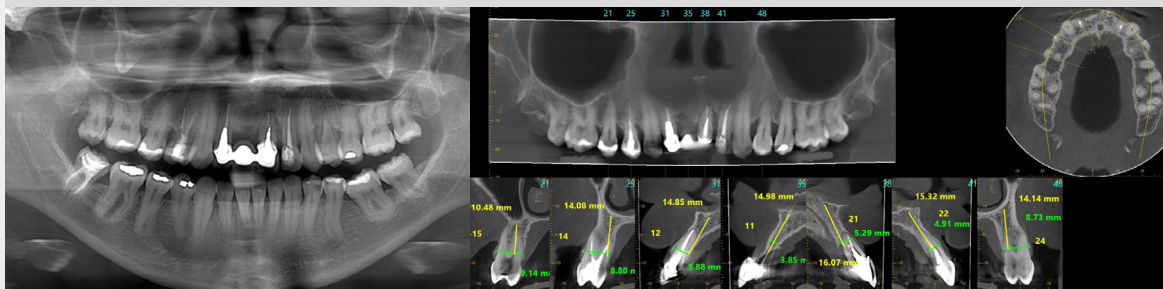
BEFORE

The images reveal gingival recession in the anterior region, exposing the cervical areas of teeth 12 and 21, associated with tissue volume loss, resulting in esthetic dissatisfaction. Tooth 22 presented darkening. The teeth showed wear and loss of brightness due to the effects of time.



RADIOGRAPH / TOMOGRAPHY

Radiograph and tomographic sections of the anterior region demonstrating severe bone loss in tooth 21, as well as in the region of tooth 11, with a certain degree of buccopalatal atrophy.



STEP-BY-STEP PROCEDURE

Removal of the prostheses and initial clinical appearance of the case on the left. On the right, appearance after preparation of teeth 12 and 22, with an esthetic core build-up on tooth 12.



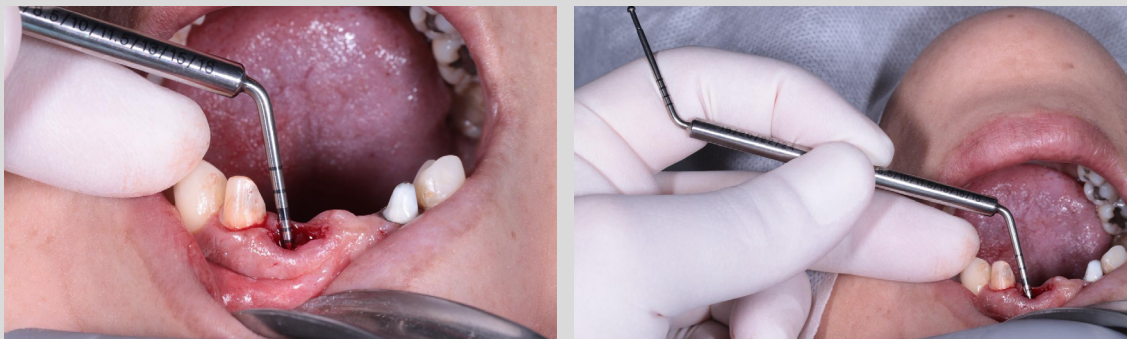
STEP-BY-STEP PROCEDURE

Occlusal view of the case, showing volume loss in tooth 11 and a mild infectious-inflammatory process in tooth 21. In the last image below, atraumatic extraction and a crestal incision from teeth 12 to 22 are shown.



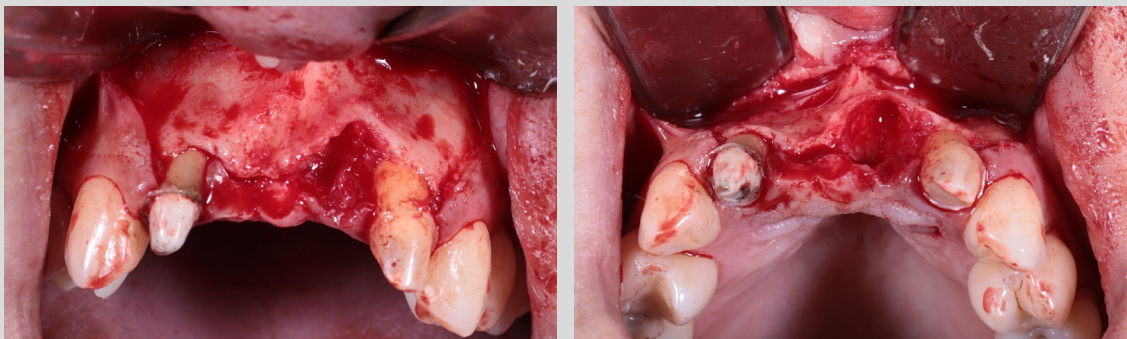
INTRAOPERATIVE

Socket decontamination performed with curettage and chlorhexidine. Probing was carried out to verify socket integrity and depth. It can be observed that the probe has two shafts, one for regular implants and another for long implants.



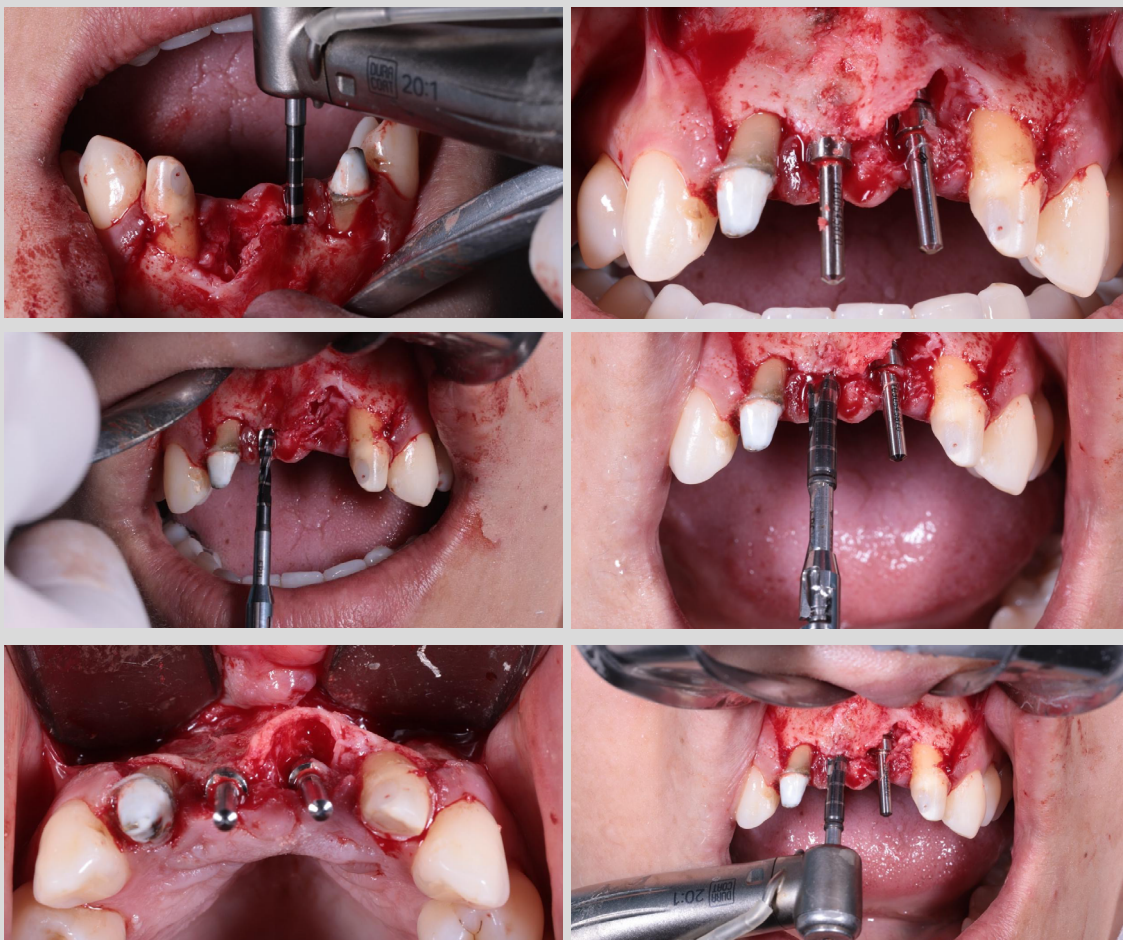
INTRAOPERATIVE

Full-thickness flap reflected with a releasing incision in the vestibular sulcus, preserving the distal papillae of teeth 12 and 22, extending to the nasal spine and nasal cavity floor, aiming to gain tissue for final closure and suturing. Height loss was observed in teeth 12 and 22, with greater volume loss in the socket of tooth 21. Reduced thickness was noted in the region of tooth 11.



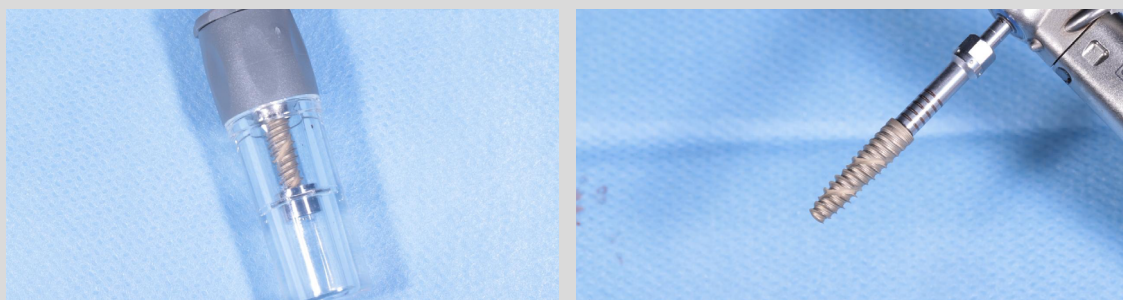
INTRAOPERATIVE

Drilling sequence performed according to the manufacturer's recommendations, using the Lance drill, 2.0 helical drill, 3.5 Soft tapered drill, and finishing with the 3.8 Soft tapered drill. Subsequently, the new drill extender and direction indicators were used to ensure safe distribution and three-dimensional positioning of the implants.



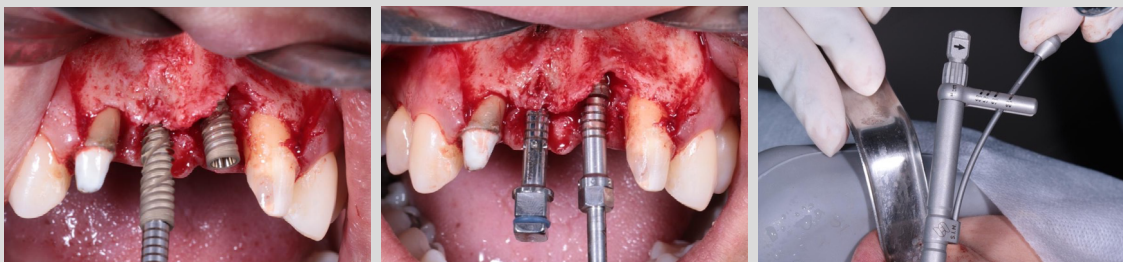
IMPLANT USED

Implant inside the blister on the left, and implant captured with the insertion driver on the right. ILM 3815N implant. The image highlights the change in geometry, reducing the thread pitch and thread depth.



INTRAOPERATIVE

Implant placement procedure, with the insertion drivers shown in the center demonstrating the final positioning and parallelism, and the final torque achieved shown in the last image.



INTRAOPERATIVE

Transmucosal gauge used for selecting the most appropriate component, followed by bone regeneration with bovine xenogeneic graft associated with PRF to gain thickness and height, and a bovine collagen membrane stabilized by the palatal tissue and crestally by the mini abutments, in its final position covering the entire defect.



PROVISIONALIZATION

Suturing performed and provisional titanium cylinders in position. No primary removal of excess tissue was carried out, relying on postoperative tissue remodeling, which will be performed after 60 days if necessary.



FINAL RADIOGRAPH

14-day postoperative radiograph.



FINAL RESULT

Prosthesis captured immediately after surgery. Immediate final appearance of the case.



UPPER FULL-ARCH REHABILITATION WITH THE SUPPORT OF THE EPIKUT S IMPLANT



BY PABLO ENRICO MONTEIRO MARTINS

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CASE INTRODUCTION

Patient E. F. V., female, 68 years old, sought treatment reporting functional discomfort, esthetic impairment, and a negative impact on quality of life. Clinical and radiographic examination revealed advanced-stage periodontal disease, with severe mobility of the upper teeth associated with significant vertical bone loss, compromising the prognosis for maintaining the remaining teeth. Given this scenario, and following referrals from other professionals, extraction of the remaining upper teeth was indicated, along with planning for an implant-supported upper Full-Arch rehabilitation. The surgical-prosthetic approach was performed with the support of Epikut S implants, aiming for adequate anchorage, correction, and biomechanical load distribution, with the goal of restoring function, esthetics, and treatment predictability.

TREATMENT EXPLANATION

The surgical-prosthetic planning was directed toward complete maxillary rehabilitation using a fixed Full-Arch prosthesis, considering the anatomical limitations and the need for prosthetically favorable implant positioning. The adopted strategy prioritized primary stability and adequate biomechanical load distribution.

Implant placement was performed with the support of the Epikut S system, allowing improved bone anchorage and optimized insertion, especially in areas with compromised bone structure. This approach enabled a predictable implant-supported foundation for the fixed prosthetic rehabilitation, focusing on function, esthetics, and long-term treatment success.

PATIENT RECORD

Patient: Female, 68 years old.

Chief Complaint: Masticatory difficulty and esthetic dissatisfaction associated with mobility of the upper teeth.

Medical History: Functional and esthetic complaints resulting from periodontal compromise of the upper teeth. Patient in good general health with no history of allergies.

Treatment Plan: Complete maxillary rehabilitation with an implant-supported fixed Full-Arch prosthesis, using zygomatic implants associated with Epikut S implants.

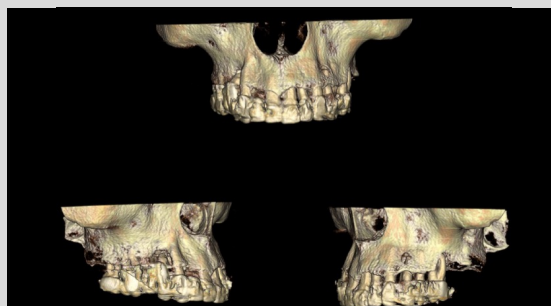
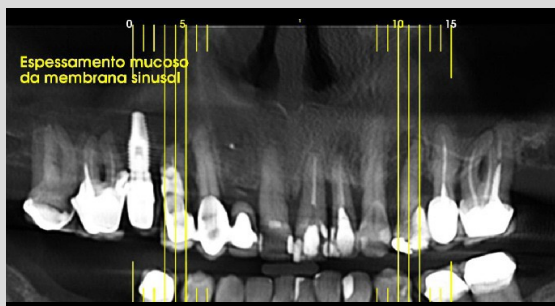
BEFORE

The initial clinical examination revealed advanced periodontal compromise of the upper teeth, with the presence of gingival inflammation, altered soft tissue contours, and a dental condition incompatible with long-term preservation. The clinical condition was associated with esthetic and functional impairment, leading to the indication for implant-supported maxillary rehabilitation.



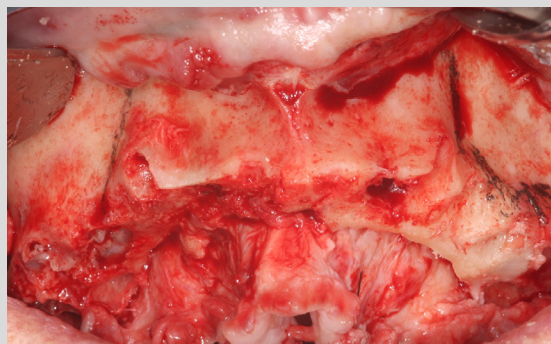
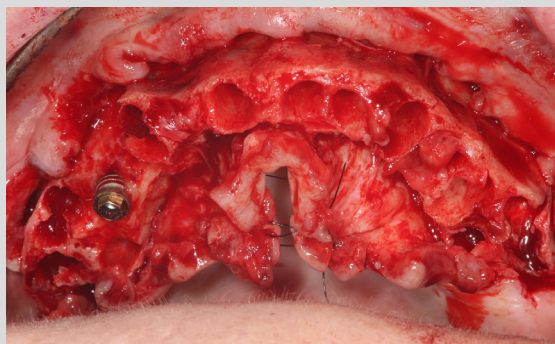
RADIOGRAPH / TOMOGRAPHY

Radiographic and tomographic evaluation revealed advanced maxillary bone resorption, with compromise of the alveolar bone volume and limitations for the placement of conventional implants in the posterior region. Three-dimensional reconstructions confirmed the anatomical feasibility for the use of zygomatic implants, as well as the need for auxiliary strategies for planning and optimizing prosthetic implant positioning. These findings supported the planning of an upper Full-Arch rehabilitation, combining zygomatic implants with Epikut S implants, focusing on stability, biomechanical load distribution, and prosthetic predictability..



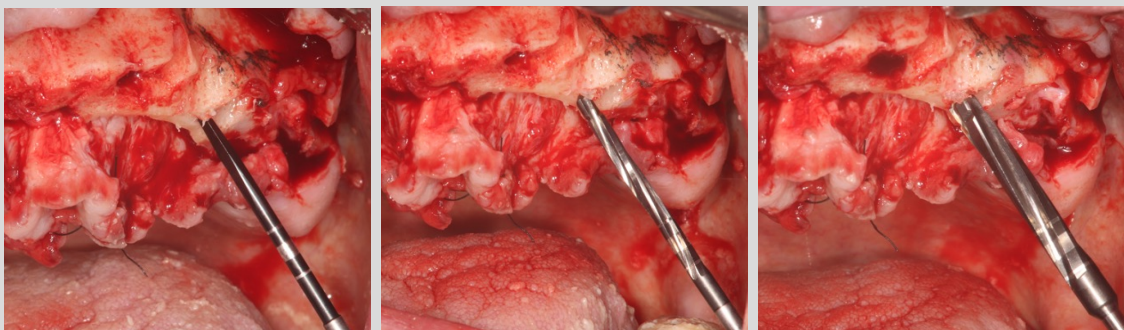
STEP-BY-STEP PROCEDURE

After local anesthesia, the remaining upper teeth were extracted, preparing the surgical site for the subsequent stages of the rehabilitative procedure. Subsequently, osteotomy was performed to regularize the alveolar ridge, aiming to improve the prosthetic space and facilitate proper implant positioning. During this stage, an explantation of a previously installed implant was carried out, as it did not present a prosthetically adequate position for the planned Full-Arch rehabilitation.



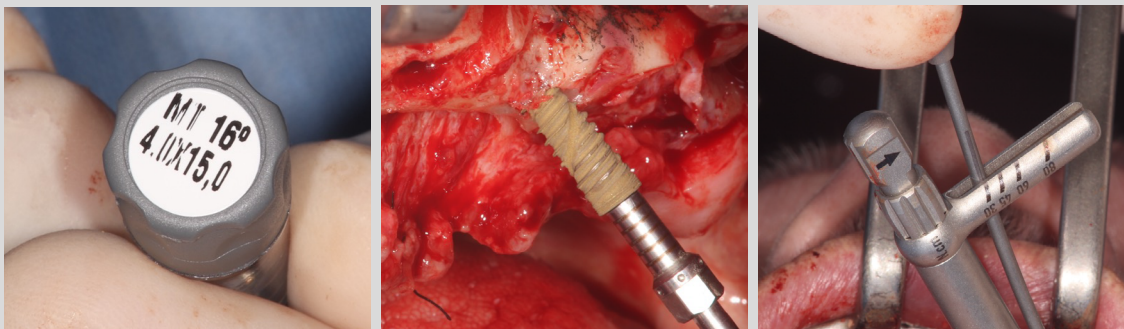
INTRAOPERATIVE

The preparation of the bone site for the first implant was performed sequentially, using a Ø2.0 lance drill followed by Ø2.85 and Ø3.0 drills. Due to the low bone density, underpreparation of the site was chosen, interrupting the drilling sequence at the third drill in order to favor primary stability for the placement of a 15 mm Epikut S Long implant – MT 16°.



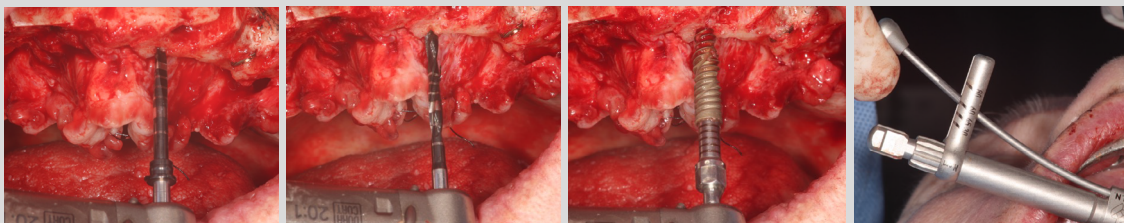
INTRAOPERATIVE

Due to the low bone density, even with underpreparation of the implant site (final drilling with Ø3.0) and the placement of a Ø4.0 implant, the insertion torque achieved was relatively low, reaching 30 N·cm. This intraoperative finding reinforces the influence of bone quality on primary stability, despite the adequacy of the preparation and implant selection, and was taken into consideration in the planning of the subsequent stages of the rehabilitation.



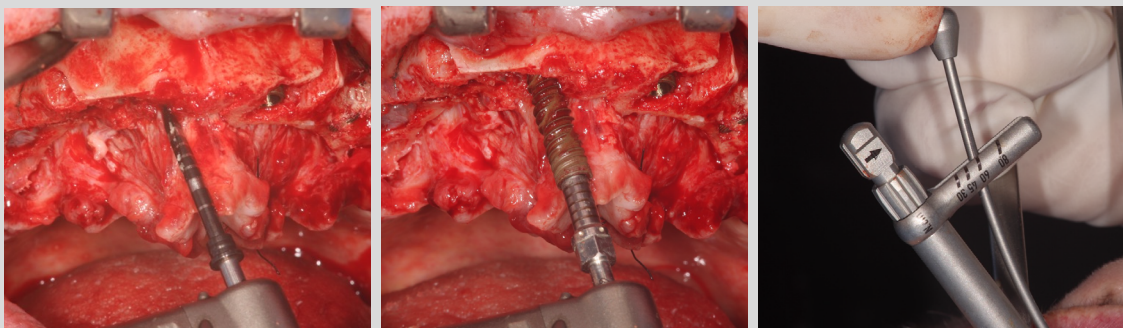
INTRAOPERATIVE

The second implant was placed in the region of tooth 22, maintaining the strategy of underpreparation of the bone site, defined based on the bone behavior observed during the placement of the initial implant. Even in a low bone density scenario, the adaptation of the drilling protocol allowed a final insertion torque of 60 N·cm to be achieved as planned, favoring adequate primary stability for the continuation of the rehabilitation.



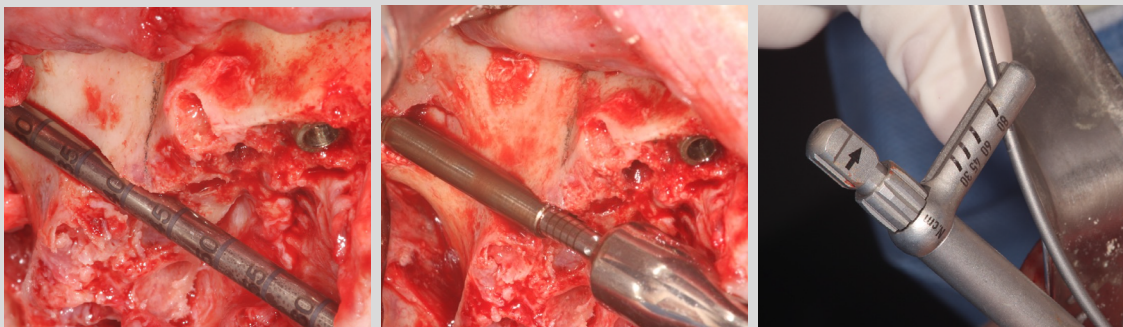
INTRAOPERATIVE

The third implant was placed in the region of tooth 12, maintaining the previously defined strategy of underpreparation of the bone site. This approach allowed a final insertion torque of 60 N·cm to be achieved, even in low-density bone, ensuring adequate primary stability for the continuation of the rehabilitation.



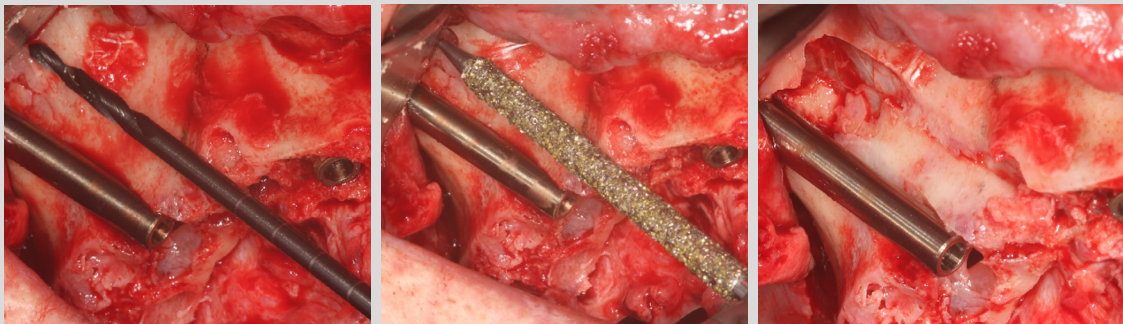
INTRAOPERATIVE

The first zygomatic implant was placed in the region of tooth 15, following adequate preparation of the bone site, achieving an insertion torque greater than 80 N·cm. The stability obtained confirmed efficient anchorage in the zygomatic bone, providing adequate posterior support and biomechanical predictability for the continuation of the Full-Arch rehabilitation.



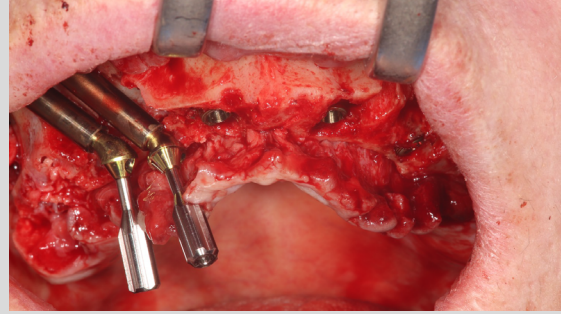
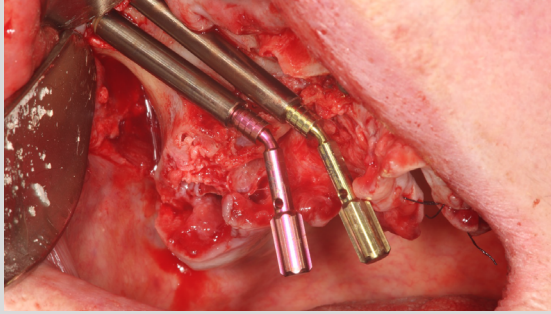
INTRAOPERATIVE

Given the availability of adequate bone space and the need to enhance posterior support for the rehabilitation, the placement of a second zygomatic implant was chosen. The implant site preparation was performed parallel to the first implant, following the surgical-prosthetic planning, with the prosthetic emergence defined in the region of tooth 13, aiming for improved biomechanical load distribution and favorable prosthetic positioning.



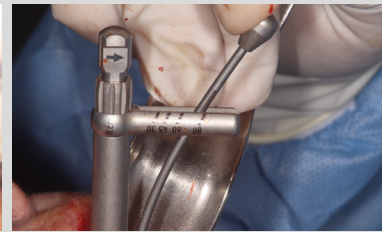
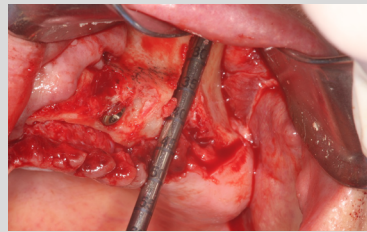
INTRAOPERATIVE

After placement of the second zygomatic implant, direction indicators were used to define the angulation of the mini abutment, allowing precise reading of the prosthetic emergence axis and assisting in the selection of the most appropriate component. The 45° direction indicator (pink color) and the 30° indicator (yellow color) were used as shown in the image. An exact correspondence can be observed between the readings obtained with the indicators and the mini abutments selected after placement of the prosthetic components, confirming the predictability of the system. This feature significantly contributes to prosthetic axis correction, improved prosthetic emergence positioning, and optimization of biomechanical outcomes, in addition to facilitating clinical decision-making during procedures involving zygomatic implants.



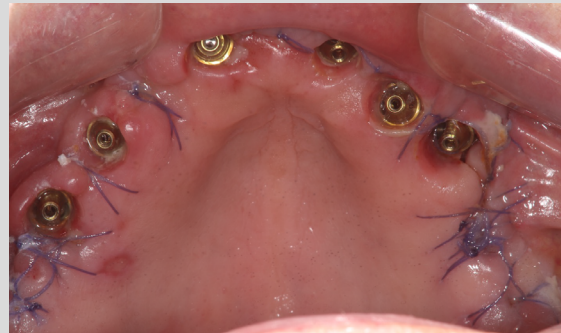
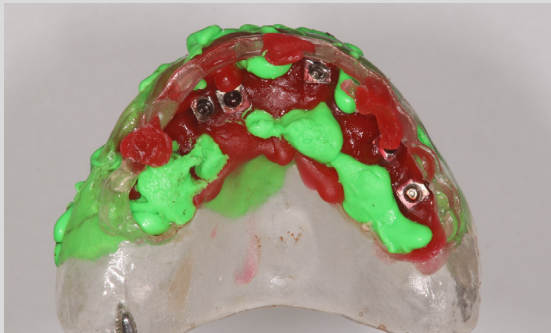
INTRAOPERATIVE

The final surgical stage consisted of the placement of a zygomatic implant with prosthetic emergence in the region of tooth 26. The chosen positioning allowed increased posterior support for the rehabilitation, favoring a more balanced biomechanical distribution of masticatory loads throughout the prosthetic arch.



PROSTHETIC PHASE

Transfer impression was performed using a multifunctional guide for the fabrication of the metal framework and acrylic processing of the protocol prosthesis (Photo 01). The second image illustrates the clinical condition after 72 hours postoperatively, showing an adequate soft tissue appearance following the removal of the protective caps from the mini abutments, with no signs of complications, confirming the stability of the surgical procedure and the predictability of the subsequent prosthetic phase.



PROSTHETIC PHASE

Appearance of the upper protocol prosthesis before clinical installation, demonstrating the correct gingival contour and the esthetic harmony of the restoration.



FINAL RADIOGRAPH

The final panoramic radiograph, obtained immediately after installation of the protocol prosthesis, demonstrates proper adaptation of the prosthetic components to the framework, as well as correct and stable implant positioning. Favorable distribution of the implants throughout the maxilla can be observed, providing biomechanical balance and significant reduction of the prosthetic cantilever. The combination of different surgical strategies, using conventional implants, long implants, and zygomatic implants, enabled the successful resolution of a highly complex case while respecting anatomical limitations and ensuring functional and prosthetic predictability for the proposed treatment.



FINAL RESULT

The upper protocol prosthesis was installed after 72 hours, presenting proper prosthetic adaptation, stability, and correct occlusal relationship. The intraoral appearance demonstrates esthetic harmony, favorable positioning of the prosthetic emergences, and functional integration of the implant-supported restoration. The extraoral image shows a satisfactory esthetic result, with restoration of the smile and natural lip contour, reflecting the predictability of the adopted surgical-prosthetic planning.



IMMEDIATE PLACEMENT OF THE EPIKUT S IMPLANT IN THE LOWER CANINE REGION WITH PERIODONTAL COMPROMISE: CASE REPORT



**BY DR. ROOSEVELT LEANDRO LOPES MACEDO
AND DR. PABLO ENRICO MONTEIRO MARTINS**

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CASE INTRODUCTION

Patient V. R. S. M., female, 70 years old, was referred for evaluation of the surgical feasibility of the extraction of tooth 33, previously indicated by another professional due to periodontal compromise in the lower canine region.

Tomographic examination revealed periodontal alterations associated with tooth 33, corroborating the initial indication for extraction. Given this scenario, a surgical treatment was proposed involving removal of the remaining root structure and concomitant rehabilitation with a dental implant, according to the individualized treatment planning for the case.

TREATMENT EXPLANATION

The surgical planning was directed toward the extraction of tooth 33 and the immediate placement of a single implant, considering the history of periodontal compromise and the local anatomical conditions. The adopted strategy prioritized preservation of the remaining tissues, achievement of primary stability, and prosthetically favorable implant positioning, aiming for a predictable rehabilitation of the anterior mandibular region.

Implant placement was performed with the support of the Epikut S system, taking advantage of its macrogeometry designed for anchorage in residual bone, especially indicated in post-extraction sites with previous periodontal compromise. This approach allowed the treatment to be carried out in a single surgical stage, focusing on prosthetic predictability, reduction in the number of interventions, and optimization of the functional prognosis of the case.

PATIENT RECORD

Patient: Female, 70 years old.

Chief Complaint: Local discomfort associated with tooth 33.

Medical History: History of periodontal compromise involving the lower left canine. Good systemic health condition, with no comorbidities or medication/food allergies.

Treatment Plan: Extraction of tooth 33 and immediate placement of an Epikut S implant.

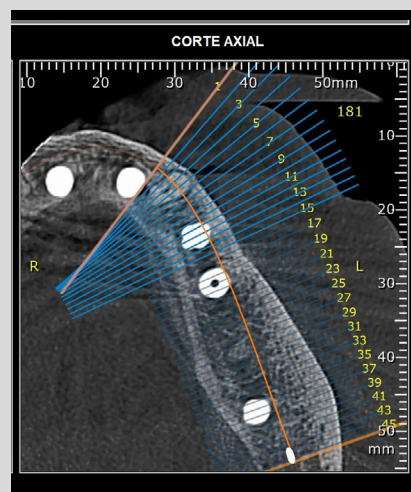
BEFORE

Clinical evaluation revealed a coronal fracture of tooth 33, with significant compromise of the remaining dental structure. The observed structural loss made preservation of the tooth unfeasible, reinforcing the indication for extraction and directing the treatment toward implant-supported rehabilitation.



RADIOGRAPH / TOMOGRAPHY

Radiographic and tomographic evaluation revealed periodontal compromise of tooth 33, with associated vertical bone loss, widening of the periodontal ligament space, and reduction of bone support around the remaining root structure. Three-dimensional analysis allowed identification of residual apical bone, a favorable condition for planning extraction followed by immediate implant placement while respecting the anatomical limits of the region.



STEP-BY-STEP PROCEDURE

The extraction of tooth 33 was performed using an atraumatic technique, with careful release of the periodontal ligament and removal of the remaining root structure, preserving the adjacent bone plates and soft tissues. This conservative approach allowed maintenance of the local bone architecture, an essential condition for the simultaneous planning of immediate implant placement.



INTRAOPERATIVE

Initially, the depth of the socket was measured, allowing precise evaluation of the available length and assisting in the definition of the bone site preparation. Subsequently, drilling was initiated with a lance drill coupled to the new drill extender, a feature that provided improved irrigation during preparation, favoring preservation of the bone tissue. Next, a direction indicator was used to verify the three-dimensional positioning, ensuring proper alignment in relation to adjacent structures and the prosthetic planning.



INTRAOPERATIVE

The preparation of the bone site continued with a progressive drilling sequence, following the recommended protocol for the Epikut S – MT 16° implant. Throughout the drilling process, a drill extender was used, allowing improved access to the surgical site and optimized irrigation, minimizing the risk of bone overheating. The sequential and controlled preparation favored preservation of the adjacent structures and the achievement of an adequate bone site for the subsequent implant placement stage.



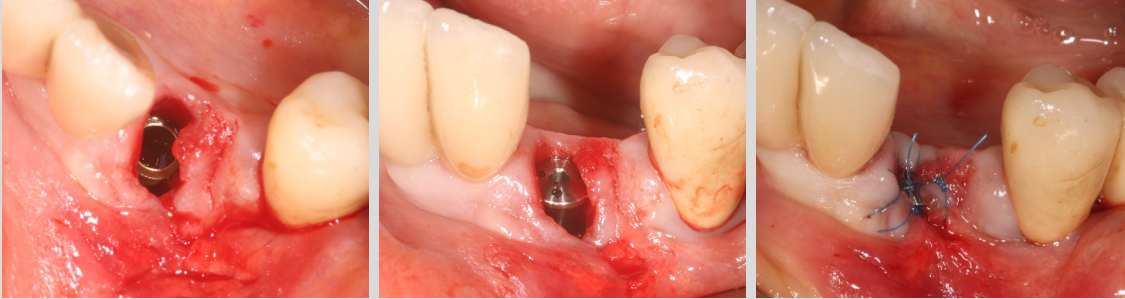
INTRAOPERATIVE

After verification of the depth of the surgical site, a 4.0 × 10.0 mm implant was placed, respecting the previously defined three-dimensional positioning. At the end of insertion, a torque greater than 45 N·cm was achieved, demonstrating adequate primary stability for the continuation of the treatment.



INTRAOPERATIVE

With the implant properly installed, a 4.5 × 4 mm healing abutment was selected to preserve the emergence profile and gingival volume of the region. Subsequently, soft tissue suturing was performed, promoting proper tissue adaptation and protection of the surgical site during the immediate postoperative period.



FINAL RADIOGRAPH

The control radiograph demonstrated adequate implant positioning, with proper relation to the adjacent anatomical structures. Satisfactory adaptation to the bone site can be observed, confirming the biomechanical predictability of the planning and the proper execution of the surgical procedure.



SINGLE IMPLANT REHABILITATION IN THE POSTERIOR MANDIBULAR REGION



**BY DR. GIOVANNI IRAN BARRETO NASCIMENTO
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CASE INTRODUCTION

Female patient, 57 years old, presenting absence of tooth 46, with a healed alveolar ridge and favorable bone conditions for implant-supported rehabilitation. Clinical and radiographic evaluation showed no local alterations, allowing safe and predictable treatment planning.

The treatment plan involved placement of a single implant in the posterior mandibular region, following a delayed loading protocol, with focus on prosthetically adequate positioning, proper distribution of occlusal forces, and predictability of long-term functional outcomes.

TREATMENT EXPLANATION

The surgical-prosthetic planning was directed toward the rehabilitation of a posterior mandibular edentulous area corresponding to tooth 46. The adopted strategy prioritized biological predictability, adequate primary stability, and proper distribution of masticatory loads.

The placement of the single implant was performed in a healed alveolar ridge, following a delayed loading protocol and respecting the period required for osseointegration. This approach allowed precise control of implant positioning, favoring future prosthetic rehabilitation with a focus on function, longevity, and maintenance of peri-implant health.

PATIENT RECORD

Patient: Female, 57 years old.

Chief Complaint: Absence of tooth 46, associated with localized masticatory impairment.

Medical History: History of posterior mandibular tooth loss, with a healed alveolar ridge and absence of local inflammatory or pathological signs.

Treatment Plan: Rehabilitation with a single implant in the posterior mandibular region (46), following a delayed loading protocol, aiming for functional restoration and long-term stability.

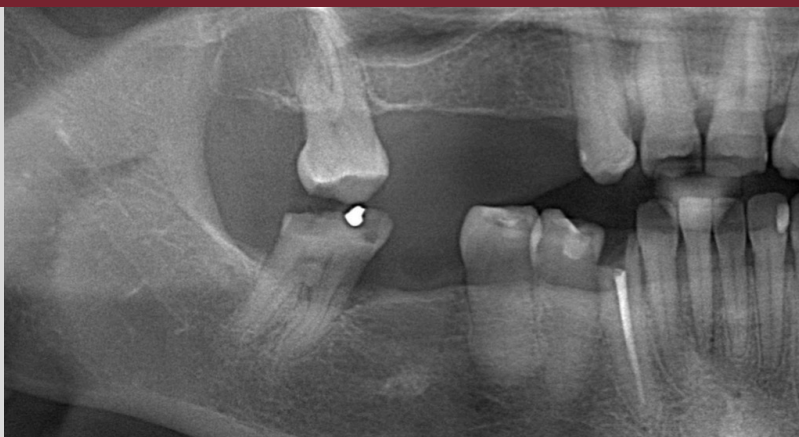
BEFORE

The initial clinical evaluation revealed the absence of tooth 46, with a healed mandibular alveolar ridge and healthy-appearing soft tissues. The adjacent structures were preserved, with no signs of active inflammation or periodontal compromise, providing a favorable environment for implant-supported rehabilitation.



BEFORE

Radiographic analysis revealed the absence of tooth 46, with a healed mandibular alveolar ridge and bone height compatible with the placement of a single implant. Adequate relationship with the adjacent anatomical structures was observed, with no signs of periapical lesions or pathological bone alterations in the region of interest.



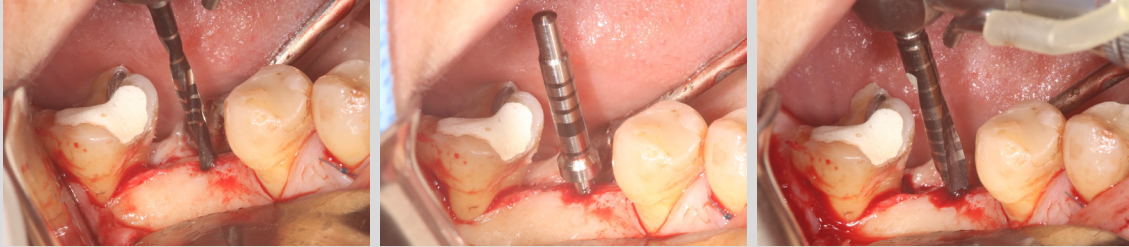
STEP-BY-STEP PROCEDURE

After local anesthesia, an incision and mucoperiosteal flap elevation were performed, allowing adequate exposure of the mandibular alveolar ridge and direct visualization of the surgical site. The access was planned conservatively, aiming to preserve the soft tissues and provide better control of the surgical field. Subsequently, the ideal point for initiating the preparation of the bone site was defined based on prosthetically guided planning. Initial drilling was performed using a lance drill, ensuring correct three-dimensional positioning and proper orientation for the subsequent stages of the osteotomy.



INTRAOPERATIVE

The bone site preparation was performed through a stepwise drilling sequence, respecting the treatment plan and the local bone characteristics. Each stage was carried out with strict control of depth, direction, and parallelism, ensuring surgical predictability. The central image shows the use of the direction indicator, positioned after initial drilling, allowing precise verification of the implant's three-dimensional positioning in relation to the adjacent structures. This visual control was essential to maintain the proper prosthetic axis and guide the safe progression of the subsequent drilling steps, ensuring alignment, stability, and correct distribution of functional loads.



INTRAOPERATIVE

After completion of the drilling sequence, the implant diameter and length were selected according to the surgical-prosthetic planning and the dimensions of the prepared bone site. This stage was essential to ensure compatibility between the performed preparation and the selected implant, contributing to adequate primary stability.



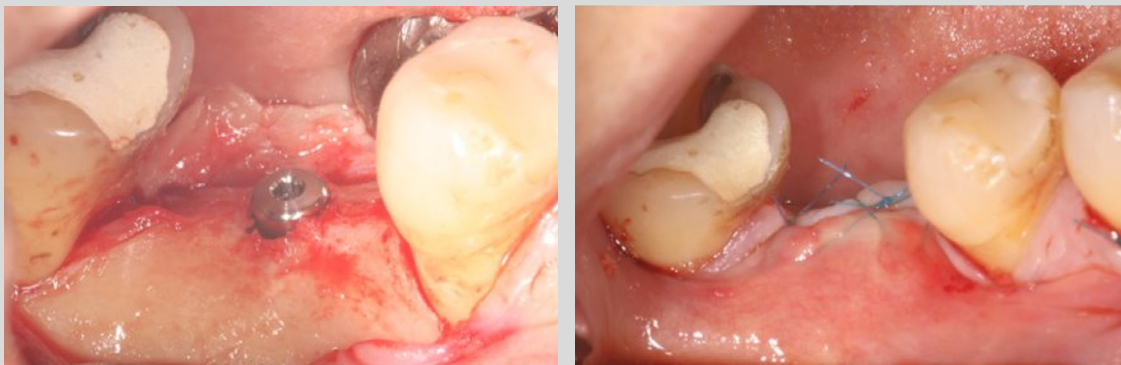
INTRAOPERATIVE

After the initial insertion with a contra-angle driver, the implant was guided into the previously prepared surgical site, reaching an approximate torque of 35 N·cm, which allowed adequate control of alignment and initial stability without the implant reaching its final depth position. Subsequently, the implant was inserted to the full planned length with the aid of a manual torque wrench, at which point a final torque of approximately 60 N·cm was achieved, confirming excellent primary stability and compatibility with the adopted delayed loading protocol. The final positioning showed the implant seated approximately 2 mm below the bone level, according to the previous planning, favoring proper emergence profile formation and preservation of the peri-implant tissues for future prosthetic fabrication.



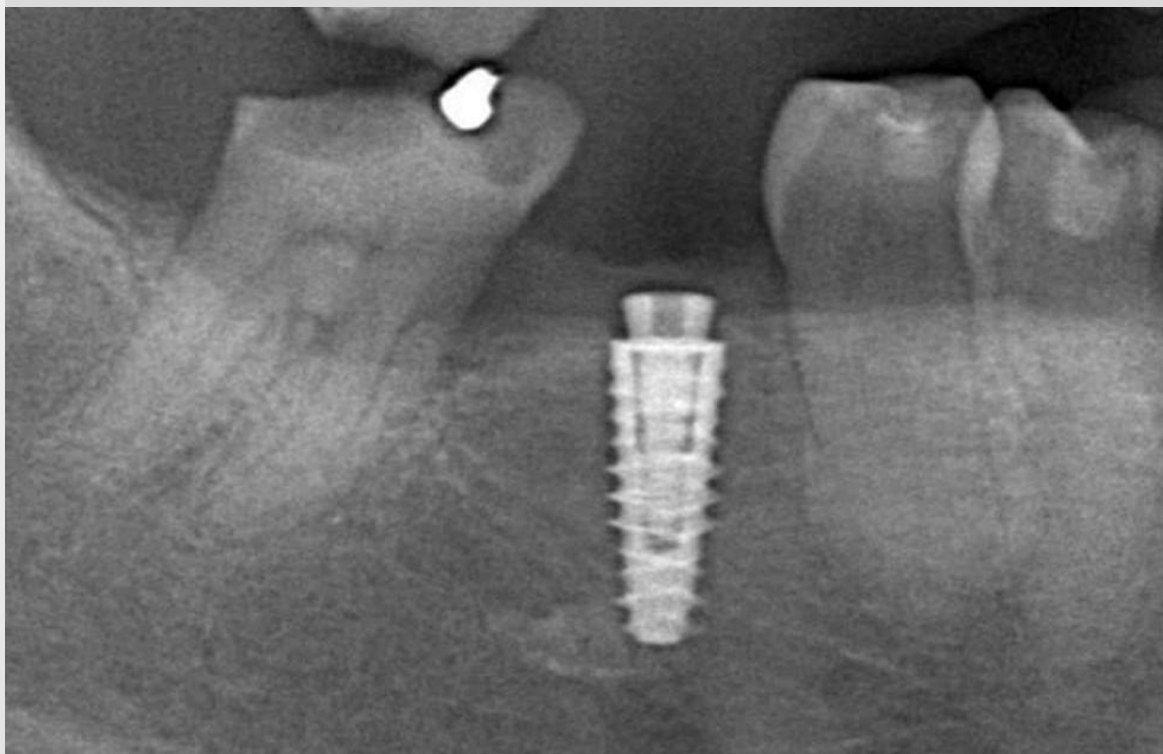
INTRAOPERATIVE

After confirmation of high primary stability, installation of the healing abutment was chosen, justified by the excellent anchorage achieved during implant insertion. This approach provided adequate protection of the surgical site and favored healing of the peri-implant soft tissues. Flap closure was performed using Blue Nylon 5-0 sutures, promoting proper tissue coaptation, stability of the surgical site, and favorable conditions for the postoperative period.



FINAL RADIOGRAPH

The immediate radiographic control demonstrated the implant correctly positioned within the bone site, with adequate parallelism in relation to the adjacent teeth and seating compatible with the surgical-prosthetic planning. Intimate contact between the implant and the surrounding bone tissue was observed, with no signs of anatomical interference or local pathological alterations. The examination confirmed the correct three-dimensional positioning and initial stability of the implant, validating the adopted approach and providing security for the osseointegration phase prior to definitive prosthetic rehabilitation.



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