

Case Report

Roll Flap Technique and Implant Placement: A Case Report

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Abstract: After tooth loss, the alveolar ridge collapses. Tooth absence often involves defects in soft tissue and hard tissue thickness. Localized defects in alveolar ridge are often found in partially edentulous patients. Soft tissue augmentation procedures have been developed. This case study presents a 50-year-old female patient who sought rehabilitation of a missing maxillary first premolar (tooth 24) lost due to trauma. After diagnosing periodontal health and confirming the absence of tooth 24 through clinical and radiographic examinations, a comprehensive treatment plan was developed. The initial periodontal phase involved biofilm control and mechanical debridement, followed by a re-evaluation after two weeks, confirming periodontal health. The surgical phase included soft tissue management using the roll-flap technique after guided implant placement using a Straumann Bone Level Tapered implant (4.1mm x 10mm). A provisional restoration was placed to sculpt the emergence profile over four months. The technique resulted in excellent implant stability, that improved gingival thickness and contour.

Keywords: Dental Implant, Roll Flap, Soft Tissue Augmentation, Guided Surgery, Xenograft, Emergence Profile, Peri-Implant Tissues, Implant Stability.

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INTRODUCTION

Bone loss also results in deficiencies in soft tissue contours, which must be corrected with soft tissue augmentation [1]. The roll flap technique is not new and has been well-documented in the literature [2, 3]. The roll flap technique covers a greater amount of connective tissue, thereby minimizing bone exposure and preserving the epithelial contour over the implant, also allowing for easier postoperative recovery [4]. The present case highlights the use of a roll flap and a Straumann Bone Level Tapered implant. This approach minimizes the need for a second surgical site by using a connective tissue graft while ensuring predictable aesthetic results [5].

CASE PRESENTATION

A 50-year-old female patient was referred to the periodontal clinic at the Universidad Popular Autónoma del Estado de Puebla (UPAEP) seeking replacement of her missing first premolar tooth. A clinical and radiographic evaluation confirmed the absence of tooth 24 due to trauma and a Seibert defect I (Fig. 1). The planning of this case was entirely with digital and guided flow (Fig. 2). Initial treatment involved a periodontal

phase including oral hygiene instructions and supragingival biofilm removal. The patient signed an informed consent form prior to the procedure, ensuring respect for autonomy and well-being. Additionally, this case was approached with strict professional responsibility, guaranteeing that all interventions were carried out in compliance with the highest clinical and ethical standards in dentistry.



Fig. 1: Initial occlusal photograph



Fig. 2: Digital and guided planning

Adequate local anesthesia was achieved with 4% articaine in combination with 1:100000 epinephrine dilution. Intrasulcular incisions were made in the buccal and palatal areas of the mesial angle of the upper left canine and the mesial angle of the upper left second premolar. Following this, a full-thickness incision was made towards the mesiodistal area in the middle of the edentulous area of the first one, directed towards the palatine, and a second partial-thickness incision was made towards the buccal area. The flap was de-epithelialized and debrided (Fig. 3). Horizontal mattress sutures were performed and when tightened, the connective tissue was rolled towards the buccal area [4]. The surgical site was sutured with 5-0 Teflon. Subsequently, the guided implant placement was performed using a Straumann Bone Level Tapered implant (4.1 mm x 10mm). After flap design and elevation, a surgical guide was placed to ensure accurate drilling (Fig. 5). The implant was inserted (Fig. 6), and the implant was position parallel to the adjacent teeth, which was confirmed radiographically [7]. The T-base attachment was placed for provisionalization. A provisional restoration was adapted and modified with fluid resin increments to sculpt the emergence profile (Fig. 8), which was adjusted four months post-placement (Fig. 9).



Fig. 3: Full thickness flap



Fig. 4: Roll flap and sutures



Fig. 5: Surgical guide



Fig. 6: Implant placement



Fig. 7: Implant radiography



Fig. 8: Implant provisionalization



Fig. 9: Final restoration

RESULTS AND DISCUSSION

Tooth loss results in significant atrophy of the alveolar process, with loss of both hard and soft tissues [1]. During implant rehabilitation, the loss of soft tissue contour will result in an artificial appearance of the implant prosthesis if not properly addressed. According to Abrams, the Roll-Flap technique is an easy and effective technique that improves gingival thickness and contour and is an excellent substitute for areas lacking gingival soft tissue [4], in the present clinical case, favorable results were obtained with a 2 mm increase in gingival thickness. Furthermore, the Bone Level Tapered implant exhibited excellent primary stability and promoted favorable bone regeneration [5]. Its conical design facilitated optimal force distribution in a limited space, essential for achieving both function and aesthetics. The rough implant surface enhanced osseointegration, particularly in a post-traumatic site [6]. Non-absorbable Teflon sutures contributed to effective wound closure and primary healing [7]. Clinical follow-up at four months demonstrated stable peri-implant tissues and successful emergence profile formation, supporting the effectiveness of this treatment approach.

CONCLUSION

The Roll-Flap technique is indicated for the correction of mild to moderate buccal ridge deficiency and provides a definitive increase in buccal soft tissue width. In addition to its simplicity, this technique is also predictable, reliable, less invasive, easy to perform, with minimal trauma, and provides good aesthetic results. This technique provided good healing and stability of the peri-implant tissues after the soft tissue augmentation had matured.

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