

SHORT COMMUNICATION

Clinical Sciences

A Novel Multipurpose Surgical Guide for Soft Tissue Recontouring and Prosthetically Driven Implant Placement in the Anterior Maxilla

Gabriela Fracasso Moraes ¹ | Leandro Boutin Perussolo ² | Ana Paula Tulio Manfron ¹

¹Department of Graduation, Faculdade Herrero. Álvaro Andrade, 345, Curitiba, Pr, Brazil

²Specialist in Implant Dentistry, Curitiba, Pr, Brazil

Correspondencia

Ana Paula Tulio Manfron Faculdade Herrero
Álvaro Andrade, 345 Zip Code 80610-240
Curitiba, Paraná, Brazil
Email: tulio.ana@gmail.com

Esthetic implant rehabilitation in the anterior maxilla conventionally requires staged procedures to optimize hard and soft tissues. This brief communication describes a novel, fully digital workflow for the design and fabrication of a single, multipurpose surgical guide that consolidates soft-tissue recontouring, prosthetically driven implant placement, and immediate provisionalization into one surgical intervention. By merging cone-beam computed tomography data and intraoral scans within a computer-aided design platform, the optimal peri-implant soft-tissue architecture and three-dimensional implant position were virtually planned. The custom guide accurately transferred this virtual plan to the surgical field without requiring additional clinical steps or physical wax-up trials. This consolidated approach enhances surgical efficiency, minimizes the need for multiple interventions, and yields harmonious esthetic outcomes, offering a predictable and patient-centered strategy for anterior maxilla restorations.

PALABRAS CLAVE

Computer-Aided Design, Multipurpose Surgical Guide, Dental Implants, Gingivectomy, Anterior Maxilla

1 | INTRODUCTION

Achieving satisfactory esthetic outcomes in implant rehabilitation between natural teeth in the anterior maxilla requires meticulous multidisciplinary planning and a staged treatment approach, leaving little room for error [1, 2]. Conventionally, this treatment is divided into two phases, each designed to optimize hard and soft-tissue conditions before the prosthetic rehabilitation [3, 4]. The present brief communication describes a anterior maxilla rehabilitation using a novel multipurpose surgical guide. To the authors' knowledge, this is a novel approach that describes a fully digital workflow for the design and fabrication of a single, multipurpose guide that integrates soft-tissue surgery, implant placement and immediate provisional restoration simultaneously.

2 | CLINICAL TECHNIQUE

Cone-beam computed tomography (CBCT) was performed to evaluate the alveolar ridge morphology, three-dimensional bone availability, and the anatomical relationship with adjacent structures. To establish a fully digital workflow, an intraoral scan (iTero, Align Technology, Tempe, AZ, USA) of both arches and the occlusal relationship was acquired. The CBCT data (DICOM files) were merged with the intraoral scan (STL files), allowing prosthetically driven virtual planning based on the desired final tooth position and ideal peri-implant soft-tissue architecture. Digital smile analysis was also performed to determine the optimal gingival contour and prosthetic emergence profile. Based on the virtual planning, a multipurpose surgical guide was digitally designed to integrate soft-tissue recontouring (gingivectomy), guided implant placement, and immediate provisionalization within the same surgical procedure. The guide incorporated reference windows that accurately transferred the planned gingival architecture to the surgical field while simultaneously serving as a fully guided implant placement template (Figure 1). Without removing the guide, the guided drilling sequence and implant placement were completed according to the manufacturer's surgical protocol, ensuring accurate three-dimensional implant positioning in accordance with the digital prosthetic plan. Postoperative healing was uneventful and at a follow-up, the patient exhibited harmonious gingival zeniths and stable peri-implant soft tissues.



FIGURE 1 Perio and implant guide

3 | DISCUSSION

In the present technique, the digital workflow was the key to success. The integration of CBCT images and intraoral images within a single computer-aided design (CAD) platform enabled the evaluation of multiple treatment scenarios, facilitating the development of a patient-specific treatment plan. Another challenge was the need for multiple surgical interventions, which could potentially reduce patient motivation and compliance. Owing to the flexibility of CAD software, a multipurpose surgical guide was developed to consolidate the procedures into a single surgical intervention [3, 4]. Borham *et al.* [5] demonstrated that a CAD-CAM-based dual surgical guide significantly outperformed the conventional approach in terms of operating time and surgical efficiency ($p < 0.001$).

Moreover, the latter technique required an additional clinical step involving the physical trial of a printed wax-up followed by rescanning for guide design. In the present paper, all the designing steps were performed digitally without the need for an additional chairside step. Although promising, this technique should be validated in prospective clinical studies with larger patient cohorts.

4 | CONCLUSION

The multipurpose guide presented combining a gingivectomy guide and a prosthetically driven implant surgical guide represents a promising approach for esthetic rehabilitation in the anterior maxilla.

References

- [1] Liu X, Yu J, Zhou J, Tan J. A digitally guided dual technique for both gingival and bone resection during crown lengthening surgery. *J Prosthet Dent* 2018;119:345–348.
- [2] Hussein B, Ghosn N, Abou Chakra R, Friedmann A. Usage of a unique digital surgical guide for simultaneous crown lengthening, implant placement, and soft tissue thickening in the esthetic zone. *Journal of Stomatology, Oral and Maxillofacial Surgery* 2024;125(5):101754.
- [3] Enfedaque-Prat M, et al. Accuracy of guided dual technique in esthetic crown lengthening surgery. *J Esthet Restor Dent* 2025;37(6):1284–1296.
- [4] Tahmaseb A, Wismeijer D, Coucke W, Derksen W. Computer technology applications in surgical implant dentistry: a systematic review. *Int J Oral Maxillofac Implants* 2014;29(Suppl):25–42.
- [5] Borham E, Abuel-Ela HA, Mohamed IS, Fouad YA. Treatment of excessive gingival display using conventional esthetic crown lengthening versus computer-guided esthetic crown lengthening: a randomized clinical trial. *BMC Oral Health* 2024;24(1):317.