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A One-step guided implant placement using a modified porcelain bridge as a support for a surgical guide and immediate removable prosthesis

Abstract

Statement of problem. Stabilization of a surgical guide in patients with existing fixed prostheses can be difficult and may require prosthesis removal, increasing chair time and loss of prosthetic reference.

A prosthetically driven technique is presented in which a pre-existing porcelain fixed partial denture was modified to allow seating of a surgical guide for guided implant placement [1,3].

Three implants were placed in the maxilla at positions 24, 25, and 12 using a single surgical procedure. A removable prosthesis fabricated preoperatively was delivered immediately after implant placement. [2,3,6].This technique maintains prosthetic reference during surgery, reduces treatment time, and improves patient comfort. [2,6].

Purpose. The purpose of this dental technique is to describe a simplified method for guided implant placement in the presence of an existing porcelain fixed prosthesis,and allow immediate removable prosthesis delivery.

1. INTRODUCTION

Accurate implant positioning is essential for achieving predictable functional and esthetic outcomes in implant-supported prosthodontic treatment. [1,3]. Prosthetically driven planning and guided implant surgery have been widely used to transfer the planned restorative position to the surgical field and improve the precision of implant placement. [2,3,6].

In patients with existing fixed prostheses,stabilization of a surgical guide can be challenging and often requires removal of the prosthesis, which increases chair time and compromises prosthetic reference. [2,6]

Digital tools now allow precise modification of existing prostheses to support surgical guides. [6,9].

This dental technique describes a digital workflow in which the existing porcelain fixed partial denture was modified using Meshmixer software, and the surgical guide was designed in CoDiagnostiX to seat on the remaining crowns of the bridge. [6,9]

This approach facilitated guided implant placement at positions 24,25 , and 12 with immediate delivery of a removable prosthesis. [5,7,10]

PROCEDURES

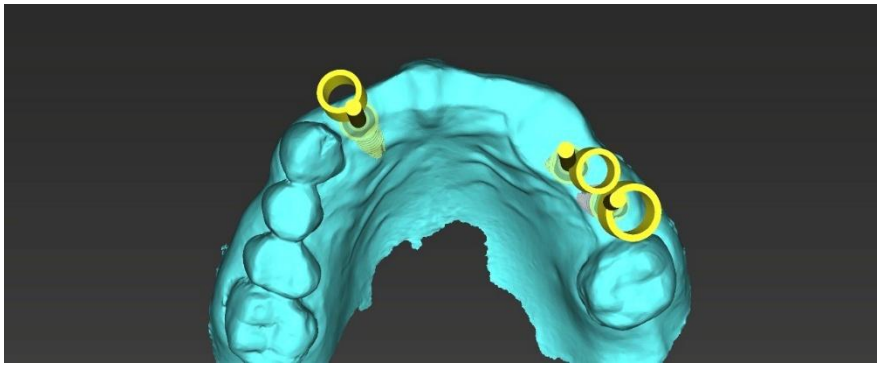
Clinical and radiographic evaluation was performed, and a prosthetically driven implant plan was established. [2,6].

An orthopantomogram (OPG) was obtained, and treatment planning was performed (Figure 1).

The existing porcelain bridge was digitally scanned.

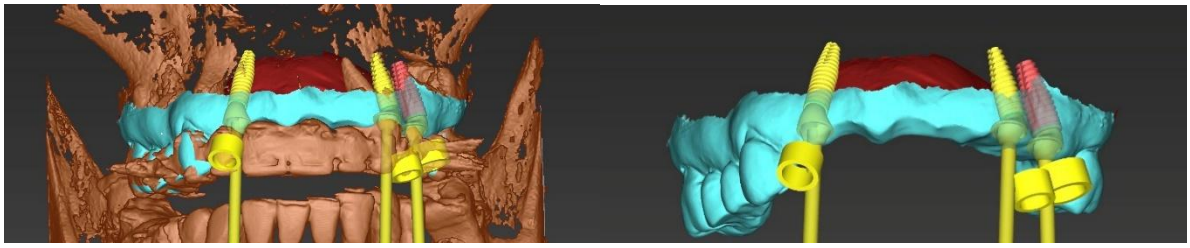
Figure 2,3 : The existing porcelain bridge (Medit i700 intraoral scan)

Meshmixer software was used to section the porcelain bridge digitally in the planned implant areas, allowing surgical guide support without complete removal of the prosthesis. [6,9]

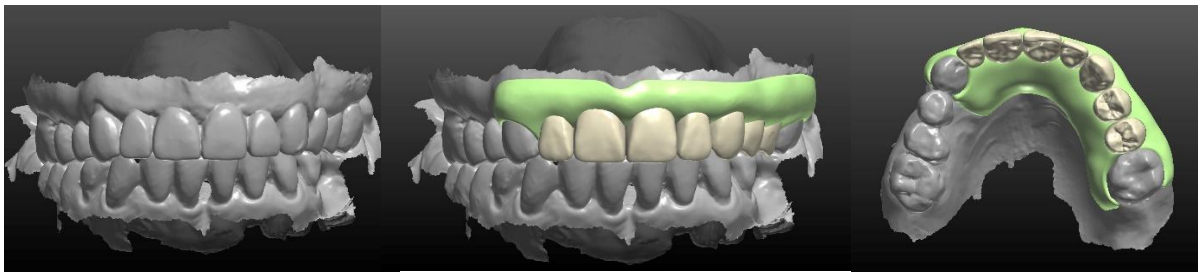


The porcelain bridge was digitally sectioned in the planned implant areas using Meshmixer software, allowing surgical guide support without complete removal of the prosthesis (Figure 4).

The surgical guide was designed to seat on the remaining crowns of the modified bridge, ensuring stable and accurate positioning. [1,3,6].



The STL file of the scanned prosthesis was aligned with CBCT DICOM data for prosthetically driven implant planning (Figure 5).
Following STL–DICOM registration, implant positioning was finalized in a prosthetically driven manner.
The surgical guide was then designed to be supported by the remaining crowns of the modified porcelain bridge, providing stable seating and accurate transfer of the digital plan to the clinical setting. [1,3].
A removable prosthesis was fabricated by StarDent , 3D printing in NextDent Printer preoperatively for immediate postoperative use.



A removable prosthesis was fabricated pre-op using 3Dprinting technology (Figure 6a-c).

Local anesthesia was administered.
The porcelain fixed partial denture was sectioned intraorally according to the digital plan,and the planned tooth was extracted.

The porcelain fixed partial denture was sectioned intraorally according to the digital plan, and the planned tooth was extracted (Figure 7).

The surgical guide was then positioned intraorally on the remaining crowns of the modified bridge and verified for passive fit and stability before initiating the guided osteotomy preparation. [1,3].

The surgical guide was positioned intraorally on the remaining crowns of the modified bridge and verified for passive fit and stability (Figure 8a, b).

Guided osteotomy preparation was performed, and three implants were placed in a single surgical session at positions 24,25 and 12, [1,3,4].

Guided osteotomy preparation was performed, and three implants were placed in a single surgical session at positions 24, 25, and 12 (Figure 9).

The pre-fabricated removable prosthesis was adjusted and delivered immediately after implant placement, with careful occlusal adjustment to avoid overloading the implants during healing. [5,7]
The pre-fabricated removable prosthesis was adjusted and delivered immediately after implant placement, with careful occlusal adjustment (Figure 10a–c).

RESULTS

Intraoral sectioning of the porcelain fixed partial denture was performed according to the digital plan, permitting extraction of the indicated tooth and accurate positioning of the surgical guide. The guide exhibited passive seating and adequate stability when supported by the remaining crowns of the modified bridge.
Guided implant placement was completed successfully, and three implants were placed at maxillary positions 24, 25, and 12 without intraoperative complications.
Satisfactory primary stability was achieved for all implants.
The pre-fabricated removable prosthesis was adjusted and delivered immediately after surgery, demonstrating acceptable fit, occlusion, and esthetics.
Postoperative clinical and radiographic evaluation confirmed implant positions consistent with the digital treatment plan. [3,10]

DISCUSSION

This report describes a digitally planned technique for guided implant placement using a modified porcelain fixed partial denture as support for the surgical guide. Integration of STL and DICOM data allowed prosthetically driven planning and accurate transfer of the virtual plan to the clinical setting. Digital modification of the existing prosthesis enabled stable guide seating while preserving prosthetic reference. [6,9].
Using the remaining crowns of the bridge to support the surgical guide eliminated the need for prosthesis removal or additional fixation methods and facilitated immediate delivery of a removable prosthesis. [2,5,7,10].This approach may enhance patient comfort and reduce overall treatment time. However, the technique requires precise digital planning, careful intraoral sectioning of the prosthesis, and adequate remaining prosthetic support. Further clinical studies are needed to assess accuracy, reproducibility, and long-term outcomes. [1,3,8]

CONCLUSIONS

This dental technique demonstrates a digitally planned, one-step approach for guided implant placement using a modified porcelain fixed partial denture as support for the surgical guide, with immediate delivery of a removable prosthesis. The described workflow allows preservation of prosthetic reference and may be considered a practical option in selected clinical situations where implant placement is planned in the presence of an existing fixed prosthesis.

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REFERENCES

[1] Abad-Coronel C, Vandeweghe S, Vela Cervantes MD, Tobar Lara MJ, Mena Córdova N, Aliaga P. Accuracy of implant placement using digital prosthetically-derived surgical guides: a systematic review. Appl Sci. 2024;14(16):7422.

[2] Nulty A. A literature review on prosthetically designed guided implant placement and factors influencing dental implant success. Br Dent J. 2024;236:169–180.

[3] Shi Y, Wang J, Ma C, et al. A systematic review of the accuracy of digital surgical guides for dental implantation. Int J Implant Dent. 2023;9:38.

[4] Pirooz P, Atri F, Gholami P, et al. Digital implant placement accuracy: a clinical study on a fully-guided flapless single-unit immediate-loading protocol. Maxillofac Plast Reconstr Surg. 2023;45:19.

[5] Fu Y, Yin C, Li S, et al. A full digital workflow to prefabricate an implant-supported interim restoration: case report and a novel technique. Int J Implant Dent. 2022;8:55.

[6] Flügge T, Kramer J, Nelson K, et al. Digital implantology — a review of virtual planning software for guided implant surgery. BMC Oral Health. 2022;22:23.

[7] Garcia-Torres F, et al. Immediate implant therapy with full-digital workflow: clinical outcomes and digital planning benefits. MDPI J Dent. 2025;13(2):73.

[8] Xing Q, Lin J, Lyu M. The accuracy of immediate implantation guided by digital templates: a systematic review. Int Dent J. 2025;doi:10.1016/j.identj.2024.10.010.

[9] Ekram AM. Full digital workflow for prosthetic driven implant planning: accuracy and clinical insights. J Dent Implantol Res. 2024; DOI:10.1902/jdir.2024.

[10] Godani A, et al. Impact of immediate interim restoration on peri-implant outcomes: systematic review and meta-analysis. J Prosthet Dent. 2024;doi:10.1016/j.prosdent.2024.

[11] The Journal of Prosthetic Dentistry. Digital workflow for definitive immediately loaded complete-arch implant-supported prosthesis in 3 appointments. J Prosthet Dent. 2024;132(1):31–36.

[12] The Journal of Prosthetic Dentistry. A digital workflow for integrating diagnostic dentures into navigation-guided implant surgery. J Prosthet Dent. 2024; DOI:10.1016/j.prosdent.2024.