

Implant-Supported Fixed Complete Denture Prosthesis for a Patient with Limited Mouth Opening Utilizing Both Conventional and Digital Workflows: *A Case Report*

Setthawut Choochaisaengrat, Gurkan Goktug, Omnia Saleh

Department of Restorative Sciences & Biomaterials, Boston University Henry M. Goldman School of Dental Medicine, Boston, MA



Introduction : Limited mouth opening presents significant challenges in implant prosthodontics, particularly when fabricating full-arch restorations where passive fit is critical. This case report highlights an innovative hybrid impression technique combining conventional and digital workflows to manage a complex clinical scenario involving restricted mouth opening.

Case Description

A 72-year-old female with chronic graft-versus-host disease (GVHD) presented with a fractured mandibular implant-supported prosthesis and severe trismus.

To manage the limited mouth opening, a custom split open-tray was fabricated with light-cured acrylic and interlocking slots for intraoral reassembly. A polyether impression and verification jig were completed using temporary abutments. Five implant-level scan bodies were captured with an intraoral scanner to generate STL files. A titanium implant level substructure was digitally designed, milled, and confirmed to have passive fit on the master cast and intraorally using radiographs and a modified one-screw test with OnX Tough 2 prototype superstructure. The definitive 3Y-monolithic zirconia superstructure was luted the titanium bar with dual-cured resin cement

Conventional Approach



A custom Split open-tray



Final impression and master cast



Implant verification jig

Digital Approach



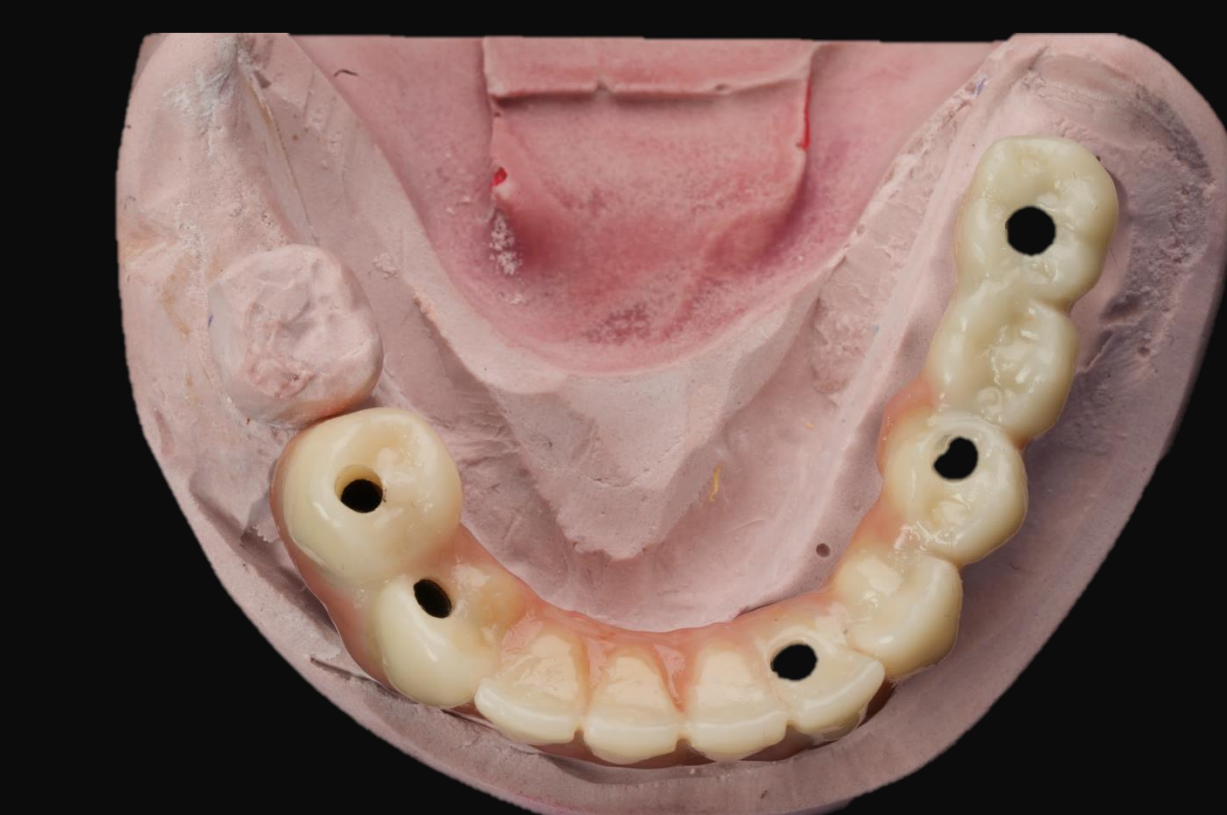
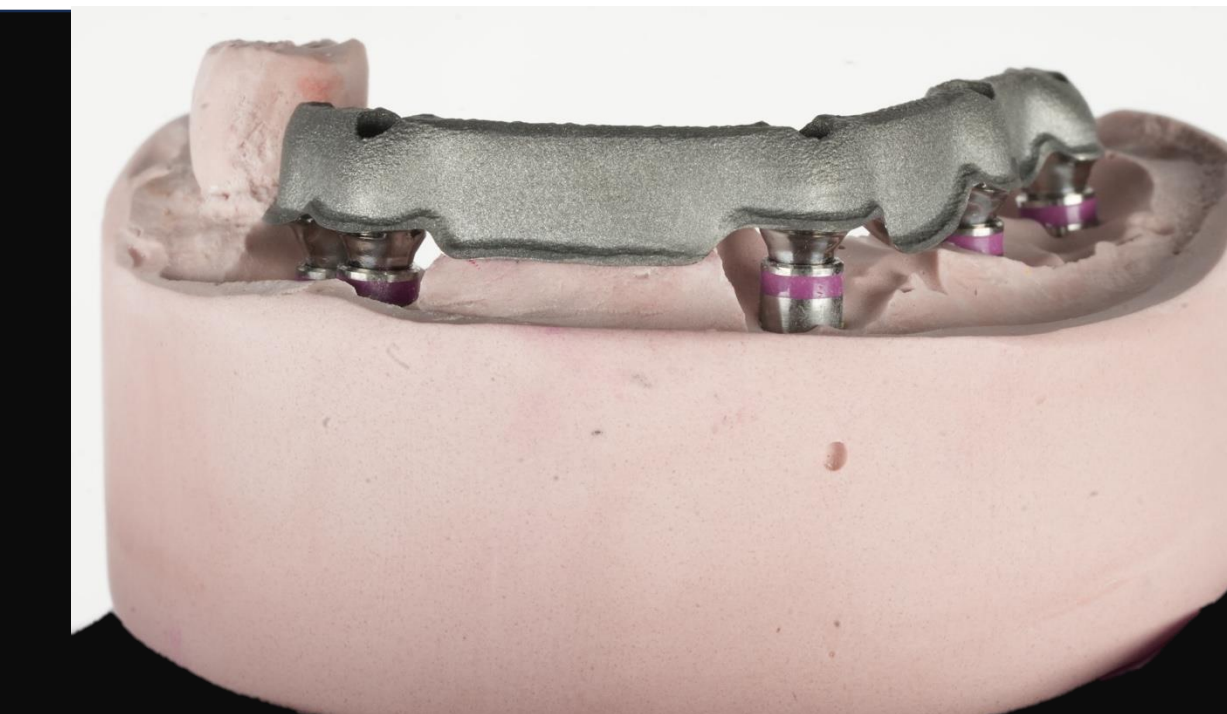
Scan bodies to capture the location and orientation of implants



STL design of titanium substructure



Substructure try-in and one-screw test



3D-printed superstructure prototype try-in with titanium substructure



Definitive implant-supported fixed complete denture

Discussion:

The combined digital and analog technique enabled cross-verification between workflows, enhancing accuracy and predictability. The titanium substructure demonstrated passive fit both on the cast and intraorally. The custom split tray effectively addressed limited access, enabling accurate impression capture.

Conclusion:

A hybrid impression approach using a split tray and intraoral scanning offers a predictable and effective solution for full-arch implant rehabilitation in patients with limited mouth opening.

Reference:

Krishna Ch V, Mahendranadh Reddy K, Gupta N, Mahadev Shastry Y, Chandra Sekhar N, Aditya V, Reddy GV. Fabrication of customized sectional impression trays in management of patients with limited mouth opening: a simple and unique approach. Case Rep Dent. 2013;2013:275047.



A fractured mandibular implant-supported fixed complete denture