

A Novel Mucosa Supported Surgical Guide

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Method: Prior to our novel approach, previous MSSG were traditionally fabricated using the DST and physically articulated dentures. From the mounting of the dentures, a second lab fabricated bite would be taken against the surgical guide and used intraorally to mount the surgical guide. This approach ensured the precise placement of the intraoral fixation pins and guide rings so that the implants can be placed in the correct positions. In contrast to this conventional approach, our new method does not require the physical articulation of the dentures and the creation of a lab fabricated bite to mount the surgical guide. By using the DST, a surgical plan was developed with implant planning software. STL files of the patient's dentures were generated with an intraoral scanner, then converted into a surgical guide, which included the denture teeth containing the guide rings for implant placement. The surgical guide was imported into a 3D modeling software in which the teeth were segmented at the gingiva and split from the full denture mesh. Cylinders were added to the base of the teeth at the surgical guide ring locations, allowing the denture-guide ring mesh and separated teeth to be press fit together. The segment containing teeth was utilized to enable intraoral mounting with the guide in occlusion. Upon placement of fixation pins, this segment was detached with the guide rings remaining in the denture base.

Aim: The purpose of this presentation is to demonstrate an innovative approach that simplifies the clinical procedures needed to fabricate and utilize mucosa supported surgical guides (MSSG). This approach builds on the dual scan technique (DST) and enables the implant surgeon to use the denture as both the mount and surgical guide to place the implants. This method saves valuable time and increases accuracy by eliminating the need to articulate physical casts to utilize MSSG.

Results and Conclusion: This unique surgical guide-denture was able to be utilized as both separated teeth to mount the case intraorally using fixation pins, and a surgical guide to place the implants in their preplanned positions. Our unique method simplifies the clinical procedures needed to fabricate and utilize MSSG by avoiding the need to physically articulate casts and improves accuracy by using the original bite taken during the DST to mount the case intraorally.

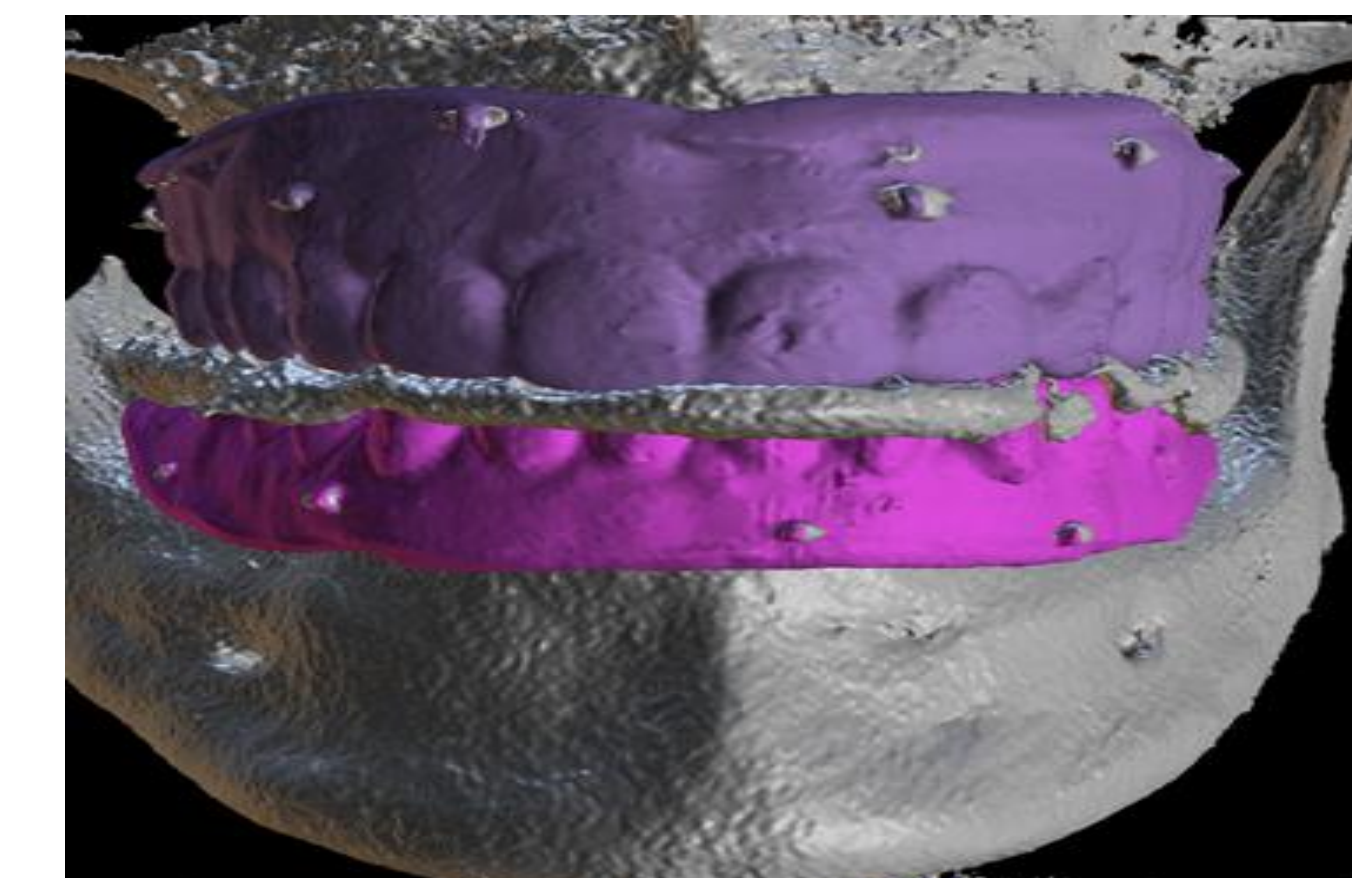
Dual Scan Technique



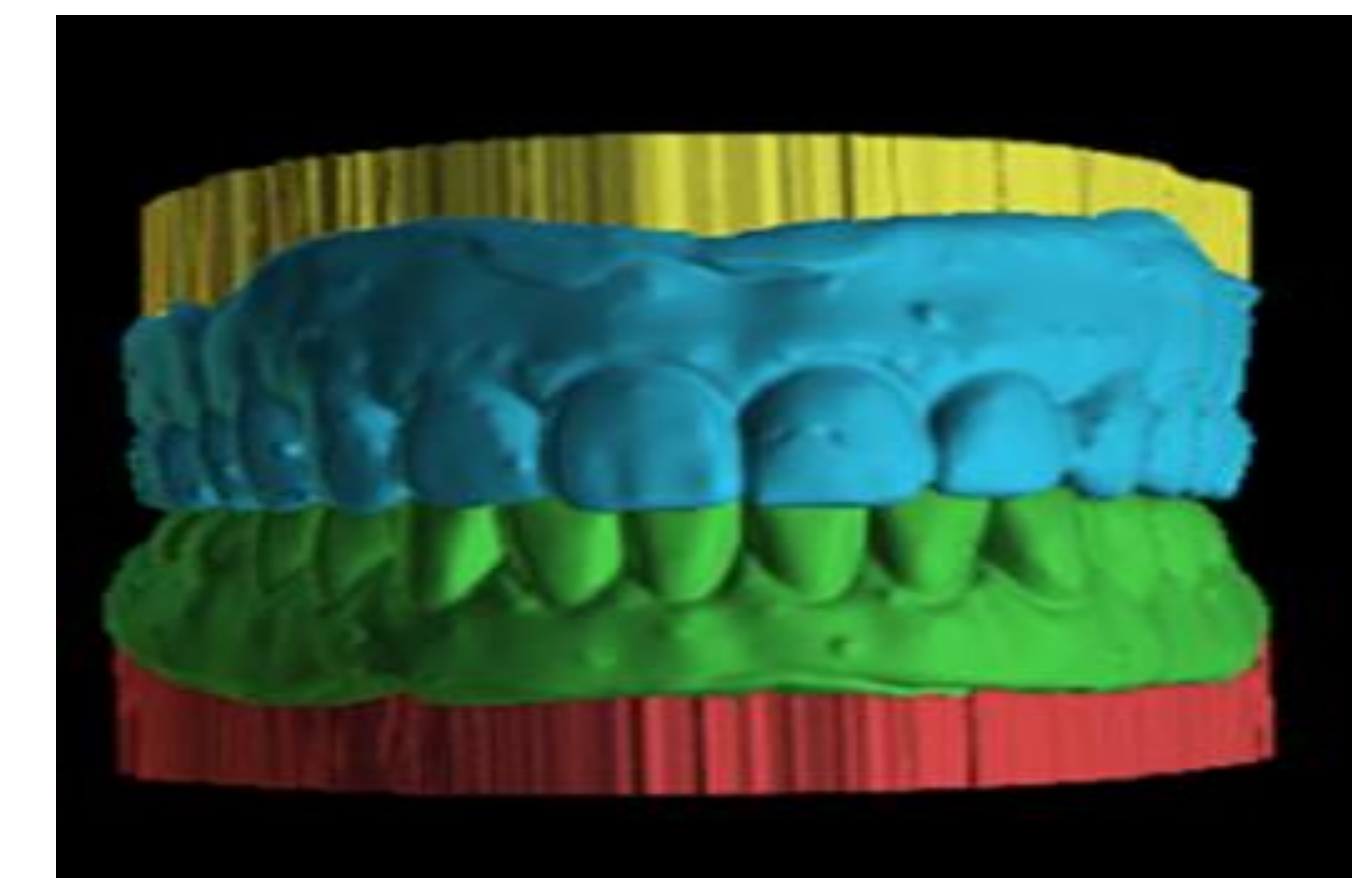
Bite registration taken with Dentures



CBCT with dentures and bite



Prosthetically driven treatment planning using implant planning software



Traditional Mucosa Supported Surgical Guide Fabrication



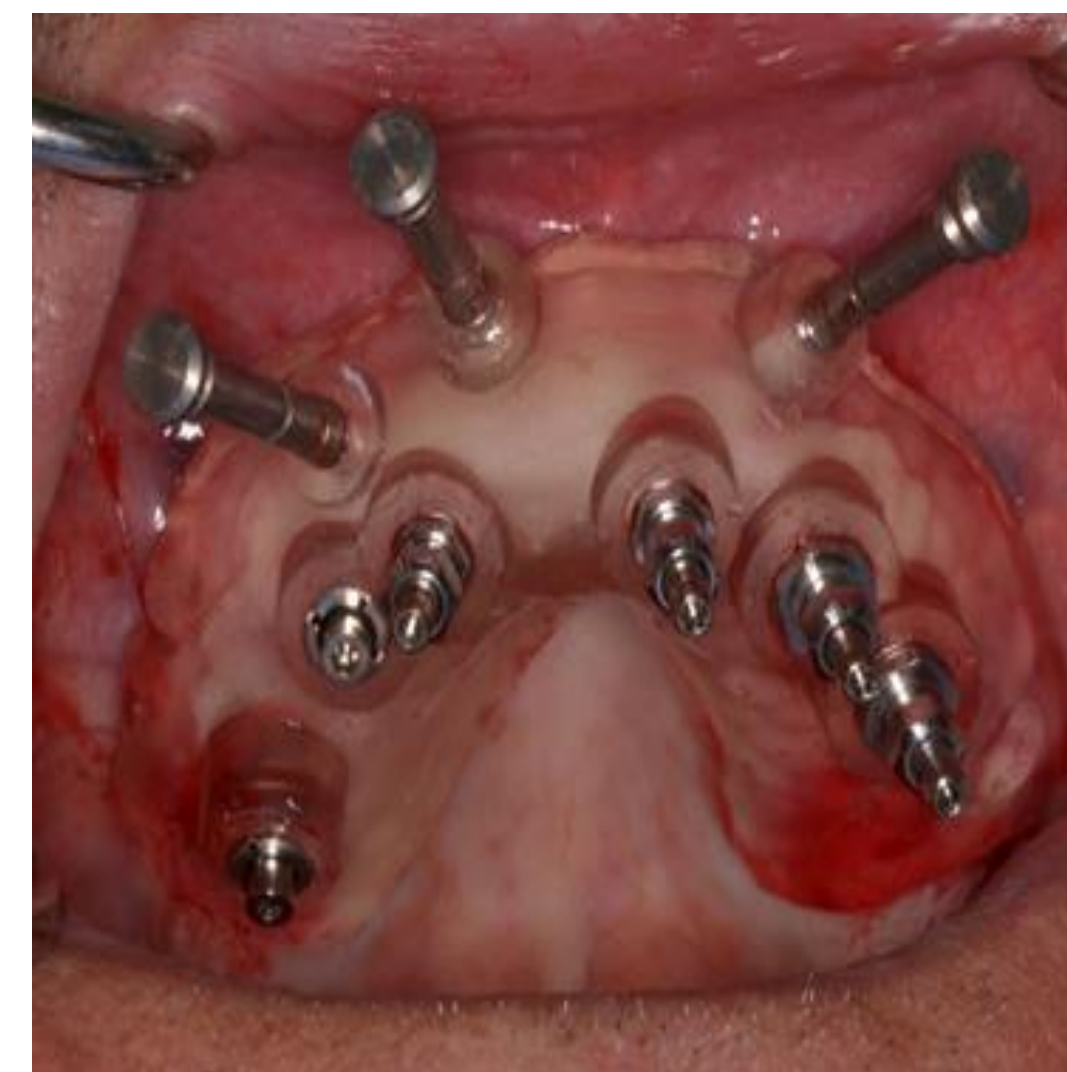
Articulated Dentures with 1st bite registration (CBCT)



Articulated Guide with 2nd bite registration

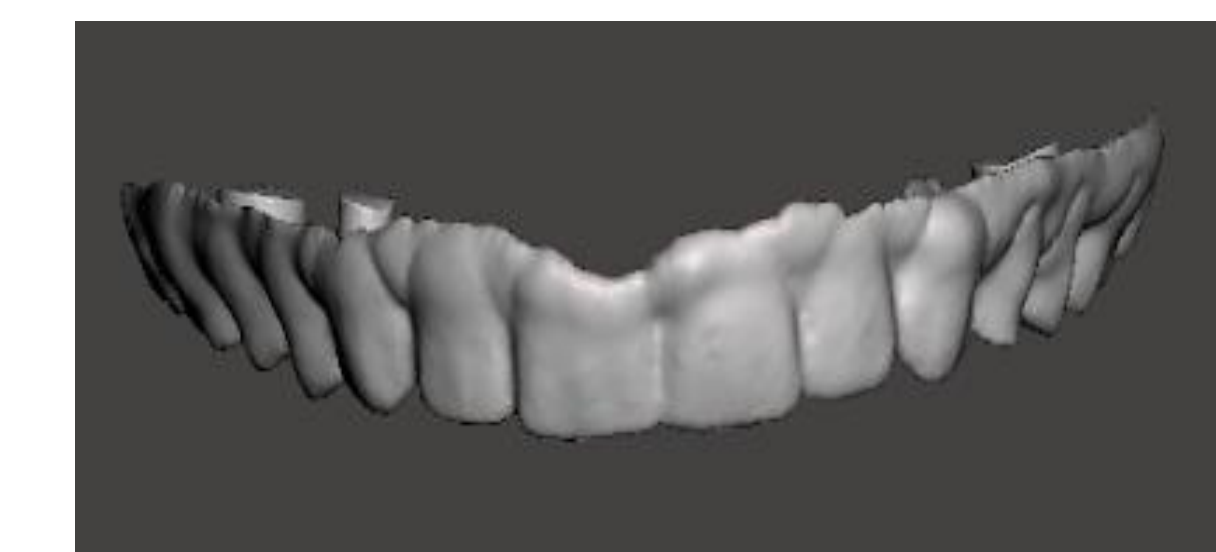
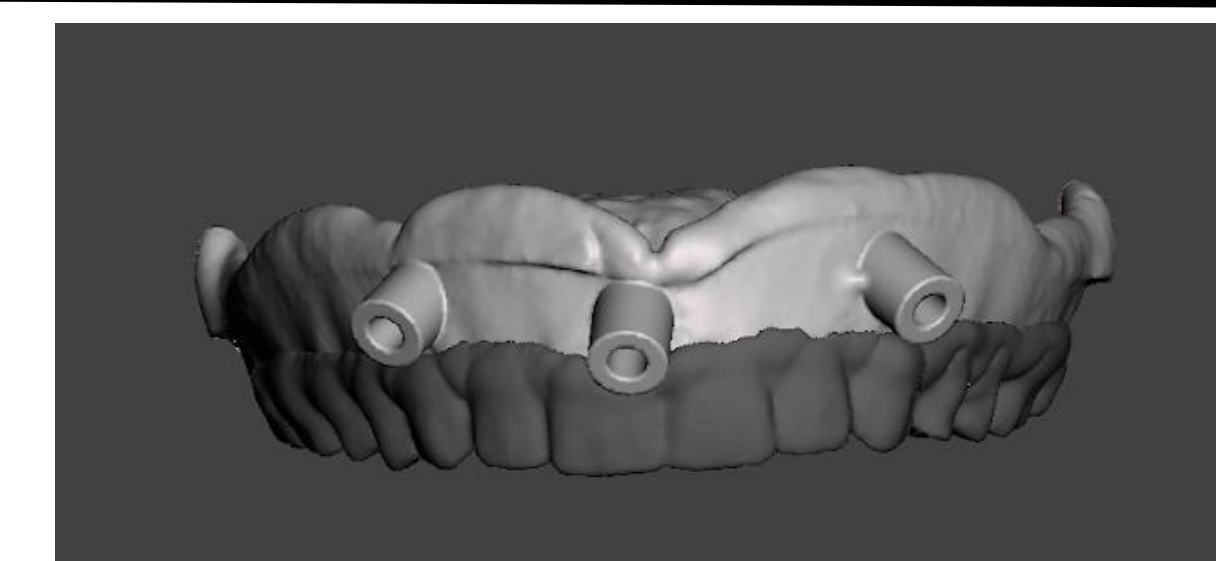


Intraoral MSSG Mounting using 2nd bite

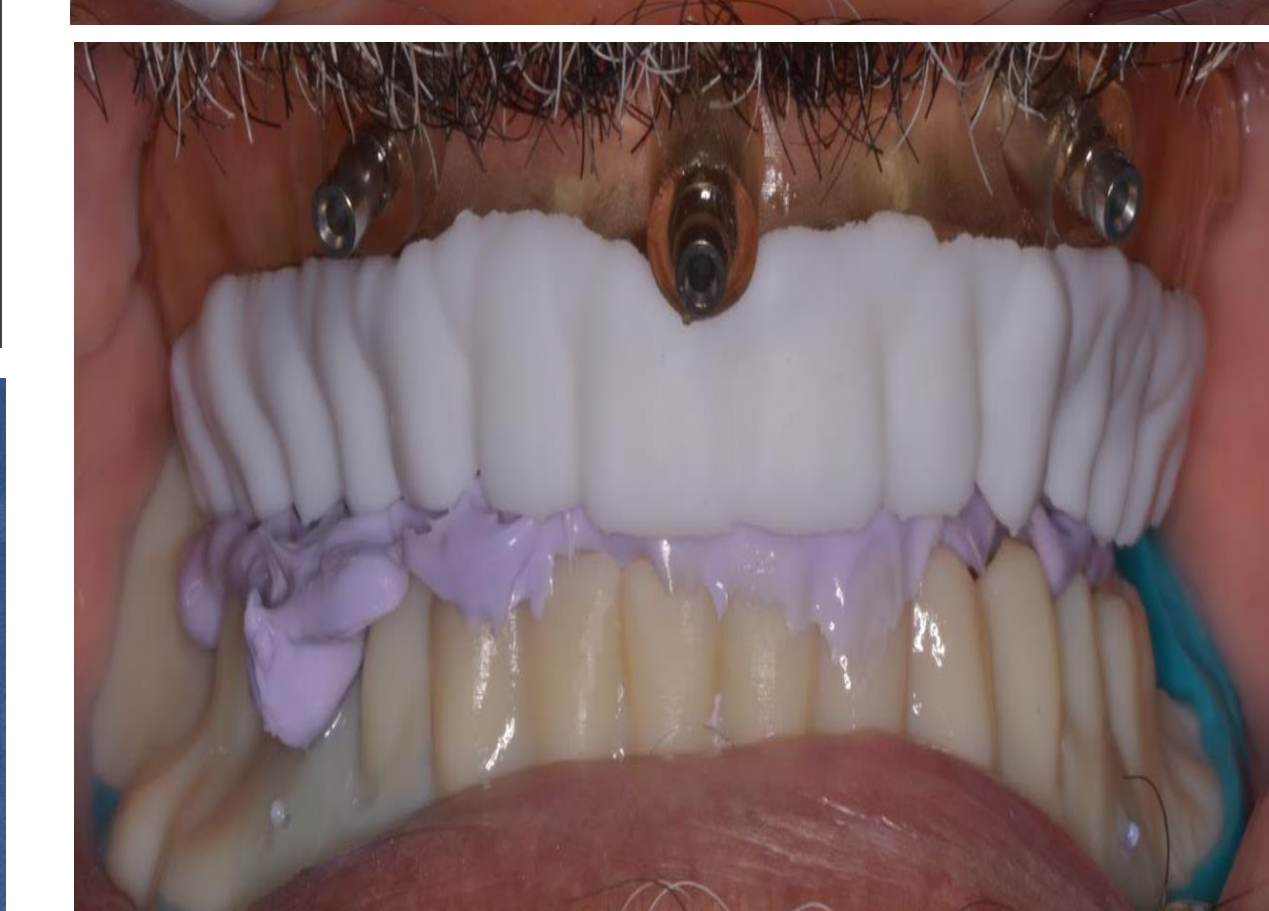


Implant placement through MSSG

Novel Mucosa Supported Surgical Guide Fabrication



Surgical-guide denture segmented and split from denture mesh yielding separated teeth for mounting (using original bite taken during CBCT) and surgical guide ring locations for implant placement



Resources:

1. D'haese J, Van De Velde T, Elaut L, DeBruyn H. A prospective study on the accuracy of mucosal supported Stereolithographic surgical guides in fully edentulous maxillae. Clin Implant Dent Relat Res. 2012 Apr;14(2):293-303. doi: 10.1111/j.1708-8208.2009.0025
2. Jones A. Accuracy of mucosa supported guided dental implant surgery. Clin Case Rep. 2018;6:2131-2139. <https://doi.org/10.1002/>
3. Raico Gallardo YN, da Silva-Olivio IRT, Mukai E, Morimoto S, Sesma N, Cordaro L. Accuracy comparison of guided surgery for dental implants according to the tissue of support: a systematic review and meta-analysis. Clin Oral Implants Res. 2017 May;28(5):602-612. doi: 10.1111/clr.12841. Epub 2016 Apr 8. PMID: 27062555.