

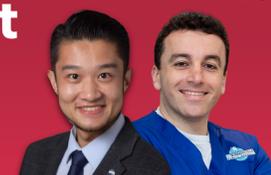


Socket Shield Technique (SST) in Full Arch Dental Implant Reconstruction - A Case Report

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CASE SYNOPSIS

This case report demonstrates the use of Socket Shield Technique (SST) in combination with a full digital approach to achieve esthetic outcomes in full arch implant reconstruction. This case combines digital imaging, extraoral scanning, guided surgery and CAD/CAM to deliver a same-day provisional restoration of full arch immediately loaded implants.

BACKGROUND

SST conserves a portion of the patient's root structure to maintain blood supply derived from the periodontal ligament complex to preserve the periodontal and peri-implant tissues during immediate dental implant therapy. In a traditional hybrid technique, total extraction and full arch dental implant therapy often require significant bone reduction and palatal/lingual placement of implants. In addition, post-extraction preservation of alveolar ridge architecture is a major challenge.

PATIENT PRESENTATION

A 74 Y M patient (ASA II) with history of sleep apnea and bruxism presented to the clinic for improvement of his masticatory function and esthetics. Comprehensive examination and diagnostic records revealed generalized severe attrition with collapse of vertical dimension of occlusion exacerbated by bruxism and parafunction. After discussion of available options, a facially generated mock-up was presented, and a full mouth reconstruction with implant-supported fixed partial denture (FPD) was selected by the patient.



FIGURE 1. PRE-OP DIAGNOSTICS AND PLANNING

A) Extraoral view of initial patient presentation B) Intraoral view of initial patient presentation with fractured crowns and severe wear attributable to bruxism and parafunctional habits C) Pre-operative CBCT scan D-F) Facially-generated 3D printed mock-ups of maxillary and mandibular arches in maximal intercuspation.

METHODS

SST was performed from teeth #6-11. Dental implants (Neodent, Curitiba, Brazil) were placed in a fully guided fashion based on the surgical plan designed in Co-Diagnostix (Dental Wings GmbH, Chemnitz, Germany). The implants achieved a minimum insertion torque of 35 Ncm, allowing for placement of the multi-unit abutments (MUA).

Photogrammetry scan was performed with Imetric 4D to record the position of the implants by attaching ICamBodies to the MUAs. Provisional FPD was 3D printed using Detax Freeprint temporary resin (DETAX GmbH & Co. KG, Ettlingen, Germany) on an Asiga Max 3D printer (Asiga, Ann Arbor, Michigan), polished and inserted with adequate occlusion. After 3 months, implant osteointegration was confirmed, followed by final restoration with monolithic zirconium FPD.

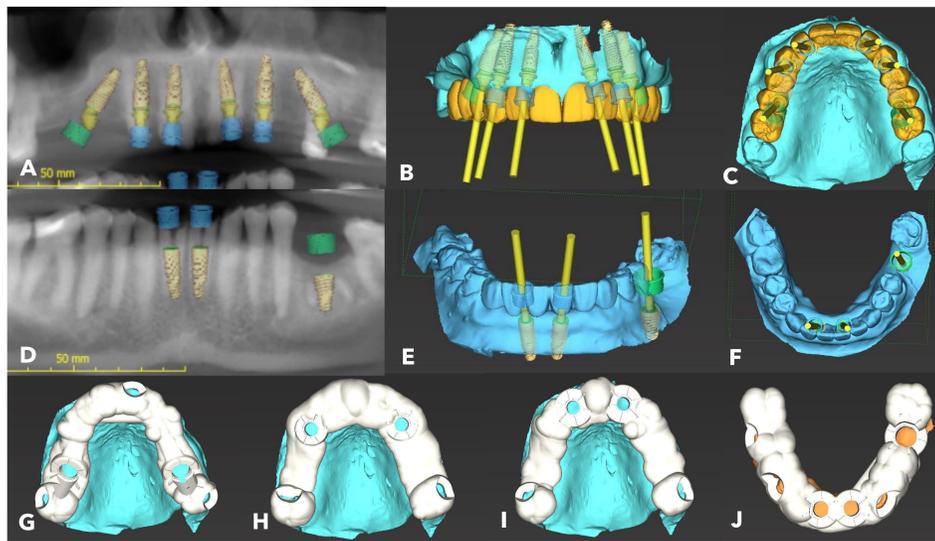


FIGURE 2. SURGICAL PLANNING AND SURGICAL GUIDE DESIGN

A) Virtual surgical planning of maxillary implant positions. B) Buccal and occlusal views of maxillary implant positions. D) Virtual surgical planning of mandibular implant positions. E-F) Buccal and occlusal views of mandibular implant positions. G-H) Guide design for maxillary implants; three guides designed to be used sequentially from posterior to anterior. J) Guide design for mandibular implants; single guide to be used.

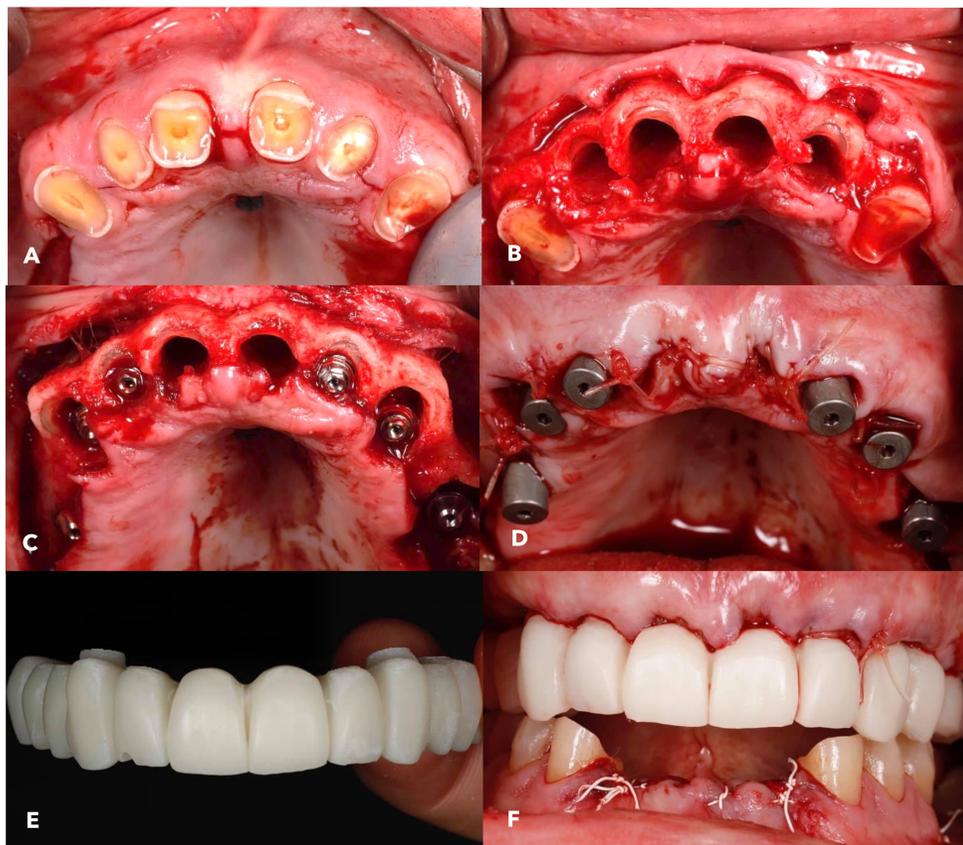


FIGURE 3. SURGICAL WORKFLOW AND IMMEDIATE PROVISIONALIZATION

A) Incision design and coronectomy of maxillary anterior teeth #6-11. B) Full thickness flap elevation and SST was performed on teeth #6-11. C) Immediate implants placement in extraction sites #6-7-10-11-13 and implant placement at site #4 healed ridge. D) Healing abutments placed after photogrammetry scan. E) Frontal view of the temporary prosthesis prior to insertion intraorally. F) Immediate provisional prosthesis inserted.

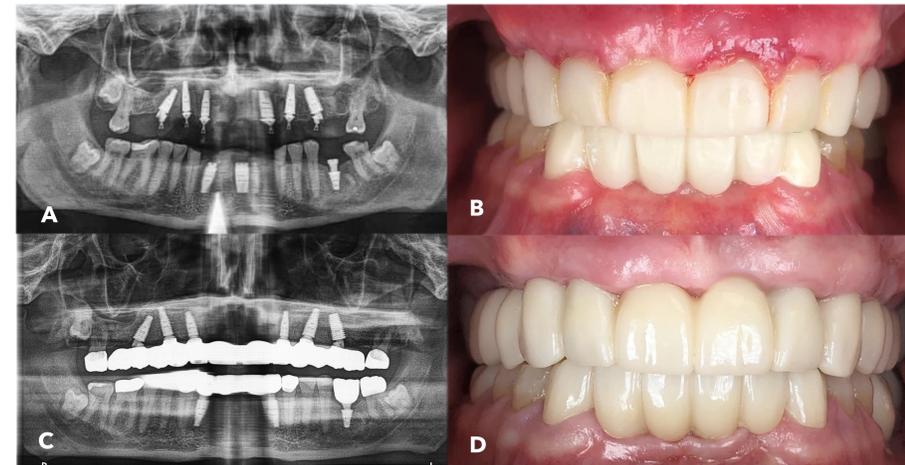


FIGURE 4. POST-OPERATIVE RESULTS AND FOLLOW UP

A) Immediate post-operative panoramic radiograph of maxillary implants. B) Delivery of provisional restorations C) 1-Year post-operative evaluation following implant osseointegration. D) Final prostheses at 1 year follow up.

RESULTS

At the 1-year follow up, clinical and radiographic examination confirmed that all implants are well osseointegrated with healthy peri-implant tissue. Patient is satisfied with the treatment outcome.

CONCLUSIONS

- SST is a viable technique in combination with guided dental implant surgery for full arch implant reconstruction and has potential to create esthetic outcomes while reducing treatment time.
- The use of photogrammetry system for registering the positions of multiple implants at the time of surgery allows for rehabilitation of the patient using a same day delivery of a 3D printed prosthesis.
- This digital workflow reduces chair time, shortens lab processing time, ensures the passivity of the temporary prosthesis, and improves patient comfort by reducing patient nausea associated with physical impressions.

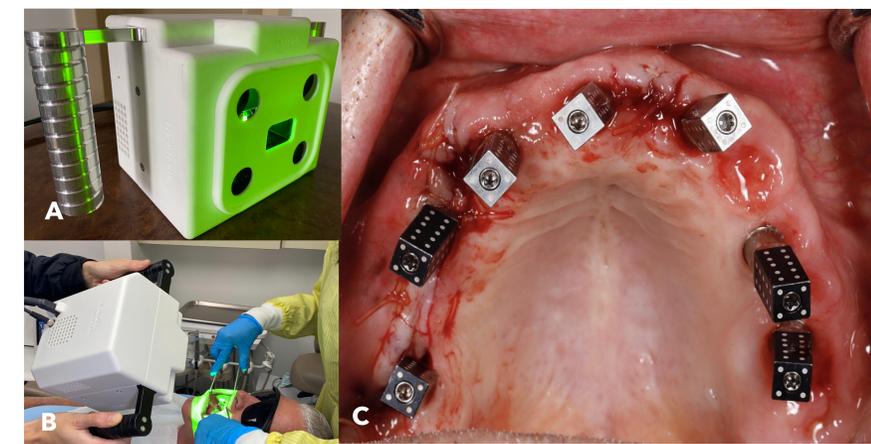


FIGURE 5. PHOTOGRAMMETRY SET UP

A-B) Example of photogrammetry scanner (Imetric 4D). C) Example of scan bodies (ICamBodies) used to record the position of the implant by attaching to multi-unit abutments without need for physical impressions.

CONTACT INFORMATION



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