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Integrated Implantology with Dentsply Sirona

In order to achieve a predictable aesthetic outcome when using an implant-supported crown for rehabilitation of an edentulous space, computer-aided design/computer-aided manufacturing (CAD/CAM) technology can be utilized in every step of the procedure, starting with treatment plan, integration of CBCT with digital scans proceeding with virtual implant surgery, guide design, implant placement and final restoration. CAD/CAM-milled customized abutments and crowns have shown superior results in maintaining the papillary fill and natural emergence profile. Not only do they provide the natural scalloping of the peri-implant soft tissue, but they also meet the white aesthetic criteria and, thanks to the direct chairside fabrication, offer a faster approach for restoration of implants.

The following report will present a case that at this time has not come to its end, but shows the ease and advantages of a digital integrated workflow for Reconstructive Dentistry and Implantology.

A new patient, 44 YO male presented at Tel Aviv Dental Center with a chief complaint of poor aesthetics, specifically in his front upper segment.

Intra oral exam revealed that upper right lateral incisor #12 had previously been treated endodontically and currently had a temporary acrylic crown. Upper right central incisor #11 had functionally and aesthetically failing composite restoration. Upper left central and lateral incisors presented with recurrent buccal swelling. Periapical radiograph demonstrated a well defined radiolucency apical to tooth #22 with involvement of #21 root.

CBCT confirmed a large periapical cystic lesion with involvement and resorption of buccal and palatal cortical plates and 1 mm of the apex of tooth #22, involving also the periapical area of tooth #21 (pic. 1).

Treatment plan for the upper anterior segment included 2 phases:

Phase 1, pre-surgical and surgical phase; root canal retreatment of tooth #21, extraction of tooth #22, removal of cyst with bone augmentation and provisional 3D printed cantilever bridge 21-22. Finally, guided implant #22 and immediate provisional crown.



Phase 2, restoration phase; final esthetic crowns teeth #12, 21, porcelain veneer #11 and final crown on implant #22.

Phase 1 was initiated, root canal retreatment #21 was performed under microscope (Endodontist Dr. Ronald Wigler), temporary 3D printed cantilever bridge was positioned (pic. 2), tooth #22 was extracted, cyst was removed and FDBA/ β -TCP bone graft was placed with APRF membrane (OMS Dr. Robert S. Miller), (pic. 3-4).

Following a 6 month healing period, intra-oral scan was obtained using Dentsply Sirona intra-oral scanner Primescan and digital wax-up was designed (pic 5-6).

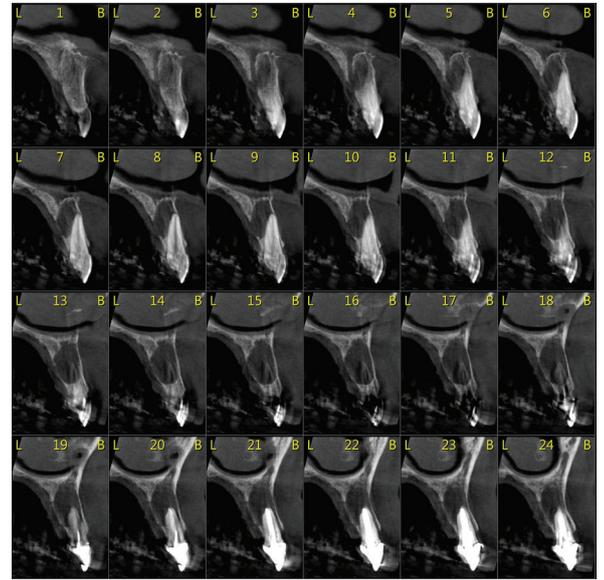
CBCT was performed (Orthophos SL 3D) and DICOM file was merged with .ssi intra-oral scan file. Virtual surgery was performed, MIS 3.3.*16 Lance+ implant was chosen and positioned in Galileos Implant SW. Drill key S was selected, D1 was positioned at 4.5 mm and D2 was positioned at 25.5 mm, coinciding with the MIS guided-surgery drill kit (pic. 7-8-9).

Surgical plan was generated and .dxd file was exported to CEREC 5.0.2 SW. CEREC Guide 2 was designed and milled using the CEREC MC XL milling unit (pic. 10-11-12). MIS titanium sleeve for CEREC Guide 2 was positioned in the guide.

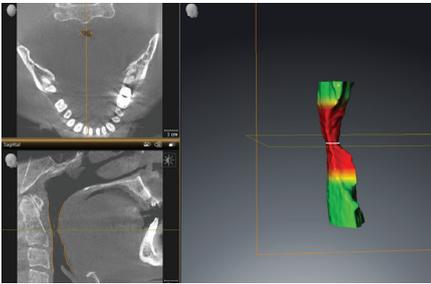
Implant procedure was performed by Dr. Ben Miller, a flapless surgery was initiated using the milled CEREC Guide 2 and MIS guided-surgery drill kit (pic. 13-14-15-16).

Following implant placement, MIS NP Ti-base and Dentsply Sirona scan body were used to scan implant position (pic. 17-18). Provisional screw-retained crown was designed in bio copy mode imitating the design of the 3D printed cantilever bridge, removing occlusal and proximal contacts (pic. 19-20-21-22-23). Vita Enamic IS crown was cemented to MIS NP Ti-base (Ivoclar Vivadent Multi link Hybrid Abutment) and positioned (pic. 24), finalizing **Phase 1** of the treatment.

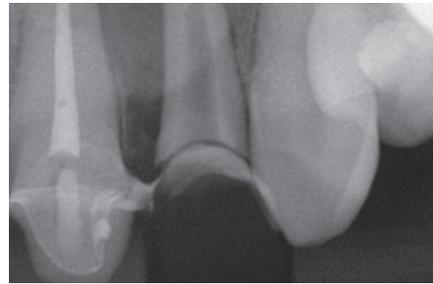
Phase 2, final anterior restorations and aesthetics, is planned for May 2020. CAD/CAM-produced implant crowns in a complete digital workflow represent an outstanding treatment option for rehabilitation of a missing-tooth space in either the aesthetic zone or a posterior region.



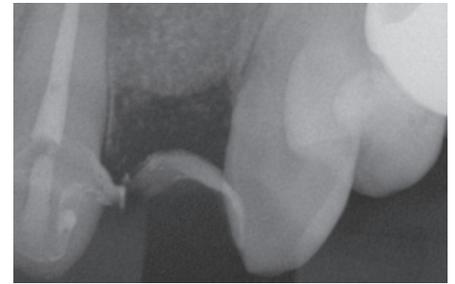
1. CBCT showing resorption of buccal and palatal cortical plates



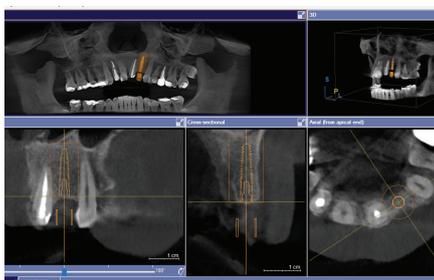
2. Temporary 3D printed cantilever bridge



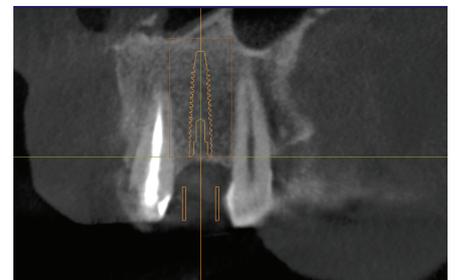
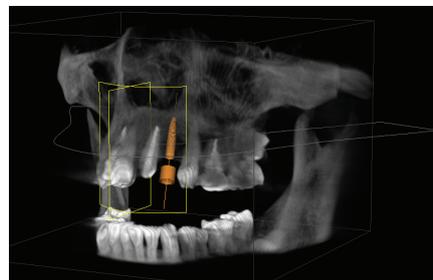
3-4. Extraction & bone graft site #22

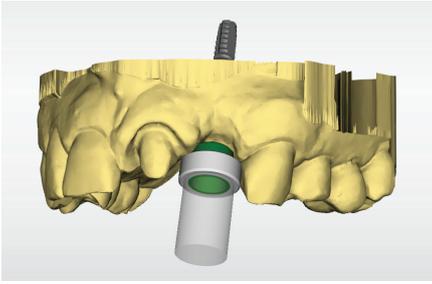


5-6. Digital wax-up

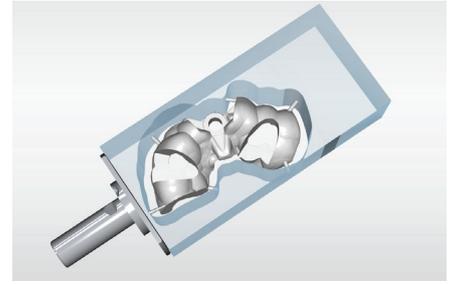
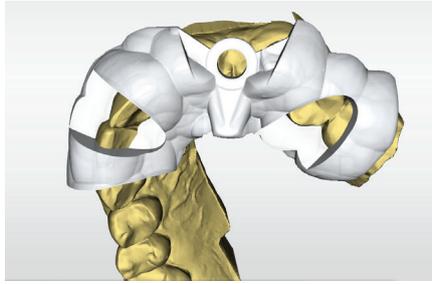


7-8-9. Virtual surgery





10-11-12. CEREC Guide 2 design



13-14-15-16. Fully guided implant surgery



17-18. Implant and Ti-base positioned for scan

