

3D-printed model with ditched dies for anterior tooth renewal

Case Description

A 47-year-old female presented to my office with concerns about six anterior zirconia crowns recently done at another office. She felt they were poorly shaped and crooked to her face and described what we as dentist refer to as a reverse smile line and lack of flow. She also complained of tooth sensitivity and occlusion that was not even and bothered her on a daily basis.

After initial consultation, photographs and intraoral scans with Primescan AC were taken to perform a comprehensive consultation. Having the digital impressions and photographs help visually discuss her concerns and create value for pursuing treatment. After the plan was finalized, all scans and pictures were sent to our laboratory to create a virtual wax-up. After finalization, I 3D printed the wax-up with Primeprint and Primeprint Model resin. This physical model of the plan allowed me to present a preview of treatment to patient, create preparation guides, make proper temporaries, and use as a Biocopy for final restorations. To finalize the proposed plan, we transferred the wax-up to the mouth with bis-acryl material at the second appointment. She approved and was excited for treatment. On appointment three, I prepared full coverage

crowns on tooth #6-11 and veneers on tooth #5 and #12. We scanned the final preparations, opposing dentition, 3D printed diagnostic wax-up in the Biocopy Folder, and Buccal Bite with Primescan AC. After margination of the preparations in the CEREC 5.2.3 software, we sent case to inLab SW 22. This software allowed us to create a solid model (with ditched dies) and a working model with removable dies. This completed model data was sent to inLab CAM 22 and 3D printed with the Primeprint out of Primeprint Model resin. The efficiency and ease of use of the Primeprint Solution allows me to quickly print models on the same day of treatment. The automation allows me to continue with my design work without having to worry about monitoring the printing process, manually cleaning resin, or dealing with messy alcohol. It took approximately 50 minutes to print both the solid and working model and under 45 minutes to wash and cure. After final design, all restorations were produced out of glass ceramic with CEREC Primemill using the extra-fine mode. The restorations were then bonded into place using Calibra resin cement. The patient was delighted with the final result.

Discussion

Technology – like 3D printing – is rapidly changing the way dentists work. The beauty of 3D printing is that any last-minute changes to models, removable dies, wax-ups etc. can be made quickly and easily, just by 3D printing another one in a very short period of time. This agile way of working helps to streamline workflows, especially when executing cosmetic treatments. It ensures that restorations will need minimal to no functional or cosmetic adjustments when seated. Technology and equipment like Primescan AC, Primeprint Solution, inLab software were pivotal in helping me give the patient a healthy smile.



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Before: Initial oral situation with significant asymmetry of the lips when smiling



Usage: 3D-printed model with ditched dies



After: Final restoration

Case Description in Pictures



Fig 1: Initial oral situation

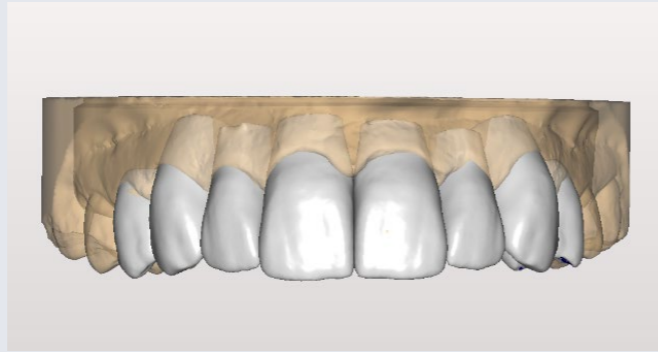


Fig 2: Digital Diagnostic Waxup in CEREC SW 5.2



Fig 3: Preparation margined

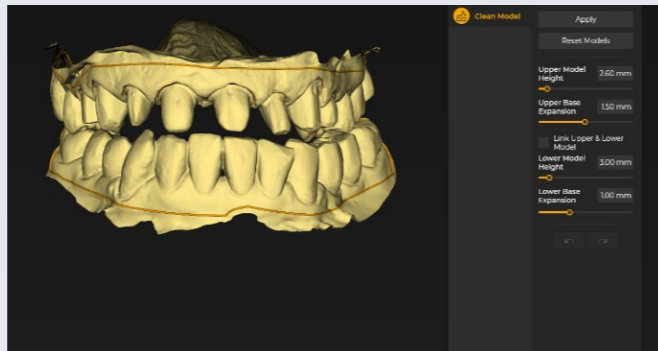


Fig 4: Models imported into inLab Model 22 to Clean

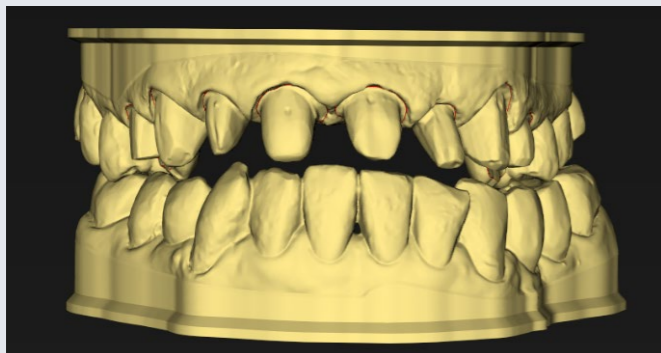


Fig 5: Models with bases



Fig 6: Solid working model ditched buccal

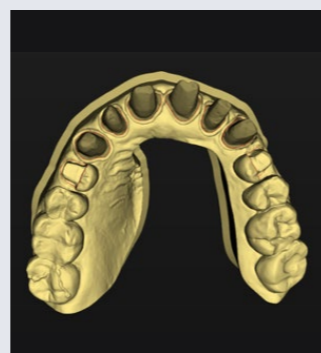


Fig 7: Solid working models ditched occlusal



Fig 8: Working models with dies buccal

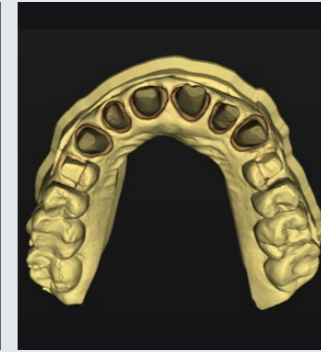


Fig 9: Working models with dies occlusal

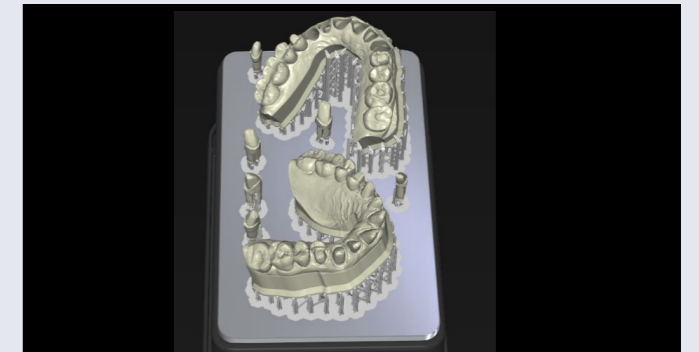


Fig 10: Models and dies on build plate inLab CAM 22



Fig 11: 3D-printed model with dies with Primeprint Model material



Fig 12: Preparation with Biocopy overlaid material



Fig 13: Final Design



Fig 14: Final restoration: immediate seat