

The Benefits of Digitally-Managed Equilibration

The second variable that can only be predictably diagnosed and managed with the T-Scan is **Bilateral Simultaneity**. It accounts for all teeth and restorations meeting at the same time, and hence, accounts for occlusion time and COF.

This was the patient's first dental implant with an occlusal scheme of crowns, bridges, and a few natural teeth. A pre-restoration full mouth equilibration was provided to achieve anterior guidance with bilateral simultaneity. The post-equilibration COF demonstrates the anterior guidance with elimination of the premature contacts on the second molars, with concurrent increase in the MIP load from 10% to 13%. This is now an atraumatic stable occlusal scheme that is better engineered to tolerate parafunctional loads. The implant at site #30 is now ready to be restored.

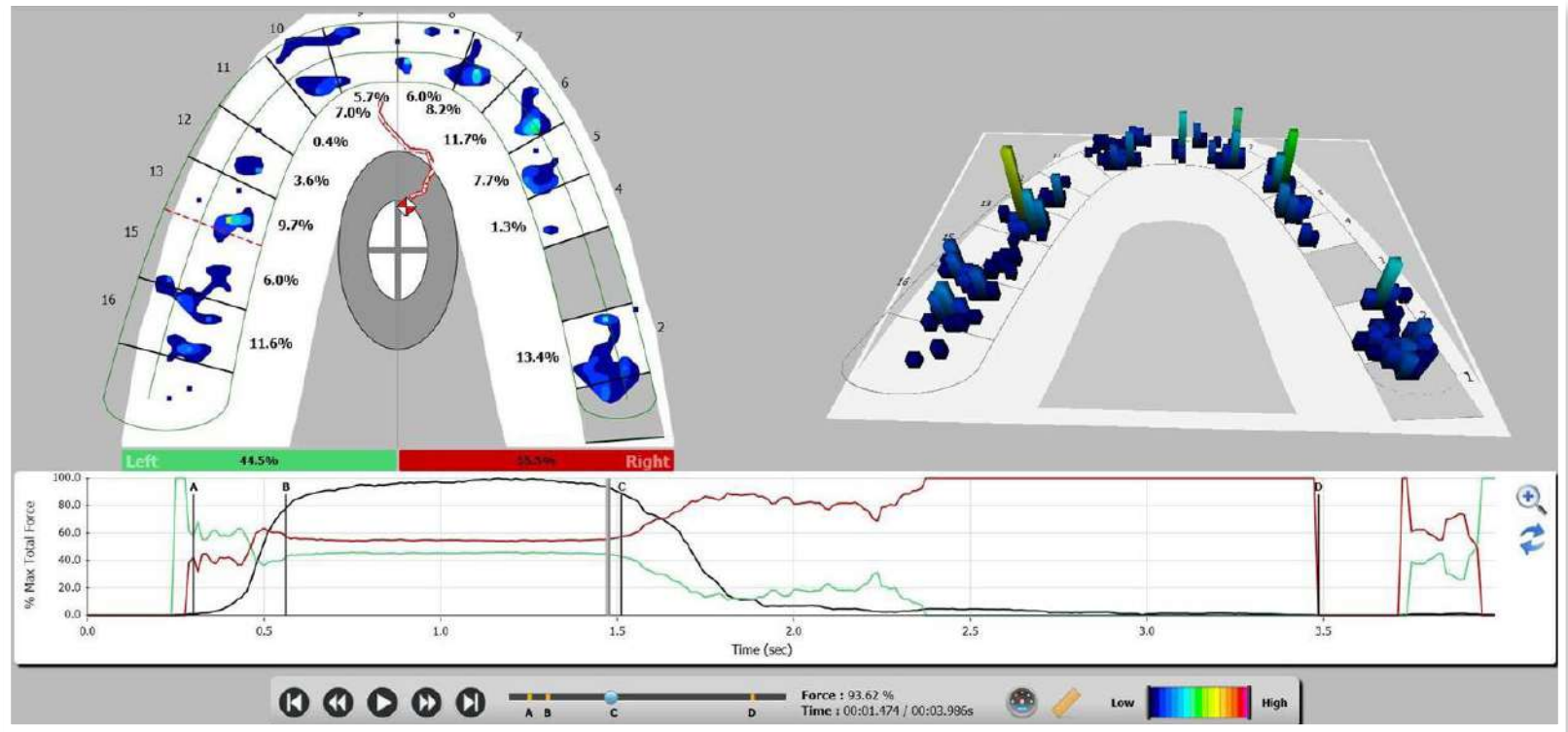


Figure 2: Pre-restoration equilibration completed.

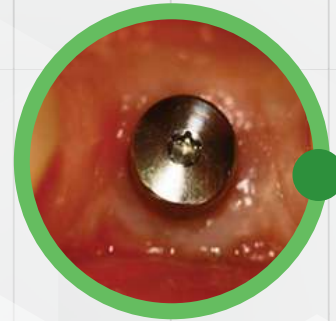


“[T-Scan Helped] Realize the Goal of Time Delay Loading.”

The adjacent teeth were restored with CEREC restorations—an onlay on tooth #29 and a crown on tooth #31. The integrated Straumann implant was uncovered, and a prefabricated abutment was placed and torqued to 35 Ncm.

The final restoration at site #30 was a full coverage, all ceramic crown. The material we used to restore sites #29, #30 and #31 was VITA Mark II, which is bit “softer” on the stress strain curve, in comparison to enamel. The energy transmission of the cement retained restorations is going to be much more favorable against the opposing dentition. If there is occlusal trauma, the material will fracture and no subsequent energy will travel to the abutment screw or implant body. This inherently mitigates against crestal bone loss. The potential crown failure will be easily visible and readily repaired.

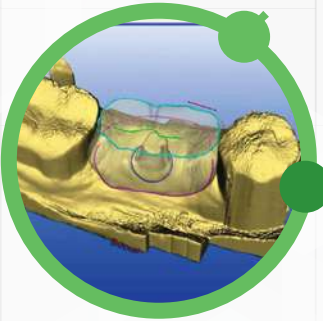
After cementation and x-ray verification of cement removal, Time Delayed Loading of the implant was implemented. The goal was to sequentially load the natural and restored teeth, then restore the implant, then finally achieve MIP without excursive interferences. This achieves proper COF, Bilateral simultaneity, occlusion, and disclusion times. The pre-restoration equilibration had established anterior guidance and MIP without excursive interferences. Utilizing the T-Scan for guidance and verification, minimal reductions in the intensity of the centric stops on the abutment-supported crown was initiated. This realized the goal of Time Delay Loading.



Pre-restoration Straumann implant



Abutment torqued to 35 Ncm



CEREC digital rendering of restoration



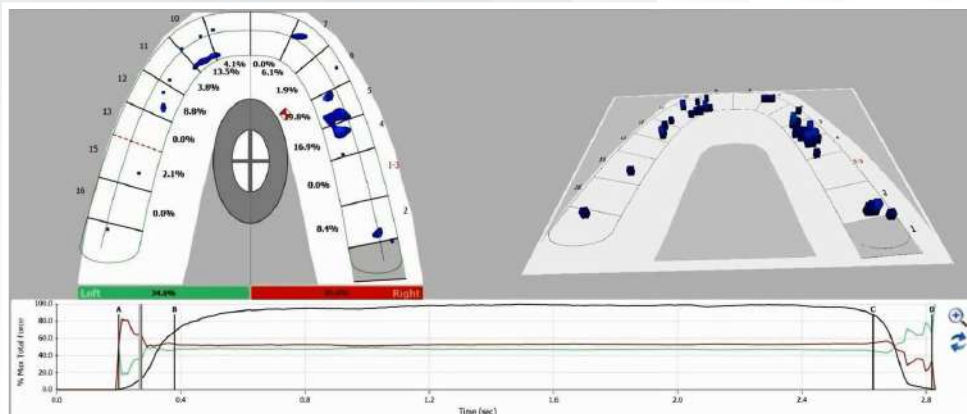
Final restoration using VITA MARK II



Using X-ray for cement removal

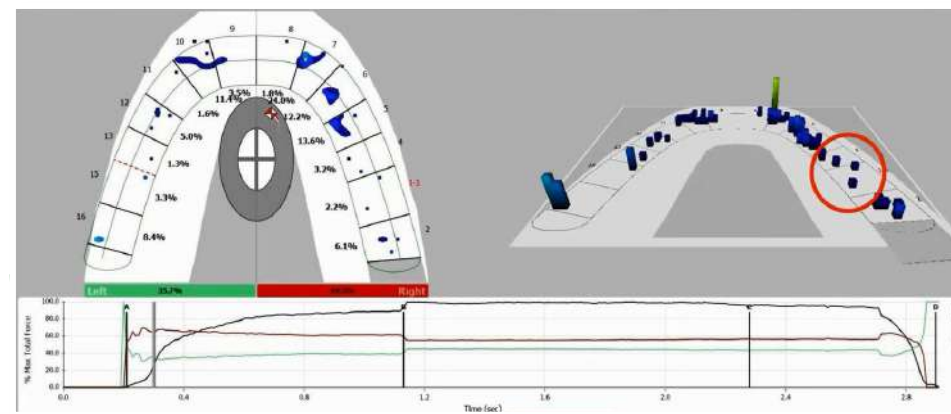
Results from T-Scan

12% Maximum Force



The T-Scan above is captured at 12% maximum force into the maximum intercuspation (MIP) occluding cycle that will eventually achieve a maximum force of 100%. The anterior teeth start to engage and so does our second molar, but there's no contact on that implant restoration.

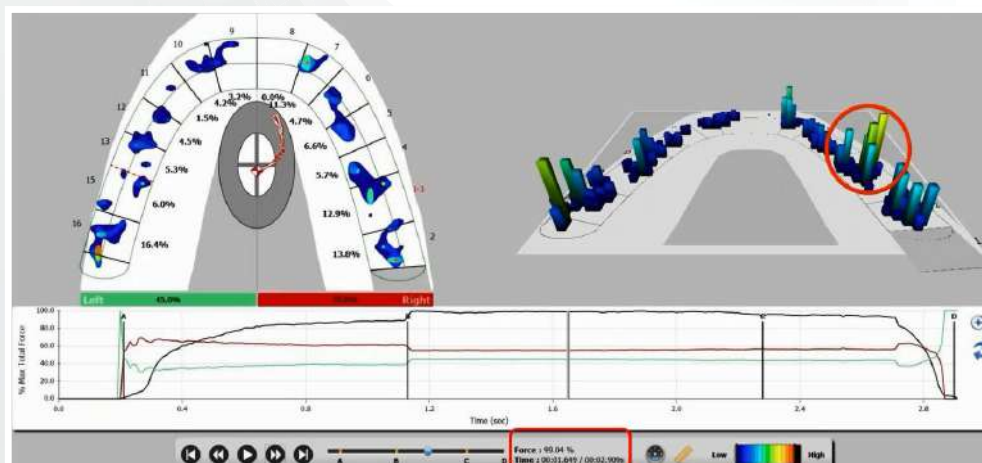
27% Maximum Force



At 27% Maximum force in the MIP occluding cycle, the initial contact on the implant restoration is evident.

At this stage, all the teeth with periodontal ligaments are already engaged; the fluid has left the periodontal ligament, and the principal fibers in the periodontal ligament are converting compressive forces into tensile energy—or, in other terms, the natural teeth have “bottomed out.” Now, we start engaging the implant.

99% Maximum Force



At 99% of the force, the anterior guidance is verified with a safe COF and acceptable bilateral simultaneity. We have used the periodontal ligaments to our advantage, and in so doing, managed not to overload that whole structure. This occlusal scheme is exactly what we look for, to ensure the longevity of the implant and overall oral health of this patient.