

A New Fixed Attachment System Using No Screws, No Cement for Immediate Load Full-arch Restorations

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Abstract

Background: An immediately loaded screw-retained implant prosthesis for the fully edentulous arch is often provided by retrofitting the patient's existing denture and converting to a provisional prosthesis. Converting a denture to a fixed solution by bonding temporary cylinders into the denture base, requires grinding holes in the denture and is often a time-consuming process with risk of fracture during the transitional healing period.

Aim: Evaluate 2-4 year follow-up of a novel screw-and-cementless fixed attachment system which utilizes PEEK Retentive Balls to fixate and retain the full-arch temporary as well as definitive prostheses. Moreover, to analyse the treatment time for fabrication of the provisional and definitive prostheses compared to a screw-retained protocol.

Material and Methods

Study evaluated thirteen edentulous patients treating 6 full-arch mandibles with 4 implants and 7 maxillae, 3 with 4 implants, 4 with 6 implants totalling 60 implants placed. Conversion of the patients' dentures to a fixed full-arch bridge was done immediately after surgery. A novel spherical Abutment (LOCATOR F-Tx) was torqued into place providing a snap-fit connection of the Denture Attachment Housing (DAH) to the Abutment allowing the DAH to pivot up to 20°, eliminating the need for angled abutments. During chairside pickup, the DAH with an internally threaded Black Processing Ball, was picked up into the denture. The fixed denture was removed, trimmed and polished. Retentive Balls were threaded into the DAH. The fixed provisional prosthesis was snapped into place. A time comparison between the novel system and screw-retained protocol was performed in 3 cases.

Final Prosthesis - After healing, an abutment-level impression was taken, a definitive titanium/acrylic or zirconia prosthesis was fabricated with the DAH fixated to the prosthesis. High-Retention Balls, or in a combination with Medium Balls, were selected for retention of the final fixed prosthesis.

Results - No implants were lost during the follow-up period (mean 37 months, range 26-47 months). Mean bone loss at 2 years follow-up was 0.32 mm. No temporary prostheses fractured during healing time. One temporary prosthesis dislodged during the healing period. One definitive prosthesis dislodged after final seating. Medium Retention Balls were replaced with High Retention Balls and no further dislodgement occurred during follow-up. In three cases, the time required to construct a fixed temporary prosthesis from an existing denture using the LOCATOR F-Tx protocol totalled 65 minutes compared to 90 minutes for screw-retained. Additional time saved during the remainder of treatment totalled 45 minutes.

Results

Conclusion: Within the limit of this study the use of a no-screw/no-cement abutment is a viable option for full-arch rehabilitation. Treatment time for fabrication of temporary and definitive prosthesis was reduced. Prostheses with no coping screws and no access channels to fill contributed to the lack of complications, and no fractures of the provisional or final restorations were reported. In addition, patients reported that the Attachment System provided more pleasing aesthetic results.

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