

Removal Force of Conometric Caps & Abutments under Dynamic Loading

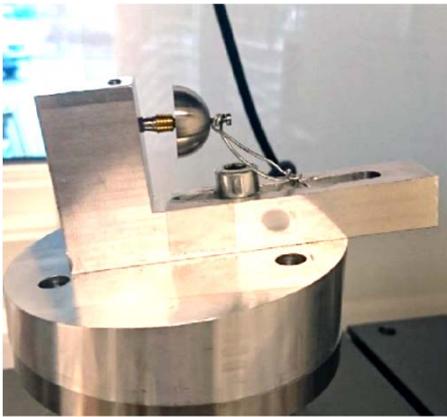
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Abstract

Instead of using a cement- or screw-retained coupling, a conometric connection can be used. Lateral forces, mainly occurring in the anterior region, can have an impact on the stability of a conical connection. This study was set up to investigate the stability of the conometric connection under dynamic lateral loading.

No caps were detached from the abutments during the tests.

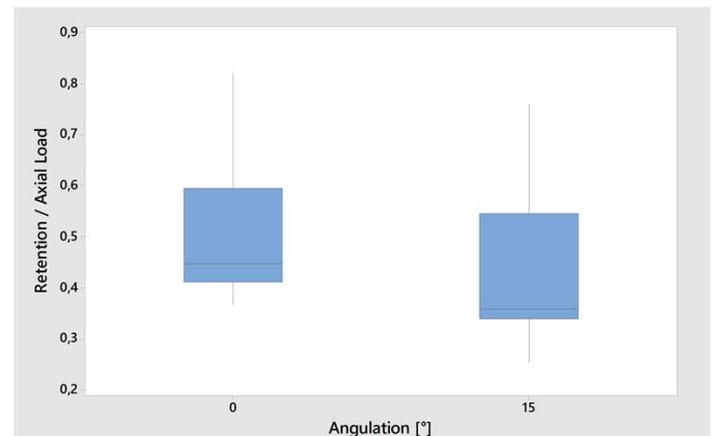
It was concluded that the conometric connection is able to tolerate the lateral forces that may occur in the anterior regions.



Test setup: dynamic lateral loading

Results

After dynamic lateral loading all caps showed sufficient retention to the abutment. No cap was separated from the abutment during the tests.



Ratio of retention to axial load over abutment angulation

Tukey test shows that there is a significant difference between the retention of the conometric caps to straight and angled abutments ($P = 0.05$). This difference is related to the different connection geometries at the conometric connection for straight and angled abutments.

Background and Aim

The retention of a single tooth friction-retained connection is dependent on the cone angle, coefficient of friction, push in force and the external load situation. Lateral forces, mainly occurring in the anterior region, can have an impact on the stability of a conical connection. The aim of the study was to evaluate the retention of a conical connection between cap and abutment loaded with dynamic lateral forces after an initial axial load.

Conclusion

The conometric mode of retention is able to withstand lateral forces that are deemed to occur mainly in the anterior region (incisors). This implies that the conometric connection is feasible for use in single-tooth restorations in the anterior jaw segment.

Methods and Materials

Conometric caps (Ankylos Ø 3.3 mm, Dentsply Sirona Implants) were assembled on conometric abutments (Acuris, Dentsply Sirona Implants, straight and angled) that were screwed into embedded implants. The samples were loaded axially (0°). Then the samples were subjected to dynamic loading of 100 N ($R = 0.1$) at 5 Hz in an 82.5° setup for 10.000 cycles. Subsequently, the caps were pulled off to measure the retention of the conometric cap to the conometric abutment.

References