

Removal Force of Conometric Caps and Abutments

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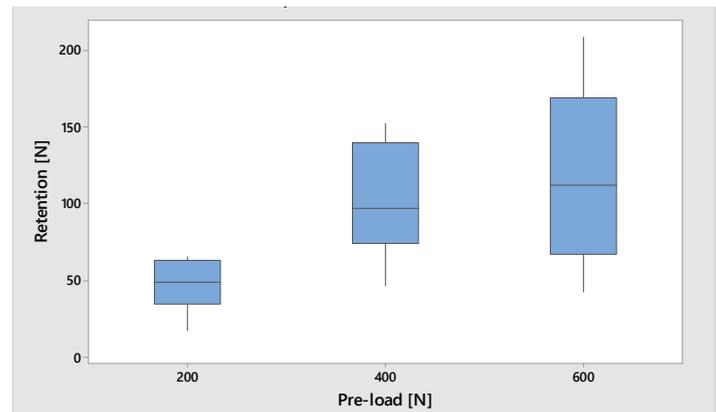
Abstract

The retention of a conometric connection was loaded with 200 N, 400 N and 600 N to simulate maximum biting forces. Subsequently, the conometric caps were pulled off to measure the retention to the conometric abutments. The removal force increased with increasing pre-load, but flattened out at higher loads (400 N – 600 N). This supports the assumption that even at higher chewing forces the retention of the conometric caps is maintained.



Test setup for retention test

Results



Boxplot of retention over axial pre-load

The release force of the conical connection increased with increasing axial force, but flattened out at higher loads. A statistical difference in removal force was seen after preload with 200 N compared to the removal force after preload with 400 N or 600 N. However, there was no statistically significant difference seen between the removal force after preload with 400 N and 600 N. There is sufficient evidence to assume that the data is normally distributed (probability plot $p \geq 0.05$).

Background and Aim

The retention of a single tooth restoration with conometric connection is dependent on the cone angle, coefficient of friction and push-in force. The biting force defines the push-in force. Studies have measured the maximum bite force, with a large variation in the results in the range of 500-1000 N [1-6] for molars and 100-500 N [3-5] for incisors. This study was set up to evaluate the retention of a conical connection between cap and abutment.

Conclusion

The test has shown that the retention of conometric caps (Ankylos, Ø 3.3 mm) to conometric abutments (Acuris) subjected to 400 N or 600 N is comparable whereas the retention of conometric caps pre-loaded with 200 N is significantly lower. This leads to the conclusion that the release force of the conical connection increased with increasing axial force, but flattened out at higher loads.

Methods and Materials

Conometric caps (Ankylos Ø 3.3 mm, Dentsply Sirona Implants) were assembled on conometric abutments (Acuris, Dentsply Sirona Implants) that were screwed in embedded implants. A spherical loading cap was plugged on and the samples were loaded axially (0°) with 200 N, 400 N and 600 N respectively. Subsequently, the caps were pulled off to measure the retention of the conometric cap to the conometric abutment.

References

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