Abrasive wear of monolithic Lava™ Plus zirconia crowns: Two Year Report

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Aim of the Study
The aim of this study was to evaluate the amount of abrasive wear on the antagonist occlusal surfaces of clinically placed monolithic Lava Plus premolar and molar crowns.

Study Design at a Glance
Design: longitudinal, prospective, two-center, clinical study
Materials: Lava Plus Monolithic Zirconia Crowns, RelyX Unicem Self-adhesive cement (3M)
Number of Lava Plus crowns included: 14 crowns (9 molars, 5 premolars)
Number of antagonist teeth available for wear analysis: 15 teeth (7 molars, 8 premolars) with 22 analyzed contact areas.

Evaluation Criteria: Polished monolithic zirconia crowns were placed at Aachen University and VPS impressions were taken. Maximum vertical loss and volume loss at the occlusal surfaces of Lava Plus crowns and antagonists were quantified by optical profilometry (CT100, Cybertechologies) based on replica. Relevant contact points on enamel or ceramic of the antagonists were visually identified and qualitatively analyzed on replicas using scanning electron microscopy.

Occlusal situation with respective contact points on antagonist. First lower molar with ceramic inlay.

SEM images of epoxy replicas of antagonist tooth, circles showing the worn areas on enamel and ceramic after 24 month.
Results
Mean maximum vertical loss of the investigated antagonist teeth after two years in situ:
166 µm (± 61 µm) (one year: 144 µm (± 55 µm)).

Conclusions from Report
• The measured wear rates are comparable with other studies and are in the normal physiological range.
• No significant difference was found between natural enamel antagonists and ceramic restorations.
• The monolithic zirconia restorations did not seem to be affected by wear in the first two years.

Related Clinical Evaluations


2-year report to 3M Oral Care (internal)