Title
Grinding Damage Assessment on Dental Ceramics

Abstract
The purpose of this presentation is to show surface and subsurface damage on 9 CAD-CAM ceramics after grinding with diamond disks of 75, 54 and 18 µm and to estimate strength losses based on damage crack sizes. The materials tested were: 3Y-TZP (Lava), dense Al2O3 (In-Ceram AL), alumina glass-infiltrated (In-Ceram ALUMINA), alumina–zirconia glass-infiltrated (In-Ceram ZIR-CONIA, Feldspar ceramic (Vita mark II), Lithium disilicate glass-ceramic (emaxCAD), Leucite glass-ceramic (Empress CAD), Hybrid-ceramic (Enamic) and a composite resin (LavaUltimate).

The induced chip damage was evaluated on the specimens’ bonded interface by means of SEM. Fracture mechanics were used to estimate fracture stresses based on average and maximum chip depths considering these as critical flaws subjected to tension and to calculate possible losses in strength compared to manufacturer’s data. Removal of the 75 and 54 µm diamond induced chip damage is necessary for most silicate ceramics using sequentially finer diamonds.

Learning Objectives
1. Grinding damage as a function of grit size and type of ceramic
2. Fracture mechanics relating toughness strength and crack size
3. Thin ceramic margins and chipping issues

Biography