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To Compare and Evaluate the Flexural Strength of Different Ceramic Materials: An In-Vitro Study

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ABSTRACT:

Strength is an important mechanical property that determines the performance of brittle materials. However, micro-cracks and defects that grow inherently during thermal or mechanical processes can significantly influence strength measurement. Strength is therefore considered a conditional property. Different methods are available to assess the tensile strength of the ceramic materials. These testing methods include 3-point bending, 4-point bending, the non-destructive test method, and the biaxial flexural test which includes the ring on ring, ball on ring, and piston on 3 ball tests. This study was conducted to compare and analyze the flexural strength of different ceramic materials. 40 samples were fabricated of four different ceramic materials of dimension 30mm × 12mm × 2mm and flexural strength were measured using 3-point flexural test on a universal testing machine with a crosshead speed of 2mm/minute.

The SEM images of fractured surfaces and the external smooth surface of specimens provides valuable information concerning the porous structure and grain size of the ceramic materials.

KEY WORDS: Dental ceramics, flexural strength, SEM

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