EVALUATION OF BIAXIAL FLEXURAL STRENGTH AND INDENTATION FRACTURE TOUGHNESS OF TRANSLUCENT VERSUS CONVENTIONAL YTTRIUM PARTIALLY STABILIZED ZIRCONIA

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Abstract

Statement of the Problem: The presence of an esthetic restorative materials offering high strength is considered an ambition for all dental clinicians.
Purpose: The aim of this study was to evaluate and compare the mechanical properties of two commercially available yttrium partially stabilized zirconia ceramics (translucent versus conventional) in terms of their biaxial flexural strength and indentation fracture toughness.
Materials and Methods: Two commercially yttrium partially stabilized zirconia blocks were used; Incoris TZI (Sirona-Dental-systems-GmbH, Biberach, Germany) representing the translucent zirconia and VITA In-Ceram YZ (VITA, Zahnfabrik, Germany) as the conventional zirconia. Disc-shaped specimens were prepared (15 mm in diameter and 1.2 mm in thickness), (n=10/gp). Five specimens from each group were used for measuring the biaxial flexural strength using a universal testing machine. The indentation fracture toughness of both zirconia types were measured by Vickers hardness testing machine, (n=5/gp). Results were statistically analyzed using Studentôs T-test.
Results: The biaxial flexural strength and the indentation fracture toughness values of both the Incoris TZI and VITA In-Ceram YZ were (738.2Ñ59.5, 737.9Ñ142.7 MPa) and (4.2Ñ0.2, 3.9Ñ0.2 MPaǏm1/2) respectively, with insignificant differences.

Conclusion: Within the limitations of this study, it was concluded that translucent Zirconia provides a promising material combining both strength and esthetics.

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