



Academy of Prosthodontics 2024 Annual Scientific Session Four Seasons Hotel, Denver, Colorado May 29 – June 1, 2024

Program Speaker – Thomas Giugliano

Title

In Vitro Comparison of Physical Characteristics of Milled Versus Printed Zirconia

Abstract

The purpose of this study was to compare the dimensional accuracy, translucency, and biaxial flexural strength of milled zirconia (MZ) versus 3D-printed zirconia (PZ) discs.

A circular disc was designed using computer-aided design (CAD) software. The resulting standard tessellation language (STL) file was used both as a control and to fabricate 36 zirconia (3Y-TZP) disc specimens: 18 were milled and 18 were 3D-printed. The diameter and thickness of each disc were measured using a digital caliper. Translucency was evaluated using a calibrated dental colorimeter. The flexural strength was determined using the piston-on-three-ball biaxial flexure test.

The MZ discs had significantly more accurate dimensions than the PZ discs in both diameter and thickness when compared to the control CAD software-designed disc. The MZ discs exhibited significantly higher translucency and biaxial flexural strength than the PZ discs. Finally, MZ were shown to be less prone to failure than printed specimens.

Learning Objectives

1. Advantages and disadvantages of subtractive (milling) and additive (3D-printing) technologies
2. To understand the advantages and disadvantages of pterygoid implants in the rehabilitation of edentulous and terminal dentition patients.
3. Clinical significance of research results

Biography

THOMAS GIUGLIANO, DDS, DICOI

Dr. Thomas Giugliano received his DDS from the SUNY at Stony Brook School of Dental Medicine in 1987, and went on to receive his Prosthodontics Specialty Certificate from New York University College of Dentistry in 1989. He began teaching part-time in 2007 in the Department of Periodontology and Implant Dentistry and became full-time faculty in the Department of Prosthodontics in 2013, and achieved Diplomate status in the International College of Oral Implantologists in 2019.

Dr. Giugliano holds active memberships in several dental organizations, including the American Dental Association, the American Prosthodontics Society, the International Association for Dental Research, and the American College of Prosthodontists. He continues to enjoy his private practice in prosthodontics and implant dentistry, which he has done for over 33 years.

He is currently an Assistant Clinical Professor and serves as the Assistant Program Director of the Jonathan and Maxine Ferencz Advanced Education Program in Prosthodontics at NYU College of Dentistry.



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Thomas Giugliano

November 27, 2023

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