Effect Of Two Milling CAD CAM Machines On The Marginal Accuracy Of Two All Ceramic Crown Materials

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By

Basma Refaat Mohamed Fayyad

B.D.S

Faculty of Dentistry, Ain Shams University, 2011

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Supervisors

Dr. Tarek Salah Eldin Morsi

Professor and Chairman of Fixed Prosthodontics

Department

Faculty of Oral and Dental Medicine

Ain Shams University

Dr. Maged Zohdy

Assistant Professor of Fixed Prosthodontics

Department

Faculty of Oral and Dental Medicine

Ain Shams University

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Dedications

All thanks to Allah for all his blessings,

To my ***mom*** *and* ***dad,*** *for carving me into what I am today, and pushing me to be the best I can be. I hope I make them proud*

To my ***sister*** *and my* ***brother*** *for always being there for me,*

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Introduction

Current trends in dentistry have seen higher demands for metal free restoration materials. All ceramic restorations have the advantages of improved esthetics, biocompatibility and resistance to compressive forces during mastication. Their durability is comparable to metal ceramic crowns.

Essential requirements for successful all-ceramic crown restorations are such things as good esthetics, high fracture resistance and perfect marginal fit. Dissolution of the luting agent and microleakage are associated with increased marginal crown discrepancies. Subsequent microleakage can lead to irritation and inflammation of a vital pulp leading to endodontic problems. Poor marginal adaptation can lead to secondary caries and affect the health of the periodontium by contributing to increased plaque retention and changes in the subgingival microflora.

Accuracy is crucial in dental practice, particularly regarding the fit of restorations, even if production involves using computer-aided design (CAD) and computer-aided manufacturing (CAM). To improve the outcome of CAD/CAM-manufactured restorations, all steps in production must be coherent and provide the necessary accuracy.

Current CAD/CAM systems comprise three components: scanning, design and manufacturing. In terms of scanning, several studies have shown that, focusing on single preparations or fixed partial denture preparations, digital impressions yield a high accuracy. The outputs of the scanning process are point-clouds and triangle meshes, which are used in the second step, the design. There are many options available for adapting the design of the restoration. The morphologies that can be generated by using the