

بسم الله الرحمن الرحيم



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شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Effect of Preparation Design and Ceramic Material on the Fracture Resistance of Onlay Restorations

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This work is dedicated:

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prayers, and sacrifices for educating and preparing me for my future.

To the Soul of My Grandfather, whose affection and

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List of Abbreviations

symbol	meaning
CAD/CAM	Computer-aided design/computer-aided manufacturing
ZLS	zirconia reinforced lithium silicate
PICN	polymer-infiltrated ceramic network
RNC	resin nanoceramic
UDMA	Urethane Dimethacrylate
TEGDMA	Triethylene glycol dimetacrylate
Bis-GAMA	bisphenol A-glycidyl methacrylate
HF	hydrofluoric acid
Y-TZP	yttria-tetragonal zirconia polycrystal
MOD	Mesio- occlusal distal
MB	Mesio- buccal
DB	Disto buccal
E A	Vita Enamic anatomical preparation
E B	Vita Enamic butt joint preparation (flat preparation)
S A	Vita Suprinity anatomical preparation
S B	Vita Suprinity butt joint preparation(flat preparation)
STL	Standard Tessellation Language



INTRODUCTION



Introduction

Restorative procedures such as decay removal or cavity preparation are accompanied by a reduction in tooth stability, decrease fracture resistance, and increase deflection of weakened cusps¹. Different treatment options are available, depending on the degree of destruction, either direct restoration with composite or partial indirect restoration. The main determinants in fracture are the restorative material and the geometry of cavity preparation. Cuspal coverage has been known to greatly affect the fracture resistance of teeth restored with onlay restorations. Numerous designs have been suggested for preparing all-ceramic onlays, as influenced by the mechanical and structural qualities of ceramic materials².

Anatomical preparation design was suggested to reduce the loss of healthy tooth tissue and decrease dentin exposure areas and to define the margin design which contributes to the quality of the adhesion, enhancing the cutting of the enamel prisms and increasing enamel surface area. In addition, the anatomic preparation design improves the insertion of the restoration during cementation and improve the esthetic outcome between the tooth and the restoration³. Flat preparation design can help to transform tensile into compressive stresses. The design also helps to avoid stress peaks and material collections where smooth transitions at flat edges can reduce stress build-up⁴. Due to the high physical properties of indirect restorations, in case of large destruction in