بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

“Two immediate sealing protocols versus delayed dentin sealing for indirect ceramic restorations”

A proposal submitted for partial fulfillment of requirements of the Master’s degree of science in fixed prosthodontics, crown and bridge department, Faculty of Dentistry, Ain Shams University

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Ibrahim Mustafa

Dedication

This work is dedicated to:

My Father and Mother for their support.

My Brothers and Sister each of whom has a special place in my heart

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List of Abbreviations

Abb.	Full term
A/D-R	Adhesive failure between dentin and resin
A/R-C	Adhesive failure between resin and ceramic
BL	Bucco-lingual
CAD	Computer aided design
CAM	Computer aided manufacturing
DBA	Dentin bonding agent
DDS	Delayed dentin sealing
DEJ	Dentino-enamel junction
FPD	Fixed-partial-dentures
HEMA	2-hydroxyethyl methacrylate
HF	Hydrofluoric
IDS	Immediate dentin sealing
ISO	International Organization for Standardization
LDCs	Lithium disilicate ceramics
Li2O	Lithium oxide
Li2SiO3	Lithium metasilicate
lTBS	Microtensile bond strength
MD	Mesio-distal
MDP	Methacryloyloxydecyl dihydrogen phosphate
MPa	Mega Pascal
NS	Non-significant
OIL	Oxygen-inhibition layer
PICN	Polymer-infiltrated ceramic network
SD	Standard deviation
SPP	Simulated pulpal pressure
μ-TBS	Microtensile bond strength

INTRODUCTION

The use of resin luting cements has increased in recent years. Resin cements provide better retention, esthetics and greater resistance to dissolution over conventional cements. They are essential for the cementation of esthetic inlays, onlays, veneers and the majority of all-ceramic crowns in providing strength to the bonded assembly [1]. Resin luting cements are, however, technique sensitive and their use demands a careful implementation of a series of steps including the application of enamel and dentin adhesives [1].

Adhesion to restorations is achieved by using bonding agents which is essential in modern restorative materials from mechanical, biological and aesthetic perspectives [2]. Resin adhesives and resin cements are found in self-cure, light-cure and dual cure formulations. The degree of polymerization plays a vital role in determining the ultimate biological, physical and mechanical properties of the material. It is significant to establish a strong bond between restoration and dentin.

A significant increase in bond strength has been suggested when the adhesive was cured prior to application of the resin cement in indirect restorations. However, if the thickness of the polymerized adhesive layer is high, either generally or in localized areas, this adhesive pre-curing step could prevent complete seating of the indirect restoration [1].

Cementation is a process dependent on several factors, such as the type of substrate, type of adhesive substance(s), humidity of the environment, and operator's ability in performing the bonding procedure.

Introduction

With regard to the dental substrates, adhesive procedures are usually performed to achieve bond to dental enamel and dentin [3]. Since the advent of adhesive dentistry, the composition of the materials and the clinical methods used for adhesion has changed [4].

Most prosthodontics restorations require a provisionalization phase. A considerable decrease in bond strength after cementation has been identified with eugenol-free formulations. This has been related to the obliteration of dentinal tubules with provisional material residues which avoid resin tag formation. Therefore, elimination of PLA from the tooth surface is crucial. There have been different attempts to accomplish complete removal of PLA. Residual PLA was evident on dentin surfaces after cleaning with pumice and water[5].

Applying dental adhesive before impression making, called immediate dentin sealing (IDS) technique. It provides adhesion to a freshly cut dentin, which is suggested to be ideal for bonding.. When the adhesive is applied only at the moment of definitive cementation, the approach is known as delayed dentin sealing (DDS)[6].

The primary advantage of immediate dentin sealing technique is to protect the tooth from the consequences of micro leakage by sealing the dentin tubules that are vulnerable to bacterial invasion immediately after completion of the preparation [7]. Sealing of the dentinal tubules also reduces sensitivity by preventing hydraulic fluid flow within the dentinal tubules, which is responsible for post-operative sensitivity, thus improving patient comfort. It has been shown that cements can penetrate the dentinal tubules before the final setting and microorganisms and their by-products can also penetrate into the patent dental tubules post- operatively.