

Prevention is Better Than Cure: A Key to Halt Peri-Implantitis

Syed Yasir Qadiri^{1*} and Shabeena Mustafa²

¹Assistant Professor, College of Dentistry, Najran University, KSA

²PG Student, IDST College, Modinagar, Ghaziabad, India

*Corresponding author

Syed Yasir Qadiri, Assistant Professor, College of Dentistry, Najran University, KSA, E-mail: dryasirqadiri@yahoo.com

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Abstract

To evaluate and compare the effect of VENT holes in crown at two different places on extrusion of excess cement at crown-abutment interface and associated tensile force in cement retained implant restorations- An In-Vitro Study.

Introduction

Implant has been used to support dental prosthesis for many decades. The greatest advantage of a dental implant is that it replaces the missing teeth in the most natural way.

Fixed implant restorations/crown are usually retained by screws or cement. The advantages of cement retained implant crowns include improved aesthetics, control of occlusion, decreased cost and time.

One of the biggest disadvantages of cement retained implant restoration is extrusion of excess cement at sub-gingival abutment restoration interphases leading.

Peri-Implantitis

Extruded cement at sub-gingival abutment restoration interphases has been reported to lead to peri-implant inflammation, soft tissue swelling, soreness, deeper probing depths, radiographic bone loss, bleeding and exudation on probing.

Furthermore, approximately 80% of peri-implantitis cases have been caused by bacterial colonization of extruded cement.

Construction of VENT in the crowns facilitate cement flow through the openings and not below the margin, providing better marginal fit to the crown and chances of peri-implantitis decreases to a large extent.

Aim and Objectives of the Study

Aim

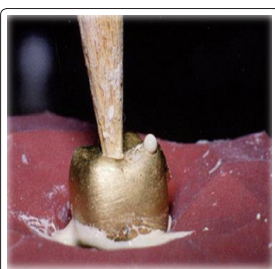
To evaluate and compare the effect of vent holes on extrusion of excess cement at crown-abutment interface and associated tensile force in cement retained implant restoration.

Objectives

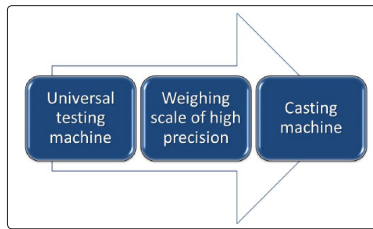
1. To evaluate the effect of full coverage crown (No vent), vent (Position 1) and vent (position 2) on the extrusion of excess cement at crown-abutment interface.
2. To evaluate the effect of No vent, Vent (Position 1) and Vent (Position 2) on associated tensile force on crown-abutment interface after luting.

Materials and Method

Materials



Equipment



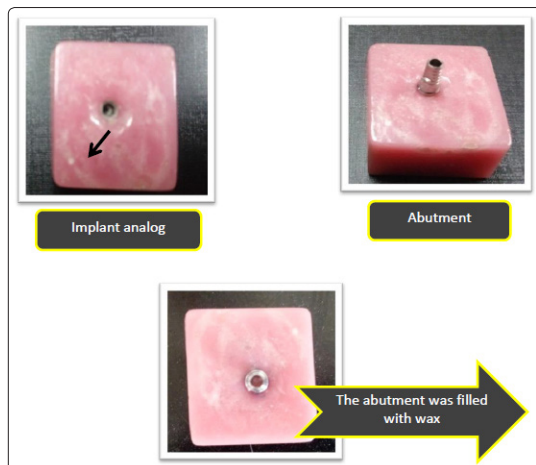
Instruments



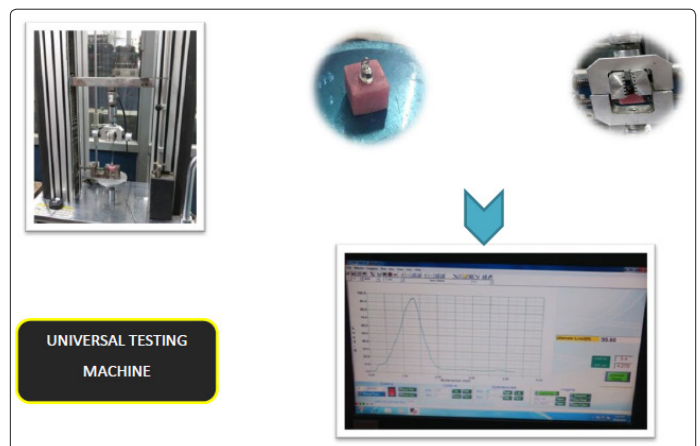
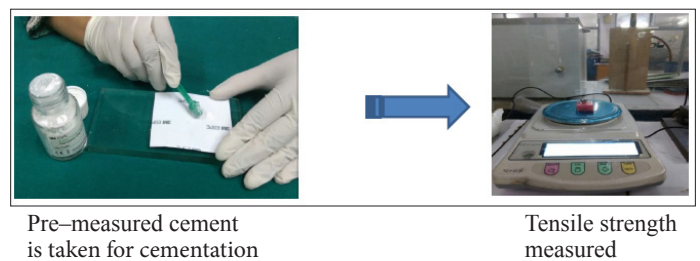
Method

Preseating was performed on an abutment analog made of a self-curing acrylic resin. This consisted of seating the crown loaded with unset cement on an abutment analog prior to final cementation on the definitive abutment. In this manner, excess cement remained on the abutment analog and a thin layer of cement was distributed on the intaglio of the restoration.

Eight cementation protocols were performed in this study, which involved a combination of two expressions of each of the three independent variables under study. The sample size was determined from a previous pilot study.



Wax Pattern

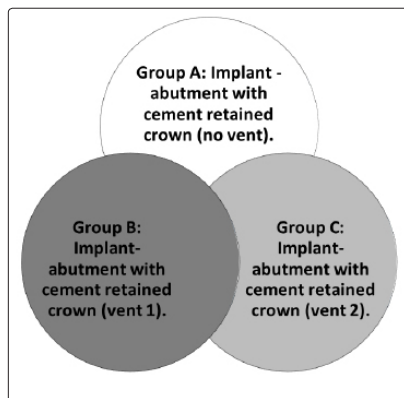


Methodology

1. An implant abutment will be tightened on implant analog.
2. All implant analogs will be stabilised in a block of acrylic resin to ensure the insertion path to be parallel to the long axis of the abutment for all cast crown copings.
3. The abutment screw access will be closed with wax.
4. The wax pattern is fabricated over the abutment and vents holes are made in the wax pattern.
5. The fabricated wax pattern will be invested with phosphate bonded investment material and will be casted in non-precious alloy.
6. The crown will be either closed or a vent will be made at two different places.
7. A standardised amount of pre weighed cement about 60mg will be loaded onto each of the implant crown for standardization.
8. Cementation procedure was performed at a standardized temperature of 21°C.

9. The cement-loaded coping was positioned on the abutment and seated into place at a load of 1 kg/min until the contact of the coping margin and abutment finish line was reached.
10. A load of 5 kg was then maintained and the cement was allowed to set for 5 minutes.
11. The cement extruded at crown-abutment margin will be scrapped off with a scalpel blade and weighed in standard measuring scale.
12. Coping cemented on implant abutments were then placed in distilled water and stored at a temperature of 32°C for 24 hours.
13. The tensile strength tests will be performed after specified time interval on the universal testing machine at a standard cross head speed and the cement tensile strength will be recorded for the each group.

Study Groups



Method of Collection of Data

Two readings will be measured for each group i.e.

1. The amount of cement extruded at crown-abutment interface by weighing the extruded cement present at crown-abutment margin for each group.
2. Three readings will be measured for tensile force associated with each group at crown-abutment interface with the help of universal testing machine in cement retained implant restorations.

Results

A general overview of the excess cement and retentive strength values for each experimental group was taken. The amount of cement extruded at the margins varied according to the types of combinations of the three independent variables.

The results of this study show that all independent variables had a significant effect on reducing excess cement. All experimental groups showed a significant reduction in excess cement when compared to the experimental control group, which lacked a vent hole.

Discussion

1. The potential for excess cement to damage peri-implant tissues is one of the main complications associated with cement-retained implant restorations. It is also difficult to observe and remove any excess material at depths greater than 3 mm.
2. So the VENTS provided the better escape for excess cement there by preventing the PERI-IMPLANTITIS.
3. Temporary cements are preferred by some clinicians to allow for retrievability of the restoration.
4. This is convenient for reserving, repairing, replacing and

salvaging restorations in the event of a biologic or technical complication.

5. The results will be concluded after statistical analysis using standard tests.

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