Evaluation of Impression Accuracy for Implants at Various Angulations

Thesis

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Dedication

This work is dedicated to:

My parents,

My husband,

And my sweet little kids

For all their patience, love, and support
which made this work possible

Acknowledgment

First and foremost I fell always indebted to **ALLAH**,
the most kind and most merciful.

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INTRODUCTION

An important factor for success with implant-supported restorations is the passive fit between the superstructure and the abutments. However, literature reported that it was difficult to achieve a passive and precise fit routinely. Misfit generates potentially detrimental tensile, bending or compressive forces into the prosthesis-implant assembly, which may lead to complications and mechanical failures more than to biological complications. [1,2]

Investigations studied the parameters of superstructure accuracy showed impression and master cast accuracy as one of the major determinants. Furthermore, machining tolerances of the components provided by the manufacturer and the accuracy of laboratory process were identified as additional factors.[1-3]

It seems prudent to use a stiff elastomeric impression material such as polyether, since it maintains impression coping positions accurately and is dimensionally stable. In addition, it presents good resistance to permanent deformation, low strain compression, and high initial shear strength. [1,2]

An accurate impression is one of the crucial steps to produce a well-fitting prosthesis. Impression transfer techniques would affect master cast accuracy. Both direct and indirect transfer techniques are commonly used in dental practice. The design of transfer coping and the tray are the main differences between both techniques. Squared transfer copings and open

tray are applied for direct transfer technique, whereas indirect technique was performed with tapered transfer copings and closed tray. [2-4]

The indirect technique may be less difficult clinically; however, it has been shown to have greater instability in transferring the implant position. On the other hand, the direct transfer technique with splinted impression copings exhibits greater transfer precision, although splinting advantages have not been established.[1,4]

Distortion associated with splinted transfer techniques can be related to residual polymerization contraction of the acrylic resin used for splinting. Different techniques for splinting impression copings with acrylic resin have been tested, such as a scaffold of dental floss, prefabricated acrylic resin bars, and stainless steel burs. [4]

In this study, the accuracy of impression through studying the changes in the poured master casts containing implants with different angulations aided by different splinting materials was evaluated.

REVIEW OF LITERATURE

Implant definition

Dental implant was defined as a prosthodontic device of alloplastic material, implanted into the oral tissues beneath the mucosal and/or periosteal layers and /or within bone to provide retention and support for fixed and removable prosthesis.[5]

Root form implants

They are preferred over other types of endosseous implants, due to better stress distribution, abutment designs, faster healing and better esthetics. [6]

Root form implant, was defined as an "Endosteal implant, shaped in the approximate form of a tooth's root." [5]

A. Classification of root form implants:

I. According to design:

1. Screw shaped:

Threaded screw shaped implants, the most commonly used today, they include:

Br (Nobel biocare)

Branemark first introduced his root form implant in 1978. Two-stage titanium threaded screwed type bone tapped with

machined surface, or conical threaded type self-tapped with sandblasted surface. [6]

Screw vent

It was first introduced in 1986. It was either made of pure titanium or titanium alloy in a solid screw design, the implant has vertical cutting grooves and threaded to the apex with an apical vent which makes it self-tapped. [7]

Denar (Steri-oss)

Two stage implant made of pure titanium coated with a uniform layer of hydroxyl-apatite with tapered apex threaded design and a smooth periodontal neck. [8]

2. Hollow cylinders:

Straumann ITI:

The ITI system was a one stage system of pure titanium with plasma sprayed surface of a hollow cylinder design. Its main indication was in a single tooth replacement, in anterior maxilla. [9]

Core vent:

Two stage titanium alloy with sandblasted surface introduced in 1985. It has a hollow vented basket design in its