Evaluation of Dimensional Accuracy of Different Implant Impression Techniques Using Two Impression Materials

Thesis

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Introduction

The connection of a fixed partial denture (FPD) to osseointegrated implants produces a unified structure in which the FPD, the implants and the bone act as one unit [(1)]. Lack of proper fitting of the FPD to osseointegrated implant, visible or not, is believed to induce internal stresses in the FPD, the implants and the bone matrix [(2, 3)]. An Endosteal implant distributes the physiologic loads onto the surrounding supporting tissues [(4)]. Implants unlike natural teeth cushioned in alveoli by periodontal fibers are somewhat intolerant to movement in their adaptation to the demands of the metal supporting structure [(4)]. The slight mobility of osseiointegrated implants is ascribed to the "elasticity" of the investing bone. [(5)]

There is a general awareness that the installation of implant and subsequent prostheses can affect changes in the metastable matrix of supporting bone [(2, 3)]. Whether the changes will be destructive or constructive in any given situation is not entirely predictable. It has been suggested that forced tightening of the metal supporting structure can result in micro fractures of bones, zones of marginal ischemia and fibro integration of the implant producing major risks for the implants treatment[(2)]. Other has suggested that there may be an optimum stress distribution dictated by design and material that will encourage maintenance of marginal bone proximal to the implant [(6, 7)]. A successful result is believed to be fully achieved only through the fabrication of passively fitting prostheses. [(8)]

The range of clinically tolerable stress regarding the long-term retention of implant prosthesis is still unclear. Accurate impression, fabrication of a model to precisely reproduce implant position and avoiding distortion during model transfer to the laboratory are required for passively fitting casts.

Several implant impression techniques have been advocated to achieve a definitive final cast with passive fit of prosthesis on osseointegrated implants, but more common include the indirect, direct, and direct-splinted. The main purpose of a multi-implant

impression is to record and transfer the relationship between implant abutments or implant and to reproduce this relationship as accurately as possible. Impression materials also play an important role in implant impression as the more dimensional stable and the more the material ability to record the details the more accurate will be the cast stone. The most material used recently with implant impressions are polyvinylsiloxane and polyether impression materials.

In this study we are trying to find out the most accurate implant impression technique with which we can obtain an exact replica of patient jaw with the dental implants in order to produce a prosthesis that fits passively in relation to the ridge bone and the dental occlusion.