Effect of implant position on the masticatory efficiency of mandibular implant retained partial over dentures

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Dedication

I am gratefully dedicating this thesis…

To … My Dearest Father, my loving mother and to all my beloved family for their kindly support, love and continuous encouragement to begin and complete this study….

What I have achieved... Or will achieve

Is all due to your love

And to your support.

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Ahmed Al Aidi

بسم الله الرحـمن الرحيـم

((وقال رب أوزعني أن أشكر نعمتك التي أنعمت علي وعلي والدي وأن

أعمل صالحا ترضاه وأدخلني برحمتك في عبادك الصالحين))

صدق الله العظيم

الاية (19) سورة النمل

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Introduction

Removable partial dentures restoring free end saddles are subjected to vertical, horizontal and torsional forces that may become an adverse during functional and Para functional activities.

The problem of disparity of support in distal extension prosthesis has always been a challenge for the prosthodontist, the problem arises from the lack of posterior abutment and the difference in the elastic behavior of supporting structures, the abutment teeth and the ridge

In distal extention cases lack of posterior occlusal support showed significantly higher variation coefficient values than those in groups with posterior occlusal support , these findings suggest reduction in function and that improved outcome with removable partial dentures (RPD) without posterior occlusal support was difficult to achieve , and there is a significant need for posterior occlusal support to preserve masticatory function .

Implant rehabilitation is an acceptable way to improve occlusal support as compared to conventional dentures, providing a simple procedure and results comparable to tooth supported overdentures .

Masticatory function can be improved by placement of endosteal implants in the distal extention area to support the mandibular denture, this procedure is usually accompanied by a better functional outcome and a greater patients satisfaction.

Restoring masticatory function is one of the main reasons for the fabrication of removable partial dentures, but many partial denture users may

judge their masticatory function as good while an objective functional test shows much lower values than those with complete natural dentition, so it is more accurate to rely on objective functional tests instead of optimistic self assessments .

One of the accurate tests to asses masticatory efficiency is Electromyographic Computarized Analyisis (EMG) , where the variation coefficient of the time parameter of (EMG) activity of muscles responsible for jaw closure can evaluate the smoothness of mastication (EMG) enables the measurement of electric potentials of masticatory muscle and the activity given in time .One can also asses neuromuscular coordination by analysing the patterns of muscular contraction in a quantitative manner during standardized dynamic activities.

Many studies have been done to assess the masticatory efficiency of implant supported over dentures as compared to conventional partial dentures , but little studies have been done to assess the most favourable position of implant to be placed to have the better effect on masticatory function and chewing efficiency.

Review of Literature

Distal extention removable partial denture:

Extension base removable partial denture is defined as removable partial denture supported and retained at one end of the denture base and in which a portion of the function and load is carried by residual ridge[1] .

Mandibular distal extension cases are found more common than the maxillary ones due to the general pattern of tooth loss and among the various partially edentulous conditions, distal extension cases are perhaps the most common.[2 3]

The structures that supports mandibular distal extension removable partial denture differ markedly in their viscoelastic response to loading. The differential between the resilience of the residual ridge tissues 500 pm and the 20 pm of the teeth permitted by the periodontal ligament' presents a disparity of support that is in contrast to the uniform support accorded a tooth-supported removable partial denture. Hence the denture tends to rotate about its most distal abutments, inducing heavy tensional stresses on the abutment teeth, and possible traumatization of the ridges. For this reason, it was advised to reduce base movement by enhancing and maintaining denture base support.[4 3]

The greatest difficulty occurs in the transition area where tooth support ends and mucosa support begins; in the tooth-tissue region adjacent to the edentulous space.[5 6]

In a study of histopathological changes in denture supporting tissues in relation to continuous pressure exerted through an experimental denture base. A high correlation was observed between the possibility of the