The Effect Of locator Resiliency On The Supporting Structures In Implant Retained Overdenture

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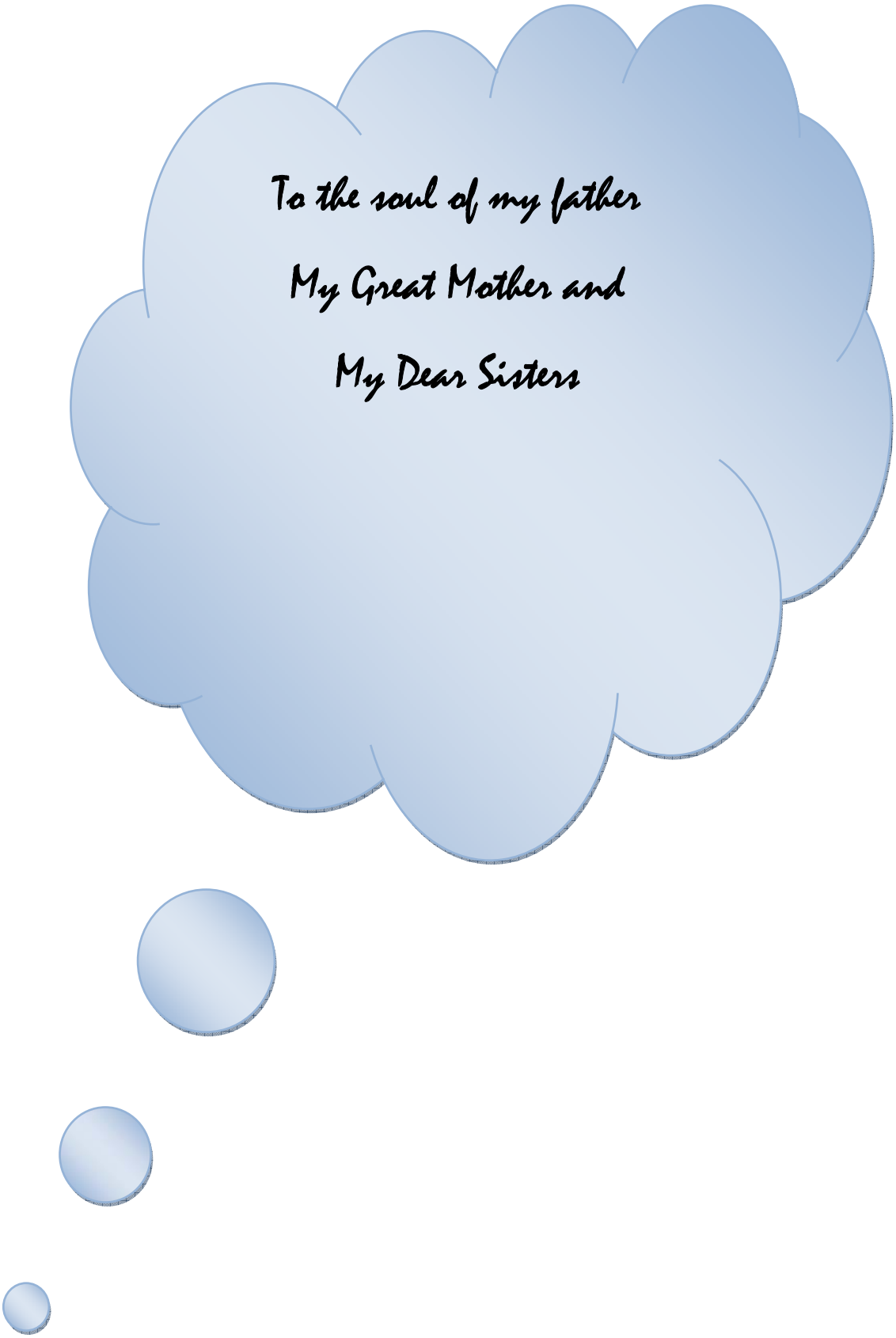
To the soul of my father
My Great Mother and
My Dear Sisters

Table of Contents

Title	Page
Introduction	**1**
Review of literature	**4**
Problems of Edentulism	4
Solutions for the Problem of Edentulism:	7
Surgical management of resorbed ridge: II- Preprosthetic surgical management:	9
II - Dental Implants	10
III - Implant Overdenture	13
Classification of Implant Overdenture: I - According to the mode of support:- *1-Mucosa supported overdenture:* *2-Implant supported Overdenture*: *3-Combined mucosa implant-supported overdenture:*	16 16 16 17 17
II- According to the connection between the abutments:- *1-Unconnected implant system :* *2-Bar attachment system:*	18 18 18
Implant number:	18
- Implant position:	19
- Bone Support for Implant Overdenture:	22
Bone quantity (Available bone):	23
Bone quality (density):	24
0sseointegration:	26

Attachment:	28
a) Magnetic attachment	29
b) Stud attachment	31
locator attachment system:	33
c) Bar attachment	36
Solitary attachment versus bar attachment:	37
d) Telescopic retainer *(Telescopic overdenture)*	39
Methods of evaluation of dental implants:	40
a- Clinical evaluation:	40
1) Mobility:	40
2) Percussion:	40
3) Pocket depth:	41
4) Radiographic evaluation:	41
Aim of the study	**44**
Materials and methods	**45**
Results	**74**
Discussion	**90**
Summary	**103**
Conclusion	**105**
References	**106**

List of Figures

Figure no.	Title	Page
Fig. 1	Completely edentulous lower ridge	50
Fig. 2	A file stopper punching the mucosa to determine its width.	50
Fig. 3	Approximate width of the bone and the thickness of the mucosa marked on a sawed cast.	50
Fig. 4	Radiographic stent with two metal balls	54
Fig. 5	Panoramic radiograph showing two metal balls as reference points.	54
Fig. 6	Modified surgical stent	54
Fig. 7	The implant in its sterile pack.	56
Fig. 8	locator abutment	56
Fig. 9	locator abutment driver	56
Fig. 10	The surgical kit for the system	58
Fig. 11	Full thickness flap 2cm mesial and distal to proposed implant site.	61
Fig. 12	A labial relaxing incision	61
Fig. 13	Surgical stent and pilot drill marking the implant sites.	61
Fig.14	Finishing drill	62
Fig.15	implant positioned in the osteotomy site.	62
Fig.16	Implant threaded into the bone	62
Fig.17	Implant flushed with the bone surface	63
Fig.18	mucoperiosteal flap repositioned and sutured.	63
Fig.19	Locator abutment in position	66
Fig.20	Denture fitting surface relieved opposite to sites of the implants.	66
Fig.21	A white spacer ring and metal housing positioned over the locator abutment	66
Fig.22	Black male in the fitting surface of denture	67

Fig.23	The black processing male was removed.	67
Fig.24	Insertion of blue replacement	68
Fig.25	Blue replacement insert is seated in the metal housing	68
Fig.26	Transparent replacement is insert seated in the metal housing.	68
Fig.27	linear measurement system supplied by the cone beam computed tomography	70
Fig.28	Patient seated in radiographic machine.	70
Fig.29	Mesial and distal marginal bone height measurement around implant	73
Fig.30	Buccal and lingual marginal bone height measurement around implant	73
Fig.31	Mean value bone height measurements for the right and left sides for Group I	77
Fig.32	Mean value bone height measurements for the right and left sides for Group II	81
Fig.33	Bar chart representing changes by time in mean bone height for Group I	84
Fig.34	Bar chart representing changes by time in mean bone height for Group II	86
Fig.35	Bar chart representing mean amounts of bone loss in the two groups	89

List of Tables

Table no.	Title	Page
Table (1)	Mean values , standard deviation (SD) values and Paired t-test for peri-impalnt between bone height measurements mm for the right and left sides for Group I	77
Table (2)	Mean values , standard deviation (SD) values and Paired t-test for peri-impalnt between bone height measurements mm for the right and left sides for Group II	81
Table (3)	Mean values , standard deviation (SD) values and Paired t-test for peri-impalnt bone loss for Group I during the follow up period	83
Table (4)	Mean values , standard deviation (SD) values and Paired t-test for peri-impalnt bone loss for Group II during the follow up period	86
Table (5)	Mean, standard deviation (SD) and Student's t-test for the amount of peri-implant bone loss in the two studied groups	89

Introduction

For many edentulous patients having problems adapting to conventional complete dentures, rehabilitation with implant-retained over denture offers considerable functional and psychosocial advantages.

Implant supported overdenture enhances masticatory function and proprioception. It reduces trauma to the underlying tissues, thereby reduce the rate of bone resorption. It maintains occlusion and vertical dimension and attains more patient tolerance.

Although implant supported hybrid prostheses have been successfully used for the treatment of edentulous patients, this treatment modality does not always represent the optimal restorative solution for all patients. The use of implant supported mandibular overdenture is an effective treatment alternative to conventional complete denture.

Implant mandibular overdentures is either rigid or non-rigid depending on the number of implants and the type of attachment used[1].

Rigid mandibular implant-retained and supported overdenture requires the use of three or more implants and has bar retentive elements. The bar used in these types of restoration is a bar unit that allows no movement between the bar and the sleeves.

On the other hand, in non-rigid design, implant retained and soft tissue supported overdenture or the two-implant overdenture requires the use of individual un-splinted ball retainers that allows rotation or a bar-clip prosthesis that is equipped with a hinge mechanism for rotation.

In either case, classic principles of complete denture construction including adequate denture base extension or proper adaptation are essential with the non-rigid two implant over denture [(1)].

Implant retained overdentures using ball-type retentive attachments have shown to be successful and cost-effective oral rehabilitation approach for edentulous individuals with resorbed mandibular ridge that leads to significant improvement of patient-based outcomes.

Since one of the principal determinants of two implants success is resiliency, a new implant attachment, the locator has been introduced with varying degrees of resiliency. The locator abutment insert is provided with different degrees of resiliency enhancing its benefit and acceptance among dental patients [(2)].

The design of the locator retentive component allows for dual retention in which a combination of inside and outside retention that ensures long-lasting retention. Locator attachments provide adequate retention and have the ability to control the degree of retention by changing retentive elements.

In addition, a critical advantage of this type of attachment is its lowest vertical height allowing its use in cases presented with limited inter-arch space. Moreover, angulations compensation and alignment correction is built into the attachment design to allow for use with nonparallel implants .The locator attachment transmits less stresses to the abutment supporting structures compared with ball-implant attachment [(3)].

Although researches have been concentrated on the influence of different attachments on the peri-implant bone loss, studies on the effect of locator attachment system on peri-implant bone loss is absent from the literature.

Review of Literature

Problems of Edentulism:

Edentulous patients suffer from tremendous consequences concerning; jaws anatomical structure, function, aesthetics and psychology. The close relationship between the tooth and the alveolar process continues throughout life. Wolf's law states that "Bone remodels in relationship to forces applied". Bone stimulation through teeth and its periodontal ligaments maintains its form and density [1,4].

Lack of stimulation to the residual bone due to tooth loss with its periodontal ligament support causes a decrease in the trabeculae and bone density with loss of external width and height of bone volume. Bone loss is not limited to alveolar bone, also portions of basal bone may be resorbed[5-7].

The gradual reduction of the residual alveolar ridge is considered by some authors a major oral disease entity. Others believe that it is a normal physiologic process; it is chronic, progressive, irreversible, and cumulative and shows wide variation. The amount of bone reduction is usually greater in mandible than that in maxilla [5,8-10].

In longitudinal studies, Atwood[8] showed an average annual alveolar ridge height reduction of approximately 0.4mm in the edentulous anterior mandible resulting from physiologic changes.

The mandible is affected to a greater degree than the maxilla owing to muscle attachments and functional surface area. As a result,

there is proportionally a qualitative and quantitative loss of tissue, resulting in adverse skeletal relationships in essentially all spatial dimensions [11].

Atrophic edentulous ridges are associated with anatomical problems that often impair the predictable results of traditional dental therapy .These problems include decreased width and height of supporting bone , prominent genial tubercles, mylohyoid ridge and internal oblique ridge , dehiscence of inferior alveolar canal, loss of basal bone and increased risk of mandibular body fracture due to advanced bone loss. Thinning of mucosa with high sensitivity to abrasion ,close muscle attachments to the crest of the ridge and more active role of tongue in mastication are also reported[1,5,12-15].

General systemic factors, such as osteoporosis, endocrine abnormalities, renal dysfunction, and nutritional deficiencies, play a role in the overall rate of alveolar atrophy. Local factors, including jaw relationship , vascular changes, increased physical demands owing to decreased mandibular plane angle, adverse prosthetic loading, mucosal inflammation, changes, and the number and extent of previous surgeries involving mucoperiosteal elevation, also contribute to progressive alveolar bone loss [16].

Although the factors contributing to bone loss and the resulting patterns are well understood, the rate of bone loss varies significantly from individual to individual. The consistent factor is the overall duration of the patient's edentulous state [17].

It was reported that edentulous patients wearing dentures had average, smaller residual ridges than those not wearing dentures. Increased residual ridge resorption seen in denture wearers was attributed to pressure from the prosthesis; movement of denture bases in any direction on their basal seats can cause tissue damage and is a major factor for residual ridge reduction. Parafunctional forces may accelerate bone loss of edentulous ridges and have been associated with soreness of the denture-bearing mucosa. Significantly greater bone loss after one year has been reported in the anterior mandible for patients wearing their dentures day and night compared with wearing dentures only during the day[18,19].

The effect of bone loss together with the aging process causes facial changes and aesthetic consequences. Decreased facial height and rotation of the chin forward, loss of tone of facial muscles of expression and deep facial grooves, thinning of vermilion border of the lips and decreased horizontal labial angle are reported. These changes together give the patient an old prognathic appearance[5,20].

The basic problem in the treatment of edentulous patients lies in the different nature of how natural teeth and their artificial replacements are attached to the supporting bone. The unsuitability of the tissues importing complete dentures for load-bearing function must be immediately recognized. In normal function for the dentulous state, light loads are placed on the mucous membrane. However, with complete dentures, the mucous membrane is forced to serve the same purpose as the periodontal ligaments that provide support for natural teeth [21].