Mandibular Versus Maxillary Implant Supported Overdenture In The Prevention Of Combination Syndrome

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INTRODUCTION

Patients rehabilitated with maxillary complete denture opposing mandibular bilateral distal extension partial denture are vulnerable to trauma leading to destructive changes in both the maxillary and mandibular ridges.

Kelly [1]referred to such changes as combination syndrome in which early bone loss from the anterior maxillary jaw is the triggering factor for such retrograde changes. He described five feature of this condition, They included loss of bone in anterior part of maxillary ridge, overgrowth of the tuberosities, papillary hyperplasia of the hard palate, over eruption of lower anterior teeth, and loss of bone beneath the removable partial denture bases. Saunders et al [2] described six additional changes associated with combination syndrome . They included loss of occlusal vertical dimension, occlusal plane discrepancy, anterior spatial repositioning of the mandible, poor adaptation of the prostheses, epulis fissuratum and periodontal changes.

Many aspects of the prosthesis design have been suggested in an attempt to overcome the detrimental hard and soft tissue changes that are frequently observed in patients rehabilitated with a maxillary complete denture opposing distal extension removable partial denture. A rigid removable partial design that provides positive occlusal support, maximum stability and maximum basal coverage beneath the distal extension bases is highly recommended. A basic principle is to develop an occlusal scheme that would reduce or eliminate excessive occlusal pressure on edentulous ridges. Balanced occlusal scheme with no anterior

contact in centric and light contact during excursive mandibular movements to avoid over loading to premaxillary region should be established.

Studies showed that many of the problems encountered by conventional upper complete denture could be eliminated when maxillary overdentures were used. Maxillary implant retained overdenture has been advocated as a preventive line of treatment to offer resistance to the anterior force that cause ridge resorption

The use implant to serve as posterior support for the bilateral distal extension partial denture to minimize the development of combination syndrome is documented in the literature.

Although many reports suggested a relation between implant supported mandibular and maxillary overdenture and the prevention of combination syndrome, these suggestions have been largely subjective as no long term controlled clinical study have been conducted and the issue whether the use of mandibular implant supported or maxillary implant supported overdenture is more effective have not given a definitive answer.

LITRATURE REVIEW

Edentulism

Edentulism is defined as "The loss of all permanent teeth, and is the terminal outcome of a multifactorial process involving biologic processes (caries, periodontal disease, pulpal pathology, trauma, oral cancer) as well as non- biologic factors related to dental procedures (access to care, patient preferences, third party payments for selected procedures, treatment options, etc.)".[3]

The incidence of Edentulism worldwide has shown a decline, and the demand for treatment may be different than what it was several decades ago. Despite the beneficial improvement in oral health and the decline in the rate of the edentulous condition, there remain a substantial number of complete denture wearers among elderly people. The number of edentulous elderly persons may even increase because of the current expansion of the oldest segment of the population. [4-6]

Edentulous patients could be considered disabled, due to their inability to eat and speak effectively. Edentulous patients show a low intake of fiber, vitamin C and other important nutrients. A nutritional deficiency can produce a number of oral symptoms such as atrophy, edema, xerostomia, and reduced healing capability. [7]

The completely edentulous patient may be at risk for development of other comorbid conditions, including diabetes, cardiovascular conditions, dementia, cancer, asthma, and others, but whether these comorbid conditions are casual or causal has not been clearly determined.[3]

Reduction of the residual ridge (RRR)

Residual ridge is a term used to describe the shape of the clinical alveolar ridge after healing of bone and soft tissues after tooth extractions. After tooth extraction, a cascade of inflammatory reactions is immediately activated, and the extraction socket is temporarily closed by the blood clotting. Epithelial tissue begins its proliferation and migration within the first week and the disrupted tissue integrity is quickly restored. Histologic evidence of active bone formation in the bottom of the socket is seen as early as 2 weeks after the extraction and the socket is progressively filled with newly formed bone in about 6 months.[8]

After the healing of wounds, the residual ridge alveolar bone undergoes a life-long catabolic remodeling. The size of the residual ridge is reduced most rapidly in the first 6 months, but the bone resorption activity of residual ridge continues throughout life at a slower rate, resulting in removal of a large amount of jaw structure.[9, 10]

Residual ridge resorption appears to be a process encountered in all complete denture wearers. However there is considerable inter individual variation in the rate of bone loss after tooth extraction and the wearing of complete dentures. Residual ridge remodeling directly affects the function of removable prostheses, which rely greatly on the quantity and quality of the jaw bones.[11-13]

Classic studies on the longitudinal loss of residual ridge height have demonstrated that once the teeth are extracted bone loss is a continuing process, and that the mandibular edentulous ridge may resorb at approximately four times the rate of the maxillary edentulous ridge.[6, 12]

Prospective clinical studies addressing the mechanical factors on residual ridge resorption were conducted by Carlsson et al.[14, 15] in which partially edentulous patients (Kennedy class I) were divided into three experimental groups wearing (1) no mandibular denture, (2) partial denture with bilateral free-end denture bases, and (3) partial denture with anterior splint bar. The longitudinal observation of the edentulous ridge of these patients revealed the increased rate of residual ridge resorption in the groups of wearing dentures.

Bone that receives constant mechanical stimuli maintains a coupled cellular activity between osteoclasts and osteoblasts. When the bone tissue is placed in a state of immobilization or a weightless environment, it bears less mechanical stress and cannot sustain the normal coupled remodeling process and results in loss of calcified bone mass described as disuse atrophy.[16]

The keratinized edentulous mucosa can be deformed as a result of pressure from dentures and vascular alterations such as arteriosclerosis may result from long-term denture wear. However, the edentulous mucosa shows remarkable tolerance, and no substantial inflammatory reaction is observed.[10, 17]

It was concluded that osteoclastic bone resorption was a pressure threshold regulated phenomenon with a lower threshold for continuous than for intermittent pressure.[18]

Factors responsible for residual ridge resorption have been reported as either local factors or systemic factors. Local factors include the length of time edentulous, the size of edentulous ridges, the amount of occlusal