

MANAGEMENT OF POOR RIDGE CASES – A CHALLENGE IN CLINICAL PRACTICE

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Abstract

Resorption of bone is a normal process. Its balance to bone apposition may be either physiologic or pathologic and is dependent upon multiple factors. Treatment of rapid (pathologic) resorption is difficult because the multiple factors are interrelated & it is impossible to evaluate clinically or radiographically the precise part played by each. A normal bone picture requires that all known body fluids & elements both intrinsic and extrinsic are in proper harmony and composition.

Key words

Bone Resorption, Flabby Ridge, Retention

INTRODUCTION

In order to render the best possible treatment for edentulous patient, a clinician must not only perfect the (1) Clinical techniques but also must have a broad insight into the (2) factors related to residual resorption and its management. Residual ridge resorption in itself is a coupled biophysical process and a common occurrence after extraction of teeth. Hence our aim should be to overcome the factors related to RRR and fabricate a stable and retentive denture.

Factors related to residual ridge resorption

I) Anatomic Factor: Deals with the rate of resorption of the alveolar bone depends to a great degree upto the type of bone structure anatomic factors include size, shape cortical caucelous and density of the ridges, the thickness and character of the mucosal covering, ridge relationships number and depth of the sockets. (1)

II Metabolic factors: These are multiple nutrition and hormonal factors which influence the relative cellular activity of the bone forming cells and thus affect the rate of resorption of the residual ridges. (1,2)

III Functional factors : Force within certain physiological limits is applied to living bone, these forces whether compressive, tensile or shearing bring about remodeling of bone, frequency, intensity, duration and direction of force applied are somehow translated into biologic cell activity resulting in either bone formation as bone resorption depending upon the patients individual resistance to these forces. (1)

IV) Dietary factors: Abnormalities of calcium-phosphorus elements of the blood stream are

associated with alveolar resorption & rarefaction deficiency of vitamin A causes poor calcification of bone. Deficiency of vitamin C causes decalcification of bone & is responsible for diffuse alveolar atrophy. Deficiency of vitamin D, disturbs the calcium phosphorus balance and promotes bone resorption.(3)

V) Prosthetic Factor: Includes various techniques, materials, concepts, principles incorporated in the prosthesis, it is desirable for a prosthesis to fit well and distribute its load over as wide an area as possible, that load being kept to minimum by careful selection of tooth material and form. Tytle (a clinician) had demonstrated increased radiolucency in the alveolar process under an ill fitting prosthesis which was reversed by rebasing it with resultant even distribution of denture load.

Oral Examination: A thorough examination of an edentulous patient includes a detailed history and psychologic assessment of the patient along with a visual and digital survey of the oral cavity. Signification of the history of the patient especially in case of an old denture wearer is essential as it helps in assessing the psychology of the patient which in turn reflects the patient's attitude towards accepting a denture – which plays an important role in the success of any prosthetics delivered to the patient

Radiographic Examination: Intracranial radiographs are taken in order to observe the density of the residual ridges. A C.T. scan of the maxilla and the mandible helps to determine the quantity of bone in the residual ridges.

Cephalometric tracings show variation in size and shape of the jaws. Resorption of the residual ridges is

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measured cephalometrically after the extraction of teeth.

McLean and Urist state that a loss of 24-30% of bone salts is necessary to produce an appreciable change in radiograms of bone (Although a broad high ridge has a greater potential bone loss, the rate of vertical bone loss may actually be slower than that of a small ridge because there is more bone to be resorbed per unit of time)

Management of Residual ridge resorption:

Prior to treating a patient who exhibits marked loss of alveolar bone, 2 Important factors must be considered:

- Psychology of the patient
- Role of systemic diseases as an etiologic factor in gross alveolar resorption.

(Patients with gross alveolar desorption lack denture stability and tend to slide over the mucosa leading to trauma, especially in very thin ridges, in which the denture presses against the oral mucosa).

Techniques of prosthodontic management:

Which are of significance are:

- (I) Mouth preparation prior to designing a prosthesis.
- (ii) Fabrication of stable and retentive dentures.

Mouth preparation prior to designing a prosthesis: The oral tissues change their shape with time and eventually the pressure-transmitting surfaces of the denture will be poorly adapted to the oral mucosa prior to construction of new prosthesis, these faults should be eradicated where ever possible by occlusal grinding or the modification of the pressure-receiving surface of the teeth. Failure to carry out such corrective therapy can result in continuing distortion of the oral tissues by the dentures and difficulty in recording Jaw relationships.(4)

Fabrication of stable & retentive dentures: is related to the concentration delivered to 3 surfaces of the denture namely:

- Pressure receiving surface.
- Secondary supporting surface
- Pressure transmitting surfaces

Pressure receiving surfaces: Comprises of the occlusal and incisal aspects of the artificial teeth.

- The use of narrow posterior teeth results in less pressure over the alveolar process during mastication.
- Teeth with a low cusp angle or inverted cusps assists further in the stability of the denture.
- Teeth fabricated of acrylic resin provide a cushioning effect over the mucosa as compare to porcelain teeth

Secondary supporting surfaces: Polished surface border deal areas. Accurate contouring of the secondary supporting surfaces of a denture especially in a patient with gross alveolar resorption is extremely significant in order to achieve stability and retention.

- Polished surfaces of the denture should adapt to the soft tissues and musculature of the oral cavity.
- Use of heat cured acrylic resin bases is recommended in patients with gross RRR as this significantly improves the retention and stability of the record blocks.

Pressure-transmitting surfaces: Should have the maximum possible area without overextension over the muscle attachments in order to reduce pressure on the oral mucosa.

- A functional impression technique introduced by Boucher is

laudatory in order to achieve and record the muscle attachments.

- Recording the correct vertical dimension and providing more free-way space (3.5mm) in patients with increased Residual ridge resorption is rightly beneficial.
- Prosthodontist should concentrate in capturing the correct centric relation record.
- It should be the aim of every prosthodontist to record centric relation and re-establish the lost centric occlusion.
- Soft liners-Soft tissue distortion can be corrected with the use of soft resilient reliners.

Accessory aids in retention: (4)

Magnets: embedded in the alveolar process and the denture in the molar region in order to attract the denture to the alveolus but this has its limitation causes the constant pressure produced by such magnets results in increased rate of Residual ridge resorption.

Spring: Inserted in the denture unstable the denture antero-posteriorly and constant pressure causes RRR thus this technique should be avoided by prosthodontist and utilized only when the accepted prosthodontic techniques have failed.

Surgical Management

In case of severe RR surgery should be considered if the prognosis appears beneficial to a considerable extent.

- Recovery of local bony excrescences or fibrous nodules.
- Increasing the height of the alveolar ridge with the use of cartilage homograft, bone autografts, freeze derived bone and silicone rubber enclosed in knitted dacrous.
- Repositioning the attachments of the soft tissues to the Jaws so as to increase the denture bearing area.
- Insertion of subperiosteal implant dentures.

CONCLUSION

Apart from the accepted prosthodontic techniques described it is extremely important for every dentist to analyze the underlying systemic causes for patients with RRR and lastly the psychological acceptance of the prosthesis by the patients contributes to its success. Thus to deal with the causes of gross alveolar resorption and hence to fabrication a successful denture in patients with poor residual ridges should be the aim of every Prosthodontics.

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