

REVIEW ARTICLE

Management of Edentulous Areas of the Jaws with Implants – Management Protocols based on Bone Availability

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ABSTRACT

Dental implants have revolutionized rehabilitation of patients who have undergone teeth loss. This article discusses a variety of cases treated keeping in mind the availability of bone, presence of natural teeth if any in the antagonistic arch and functional requirements of the patient for an all-round effective rehabilitation with implants. Management in 10 different cases is represented keeping in mind the above mentioned protocols which can serve as a guide for the respective situations delineating the limitations and advantages of each.

Keywords: Resorption, dental implants, prosthetic rehabilitation.

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INTRODUCTION

Rehabilitation of atrophied edentulous arches comprises one of the most challenging tasks in the field of dental implantology.¹ The options of treatment for the same are limited and comprise of complete dentures, implant retained overdentures (with 2-4 implants), implant retained fixed prosthesis and implant retained hybrid prosthesis.²

Generally when bone resorption has exceeded beyond the alveolar socket level and moved on to basal bone rehabilitation becomes a challenge. Also the presence

or absence of natural dentition should be kept in mind before contemplating final prosthesis for the same.

The general changes in the ridge shape following extraction include a ridge broad enough at the crest initially (class I) to accommodate the width of the immediately extracted teeth to one that becomes pointed, then one flat to the level of the basal bone and finally concave ridge with resorption of the basal bone (class IV). An inverse or cross-bite Class- III ridge relationship is developed with advanced stages of ridge resorption. This happens as mandibular base becomes broader than the maxillary one. To respect this natural disproportion teeth have to be differently aligned, the lower molars inward to the lingual side and upper molars outward to the buccal side.¹

The soft tissue is also not spared and the muscular attachment to the ridge interferes with the denture flanges. This is pronounced in the anterior region in the mandible and canine region in the maxilla. These anatomic changes must be well understood to promote a solution more effectively.

Prosthetically. The large inter-ridge distance must be filled by a large acrylic base

over which artificial teeth are set far from their center of gravity. One major error which can be incurred in improving denture stability without reconstructive surgery is to reduce the vertical dimension but to risk temporomandibular joint problems as an esthetic prejudice.³

Out of these 7 cases needed restoration of both the arches with four being previous complete denture wearers, one required only full maxillary arch replacement with intact natural mandibular set of teeth and two required mandibular arch replacement with intact natural maxillary set of teeth.

In three cases where ridge resorption was not severe and wherein adequate bone (>13mm) was available a fixed prosthesis was contemplated which comprised of ceramo-metal bridge with natural teeth as opposing dentition. Where prognosis of existing natural teeth was not good (two cases) with adequate amount of bone available (>13mm), a fixed prosthesis was given in both upper and lower jaws (immediate tempo-

rization followed by early loading). Where resorption of ridge was more to the extent that fixed prosthesis would require extremely long crowns to compensate or restore the vertical dimension a hybrid prosthesis was planned. (fig_2) Two Cases where ill-fitting mandibular dentures was an issue were treated with new dentures and a 2-4 implant retained over-denture was given in the mandible with a complete denture in the maxilla. The last two cases which had severe bone resorption where there was no hope for denture retention naturally were treated with implant retained overdentures for mandibular arch and maxillary complete dentures. Usually retention of maxillary dentures is not an issue because of the retention provided by the posterior palatal seal, hamular notches, soft palate which are not altered even in severely resorbed cases the buccal vestibule being the only highly affected one.

DISCUSSION

Dental implantology is a complex science which has to take in to account bone morphology and teeth rehabilitation to promote function and esthetics. Proper planning of a case would necessitate CT scans preferably CBCT,⁴ study models of plaster of paris mounted on an articulator to understand the jaw relationship post resorptive changes, preliminary wax-ups with teeth setting done on the base plates with a clear idea of the final prosthesis to be given.

Bar-retained overdentures either for the maxilla or mandible

Require precise laboratory fabrication beyond the expense incurred and is also fret with maintenance issues.⁵ Zygoma implants have recently evolved as good options for extremely resorbed maxillae but treatment with upper complete denture and lower implant retained overdenture have showed extremely gratifying results as compared to the complex specialized surgery to be carried out for zygoma implants.

Conclusion: Concluding from a wide array of cases done and a few presented here some points can be noted with respect to bone resorption and choice of rehabilitation. In the past 14 years of clinical implant practice, all the presenting cases could be managed by one of the protocols suggested and the following algorithm may be applied i.e.

Natural teeth in opposing arch present – adequate bone in jaw to be restored present-fixed prosthesis (ceramo-metal cemented) as first choice splinted as one unit if it is in maxilla.

If Some natural teeth are present-immediate non-func-



Figure-1: Hybrid prosthesis in a patient with bone loss and high esthetic demand

tional loading of implants placed post-extraction can be done

Totally edentulous arches with adequate bone (>13mm) – (1) Fixed prosthesis –to opposing fixed cement retained (2) one arch fixed- the other is fixed detachable(overdenture) or hybrid (slightly adjusting prosthesis)

Totally edentulous arches with inadequate bone up to 13mm – Maxillary denture (with /without implants) and mandibular hybrid prosthesis (screw retained and hygienic) or overdenture is a very successful and satisfying option

Severely resorbed arches – (some areas 10-12 mm like mandibular symphysis) - maxillary denture based on zygoma implants and mandibular implant retained overdenture. Thus identifying the case with respect to the amount of bone available the prosthetic design to be implemented should immediately come to the fore for a successful outcome.

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