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Prosthodontics

METAL REINFORCEMENT OF MANDIBULAR DENTURE OPPOSING NATURAL DENTITION – A CASE REPORT.

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ABSTRACT Complete dentures opposing natural dentition and implant supported mandibular overdenture bases can be a problem, especially because they are prone to fractures. Hence, metal reinforcement for such denture bases can substantially reduce the incidence of fractures in such prosthesis. Also, Several difficult situations are encountered in providing a successful and functional single arch complete prosthetic denture treatment.1 This case report deals with rehabilitation of edentulous mandibular ridge opposing natural dentition in maxillary arch, mandibular denture is prosthetically reinforced with metal within Poly Methyl Methacrylate denture base material to combat the masticatory forces from natural dentition. This will improves the longevity of the prosthetic rehabilitation and at the same time, also improves the strength of the mandibular denture base.2 This article describes the advantages, indications and method of reinforcing mandibular denture opposing natural dentition.

KEYWORDS : resorbed ridges, metal reinforcement, lostwax technique.

INTRODUCTION

Fracture of mandibular denture base is a common problem in prosthodontics, especially in the midline, mandibular overdentures and in single complete denture opposing natural dentition. A number of factors are responsible for such fractures - Occlusal disharmony, Excessive occlusal forces, Flexure and fatigue of denture as a result of alveolar resorption and Inadequate thickness of acrylic resin resulting from the dimensions of bar and clip abutments.[1,2,3]

So, reinforcement of denture bases has been suggested as a method to increase the fracture resistance and to improve the denture dimensional stability.

CLINICAL REPORT :

A 53 year old male patient reported to the Department of Prosthodontics of Maharishi Markandeshwar college of dental sciences and research, Mullana, Haryana with a complaint of difficulty in chewing. Intraoral examination revealed edentulous mandibular ridge and opposing full complement of natural dentition. Oral Mucosa was normal, recession was present in upper (anterior & posterior) teeth and the teeth present in maxillary arch required minor alterations. Consistency of saliva was medium and patient was co-operative and philosophical. After discussion with patient mandibular denture reinforced with metal was planned for this patient.

TREATMENT PROCEDURE

1. We perform all the steps of conventional complete denture fabrication until the wax trial denture stage. At try in stage phonetics, esthetics, centric relation and vertical dimension of occlusion have to be verified with the trial dentures.
2. Make a silicone index of the trial denture on the master cast to record the facial and lingual position of teeth and denture base. Index helps to determine available space for metal reinforcement.
3. On the master cast adapt wax spacer from premolar to premolar area. Three tissue stops are made in center and in second premolar area bilaterally. These stops are used for the purpose of retention of metal reinforcement during packing and curing.(Fig-1)

Fig-1

4. Flow blue inlay wax in these tissue stops and adapt 8 guage sprue wax(round in cross section) over this area till the second premolar area of both the sides.[2](Fig-2)

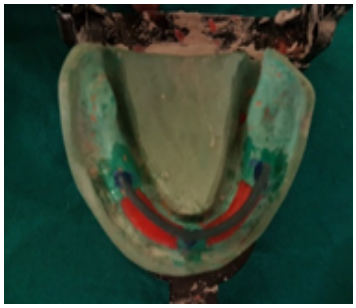

Fig-2

5. Sprue, Investing and casting is done with cobalt chromium metal alloy using lost wax casting procedure. (Fig-3,4)

Fig-3

Fig-4

6. The metal reinforcement so formed, is then positioned over the master cast and attached with cyanoacrylate on tissue stops. Trial denture and teeth are adjusted for the proper seating of the wax trial denture base over it. (Fig-5)

Fig-5

7. Flask and process the trial denture in conventional manner. (Fig-6)

Fig-6

8. Deflasking, Finishng and polishing of the metal reinforced denture is done. (Fig-7,8)

Fig-7

Fig-8

9. Insertion of metal reinforced denture is done.

DISCUSSION-

One of the very common clinical situations involving a single denture is that of a complete lower denture and upper natural dentition. When a denture prosthesis is opposed by natural dentition, it will require some amount of contouring of teeth to provide a harmonious occlusion. The reasons for such contouring and alteration is due to unfavourable inclination of the occlusal plane, supraeruption of teeth, malpositioned teeth because of which there is excessively steep cuspal inclinations, and wide buccolingual width of the natural teeth. Mandibular denture bases may encounter tissue changes of the residual ridge followed by discomfort, occlusal problems and fracture of denture bases. There might be occlusal stress on the mandibular denture and the underlying edentulous tissue due to forces from natural teeth and musculature of opposing dentition; the position of the maxillary teeth, which are improperly aligned may also avoid achievement of bilateral balance for stability and lead to flexure of the denture base. The midline fracture in a denture is often a result of flexural fatigue. Though poly Methyl Meth Acrylate denture bases have good functional (mechanical, biological and esthetic) properties, the impact and fatigue strength of PMMA are not entirely satisfactory, thus may fail when there is excessive functional or parafunctional loads & forces. This combination of i.e. mandibular denture with metal incorporated in PMMA denture base with the opposing natural dentition provided great function & comfort to the patient as the metal denture base was strong to resist catastrophic failure and flexural fatigue (denture fracture).[4,5,6]

Silicone index helps to ensure that metal reinforcement casting will remain within the contour of the denture base and not produce the bulky lingual flange of denture. Select appropriate site for metal reinforcement so, it will not produce excessive bulk of denture base and not interfere with the teeth arrangement and esthetics. Opaque ceramic can be applied on metal reinforcement to mask the dark shadow of metal.

CONCLUSION

This combination i.e. mandibular metal base and opposing natural dentition provided great comfort to the patient as the metal denture base was strong to resist catastrophic failure and flexural fatigue if PMMA was to be used as denture base. The metal denture bases are good thermal conductors and less bulky. There would be no propagation of crack from the deep labial notch as well.

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