HEMISECTION- A CONSERVATIVE APPROACH FOR PRESERVATION OF TOOTH A CASE REPORT OF THREE CASES.

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ABSTRACT

Damage to the tooth supporting bone is one of the most disturbing consequences of advanced periodontal disease. The functional stability of teeth with such advanced bone loss can be achieved by regenerative or resective procedures depending on factors like defect type, defect volume, tooth related anatomical factors, etc. Successful management of such teeth also mandates a multidisciplinary approach involving endodontic, restorative and prosthetic interventions, especially in case of multi-rooted teeth. Resective procedures in periodontal therapy aim at removing the hard tissue wall of the pocket and preserve part of the tooth instead of opting for tooth extraction. The article presents 3 cases reports of hemisection where the furcation areas of the involved tooth where beyond the scope of regeneration but were successfully treated with a resective combines with multi-disciplinary approach.

KEY WORDS: Hemi Section, Bone Regeneration, Tooth Preservation

INTRODUCTION

Resection is defined as "the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion". Based on the structures resected, respective periodontal therapy may involve removal of root with/ without crown structure. Removal of root with extensive bone loss in multirooted teeth is termed as root amputation, whereas separation or removal of root with its accompanying crown in mandibular molars is termed hemisection. Splitting mandibular molars into mesial and distal roots of along with its crown portion is referred to as bisection / bicuspidization. Removal of roots of maxillary molarsis termed as radisection.[1]

Distal molar teeth with extensive decay are normally indicated for extraction and planned for RPD or Implants, but implants require sufficient bone level, are techinque sensitive, and costly. Hemisection is the treatment of choice if the decay limits to single root especially in furcation involvement of mandibular molars and helps in preserving the original tooth structure as much as possible. Furcation involvement refers to invasion of the bifurcation and trifurcation of multi rooted teeth by periodontal disease[2]. Because of the complex anatomy related to furcations, complete root debridement is not always achievable using conventional periodontal instruments.

According to Weine the indications for hemi section are (a) severe bone loss (b) Through and through furcation involvement (c) Severe root exposure (d) Perforation in endodontic treated teeth, and the hemisection of multi-rooted tooth is contraindicated in (a) tooth with strong adjacent abutment teeth (b) Inoperable root canals(c)Fused roots[3].

Root resection: Through comprehensive history with IOPA x-rays, casts with clinical examination should be carried. Written and verbal consent should be obtained from the patient, regarding procedure and associated problems.

Carnevale(1995) suggested endodontic treatment along with preliminary prosthetic preparation to be carried out before periodontal resective surgery procedure like root resections. The final tooth preparation should be done during the surgical phase, followed by provisional restoration, re-evaluation and final prosthetic rehabilitation[4].

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CASE REPORTS

A male patient aged 45 years reported to the outpatient wing of Periodontics, Mamata Dental College & Hospital complaining of pain and mobility of lower molar tooth. On clinical examination, mandibular right first molar (46) was sensitive to percussion with grade II mobility, PD> 13 mm around the distal root and grade III furcation involvement. Mandibular right second molar (47) had PD>15mm all around with grade III mobility [Fig. 1].

On radiographic examination, there was vertical bone loss extending more than apical third present on the distal root of 46with intact bony support of mesial root. 47 had extensive bone loss extending above both mesial and distal roots [Fig. 2]. Keeping these in mind, the treatment planned was hemisection of distal root of 46 after RCT [Fig. 3] and extraction of 47.

Surgical procedure:

After achieving adequate anaesthesia in the mandibular right quadrant, a crevicular incision extending from distobuccal aspect of second premolar to mesial aspect of third molar was given and a full thickness envelope flap was elevated. Wound debridement using mechanical instruments was done till the bone around the molar roots were exposed. Using a long shank, taper carbide bur a buccal groove was intitiated on 46 and a vertical cut was continued apico-lingually until the furcation area was reached. To ensure complete separation of the mesial and distal halves of the tooth, a fine probe was passed through the severed floor of pulp chamber [Fig. 4] The distal segment including the crown was extracted. Wound approximation was done by repositioning the flap to original level using 3-0 black

non-resorbable braided silk sutures. To facilitate redirection of masticatory forces along the long axis of the mesial segment of 46, coronoplasty was done and the occlusal table was minimized. Temporarization of retained mesial half with sanitary pontic for missing 47 was done one month post surgery. After satisfactory healing and occlusal analysis, final prosthesis was placed three months post surgery [Fig. 5]. The occlusion was reverified and a IOPA radiograph of 46 was taken to confirm proper position. On the sixth month and 1 year recall visits, patient was satisfied with both functional and esthetic result without any other complaint. [Fig .6].

CASE 2:

A 44 years male patient reported with similar complaint of pain and mobility of right lower molar tooth. On clinical examination, sensitivity to percussion with grade I mobility with respect to 46 was seen. On probing the area, PD> 11 mm around the distal root of 46, with grade III furcation involvement was present. On radiographic examination, there was vertical bone loss extending more than apical 3rd present on the distal root of 46. The bony support of mesial root was completely intact [Fig. 7]. It was planned for hemisection of 46 after RCT (Root Canal Therapy). Tooth was hemisected following the above mentioned procedure [Fig.8].

CASE 3:

Pain Associated with mobility of right lower back tooth region was reported by a 25 year male patient in the OPD of Periodontics. On examination, 46 tooth had PD> 13 mm around the distal root of 46, grade III furcation involvement and grade I mobility associated with sensitivity to percussion. On radiographic examination, there was severe vertical bone loss extending more than apical 3rd present on the distal root of 46. The bony support of mesial root was completely intact [Fig. 9]. RCT followed by hemisection was planned for 46. Tooth was hemisected similar to the above mentioned procedure. The underlying osseous defect was filled with alloplastic bone substitute (sybograft) [Fig. 10]; adequate flap repositioning and wound approximation was done. A provisional restoration was given after 3 months and a fixed partial prosthesis over the residual half of 46 was planned. The final restoration was done [Fig. 11] with uneventful follow up till 1 year post surgery.

FIGURES WITH FIGURE LEGENDS:

FIGURE-1: PRE-OPERATIVE (CASE-1)

FIGURE-2: PRE-OPERATIVE - IOPA

FIGURE-3: AFTER ENDODONTIC THERAPY

FIGURE-4: HEMSECTION

FIGURE-5: 3-MONTHS POST-OPERATIVE

FIGURE-6: 1-YEAR POST-OPERATIVE

FIGURE-7: PRE-OPERATIVE (CASE-2)

FIGURE-8: FINAL PROSTHESIS

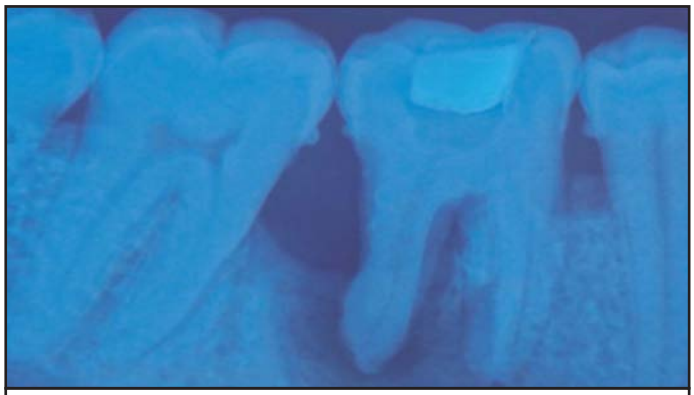

FIGURE-9: PRE-OPERATIVE (CASE-3)

FIGURE-10: BONE GRAFT

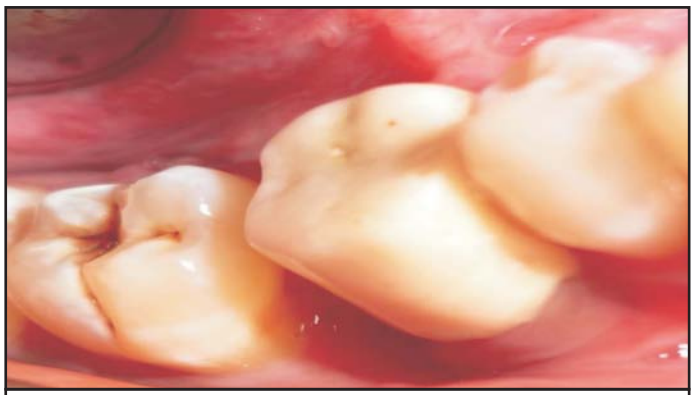

FIGURE-11: FINAL PROSTHESIS

DISCUSSION

Successful management of molars with questionable prognosis using hemisection has been advocated by Park et al (2009)[5] due to negligible post treatment bone loss in the long term. Since the remaining healthy root of a mandibular molar can be used as abutment for the final restoration, hemisection of the diseased root can be suitable treatment option.[6] Thus, resective periodontal management of multi rooted teeth with questionable prognosis have been suggested as an alternative procedure by Jain et al (2011)[7]. However, a few disadvantages associated with root resection/ hemisection can be (a) pain and anxiety, (b)increased susceptibility to caries, (c)increased risk of

trauma from occlusion(TFO) due to improperly shaped occlusal contact area[8]. Inspite of the reported disadvantages, successful management of furcation involved teeth by hemisection was recently reported by Bhutada G et al (2012)[9].

CONCLUSION

Management of teeth with advanced grade II and grade III furcation involvements with hemisection is a viable treatment modality with functionally acceptable results. An integrated, multi disciplinary approach involving endodontics and restorative dentistry are key to the success of this treatment in multi-rooted teeth.

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