An innovative approach to salvage a fractured endodontically treated tooth – A case report of resection, regeneration and restoration

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Abstract

Introduction: The progressing inflammatory periodontal disease, if untreated, results in attachment loss. This can affect the furcation region of multirooted teeth. Hemisection is the splitting of two rooted tooth into two separate portions accompanying crown portion of two-rooted teeth most likely mandibular molars. In the healing phase after hemisection, alveolar bone undergoes additional atrophy as a result of the natural remodelling process. Post-extraction Alveolar Ridge resorption may have an impact on dental implant placement, since sufficient vertical and horizontal volume of alveolar bone should ideally be present at the site of insertion. Alveolar ridge preservation (ARP) procedures have been introduced for aesthetic concern, as well as to prevent alveolar ridge atrophy and maintain adequate dimensions of bone in order to facilitate implant placement in prosthetically driven positions.

Case Description: A 51 years old systemically healthy male patient came with a chief complaint of pain and swelling in his lower left back tooth region. On clinical examination, Endodontically treated mandibular first molar manifested bucco-lingual fracture, grade 2 mobility of mesial component, 10 mm probing depth in mesial region and grade 3 furcation involvement. The treatment of the tooth included proposed hemisection of the mesial component followed by socket augmentation and delayed implant placement. After phase 1 therapy, hemisection was performed and mesial root socket was augmented with xenograft and PRF membrane. After 8 months, Osteotomy site was prepared with flapless procedure then narrow, two piece implant of size 3.3 × 11.5 mm was placed in hemisected region of mandibular molar which was followed by provisional restoration at 3 weeks.

Conclusion: An innovative approach for a periodontally compromised fractured endodontically treated tooth which was undertaken with a definitive treatment.

Keywords: Early loading, Furcation, Hemisection, Mandibular first molar, Socket preservation.
Socket Preservation

After Hemisection of mesial component, Curettage of mesial socket was done. Thorough irrigation with sterile saline was done to clear the remnants. Then, Socket preservation was done by grafting the extraction site with DMBM Dimineralized bone matrix \* and covered with PRF to induce the bone formation and to prevent the collapse of the soft tissue in to the socket. The flap was approximated, simple interrupted sutures were placed using 3/0 vicryl sutures\#. The surgical site was covered with a periodontal dressing\$. Postoperative instructions educated and medications prescribed. Review was done at 1,2,4 weeks following surgery. Extraction socket was covered completely by approximation of flaps, epithelial attachment has taken place and no more periodontal pocket was evident.

\* = (OSSEOGRAFT, advance biotech products (p) ltd. Tamilnadu, india)
\# = (Ethicon, Division of Johnson & Johnson Ltd., Aurangabad, India)
\$ = (coe-packTM GC America INC.ALSIP, IL, USA)

Implant

Patient was under follow up. Review done in 1, 2, 4 weeks after hemisection. Radiographic socket fill seen after 8 months and then planned for implant placement. Preoperative radiographs taken, casts prepared. According to patients bone availability and related an anatomical landmarks, Implant size is determined as 3.35 * 11.5 mm \*.

Under LA in 36 region. Without flap elevation, pilot drill placed. Osteotomy done in sequential drill protocol. Followed by Implant placement, healing abutment placed. After 3 weeks healing abutment removed. Impressions taken for restoration. Two separate final restoration were given for implant and the distal component of 36. Follow up of one year with restoration was done with periodic reviews at the interval of 3, 6, 9 and 12 months.

\* = (ADIN IMPLANTS).

Fig. 1: Clinical Representation
Buhler stated that hemisection should be considered before every molar extraction, because it provides a good, absolute, and biological cost saving alternative with good long term success. DBM has been studied to an increasing extent in recent years in connection with alveolar ridge preservation. Overall, the studies show clinical validation and the establishment of a good therapeutic track record for DBM use. When the tooth loses part of its root support, it will require a restoration to permit it to function independently or serve as an abutment for fixed partial denture or splint. Thus, restoration is required for function and stabilization of occlusion.

Wongthai P et al, in their case report in 1993, described the replacement of the mesial root of the mandibular first molar, 5 months after hemisection, with a root form implant followed by two separate crowns for the retained distal root and the implant 4 months after the implant placement. The results from this exploratory case offer considerable evidence to support the osteoinductive activity of the DBM graft and PRF membrane materials tested, their clinical acceptability in preserving sockets, and their ability to generate new bone capable of reliably supporting implants.

Mahender singh et al, in their case report in 2017, described the replacement of the mesial root of the mandibular first molar, immediately with BCS implants after hemisection followed by single crown for the retained distal root and the implants immediately. The results from this exploratory case offer considerable evidence to support
the BCS IMPLANTS and their clinical acceptability in immediate placements, with immediate loading.

EL Gendy et al, in their study in 2014, evaluated clinically and radiographically the validity of using hollow versus solid immediate screw implants in the socket of extracted root of hemisected mandibular molars augmented with Cerasorb in the treatment of advanced periodontal lesion affecting mainly. They concluded that Immediate one piece (hollow or solid) implantation and augmentation with Cerasorb in the socket of extracted root of lower hemisected molars resulted in favorable clinical results with success rate up to 100% in follow up period extended up to 15 months.

**Conclusion**

This case highlights the interdisciplinary approach of molar hemisection, implant placement and prosthetic rehabilitation as an innovative procedure providing better results with minimal patient apprehension and long term stability.

**Conflict of Interest:** None.

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