Hopelessness..? Turned Hopefullness..! – Salvaging A Molar with A Mother's Touch– Case Report

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Abstract: Periodontitis is the inflammatory disease that leads to destruction of the supporting structures of the teeth. The early diagnosis and treatment of periodontitis is always not possible as the periodontitis progress with minimal or no pain. Regenerative medicine is the field that uses exogenous or endogenous stem cells for the regeneration of the lost periodontal tissues. This case report presents about salvaging a molar which was of poor prognosis and at the verge of extraction using Amniotic Membrane as a barrier membrane in the procedure of Guided Tissue Regeneration.

Keywords: Root resection, Amniotic membrane, Endo-Perio lesion, Guided tissue regeneration, Hopeless tooth, Periodontal regeneration.

INTRODUCTION

Tooth loss may be due to many etiological factors. Periodontitis is the inflammatory condition that may lead to loss of tooth. The amount of bone destruction is based on the severity of the disease. The extensive destruction to alveolar bone surrounding the multi rooted with furcation involvement is treated by Hemisection or Root resection. Resection of the involved root may prevent the need of bridges, abutments, biological stops under removable partial denture free end saddles [1]. Langer *et al* investigated root resection cases for 10 years after surgery and reported a total failure of 38% [1]. The prognosis of the furcation involved molars can be improved utilizing many regenerative therapies and reconstructive procedures. Cells derived from Amnion have multipotent differential ability. This led to the use amniotic membrane as a source of stem cells for the regenerative therapy. In 1913, Salbella presented the first clinical report of successful use of amniotic membrane in the treatment of skin ulcerations. Amniotic Membrane is used in dentistry for various purposes. It is been used in treating gingival recessions [2, 3]. It is also used in treating furcation defects [4] and as a barrier membrane in regeneration of the intra bony Defects [5]. Since treating an furcation involvement is a complex procedure, it needs a good source of stem cells for the proliferation of the lost tissue structures. Therefore use of Amniotic membrane serves as a source for epithelial stem cells which is pluripotent [6], that may serve as an excellent guide in regeneration of the lost tissues.

CASE REPORT

A 37 years old patient reported to the Department of Periodontics with a chief complaint of mobile teeth in mouth and wanted to rectify it. The patient had no past medical history but a familial history of complete teeth loss for the patient's father and grandparents was elicited. On examination the patient had generalised bleeding on probing, increased probing depth greater than 6mm in maxillary and mandibular incisors, premolars and molars. Probing depth in 46 was about 14mm. 46 exhibited a Grade III mobility along with Grade III furcation involvement. Orthopantamograph showed a classical arc shaped bone loss from premolars to molars in first and second quadrants (Figure **1**). IOPA of 46 revealed extensive bone loss around mesial and distal roots along with resorption of distal root of 46 (Figure **2**). The tooth (46) was subjected to vitality test. There was no response on electric pulp testing, indicating the tooth (46) is non-vital. Based on the clinical and radiological findings it was diagnosed as Generalised Aggressive Periodontitis with Endo-Perio lesion in 46. Initial treatment plan was extraction of 46 and followed by phase I therapy. Since the patient was not ready to

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compromise his tooth, Intial Phase I therapy of Complete Scaling followed by quadrant wise root planing was performed. Phase II therapy of Root canal Therapy in 46 was carried out (Figure **3**) and patient was recalled after 4 weeks for review.

Figure 1: OPG Showing arc shaped bone loss in 1st and 2nd quadrants.

Figure 2: IOPA of 46 shows extensive bone loss around mesial and distal root of 46 and resorption of distal root.

Figure 3: Root Canal Therapy Performed in 46, showing calcified canals.

After 4 weeks of Phase I and II therapies, clinical examination revealed reduction in bleeding on probing, considerable decrease in the probing depth of maxillary and mandibular central incisors, premolars and molars (except 46). The Grade III mobility of 46 got reduced to Grade I. The probing depth in 46 remained to be 14 mm (Figure **4**). The Phase II therapy was planned with Quadrant wise Flap surgery along with resection of distal root in 46 followed by guided tissue regeneration procedure in 46.

Figure 4: Pre operative Probing depth of about 14mm.

SURGICAL PROCEDURE

Periodontal flap surgery was done in first three quadrants. The surgical site was properly isolated with betadine solution and Local anaesthesia with 2% lignocaine hydrochloride (1:2,00,000 adrenaline) was administered. Crevicular, interdental incisions were given from mesial aspect of 41 to distal aspect of 47. A full thickness mucoperiosteal flap was reflected (Figure **5**), de-granulation was done, irrigated with normal saline, distal root of 46 was resected using a 703 bur (Figure **6a** & **6b**), the inferior surface was burnished well using a ball burnisher. The osseous defect was filled with Modified Colocast bone graft (Xenograft) (Figure **7**) and Amniotic membrane (Freeze –Dried, Irradiated Amnion) obtained from TATA MEMORIAL HOSPITAL TISSUE BANK – Mumbai was placed over the osseous defect (Figure **8**). The flap was approximated and secured with continuous sling suture using 3-0 silk suture material (Figure **9**). Coe-Pak

Figure 5: Full Thickness mucoperiosteal flap reflected showing osseous defect around distal root of 46.

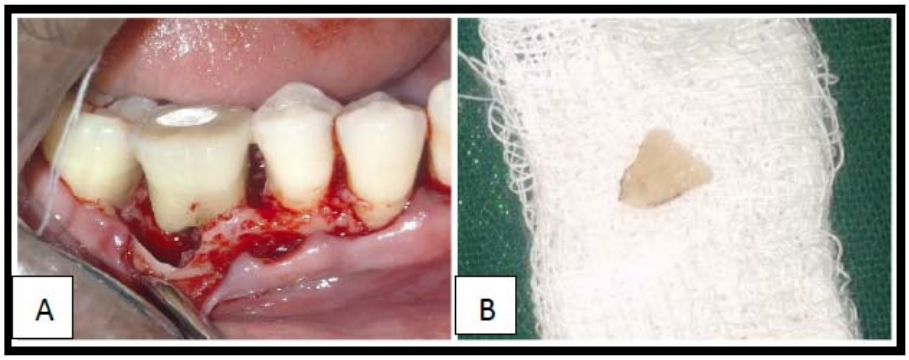

Figure 6: A). Resection of the distal root of 46 done, **B).** Resected distal root of 46.

periodontal dressing was given over the surgical site (Figure **10**).

Figure 7: Bone Graft (Colocast) placed in the osseous defect.

Figure 8: Amniotic Membrane placed over the bone graft in osseous defect.

Figure 9: Flaps approximated and continuous sling sutures placed.

Figure 10: Periodontal dressing given at the surgical site.

POSTOPERATIVE INSTRUCTIONS

Analgesics were prescribed twice daily for three days for postoperative pain. 0.2% chlorhexidine digluconate was also prescribed to be used twice daily for 3 weeks. The patient was asked not to brush at the surgical site for 2 weeks.

RESULT

The patient recalled 1 week after surgery and the sutures were removed (Figure **11**). The patient was kept under observation and was called after 3 months for clinical and radiological evaluation. The healing was complete after three months (Figure **12**) and the IOPA

Figure 11: One week post operative image.

of 46 at 3 months showed good bone formation around the mesial root of 46 (Figure **13**) and tooth became clinically firm. Then Phase III therapy of Prosthetic crown was planned in 46. Tooth preparation was done and a Metal –Ceramic crown was placed in 46 with retentive clasps in adjacent tooth (45 & 47) (Figure **14a** & **14b**). One year follow up radiograph showed significant bone formation and stability of the tooth.

Figure 12: 3 months postoperative image.

Figure 13: 3 Months post operative IOPA of 46 showing bone formation around 46.

DISCUSSION

The successful clinical outcome for the treatment of an furcation involved molar lies in the regeneration of the lost soft and hard tissue structures which was lost during the inflammatory process. Proper diagnosis and treatment plan is essential for the successful outcome of the treatment of furcation involvement. The resection of root procedure should be performed with proper cautions so that the site should be easily accessible for prophylaxis and should not harbour food substances. Studies have found that patients enrolled in maintainance programs every 6 months after root resection have shown an increased success rate of 93% [7]. The survival of the root resected molars depends upon various factors, roots resection done in tooth due to the periodontal problems had more survival rate than resection done due to fracture, caries or Endodontic problems. In order to achieve better results it is important that the remaining root has greater than 50% of bone support [9]. Studies in Taiwan population regarding the survival of root resected molars indicated that the survival rate of the root resected molars depends on the patient related factors [10]. In present scenario root resection in mandibular molar is performed to conserve as much as that of natural tooth structure and bicuspidization was not indicated since distal root was resorbed. There are many commercially available barrier membranes that are available to be used in Guided Tissue Regeneration but they have their own limitations and disadvantages such as difficulties in manipulation and high cost. Amniotic membrane was used in present case as it acts as a reservoir of Multi-Potent Stem cells aids in the acceleration of the healing process along with which it has many advantages over the other materials in properties. Amniotic membrane when used as a barrier membrane along with Bone graft increases the properties such as osteoinduction and

Figure 14: Tooth Preparation done and metal ceramic crown cemented in 46.

osteoconduction, accelerating the bone formation. When compared to traditional GTR membranes, Amniotic membrane has certain unique properties. The bioactive matrix of Amniotic membrane has variety of protein that facilitate wound healing, including type I, III, IV, V, and VI Collagen and laminin. Amniotic membrane is viscoelastic in nature which is a critical property of scaffolding in most of the tissues. It contains growth factors such as platelet-derived growth factor-α (PDGF-α); PDGF-β, fibroblast growth factor; and transforming growth factor-β which enhances the growth of lost periodontal structures and aids in the rapid granulation covering of exposed graft [10].

CONCLUSION

Root resection serves as a better treatment option for furcation involved molars. It reduces the need for abutments, endodontic management of the adjacent tooth and bridges. However selection of the root to be resected depends upon many factors and the successful outcome of the treatment depends on number of patient's factor and remaining bone support. The regeneration of the lost periodontal structures is essential for the root resected tooth to survive. Amniotic membrane is one such barrier membrane with a number of unique properties such as anti-inflammatory, anti scarring, antibacterial properties, it also serves as source of multipotent stem cells for the regeneration of lost periodontal tissues. The matrix of amniotic membrane harbours many protiens and growth factors that accelerates the wound healing process. The improvement and long term result in root resection can be achieved by proper surgical techniques periodic follow ups and patient motivation.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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