



## An Interdisciplinary Intervention in Effective Management of Perio-Endo Lesion – “Blend to Cure”

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### ABSTRACT:

The term perio - endo lesion has been proposed to describe the destructive lesions resulting from inflammatory products found in both the periodontium and pulpal tissues. The periodontium and dental pulp are inter-linked from embryonic stage. The dental pulp originates from dental papilla and the periodontal ligament originates from dental sac, both of which have a common mesodermal origin [1].

### INTRODUCTION

The term perio - endo lesion has been proposed to describe the destructive lesions resulting from inflammatory products found in both the periodontium and pulpal tissues. The periodontium and dental pulp are inter-linked from embryonic stage. The dental pulp originates from dental papilla and the periodontal ligament originates from dental sac, both of which have a common mesodermal origin [1].

At apical foramen, the dental pulp and periodontal ligament communicate with each other. Other possible routes are the accessory canals, lateral and secondary canals and the dentinal tubules. Vertical route fractures act as the bridge for pulpal contamination [2]. The relationship between the periodontium and pulp was first described by Simring and Goldberg in 1964 [3].

There are various etiological and contributing factors responsible for perio-endo lesions. The etiological factors include plaque, calculus and various microorganisms and contributing factors include trauma,

root resorptions, dental malformations, iatrogenic perforations of the rootcanals and so on.

According to Simon and Frank (1972), Endo-Perio lesions are classified as 1) primary endodontic lesion, 2) Primary Periodontal lesion, 3) Primary endodontic lesion with secondary periodontal involvement, 4) Primary periodontal lesion with secondary endodontic involvement, 5) True combined lesion [4].

Isolated areas in which the root is denuded of bone and the root surface is covered only by periodontium and overlying gingival are termed as fenestrations. In these areas the marginal bone is intact. Fenestrations occurs most commonly in maxillary molars and canine region. Fenestrations can be treated by root planning along with chlorhexidine rinse, flap surgery, free gingival grafting and by guided tissue regeneration [5].

Periodontal regeneration is the growth and differentiation of new cells and inter-cellular substances to form new tissues and parts. It can be achieved by



means of bone grafts and GTR membrane for reconstructing intraosseous defects in treating periodontal diseases<sup>[6]</sup>. According to Carranza and Newmannbone grafts are classified into autograft, allograft, xenograft, alloplast and non-bone graft materials<sup>[7]</sup>. Sybograft is the synthetic bone graft material made up of  $\beta$ -Tricalcium phosphate. It acts as a partially resorbable bone graft material with better biocompatibility.

Guided tissue regeneration prevents the epithelial migration and facilitates the growth of periodontal ligament and the bone cells to proliferate in order to establish the proper regeneration<sup>[8]</sup>.

Amniotic membrane, a resorbable membrane is most commonly used for regeneration procedures. Amniotic membrane possesses various properties such as anti-inflammatory, immunomodulatory, anti-microbial, anti-fungal, anti-scarring etc. Amniotic membrane not only maintains the structural and anatomical configuration but also contributes to the enhancement of healing through reduction of post operative scarring and subsequent loss of function and providing a rich source of stem cells. Amniotic membrane acts as a scaffold and provides a better environment for the tissue growth<sup>[9]</sup>.

The present case report describes the management of perio – endo lesion by means of regenerative materials such as bone grafts and amniotic membrane

## CASE REPORT:

### EXAMINATION:

A 36-year-old male patient reported to the Department of periodontics, JKKN dental college and hospital, komarapalayam with a chief complaint of pain in upper left front tooth region associated with pus discharge for the past 1 month. History reveals that patient met with an accident and fractured his teeth before 2 years and had undergone Root canal treatment in 11 and 21. On periodontal examination localized gingival inflammation with pus discharge was seen in 21 and 11 with the probing depth of 4 mm and the high frenal attachment was seen in relation to maxillary labial frenum. Patient exhibited tenderness on percussion in

relation to 21. A sinus opening was seen on the distal aspect of 21 (Fig 1).

### INVESTIGATION

A gutta percha cone was inserted into the sinus to find out the path of the sinus tract. A radiograph was taken along with the gutta percha. It was found that the sinus was associated with the distal side of middle third of root of 21. A radiolucency was associated with the periapical region and middle third root of 21 on both mesial and distal side (Fig 2). Tension test was positive which confirmed the presence of high frenal attachment in relation to maxillary labial frenum. Patient advised for routine blood investigations. Patient platelet count, bleeding time, clotting time, hemoglobin, ESR was found to be within normal limits. Based on the finding, diagnosis was made as an Perio – endo lesion of primary periodontic with secondary endodontic involvement.

### SURGICAL PROCEDURES:

The surgery protocol was approved by ethical committee of JKKN dental college and hospital. Full mouth scaling was done. The clinical crown and the Gutta percha filling was removed, the root canal was reshaped and the teeth was restored temporarily with zinc oxide eugenol. Frenectomy was done in upper anterior tooth region by scalpel (Fig 3). Sutures were placed followed by periodontal dressing and patient recalled after 4 weeks. Intra oral antiseptics was obtained by using 0.2% chlorhexidine digluconate rinse. Following the administration of LA, sulcular incision was given in relation to 12, 11, 21, 22 and vertical relieving incision was given in relation to 12 and 22 in order to gain complete access to the operating site and a mucoperiosteal flap (Kirkland flap) was elevated.

Flap elevation was done and a fenestration was seen in the middle third root of 21. The curettage is done by an area specific Gracey curettes to remove the granulation tissue (Fig 4). Corticotomy was done in the periapical region of 21 using 701 tungsten carbide bur, followed by apicectomy (Fig 5) and a retrograde filling. The root end cavity was sealed with the MTA (Fig 6). The degranulated wall defect was treated with Diode laser (Fig 7). After laser treatment the Bone graft was mixed with saline and placed in the defect region (Fig 8). The amniotic membrane was placed as a regenerative



material to stabilize the graft(Fig 9). The flap is approximated with 4.0 Ethicon sutures(Fig 10). Immediate post operative RVG was taken(Fig11). Periodontal dressing was given. The suitable antibiotics and analgesics and chlorhexidine mouth rinse was administered.

## RESULT:

Patient was recalled after 1-week, periodontal dressing was removed and saline irrigation was given. At 6-month, patient was reevaluated, there was no evidence of pain and pus discharge on examination. The RVG shows the radio opacity over the middle third root of 21 which signifies the bone fill over the defect region on the middle third root of 21, which indicates the significance of periodontal regeneration. Because of the improved clinical condition, the permanent crown was placed and the RVG was taken.

## DISCUSSION:

Perio – endo lesion involves multidisciplinary treatment. Proper diagnosis is essential for treating perio – endo lesions. In this case report fenestration was treated properly with the help of amniotic membrane and bone graft. The root canal treatment was repeated followed by corticotomy and apicectomy. mineral trioxide aggregate (MTA) appears to have become the gold standard for a root-end filling material, it has major advantages, including excellent biocompatibility, ideal adherence to the cavity walls low solubility, and cementogenesis at the cut root face, with deposition of new cementum onto the exposed dentin and MTA surfaces <sup>[10]</sup>.

Laser was applied over the defect area to decontaminate the surgical site<sup>[11]</sup>. Laser therapy significantly increases the formation of new capillaries (tiny blood vessels) within damaged tissues and Faster healing always leads to less scar tissue formation <sup>[12]</sup>.

Bone grafts were found to be safe and advantageous in reconstructing the defect. Bone grafts possess osteoconductive, osteoinductive and osteoneogenesis properties. Sybograft is the synthetic resorbable nano hydroxyapatite crystals possess osteoinductive properties. which facilitates the ingrowth of vascular channels and subsequent formation of new

bone and spreading osteoblasts and new bone in contact with the particles <sup>[13]</sup>.

In our case report, graft is stabilized using Amniotic membrane consists of pluripotent cellular element embedded in a semipermeable membrane. Pluripotent stem cells differentiate into other cell types makes it suitable membrane for GTR. Amnion has shown an ability to form an early physiologic seal with the host tissue precluding bacterial contamination. Amnion tissue contains growth factors that may aid in the formation of granulation tissue by stimulating fibroblast growth and neovascularization.

It has an ability to decrease the host immunologic response via mechanism such as localized suppression of polymorphonuclear cell migration. Laminin 5 being the most prevalent plays a role in the cellular adhesion of gingival cells and concentrations of this glycoprotein is useful for periodontal grafting procedures. It is also in accordance with the study done byKumar KA et al, stated that application of bone graft and amniotic membrane results in proper regeneration <sup>[14]</sup>.

## CONCLUSION:

The multidirectional treatment of Perio – endo lesion results in optimal resolution of the lesion. Eliciting the clinical signs at the earliest, by careful examination, is of paramount importance in the treatment. Based on the clinical condition conventional treatment or advanced regenerative procedures can be selected.

There was a lack of sample size and histological data for comparison, longitudinal studies that compare bone graft with amniotic membrane and other membrane are also required to claim the efficacy of amniotic membrane. Within these limitations, this case report demonstrates the synergistic action of amniotic membrane and bone graft.

## REFERENCES

1. Singh P. Endo-perio dilemma: a brief review. Dental research journal. 2011;8(1):39.
2. Choudhury GK, Panda S, Garahnayak M, Mohapatra A, Sahoo P, Nayak R. Possible Pathways of Disease Communication of the Endo-Perio



- Lesions and their Management. Indian Journal of Forensic Medicine & Toxicology. 2020 Oct 1;14(4):8415.
3. Simring M, Goldberg M. The pulpal pocket approach: retrograde periodontitis. The Journal of Periodontology. 1964 Jan;35(1):22-48.
  4. Simon JH, Glick DH, Frank AL. The relationship of endodontic-periodontic lesions. Journal of periodontology. 1972 Apr;43(4):202-8.
  5. Singh S, Panwar M, Arora V. Management of mucosal fenestration by multidisciplinary approach: A rare case report. Medical Journal, Armed Forces India. 2013 Jan;69(1):86.
  6. Wang HL, Cooke J. Periodontal regeneration techniques for treatment of periodontal diseases. Dental Clinics. 2005 Jul 1;49(3):637-59.
  7. Newman MG, Takei H, Klokkevold PR, Carranza FA. Carranza's clinical periodontology. Elsevier health sciences; 2011 Feb 14.
  8. Mancini L, Fratini A, Marchetti E. Periodontal Regeneration. Encyclopedia. 2021 Mar;1(1):87-98.
  9. Sharma M, Kotwal B, Mahajan N, Kharyal S. Amniotic membrane in periodontics: An insight. INTERNATIONAL JOURNAL OF SCIENTIFIC STUDY. 2017;4(11):211-4.
  10. Apical surgery: A review of current techniques and outcome Thomas von Arx2010
  11. Cobb CM. Lasers and the treatment of periodontitis: the essence and the noise. Periodontology 2000. 2017 Oct;75(1):205-95.
  12. Lasers in periodontics SugumariElavarasu, Devisree Naveen, ArthiieThangavel 2012
  13. A Clinical and Radiographic Evaluation of the Efficacy of Nanohydroxyapatite (Sybograf™) versus Bioactive Calcium Phosphosilicate Putty (Novabone®) in the Treatment of Human Periodontal Infrabony Defects: A Randomized Clinical Trial.SravaniKoduru, SuchethaAghanashini, Sapna Nadiger, S. M. Apoorva, Divya Bhat, Bhavana Puvvalla 2019
  14. Kumar KA, Chakravarthy M, Selvarajan S, Ramakrishnan T, Ari G. Use of an amniotic membrane as a novel barrier in a tooth with a questionable prognosis. Journal of Indian Society of Periodontology. 2017 May;21(3):237





**Fig-1 Preoperative**



**Fig - 2 Sinus tracking with GP**



**Fig - 3 Frenectomy done**



**Fig-4 Debridement done**



**Fig-5 Apicectomy done**



**Fig-6 MTA Sealing**



**Fig-7 Laser debridement done**



**Fig-8 Bone graft placed**



**Fig-9 Amniotic membrane placed**



**Fig-10 sutures placed**



**Fig-11 Pre and post op IOPA**