**Case Report:**

# Multidisciplinary Approach To Treat A True Combined Perio- Endo Lesion

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**Abstract**

The merging of periodontal and endodontic disease has created much confusion amongst most of the dental practitioners regarding the diagnosis and its treatment plan. More than 50% of tooth mortality faced in the present scenario includes both Pulpal and Periodontal problems.

Severe periodontal disease would result in destruction of supporting tissue further bringing down the prognosis of a true combined lesion to poor (or) even hopeless. This paper highlights on a case of a lingually inclined tooth with a combined perio-endo lesion, which has been treated using both endodontic and periodontic measures. Successful management of such problems depends on patient compliance, possibility of tooth restoration and cost effectiveness together favoring in proper treatment planning.

**Key words** - Periodontic – Endodontic Lesion, Healiguide, Periobone-G, Plasma rich – derivative, Free gingival graft.

**الملخص**

أدى دمج أمراض اللثة وأمراض عصب الأسنان إلى حدوث الكثير من الالتباس بين معظم أطباء الأسنان فيما يتعلق بالتشخيص وخطة العلاج. أكثر من ٥٠ ٪ من خسارة الأسنان يكون سببها مشاكل في العصب السني واللثة.

من شأن أمراض الأنسجة المحيطة بالأسنان الحادة أن تؤدي إلى تدمير الأنسجة الداعمة مما ينتج عنه مزيد من الانخفاض في نجاح علاج امراض اللثة وعصب الأسنان المشتركة أو حتى الى ان تكون ميؤوس منها. تسلط هذه الورقة الضوء على حالة السن مائل الى الجهة اللسانية مع آفة لثوية ولبية مشتركة ، والتي تمت معالجتها باستخدام تدابير لبية ولثوية. تعتمد المعالجة الناجحة لمثل هذه المشكلات على امتثال المريض للخطة العلاجية وإمكانية ترميم الأسنان وفعاليتها في الحصول على نتيجة جيدة وسليمة للخطة العلاجية.

**الكلمات المفتاحية:** لثوي, افة ذروية, طعوم عظمية, .زرعة لثوية منفصلة

## Background:

The merging of periodontal and endodontic disease has created much confusion amongst most of the dental practioners regarding the diagnosis and its treatment plan. More than 50% of tooth mortality faced in the present clinical cases today manifest both Pulpal and Periodontal problems [1].

Simring and Goldberg in 1964[2] were the first to describe the relationship between periodontal and pulpal disease. From then onwards the term "perio-endo lesion" was used to explain the lesions with varying severity of inflammation found in both periodontal and pulpal tissues [2].

Inflammation and pulpal necrosis are initiated by dental caries, faulty restoration, iatrogenic trauma caused due to irritation of pulpal irrigants used and thermal stimulation. As the root canal system is a low compliance system, an increased intrapulpal pressure may cause toxic agents to be expressed through

patent canals and dentinal tubules which can result in retrograde periodontitis. Abscess formation follows periodontal inflammation which spreads through the connecting pathways between the pulp and periodontium. The abscess may drain through a fistula resulting in destruction of the periodontal ligament and adjacent alveolar bone involving the entire root of the tooth involved. Periodontal occlusal trauma may cause pulp ischemia, especially in teeth with greatly reduced periodontal support [3, 4].

Mostly the tooth with a true-combined lesion with severe periodontal destruction will have a poor or hopeless prognosis. The prognosis of tooth with severe periodontal destruction can be improved by regenerating the damaged periodontal tissue including periodontal ligament, cementum and the alveolar bone which can be achieved by bone grafts and guided tissue regeneration membrane [4].

This paper highlights on a case report on a tooth with a combined lesion which has been treated using both endodontic and periodontic measures. The case was treated endodontically followed by periodontal treatment using bone graft, and guided tissue regeneration membrane. Further a second stage surgical procedure was attempted with platelet rich fibrin and gingival graft to widen the keratinized gingiva.

**Case Report:**

A 25 year old male patient was referred to Periodontics department, Meenakshi Ammal Dental College from the Department of Oral Medicine and diagnosis. The patient complained of excruciating pain and swelling in relation to lower right posterior region. The patient reported with a history of fall from his bike four days before he reported to the clinic. Past dental history of the patient indicated that the patient experienced dull pain in relation lower right posterior region before and did not consult any dentist for the past four months. The patient noticed mobility in relation to 45 after the accident.

Palpation of attached gingiva revealed pain and inflammation with expulsion of pus through gingival sulcus in relation to 45. (Fig.1). An abnormal painful response to percussion on 45 indicated the inflammation of periodontal ligament which could be of pulpal or periodontal origin. The tooth was lingually inclined and presented with plaque and calculus. Cold test using ice sticks were performed to check the pulp vitality which indicated no response and the results were confirmed using pulse oximeter[3], hence the pulp of 45 was considered to be non-vital.



A



B

Fig.1

(A) Intraoral swelling in relation to 45. (B) Intraoral periapical radiograph in relation to 45

Periodontal examination in relation to 45 revealed a pocket depth of 7mm, clinical attachment loss of 10 mm and Grade II mobility. Radiographically, a vertical defect extending till the apex was found in relation to the distal aspect of 45. The case was diagnosed as combined perio – endo lesion with acute periodontal abscess in relation to lower right second premolar tooth.

Following the drainage of the periodontal abscess, the patient was advised to take antibiotics and analgesics. The tooth 45 was temporarily splinted and referred to the Department of Endodontics for endodontic therapy. [5] Patient was recalled after a week and complete scaling and root planning was initiated.

Periodontal examination after a month revealed a pocket depth of 5mm and clinical attachment loss of 8 mm in relation to 45 .Surgical management of intrabony defect was attempted using bone graft [6,7] and guided tissue regeneration(GTR) membrane [8]. Full thickness mucoperiosteal flap was reflected using horizontal sulcular incision and two vertical releasing incisions extending beyond mucogingival junction along the 44 and 46. Root debridement was done in relation to 45 followed by placement of porous hydroxyapatite bonegraft (periobone G) and bioresorbable GTR membrane (Healiguide). (Fig. 2)



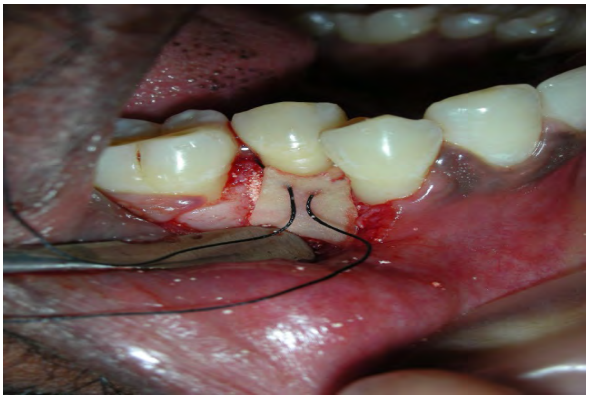


Fig.2 A B

(A) Placement of periobone G (alloplastic bone graft) in relation to 45. (B) Guided tissue regeneration membrane (Healiguide) in 45

Periobone G is synthetic hydroxyapatite (Periobone G, top- notch health care products pvt. Ltd, kerala) it is biocompatible and osteoconductive bone repair material. This was followed by placement of guided tissue regeneration membrane [9,10] (Healiguide, Advanced Biotech Products Pvt Ltd, Chennai).

A thin type I collagen based membrane, Healiguide was used for guided tissue regeneration procedure, to enhance the formation of new alveolar bone. Resorbable ethicon suture was used to stabilize the membrane which was followed by placement of non resorbable ethicon suture, for the closure of the flap. The surgical site was protected using periodontal pack. Patient was given post operative instructions, and 0.12% chlorhexidine rinse was advised as home oral care regimen for two weeks. After two weeks the sutures were removed and healing was found to be adequate.

Periapical radiographs taken at 4 month after placement of bone grafts , revealed bone fill in relation to 45 (Fig. 3) but the recession was left uncovered as the tooth was lingually inclined. The width of the attached gingiva in relation to 44 and 45 was also insufficient for coronal advancement of the flap. The periodontal pocket depth was reduced to 3mm and the clinical attachment loss was found to be 6mm in relation to 45.

A) Postoperative clinical presentation after 4 months. (B) Post-operative radiograph after 4 months shows adequate bone fill

After 4 months of initial surgery, second surgical attempt was planned to increase the width of the attached gingiva by using a free gingival graft with plasma rich derivative (PRF) [11].

Prior to the surgery, PRF was obtained by centrifugation of the patient's whole blood [12]. The recipient site was prepared first by de-epithelization of the area of 44 and 45 regions. Free gingival graft was obtained from the palatal aspect of 24 and 25 regions. The prepared PRF membrane, (Fig 4) followed by free gingival graft were placed and stabilized






Fig. A B

in relation to 45 followed by placement of Coe-pac. Patient was recalled after two weeks and it was found that along with the increase in width of the attached gingiva, root coverage of 2mm was achieved.

(A) Second stage surgery-Plasma rich derivative placed in 45. (B) Postoperative healing after 1 month shows increased width of keratinized tissue

The treatment was successfully completed by giving a full ceramic crown restoration, in alignment with the adjacent teeth after 8 months of initial surgical procedure. (Fig.5.A) Radiographically, adequate bone fill on the distal aspect of 45 was noted after eight months. (Fig.5.B)







**Fig.4.** **A** **B**






**Fig.5.** **A** **B**

*(*A) Full ceramic crown placed in relation to 45. (B) Post treatment radiograph after 8 months

## Discussion

Various factors contribute in healing following periodontal therapy, like post-operative oral hygiene and effective treatment method. Recent studies have demonstrated that infection of root canal can have a negative influence on the healing of periodontal tissues [13]. Studies comparing the effect of scaling and root planing on teeth with periapical lesions and without periapical lesions demonstrated a significant reduction of probing depth overtime in cases without periapical compared to teeth with periapical infection. This clearly suggests that root canal can serve as a bacterial reservoir, maintaining periapical inflammation further favoring marginal inflammation [14].

In this case, it was seen that the outcome of endodontic treatment followed by flap surgery along with bone regeneration therapy, could reduce the grade II mobility in 45 to less than grade l. There was a reduction in the probing depth from 7mm to 3 mm. The biological principle proposed by Melcher et al on the use of guided tissue membrane was based upon the use of mechanical barriers to prevent the unwanted cells and allowing the selective periodontal ligament cells to re-populate on the root surface [10]. Healiguide (guided tissue regeneration membrane)[9] was used in the present study along with porous hydroxyapatite (Periobone-G)[6] for periodontal regeneration. For regenerating an infrabony defect, the space between the root surface and the GTR membrane has to be filled with a blood clot further allowing the migration of periodontal ligament cells into the wound area from the residual ligament [7].

In this present case, during the second stage surgery, an attempt was made to cover the gingival recession. A Platelet–rich derivative (PRF) was used along with free gingival graft to cover gingival recession and to increase the width of the attached gingiva [9]. Study done by Okuda K et al in 2003, demonstrated that fibrin-rich clot , Platelet- rich plasma (PRP)contain several growth factors, like platelet derived growth factor (PDGF) and transforming growth factor-beta (TGF-beta), responsible in stimulating fibroblastic and osteoblastic proliferation [15]. Various mechanisms are involved in the action of Platelet rich plasma on periodontal ligament cells. Firstly, PRP contains fibrinogen which is cleared by serine protease thrombin produced by periodontal ligament cells and converts it to insoluble fibrin. Secondly, the formation of fibrin clot is enhanced by a components derived from the platelets. Thirdly, fibrin clot stimulates the synthesis of type 1 collagen. Finally the growth factors contained in the PRP like PDGF and TGF-beta was capable of promoting PDL cell proliferation. Henceforth PRP supported in periodontal regeneration by increasing the numbers of progenitor cell of the periodontal ligament in the healing site and simultaneously up-regulating collagen matrix production. All these factors

promoted wound healing in the area of damaged periodontal tissue.

A free gingival graft was used along with PRF in order to cover the recession and to attain adequate vestibular depth. It was found that PRP on combination with free gingival graft decreased post operative bleeding, enhanced soft tissue healing, promote initial stabilization and revascularization of the graft, and reduced post operative infection and graft sloughage. [9,15] Post operative results after eight months of initial surgical procedure indicated increased vestibular depth with 80% coverage of the root in relation to 45, since it was lingually inclined. The outcome of two stage surgical therapy resulted in reduction in probing depth from 5 mm to 3mm, and clinical attachment loss was reduced from 8mm to 4.5 mm. After the second surgical procedure, the gingival recession of the tooth was also reduced from 3mm to 1.5mm. Overall the clinical attachment gain for the tooth was achieved due to the combined treatment modalities attempted for hard tissue as well as soft tissue regeneration. The prime factor beneath any successful therapy depends on the patient cooperation and post-surgical maintenance therapy. The patient was reviewed regularly and the lingually placed tooth (45) was restored with full ceramic crown in alignment with the adjacent tooth.

Systematic review on the endodontic periodontic lesions have pointed out that success in treatment depends on the identification of the etiology, controlling of microbacteria and the immunological response of the individual towards the infection. The prognosis of the lesion depends on the origin of the infection, whether it's from endodontic or periodontal and the persisting supporting tissue surrounding the tooth [16].

## Conclusion

Inspite of complex and varied pathogenesis of combined endo-perio lesion, the primary goal of any treatment effort must be to rid the patient of the infection. This case report suggest that treatment creditability of combined endo-perio lesion, despite of having a questionable prognosis, depended on patient co-operation, restorability and economics, which helped in taking treatment decisions.

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**Conflict of interest:**
there are no conflicts of interest

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