

## Pulp Orperiodontium??-Diagnosis and Management of Endo - Perio Lesion.

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**Abstract:** A female patient of 16 years of age reported with a chief complain of severe pain , swelling and pus discharge with respect to right lower back tooth region since two days, with a previous history of sensitivity to hot and cold. On the basis of case history ,clinical and radiographic findings case was diagnosed as primary endodontic lesion with secondary periodontal involvement, and was decided to treat it first endodontically followed by periodontal surgery based on the principles of periodontal regeneration by using synthetic bonegraft and resorbable GTR membrane. At the end of 6 months the case showed the positive results with gain in both soft and hard tissue parameters .

**Key Words:** Perio-endo lesion, Secondary Periodontal Lesion. Ectomesenchymal, GTR

### I. Introduction

The endo-perio lesion is a condition characterized by the association of periodontal and pulpal disease in the same dental element. A perio-endo lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. Knowledge of these disease processes is essential in coming to the correct diagnosis. Simring and Goldberg (1964) were first to describe the relationship between periodontal and pulpal diseases<sup>(1)</sup> Since then, the term 'perio-endo lesion' has been used to describe lesions due to inflammatory products found in varying degrees in both periodontium and pulpal tissues.

The intimate anatomic and vascular connection between the pulp and the periodontium is studied in great detail by the Periodontists and the Endodontists . Dental pulp and periodontium have embryonic, anatomic and functional inter-relationships<sup>(2)</sup> They are ectomesenchymal in origin, the cells from which proliferate to form dental papilla and follicle , which are the precursors of the pulp and periodontium, respectively. They are separated by the formation and development of tooth bud from the overlying ectoderm into enamel and dentine<sup>(3)</sup> The dental pulp and periodontal tissues are inter-related. Both are separated by Hertwig's epithelial root sheath. There are two main pathways for the bacteria and their products connecting the two tissues: anatomical and nonphysiological<sup>(4)</sup> the anatomical pathways include apical foramina, accessory canals and the dentinal tubules. While the nonphysiological pathway includes iatrogenic root canal perforations due to various causes eg. powered rotary instruments , improper manipulation of endodontic instrument and vertical root fractures Dental injuries or trauma may take on many shapes but generally can be classified as enamel fractures, crown fractures without pulp involvement, crown fractures with pulp involvement, crown-root fracture, root fracture, luxation, and avulsion<sup>(5)</sup> Treatment of traumatic dental injuries varies depending on the type of injury and it will determine pulpal and periodontal ligament healing prognosis The most commonly used classification was given by Simon, Glick and Frank in 1972<sup>(6)</sup> According to this classification, perio-endo lesions can be classified into:

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

Regenerative periodontal surgery provides more predictable result for the regeneration of lost periodontal structures. Recently various modalities e.g .guided tissue regeneration (GTR), autologous concentrate have been tried, like platelet rich plasma (PRP) and platelet rich fibrin (PRF) in combination with bone graft for the regeneration which showed better clinical result. The other contributing factors in new

attachment includes various growth factors (fibroblast growth factors, platelet derived growth factors, insulin like growth factors, transforming growth factor, epidermal growth factors and certain attachment proteins) and various root conditioning agents.

## II. Case Report

A 16 years old female patient reported with the chief complaint of severe pain , swelling and pus discharge with respect to right lower back tooth region since two days,with a previous history of sensitivity to hot and cold. On clinical examination a large carious lesion with a localized peri apical sinus opening was present along with gingival inflammation i.r.t.46. On periodontal examination there was no mesial or distal probing pocket depth and even midbuccal vertical probing depth(VPD) with UNC-15 was only about 4mm .These finding gives a diagnosis of purely endodontic lesion however the horizontal probing depth(HPD) in midbuccal area of 46 with Nabers probe was around 7mm gave us a suspicion of periodontal involvement also. The tooth respond to vertical percussion tests. It neither responded to the electrical pulp test nor thermal tests .In order to rule out the exact condition patient was advised an radiograph .i.r.t46( IOPAR) .Radiographic examination also revealed a large carious lesion involving the occlusal surface of the tooth ,the wide periapical radiolucency present at the apex of the mesial root which was in also found to be in continuation of mesial part of whole root along with wide area of furcation involvement showing a large amount of periodontal bone loss suggestive of grade III furcation involvement(fig-1).This extensive amount of bone loss along with above clinical findings gives a suspicion of endo- perio lesion according to Simon, Glick and Frank in 1972 .On the basis of above history,clinical and radiographic features we land up on the diagnosis of primary endodontic lesion with secondary periodontal involvement .



Figure 1: Pre-operative Radiograph

As per the diagnosis as well as emergency condition patient was advised endodontic treatment first followed by a surgical intervention if required for the maximum correction of osseous defect with bioresorbable, guided tissue regeneration (GTR) membrane and biosynthetic bone graft .

### Endodontic treatment

Since pain and sinus opening was present at the apex of the 46,so access cavity was made on the same day, canal was dressed temporarily with calcium hydroxide and the access cavity sealed with temporary filling cement. The patient was asked to stop all analgesic drugs and was given an appointment in seven days to continue the root canal treatment if the condition become asymptomatic and stable. After one week in the absence of all symptoms finally the endodontic treatment was completed with gutta-percha and a root canal sealer. However after three months of post endodontic treatment, periodontal examination showed negligible change in probing pocket depth. Radiographically also there was no gain in osseous defect. So a decision to treat the soft tissue and to correct the osseous defect surgically was taken.

### Surgery

Prior to surgery a pre-surgical rinse with chlorhexidine was done in order to maintain asepsis during entire surgical procedure. Local anaesthesia 2%lignocaine containing adrenaline at a concentration of 1:80,000.was given. Intracrevicular incision was given along with vertical releasing incisions on buccal aspect and only intracrevicularincision on lingual aspect for a better access, and to achieve a better closure of the surgical site. Mucoperiosteal flaps were raised buccally and lingually. All granulation tissue were removed from the defect which upon through cleaning showed the large osseous defect[Figure 2].



Figure 2: Defect after debridement buccally& lingually

The defect was through- n- through as assessed by a Nabers probe and gave a confirmation of grade III furcation involvement. Roots were thoroughly scaled and planned using the hand instruments followed by root conditioning with tetracycline both buccally and lingually. The defect was filled with bone graft i.e. bioactive ceramic composite granule with particle size of 0.15-0.50mm both buccally and lingually. The graft material was moistened in sterile saline for 5min before placement into the defects, care was taken not to overfill the defect. Following bone grafting an aluminum foil template was trimmed and adapted over the entire defect 2-3mm of the surrounding alveolar bone both buccally and lingually [figure 3]. After the preparation of the template a membrane of the same size and shape *i.e.* 2-3 mm of the surrounding alveolar bone was trimmed and was placed over the defect both buccally and lingually and was secured with 5-0 vicryl resorbable suture material in order to ensure stability of membrane and the graft material positioned below it. Finally the mucoperiosteal flap was repositioned and sutured at the original level using 3-0 silk with an interrupted horizontal mattress suturing technique. Periodontal dressing was placed over the area.



Figure 3 : Membrane placed after root condition

Immediately after surgery post operative instructions were given. Patient was prescribed antibiotics and analgesic. The postoperative care consisted of 0.2% chlorhexidine rinse twice daily for 4 weeks. The recall appointments consisted mainly of reinforcement of oral hygiene measures and professional supragingival tooth cleaning. All presurgical measurements were repeated after 6 months. Patient was totally asymptomatic in 6 month follow up [figure 4]



Figure 4 : post-operative Radiograph after 6 months

### III. Discussion

Though the definitive diagnosis in the endo –perio lesion is often difficult to give, however the above case on the basis of the clinical and radiographic findings was diagnosed as primary endodontic lesion with secondary periodontal involvement as per Simon classification [6]. The points in favour of above diagnosis were -

1. Sensitivity to hot and cold
2. Large carious lesion (Figure-1)
3. Peri apical sinus (the location is more in favour of periapical abscess than periodontal abscess as it is present at the root apex.
4. Pulp vitality test showed it non- vital
5. Clinically no probing depth at interproximal areas except 4mm (VPD) in midbuccal and 7mm in horizontal probing (HPD)
6. During surgical intervention the intact crestal bone both on mesial and distal aspect again support for no interproximal pocket depth.
7. Radiographically a large periapical lesion along with grade -III furcation area radiographically suggestive of secondary periodontal involvement.

It has been observed that down growth of epithelium along the tract can result in a periodontal pocket if the acute periapical drainage becomes chronic and drainage through the gingival sulcus continues and thus a secondary periodontal disease may complicate the lesion [7].

Regarding endoperio lesions which treatment should be initiated first is always discussed as a controversial topic. In general, when primary disease of one tissue *i.e.* pulp or periodontium is present and

secondary disease is just starting ,treat the primary disease first[8].However when it comes to acute or chronic conditions the treatment should be done accordingly. In acute conditions the source of the pain and /or swelling should be traced out first and should be treated as first priority irrespective of endodontic or periodontal involvement. However when secondary disease is established and chronic, both primary and secondary disease must be treated .

However it is seen that by an large endodontic therapy proceeds the periodontal therapy[9]. Whenever there is a communication between the lesions of the two diseases i.e endodontic or periodontic it is often difficult to access which pathology involvement has affected the periodontium tissue more .So whenever such conditions persist and it's difficult to diagnose the initiating pathology ,under that circumstances it is preferable to medicate the root canals until the periodontal treatment has been completed as it is often seen that the use of nontoxic intracanal therapeutic medicaments is beneficial to destroy bacteria and help in tissue repair.

This case presents with severe pain of endodontically involved teeth so priority was given to the endodontic treatment first followed by a period of observation in order to assess, extent of periodontal healing resulting from the endodontic treatment . The main aim behind observation period is to look for the positive changes in soft and hard tissue as the probing depth was expected to reduce within couple of weeks though bone regeneration requires several months before it can be radiographically detected. In present case the obturation was uneventful and patient was asymptomatic even after six months of follow up, but the progress regarding the soft tissue and hard tissue was almost at the same level except with negligible amount of change which was present in the initial stages. So a decision for periodontal surgical therapy was taken after three months of observation. The prognosis of an affected tooth can be improved by increasing bony support which can be achieved by bone grafting[10] and guided tissue regeneration[11].Several studies has been reported in literature where combination therapy i.e. the use of grafting materials in along with bioresorbable barrier membrane was implemented for different type of osseous defects and mixed results were seen. The results of combination therapy as used by Lekovic et alfor the treatment of mandibular degree II FURCATION concluded that there is a greater extent of furcation fill , thus supporting a possible added benefit for the use of grafting materials in combination with boiresorbable barrier membrane[12].

Finally the periodontal bone loss was treated with bone grafting and guided tissue regeneration using a bioresorbable GTR membrane .The patient after a follow up of 6 months showed both gain in soft and hard tissue parameters[figure 4]. The results of the above case with combine therapy endodontic and of bonegraft with GTR resulted in a significant amount of bone fill and reduction in HPD .

#### **Take Home Messages**

1. Primary endodontic diseases usually heal following root canal treatment. However the repair and regeneration of periodontal tissues in combine lesion is unpredictable.
2. In cases of primary endo and secondary periodontal involvement case, only endodontic treatment alone is not sufficient for most of the time to resolve periodontal problem..
3. The tooth, and its surrounding tissue act as a single biological unit. They all are interconnected in relation to their health, and desiese. A proper treatment plan and follow up required for better prognosis.

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