

# Management of Endo-Perio Lesion: A Case Report

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**Abstract:** One of the most challenging problems encountered by the clinician is the endo-perio lesion. It is a perplexing problem faced in diagnosing the lesion and a dilemma as to which part of the lesion to be addressed first. There are various schools of thought as to which approach to take in managing such lesions. Some say endodontic lesion is to be addressed primarily and other school advocates for treating periodontal lesions first. To address this issue, a proper diagnosis is to be formulated which can only be achieved by recording a comprehensive history and meticulous examination of the defect. Examination of the endo-perio lesion involves thorough clinical assessment, radiographic assessment, vitality testing, root fracture assessment without which a firm diagnosis and complete treatment plan cannot be made. The lesion can only be treated if it is classified correctly and many authors over many decades have proposed various classification which has helped in categorizing the lesion and planning the management of the same. One such classification is Simon classification (1972) which classified the lesion into primary endo, primary perio, and combined endo-perio lesions. This gave an insight to the clinicians as to which part of the lesion to treat first to achieve favorable results. This case report discusses the management of an endo perio lesion.

**Index terms:** Endo-Perio lesion, Primary-endo, Primary-perio, Combined Endo-perio

## I. Introduction

For many years there was a dilemma on the interrelationship between endodontic and periodontal disease. According to the data, pulpal and periodontal diseases are responsible for more than 50% of tooth mortality. Sometimes the patient may present with a condition where both the lesions are present simultaneously in the same tooth. This leads to a state of confusion for the clinician to formulate a diagnosis and to determine which condition to give priority. The diagnostic criteria used to distinguish between a disease that may have originated from the pulpal necrosis or

from attachment loss are not always sufficiently specific to allow determination of the disease etiology. To understand this complicated disease, it is important to understand the anatomy and the structures of the tooth which are affected and the role they play in propagating the lesion in a certain direction so that they become primary-endo or primary-perio. There are times when both lesions occur concurrently, these types of lesions are called Combined perio-endo lesions and the clinician must determine the causative factor of the established lesion and the route of infection to plan the treatment accordingly. There may be certain conditions where the destruction of the tissue has already started and the other may have contributed to the disease later on. Hence, it is critical in the case of perio-endo lesion to diagnose the case and make a treatment plan for the same. Hiatt (1977) has suggested that such lesions be considered endodontic in nature for treatment planning purposes, since endodontic therapy alone may resolve the lesion. [1] However, resolution of the defect is highly dependent on the primary source and the chronicity of the lesion; treatment may eventually involve both endodontic and periodontal treatment according to Benenati et al (1981). [2]

To establish correct diagnosis, it starts with recording clinical case history followed by clinical examination of the affected tooth and surrounding region by inspection of the area, this can be done by direct vision, indirect vision or also under assisted vision or magnification using loupes or microscope to detect for any presence of decays and infiltrated restorations, lines of fracture, dyschromia, all related elements to pulpal diseases and possible fractures.

Palpation is done to assess for any tenderness in the mucosal region covering the root surface and the apical region for any infection, any signs of inflammation which is frequently associated with endodontic lesion and sometimes with periodontal lesions as well.

Percussion of the involved tooth will give clarity on the area the inflammation is present as

positive lateral percussion is suggestive of periodontal involvement and vertical percussion is a sign of endodontic involvement.

Evaluation of the tooth mobility is suggestive of periodontal involvement due to the destruction of the supporting structures like periodontal ligament, cementum and alveolar bone leading to abnormal movement of the tooth in the alveolar socket.

Clinical tests are imperative for obtaining a correct diagnosis and differentiating between endodontic and periodontal disease. The extraoral and intraoral tissues are examined for the presence of any abnormality or disease. One test is usually not sufficient to obtain a conclusive diagnosis. Radiographic examination of the lesion is one of the important assessment tools to guide the type of tissue involved i.e. pulpal, periodontal or both. Other tests like: Pulp vitality test, Cold test, Electric pulp testing, blood flow test, Cavity test, Restored teeth testing, Pocket probing, Fistula tracking, Lesion with narrow sinus tract-type probing, Cracked tooth testing with Transillumination, Wedging, Staining, Selective anesthesia can be done to determine and diagnose the lesion.

Classifying the lesion also plays an important role in treatment planning, hence various authors over many years have classified endo perio lesion and various ways. [3-9] The first classification of the endo perio lesion was given by Oliet and Pollock in 1968 [10] and after that, many classifications have been proposed for endo-perio lesion.

This case report discusses the management of an Endo-perio case with both endodontic treatment as well as periodontal surgical intervention.

## II. Case Report

A 49-year-old female patient reported to the division of Periodontology with a chief complaint of pain in the upper front tooth region with respect to 11 and 21 since 3 months. She also informed about the mobility of teeth 11 and 21 since 2 months. She noticed pus discharge from 21 region one month back for which she did not take any medication. The patient was a systemically healthy patient with no history of any dental treatment.

Intraoral clinical examination of the lesion was done by conduction a visual examination that revealed Non-carious teeth with respect to r.t 11

and 21, supragingival plaque and calculus, sinus tract in relation to 21, Midline diastema in 11 and 21 region. Gingival findings revealed generalized inflamed marginal gingival which was reddish-pink in color with greyish brown diffused melanin pigmentation, rolled out margins, soft & edematous in consistency, presence of bleeding on probing and attached gingiva showing loss of stippling. Periodontal examination showed deep periodontal pocket in relation to 21 (mesially – 09 mm, mid buccally – 11 mm, distally – 12 mm) and grade- 2 mobility of tooth 11 and 21. Radiological examination was done and IOPA revealed interdental bone loss mesial of tooth 11, mesial and distal of tooth 21. It also revealed a loss of interproximal contact (midline diastema) in between 11 and 21.

A diagnosis of Primary periodontal lesion with a secondary endodontic lesion in relation 21 with a periodontal abscess in relation to 21 was established, According to the classification proposed by Simon et al, 1972 [11] based on clinical and radiological examination.

According to Rotstein et al in 2004, lesion should be first treated endodontically along with Phase-I of periodontal therapy i.e. scaling and root planning. [12] Further management of the lesion should be carried out post-evaluation after 2-3 months as suggested by Parolia et al in 2013. [13]

Treatment Plan was formulated and was divided into different phases. Periodontal therapy consisted of scaling and root planning; Correction of brushing technique; Patient Motivation; Oral Hygiene instructions, Occlusal correction for the TFO in relation to 11 and 21. Subsequently, Root canal therapy was carried out in relation to 21. The access cavity was prepared in 21 using No 2 - round bur and No 4 - tapered fissure bur. A working length radiograph was taken and one canal was compensated in 21 using # 15 K-file (Kerr Manufacturing Co.TM). Biomechanical preparation of the canal was done using crown- down technique using stainless steel files and pro-taper system till #F2 file under copious irrigation with saline, 5.25% sodium hypochlorite solution and 17% EDTA (GlydeTM File Prep, Densply France). After BMP was done, canals were dried using absorbent paper points (DentsplyTM Maillefer) and the inter-appointment dressing was done with calcium hydroxide and temporary filling (cavit 3M, ESPE) was placed. The patient was recalled after 10 days and calcium hydroxide was removed from the canals using EDTA and sodium hypochlorite 5.25% after which canal was irrigated with normal saline and dried using absorbent paper point and obturated with corresponding # F2 gutta-parch point/cone of Pro-taper systemTM by cold lateral

compaction of the gutta-percha using root canal sealer. The access cavity was sealed using glass ionomer cement (Fuji IITM, GC Corporation, Japan). Post obturation IOPA was taken to assess the completed root canal therapy. (Fig 8) After the endodontic therapy was completed, splinting of the mobile teeth were done using composite resin reinforced with Co-axial wire from 13 to 23 to reduce the occlusal load and mobility of the teeth and also to stabilize the teeth in form & function by distribution of the occlusal forces. After one week the patient was recalled for assessment of the tooth.

After adequate maintenance phase, periodontal surgery consisting of open flap debridement in relation to 11, 21 and 22 regions was planned. Patient was anesthetized with 2% Lidocaine with 1:80,000 epinephrine by giving Nasopalatine nerve block, Infraorbital nerve block on both left and right side of the face following which a full-thickness mucoperiosteal flap was raised by giving crevicular incisions from 11 to 22 and two releasing incisions i.e. distal to 11 and distal to 22 from the line angle of the tooth was given extension till alveolar mucosa for ease in reflection and better repositioning of the flap. (Fig 9) Bony defects were debrided of any granulation tissue using curettes (#1- #2; #3 - #4 GraceyTM curettes) Residual calculus and altered cementum was removed using a curette and pocket lining were removed. After thorough root planning and complete removal of the granulation tissue, residual calculus, altered cementum, root surface was assessed to be smooth and shiny and free of any debris.(Fig 10) The flap was readapted, approximated and stabilized with simple interrupted sutures using 3-0 silk sutures. (Fig 11) Post-operative instructions were given to the patient and medication i.e analgesics (Tab ibuprofen 400mg thrice a day) was prescribed for 3 days. The patient was asked to maintain good oral hygiene and use of 0.2 % chlorhexidine mouthwash twice a day for 07 days. The patient was recalled after 1 week for the removal of the suture.

On the assessment of the surgical site after one week, the site showed uneventful healing and sutures were removed and the patient was put on the maintenance phase and was recalled for follow up according to Merin's classification for recall assessment. Reassessment of the region was done after 2 months and after 3 months post periodontal surgery. Periodontal pockets were reassessed by probing. Mobility was checked by the digital method of assessment of mobility using the blunt end of the mouth mirrors and finger/digit. Reinforcement of plaque control; re-assessment of plaque and calculus; re-assessment of mobility; reinforcement of oral hygiene instruction and

brushing technique was carried out in each maintenance visit.

Evaluation of the lesion was done after 3 months post flap surgery. On examination, it was observed that the patient was keeping good oral hygiene. There was an absence of bleeding on probing in relation to 11,21 and 22 region. Resolution of the inflammation was observed and a considerable amount of reduction in the periodontal pocket depth in 21 region from previously mesial – 09 mm, mid buccal – 11 mm, distal – 12 mm to mesial – 02 mm, mid buccal – 02 mm, distal – 02 mm.(Fig 13, 14) On examination it was also observed that color of the gingiva was coral pink with melanin pigmentation, marginal gingiva was knife-edge in contour, firm and resilient in consistency, position of the marginal gingiva which was previously at CEJ has shrunk below CEJ approximately 3 mm as a compensation to the resolution of the inflammatory component and removal of the granulation tissue. IOPA was taken which revealed a decrease in radiolucent areas in relation to 21. The healthy tissues show signs of resolution of signs of inflammation and reattachment. (Fig 15) The mobility component reduced from Grade-II to Grade-I in tooth 11 and 21. This healthy tissue helps in regeneration and creeping attachment.

#### IV. Discussion

Tissues of periodontium and pulpal tissue share a common embryonic origin. The origins of both the tissue are mesodermal. Subsequently, the development takes one from the dental papilla and other from the dental sac. The inter-relationship between both is unique and closely related. Simring and Goldeberg, 1964 [14] elaborated the inter-relationship between the periodontal tissues and the endodontic tissues and has aroused a lot of controversies, speculations, and confusion regarding the same. A true Endo-perio lesion (EP) or true combined endo-perio disease is when the pulpal lesion communicates with the periodontium via apical foramina, lateral canals or through furcation. Harrington and Steiner [15] also defined an Endo perio lesion as a non-vital tooth that shows the destruction of periodontal attachment reaching the whole way to the root apex or a lateral canal, for which both root canal treatment and periodontal therapy are required.

The sequelae of endodontic involvement and periodontal disease are increased periodontal probing depths, localized gingival inflammation or swelling, bleeding on probing, suppuration, fistula formation, tenderness to percussion, increased tooth mobility, angular bone loss, and pain.

Classifying the endo-perio lesion is a challenge for the clinician as the disease remains symptom-free and only expresses once the acute exacerbation of it happens. This exacerbation can be due to the pulpal involvement presenting as a periapical abscess or as periodontal involvement as a periodontal abscess or dull groaning pain pathognomonic of periodontal pocket pain. According to Simon et al 1972, endo-perio lesion can be classified into Primary endodontic lesion, Primary endodontic with secondary periodontal involvement, Primary-periodontal, primary periodontal with secondary endodontic involvement, or True combined lesion. The latest classification is given by the world workshop of Periodontology in 2017 divided the lesion into two according to etiology. [16] First, endodontic and/or periodontal infections and second, trauma and/or iatrogenic factors. Endo-perio lesion caused due to endodontic and/or periodontal infections can be triggered by a carious lesion that affects the pulp and, secondarily, affects the periodontium, or by periodontal destruction that secondarily affects the root canal; or by both events concomitantly. Whereas endo-perio lesion caused due to trauma and/or iatrogenic factors can be triggered by root/pulp chamber/furcation perforation; root fracture or cracking; external root resorption; pulp necrosis draining through the periodontium.

It is important for the clinician to diagnose the case as it helps in treatment planning and further management of the case. Management of the cases with Endo-perio lesion most of the time begins with root canal therapy and rarely it requires initial periodontal intervention. But at times of periodontal abscess complicates the clinical scenario with pain and discomfort. The same needs to be addressed by incision and drainage to overcome the acute symptoms. Most of the endo perio cases resolve with good prognosis and follow-up shows reduction in the periapical radiolucency. In cases with primary-perio and combined lesions, periodontal surgical intervention becomes inevitable for success and good prognosis of the tooth/teeth. Flap surgery/ Open flap debridement, removal of the remaining calculus, altered cementum and removal of the granulation tissue reduce the inflammation in the region and healthy tissue can be achieved and regeneration can be attempted.

## V. Conclusion

Endo-perio lesion is a complicated disease that requires a meticulous diagnosis and schematic treatment planning. Comprehensive management of the lesion will lead to a better prognosis of the involved tooth/teeth. This can only be achieved with proper case selection, history taking, clinical

examination, and vitality testing and reaching to a proper diagnosis. Management of such lesion is made easy once proper protocols are followed and care is taken for both pulpal and periodontal tissues and follow-up of the case is done. Hence, an interdisciplinary approach is a boon for the management of endo-perio lesion for successful management of such lesions.

## Appendices

Appendix 1: Fig 1 , 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18

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## Appendix 1



Fig 1 – Pre op presentation of the patient



Fig 2 – Pre op periodontal probing showing 10 mm using UNC 15 w.r.t. 21 (mesial)



Fig 3 - Pre op periodontal probing showing 11 mm using UNC 15 w.r.t 21 (mid-buccal)



Fig 4 - Pre- op periodontal probing showing 13 mm using UNC 15 w.r.t 21 (distal)

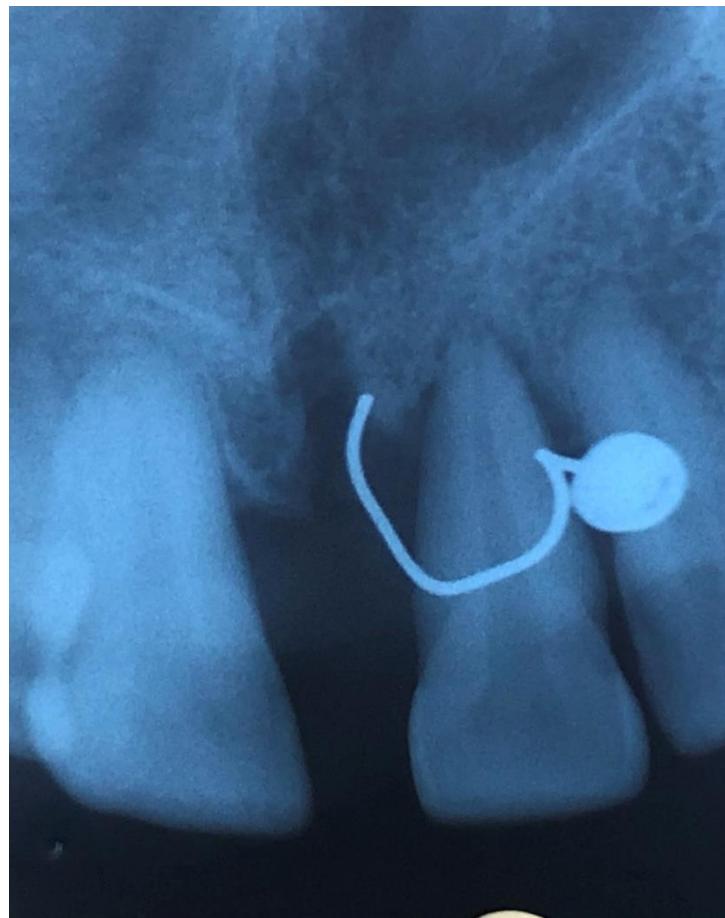


Fig 5 - Pre op IOPA w.r.t 21 showing periapical radiolucency

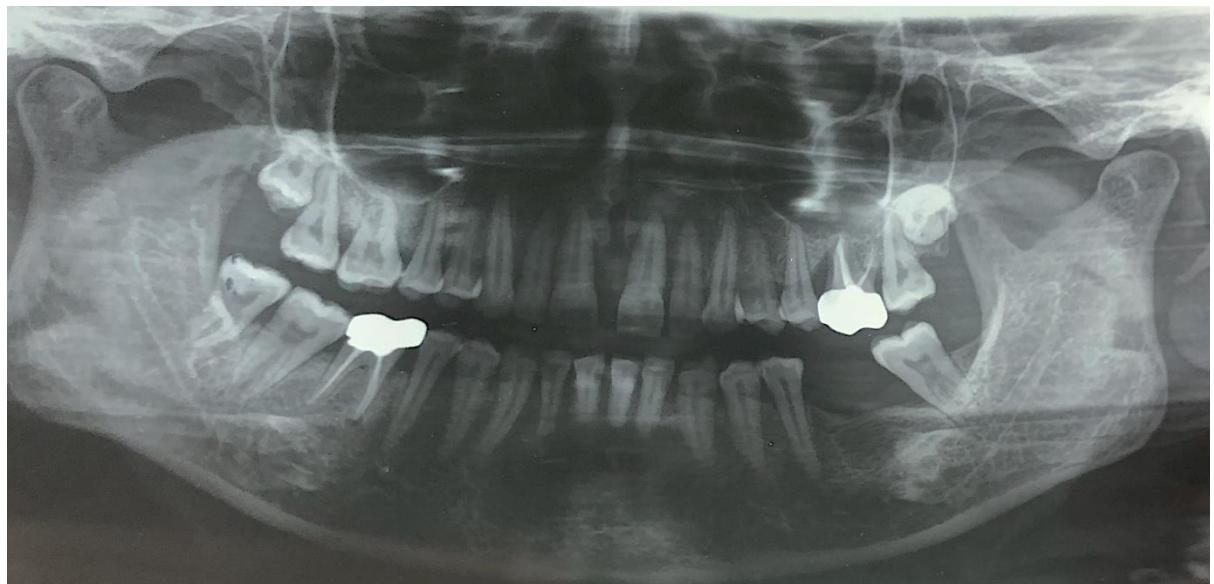


Fig 7 - Pre op OPG



Fig 8 – Root Canal Treatment done w.r.t 21



Fig 9 - Intra op – incision w.r.t 11, 21and 22 (crevicular and vertical release incisions)

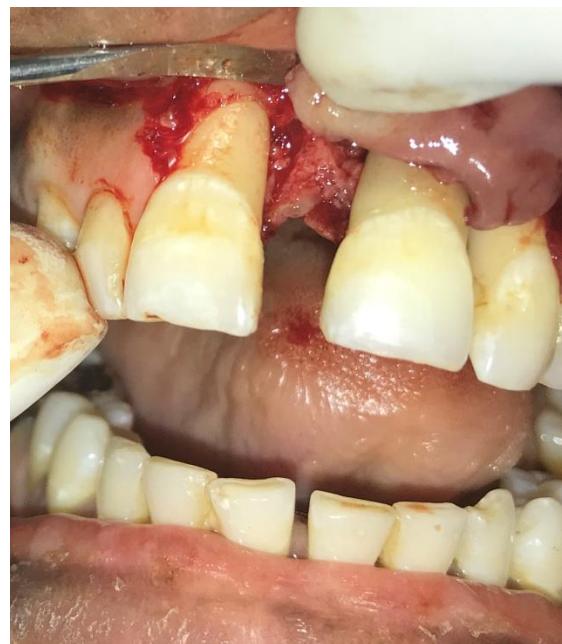


Fig 10 - Intra op – Flap reflection, debridement and scaling & root planning done w.r.t 11 and 21



Fig 11 - Flap approximation, stabilization and flap closure achieved using 3-0 silk sutures



Fig 12 - IOPA showing Splinting done w.r.t 13, 12.11,21, 22 and 23



Fig 13 - 3 months post op periodontal probing showing reduction to 2 mm w.r.t 21 (mesial)

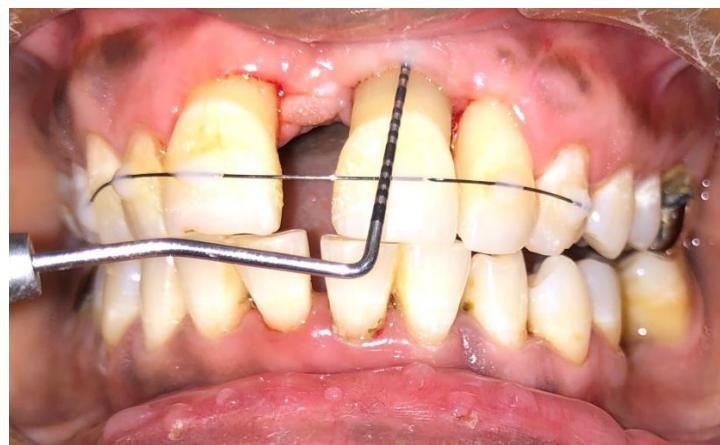


Fig 14 - 3 months post op periodontal probing showing reduction to 2 mm using UNC 15 w.r.t 21 (mid buccal)



Fig 15 - 3 months post op IOPA showing reduction in the periapical radiolucency



Fig 16 - 3 months post op



Fig 17 - 3 months post op



Fig 18 - 3 months post op