

## Surgical Management Of Endo-Perio Lesion using Bonegraft and Guided Tissue Regeneration - A Case Report

Case Report

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### Abstract

**Background:** Endo-perio lesion is the term given to describe the varying degrees of damage in both the pulpal tissues and periodontium due to the destructive lesions arising from the various inflammatory products. This clinical case report demonstrates the successful management of an endodontic-periodontal lesion with interdisciplinary treatment strategies.

**Case Report:** An endodontic-periodontal lesion with grade II mobility in a 30-year-old male patient is reported. Endodontic root canal treatment was done followed by periodontal therapy using bone graft and guided tissue regeneration [GTR].

**Conclusion:** Long-term clinical outcomes are more predictable when there is proper history, optimal diagnostic processes, treatment strategies, and intervals. Peri apical lesions with combined causes will need both endodontic & periodontal therapy.

**Clinical Significance:** Immediate and correct management of endodontic-periodontal lesions can hinder the loss of the involved teeth.

**Keywords:** Endo-Perio Lesion; Bonegraft; Guided Tissue Regeneration.

### Introduction

Endo-perio lesion is the term given to describe the varying degrees of damage in both the pulpal tissues and periodontium due to the destructive lesions arising from the various inflammatory products. Endo-perio lesions might be interdependent because of the vascular and anatomic connections between the pulp and the periodontium. The relationship between pulpal and periodontal disease was first described by Simring and Goldberg in 1964 [1]. In many cases it is easy to establish a diagnosis, but there are certain cases, where the situation becomes more complex, especially when it combines with periodontal disease [2].

Periodontal disease is a chronic inflammatory disease process that eventually leads to loss of periodontal attachment and an eventual, bone destruction. The objective of periodontal therapy is to regenerate the lost periodontal tissues. However, periodontal

regeneration requires a sequence of biological events including cell adhesion, migration, proliferation and differentiation [3]. It is quite essential to correct the periodontal defects caused in order to prevent recurrences and also to enhance and improve the form and function of the tooth [2].

The effect of periodontal inflammation on the dental pulp tissue is controversial [4-6]. The embryonic connections give rise to the anatomical connections which remain throughout the life of the tooth [7]. The apical foramen remains patent and serves as the communication through which the pulp tissues obtain nutrition and nervous innervations. Accessory canals also serve as a pathway for communication. The tubular communication between the pulp and periodontium tends to occur when dentinal tubules get exposed to the periodontium by the absence of overlying cementum. Pathological agents thus gain their entry through such pathways and create the disease process by passing between the

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pulp and the periodontium [8]. The treatment consists of correct diagnosis which can be achieved by careful history taking, examination and use of special tests [9].

Various treatment modalities have been proposed earlier for the treatment of endo-perio involvement including open flap debridement, root resection and retrograde filling, where healing is by scar [10]. Since this is not ideal, newer approaches such as regenerative procedures like guided tissue regeneration (GTR), bone grafts and growth factors that aim to restore lost tissue have been introduced.

Demineralized bone matrix (DBM) Xenograft is a bone inductive sterile bio resorbable material composed of Type I collagen. It is extracted from bovine cortical samples that results in non-immunogenic flowable particles of approximately 250µm that are completely replaced by host bone in 4-24 weeks. The Xenograft combination for periodontal regeneration therapy results in an interesting and effective clinically useful modality to the clinician in treating various periodontal osseous defects [11].

The ideal outcome of the surgical procedure should be regeneration of the tissues. This can be achieved with the application of guided tissue regeneration (GTR) technique. GTR works on the concept of cell occlusion, by restriction of rapidly proliferating epithelial and gingival cells. This promotes the repopulation of the surgical defect with periodontal ligament cells, which assists in the regeneration of tooth supporting tissues [12]. The principle of GTR can be successfully used, as an adjunctive technique in periradicular surgery [13-15].

Previously our team had conducted numerous studies which include *in vitro* studies [16-22] review [23-26], survey [27, 28], clinical trial [29], Case report [30]. This case report demonstrates successful management of endo-perio lesion using Bone graft and GTR.

## Case Report

### Examination

A 34-year-old male patient complained of mobility in the lower right back teeth region for the past 1 year. He gave a history of food lodging in the region for the past 1 year with dull pain. Medical history was noncontributory. On clinical examination, Grade II mobility was observed in 46 with no tenderness to percussion or palpation. On periodontal examination, presence of a deep periodontal pocket of 5mm in the mid-buccal aspect with furcation involvement of 46 was observed [Fig 1A,1C].

### Investigations

Radiographic examination revealed a well-defined radiolucency on the distal aspect of 46. No response to heat and cold sensitivity tests and a delayed response on Electric pulp testing was observed [Fig 1B].

### Diagnosis

According to the above findings found, we arrived at a diagnosis of endo-perio lesion with primary perio and secondary endodontic involvement.

## Treatment planning

A combined approach of endodontic therapy followed by a surgical approach was planned. The patient was informed about the procedure and consent was taken. Patient was advised to undergo blood investigations to rule out bleeding disorders. Complete blood picture and coagulation studies report were normal. The general health condition of the patient before the surgery was good and he fell under ASA I, according to "ASA" physical status classification system.

## Endodontic therapy

Routine Root canal therapy was carried out first. Local anesthesia was administered using 2% lidocaine with 1:100,000 epinephrine (Alphacaine, DFL), the tooth was then isolated using a rubber dam and access opening was done. Working length was determined using an electronic apex locator and a confirmatory radiograph was taken [Fig 2A]. Shaping and cleaning of canals was done using hand K-files and M-two rotary file system with alternated irrigation using 3% sodium hypochlorite. Obturation was done with guttapercha and AH plus sealer using cold lateral compaction technique [Fig 2B,C].

## Periodontal therapy

On the same day periodontal therapy was planned in 46. Local anesthesia was administered. First a crevicular incision was placed and full thickness mucoperiosteal flap was elevated buccally [Fig 3A]. After flap reflection, complete debridement of defective lesion was curetted using Gracey curette #13 and #14 [Fig 3B]. After curettage, adequate isolation of area was done with proper bleeding control and Xenogenic bone graft material (Osseograft, DBM) was carried to the area and placed in increments with proper condensation [Fig 3C]. Guided tissue regeneration was used as a scaffold to retain the bone graft in place [Fig 3D]. The flap was then secured with suture and periodontal COE-PAK dressing was given which was removed after one week [Fig 3E,3F]. Patient was prescribed 500 mg of amoxicillin thrice a day for five days, 400mg of metronidazole thrice a day for 5 days and combination of 100 mg of aceclofenac and 15 mg of serratiopeptidase twice a day for five days. Patient was followed up for 1 year and there was significant reduction of lesion size with tooth resorption and probing depth was reduced to 2mm [Fig 4A-4C].

## Discussion

Endo-perio lesions are common conditions that are difficult to diagnose. However, if the patient's history is taken carefully and thorough clinical examination is done, these lesions can be treated completely to give a favorable outcome. Data collected must include periapical radiographs, pulp vitality testing, cavity test, percussion, palpation, and pocket probing depth. In this report, history of trauma and the pulp vitality test which showed the nonvital nature of the tooth was a pivoting finding suggesting the endodontic involvement. Infrabony pocket of 8 mm on distal aspect of tooth indicated a secondary periodontal involvement requiring specific therapy to achieve success. The success rate of the endodontic-periodontal combined lesion without a concomitant regenerative procedure has been reported to range from 27

Figure 1A-1C : A – Preoperative Photograph, B- Preoperative Radiograph, C- Probing depth – 5mm.

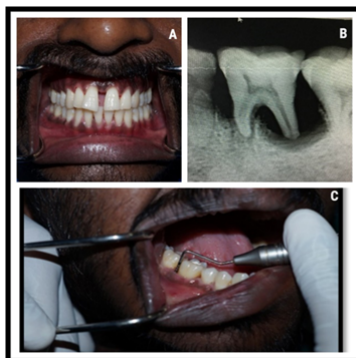


Figure 2A-2C: A – Working length Determination, B- Mastercone Radiograph, C- Obturation using Guttapercha and AH-Plus sealer.

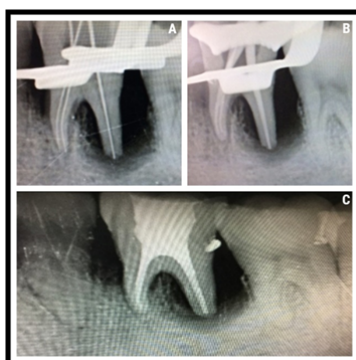
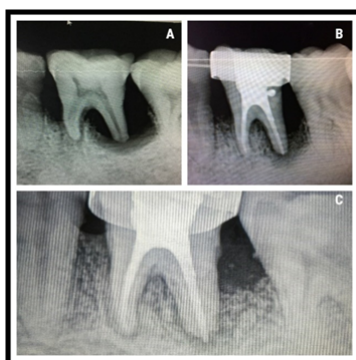


Figure 3A-3F. A- Full thickness mucoperiosteal flap was reflected, B- Curetting the defective areas, C- Placement of Bone graft, D- Guided tissue regeneration membrane was placed in order to cover the root surfaces, E-Suturing, F-COE-PAK was placed.



Figure 4A-AC. A-Preoperative Radiograph, B-3 months follow up, C-1 year follow up.



to 37% which suggests the need of surgical intervention [31].

The goal of periapical surgical procedures is to remove all the necrotic tissue from the periapical area to completely seal the pulp canal system to facilitate the regeneration of hard and soft tissues including the formation of a new attachment apparatus [32].

Many times, there is no clear insult to the pulp noted in these types of lesions. The most common clinical/radiographic features of these lesions include periapical radiolucency and deep pocket depths associated with a non-vital pulp. Traditional approaches to treat endo-perio lesions include non-surgical debridement of the root surfaces and pulp canals, as well as surgical approaches that provide better access to clean the root surfaces and apical lesions and to re-shape the surrounding bone/root apex. Bone loss caused by pulpal disease is reversible, whereas advanced bone loss caused by periodontal disease is usually irreversible [33]. The necessity of periodontal surgical therapy most likely remains because the periodontal bone loss is usually more advanced and is less likely to resolve after non-surgical pulp canal therapy alone [34].

In this case report, pulp sensibility tests showed the necrotic nature of the pulp thus indicating non-vitality of the tooth thus suggesting primary endodontic involvement. Generally, in cases of combined endo-perio lesion, endodontic therapy would result in healing of the endodontic component, and prognosis would depend on the efficient healing of periodontal tissues initiated by either of the treatment procedures. Although, in this case, following endodontic therapy, the periodontal disease did not seem to subside completely with no change in clinical parameters. This confirmed the secondary periodontal involvement along with primary endodontic infection.

When the cause is primarily endodontic, intracanal medicament such as calcium hydroxide and double antibiotic paste can be used. Due to them being bactericidal, anti-inflammatory and proteolytic in nature, they tend to inhibit resorption and promote repair [35]. These are effective in endodontic lesions with extensive periapical pathology and periodontal pockets. This regimen usually resolves pockets in a few weeks, however, lesions that are not true combined; no improvement is seen from the periodontal aspect after endodontic therapy [36]. But, with the advent of newer regenerative materials, successful periodontal treatment of such lesions has been possible [37].

Due to the presence of a deep periodontal pocket of about 5mm mid-buccal of 46, xenogenic bone graft (Osseograft, DMBM) was used. These are said to be biocompatible and osteoconductive and therefore act as a scaffold thus offering a chemical environment and surface conducive for stimulation of new bone formation. These have the ability to breakdown and allow new bone formation and bone remodeling required to attain optimal strength without interference. Hydroxyapatite crystals from the bone graft act as a scaffold on which osteoblasts act to form bone and preserve the space for regeneration. Complete bone formation occurs by the end of 1-year months after periodontal surgery [37].

GTR technique successfully used in clinical periodontal practice may be applied as an adjunctive therapy in endodontic surgery. Several authors have reported the successful resolution of peri-

apical defects with a combined application of GTR and bone grafts [38, 39] or with GTR alone [40, 41]. Some have resorted to combined technique of GTR and Platelet rich plasma [42].

## Conclusion

Long-term clinical outcomes are more predictable when there is proper history, optimal diagnostic processes, treatment strategies, and intervals. Periapical lesions with combined causes will need both endodontic & periodontal therapy.

## Clinical Significance

Immediate and correct management of endodontic-periodontal lesions can hinder the loss of the involved teeth.

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