RESEARCH PAPER

Periodontal Regenerative Management of a Maxillary Canine with an Endodontic-Periodontal Lesion Beyond Root Canal Therapy

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ABSTRACT

Background: Endodontic-periodontal lesions are challenging to diagnose and manage because of the close anatomical relationship between the pulp and periodontal tissues. This case report describes the interdisciplinary management of a combined endodontic-periodontal lesion complicated by external root resorption.

Case Description: A patient presented with pain, purulent exudate coming from the gingival sulcus, tenderness on percussion, deep periodontal pocket and a periapical radiolucency associated with the right maxillary canine. After phase I therapy root canal of affected tooth was performed, followed by periodontal flap surgery one month later. Surgical exposure revealed external root resorption with an intrabony defect. Following debridement, the defect was grafted with sticky bone prepared with xenograft (DMBM) and injectable PRF (i-PRF), stabilized using a gelatin sponge enriched with Placentrex® injection.

Results: Clinical follow-up demonstrated complete resolution of symptoms, reduction in probing depth, satisfactory soft tissue healing, and absence of postoperative complications.

Conclusion: Sequential endodontic and regenerative periodontal therapy can effectively preserve teeth affected by complex endodontic-periodontal lesions with external root resorption.

Keywords: Endodontic-periodontal lesion; External root resorption; Periodontal regeneration; sticky bone; Placentrex® injection; Root canal therapy.

How to cite this article: Sargun Kapoor1 Preetika Bansal2 Arshdeep Kaur3 Gurleen Kaur4 Parul Sharma5. Periodontal Regenerative Management of a Maxillary Canine with an Endodontic-Periodontal Lesion Beyond Root Canal Therapy. Int J Drug Deliv Technol. 2026;16(89s):1594-1598. DOI: 10.25258/ijddt.16.89s.164.

INTRODUCTION

The intimate anatomical and vascular relationship between the pulp and periodontal tissues through the apical foramen, lateral canals, and dentinal tubules permits the spread of infection between these two tissues, resulting in endodontic-periodontal lesions. Such lesions often present with overlapping clinical features, including deep periodontal pockets, sinus tract formation, tenderness on percussion, and periapical radiolucencies, making accurate diagnosis and treatment planning challenging.[1] A thorough clinical and radiographic examination is therefore essential to differentiate the primary source of infection and formulate an appropriate treatment strategy.

The management of endodontic-periodontal lesions requires an interdisciplinary approach that addresses both the endodontic and periodontal components of the disease. Conventionally, root canal therapy is performed first to eliminate the intracanal source of infection, followed by periodontal treatment to manage the associated periodontal defect. Surgical intervention becomes necessary in cases with persistent periodontal destruction, deep intrabony defects, or when the true extent of the lesion cannot be adequately assessed through nonsurgical therapy alone.

External root resorption is a relatively uncommon but clinically significant finding that may be associated with chronic inflammation, trauma, or long-standing endodontic-periodontal infection. The presence of root resorption adversely affects the prognosis of the involved tooth and necessitates careful surgical management to preserve the remaining periodontal support.[2] Regenerative procedures using bone grafts, in conjunction with biologically active adjuncts, have been advocated to promote periodontal regeneration and enhance wound healing in such defects.[3]

This case report describes the successful interdisciplinary management of a maxillary canine presenting with a draining sinus, tenderness on percussion, and an endodontic-periodontallesion.

CASE REPORT

A patient presented to the Department of Periodontology with the chief complaint of pain and swelling in relation to the maxillary canine region. Clinical examination revealed tenderness on percussion, a purulent exudate from gingival sulcus associated with the affected tooth, and deep periodontal probing on the affected surface. The tooth tested positive to tenderness on percussion

(TOP), suggestive of pulpal and periapical involvement. Intraoral periapical radiographic examination demonstrated a periapical radiolucency associated with the involved right maxillary canine. Based on the clinical and radiographic findings, a diagnosis of combined endodontic-periodontal lesion was established, and an interdisciplinary treatment approach was planned.Phase I therapy, scaling and root planning was done and the patient was prescribed antibiotics. After a week the abscess drainage was done and the patient was recalled again. Following informed consent, conventional root canal therapy with Mineral trioxide aggregate (MTA) was initiated to eliminate the endodontic source of infection and cease the external root resorption.

After the completion of the root canal therapy the patient was prescribed appropriate postoperative medications and recalled after one month for periodontal surgical intervention. After 1month periodontal flap surgery was performed following administration of local anesthesia (2% lignocaine with 1:80,000 adrenaline), intracrevicular incisions and vertical incisions were given and a full-thickness mucoperiosteal flap was reflected to expose the underlying defect. Thorough debridement of the granulation tissue and meticulous root planing were carried out. On surgical exposure, an external root resorption defect involving the maxillary canine root was identified. The associated intrabony defect was carefully debrided and irrigated with sterile saline.The osseous defect was then grafted with sticky bone[4] prepared using xenograft (DMBM) and injectable PRF (i-PRF)[5]. A sterile gelatin sponge enriched with Placentrex®[6] injection was adapted over the grafted site to stabilize the graft, assist in haemostasis and enhance soft tissue healing owing to its anti-inflammatory and regenerative properties.[7]

The flap was repositioned to achieve primary closure and secured using interrupted 4-0 black silk sutures. A periodontal dressing was placed over the surgical area. Postoperative instructions were provided, and the patient was prescribed antibiotics, analgesics, and 0.2% chlorhexidine mouth rinse. Sutures were removed after 10 days, and the patient was enrolled in a supportive periodontal maintenance program with periodic clinical and radiographic follow-up to assess soft tissue healing, resolution of the lesion, and osseous regeneration. Following are the clinical photographs of the same:-



(A) Preoperative clinical presentation of the maxillary right canine region.
(B) Preoperative intraoral periapical radiograph showing periapical radiolucency associated with the affected canine



(C) Reflection of a full-thickness mucoperiosteal flap.

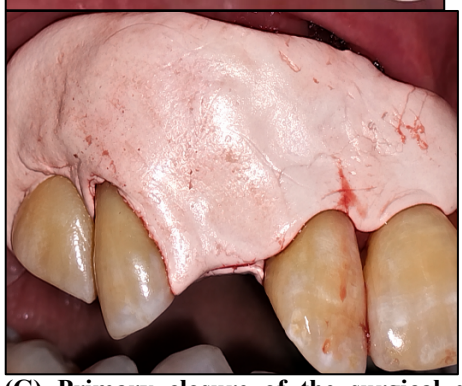
(D) Placement of sticky bone





(E) i- Placentrex®
ii- gelatin sponge enriched with Placentrex®
(F) Stabilization of the grafted defect using a gelatin sponge enriched with Placentrex® injection





(G) Primary closure of the surgical site with interrupted 4-0 black silk sutures.
(H) Periodontal dressing (Coe-pak) given.





(I) One-month postoperative clinical evaluation showing reduced probing depth and healthy gingival tissue
(J) Three-month postoperative intraoral periapical radiograph demonstrating the treated maxillary canine and periapical region.



(K) six-months postoperative intraoral periapical radiographs demonstrating the treating maxillary canine and periapical region.

RESULTS

The patient demonstrated uneventful postoperative healing, with no evidence of pain, swelling, or postoperative complications during the follow-up period. The abscess resolved completely following endodontic therapy and did not reoccur after periodontal surgery. Soft tissue healing was satisfactory, with healthy gingival architecture and no signs of inflammation or infection at the surgical site.

Clinical evaluation at 1month follow-up revealed a reduction in probing pocket depth, improvement in gingival health, and the absence of tenderness on percussion or tooth mobility. The surgical site exhibited satisfactory tissue adaptation, and the

patient reported complete resolution of symptoms with restoration of normal masticatory function.

DISCUSSION

Endodontic-periodontal lesions remain a diagnostic challenge because of the anatomical communication between the pulp and periodontal tissues through the apical foramen, accessory canals, and dentinal tubules. Consequently, clinical findings such as deep periodontal pockets, sinus tract formation, and periapical radiolucency may represent either primary endodontic disease with secondary periodontal involvement or a true combined lesion, necessitating careful diagnosis before treatment.

In the present case, root canal therapy was performed before periodontal surgery to eliminate the intracanal source of infection. This treatment sequence is well established, as successful endodontic therapy frequently resolves periodontal manifestations of pulpal origin and allows accurate assessment of the residual periodontal defect. Persistence of the intrabony defect following endodontic treatment justified surgical intervention.

A notable finding during flap reflection was the presence of external root resorption that was not evident clinically. Chronic inflammatory stimulation associated with longstanding endodontic-periodontal infection may contribute to external inflammatory root resorption, adversely affecting the periodontal prognosis. Direct surgical visualization enabled complete debridement of the defect and appropriate regenerative management, highlighting the diagnostic value of surgical exploration in selected cases.

Regenerative therapy was performed using sticky bone to facilitate osseous regeneration. Demineralized bone grafts provide an osteoconductive scaffold and possess osteoinductive potential through the release of bone morphogenetic proteins, thereby promoting new bone formation within periodontal defects. Placement of a gelatin sponge over the graft further stabilized the graft material and blood clot, creating favorable conditions for early wound healing.

Placentrex® injection was used as an adjunct to enhance soft tissue healing. Human placental extract contains several bioactive molecules like polydeoxyribonucleotide (PDRN) that have been reported to promote angiogenesis, fibroblast proliferation, collagen synthesis, and epithelial regeneration while reducing local inflammation. Its adjunctive application has contributed to the favourable postoperative soft tissue response observed in the present case.

The combined interdisciplinary approach resulted in complete resolution of the draining sinus, elimination of tenderness on percussion, reduction in probing depth, and satisfactory soft tissue healing during follow-up. These findings reinforce the importance of addressing both the endodontic and periodontal components of disease and support the use of regenerative procedures when significant periodontal destruction persists after successful endodontic therapy.

The principal limitation of this report is its single-case design and relatively short follow-up period. Furthermore, histologic confirmation of true periodontal regeneration was not possible, and the individual effects of DMBM, gelatin sponge, and Placentrex® injection cannot be independently determined. Long-term controlled clinical studies are required to establish the effectiveness of these adjunctive regenerative approaches in the management of endodontic-periodontal lesions associated with external root resorption.

This case demonstrates that accurate diagnosis, sequential endodontic and periodontal therapy, and the judicious use of regenerative materials can preserve teeth with complex endodontic-periodontal lesions and achieve favourable clinical outcomes despite the presence of external root resorption.

CONCLUSION

The successful management of endodontic-periodontal lesions requires accurate diagnosis and a well-coordinated interdisciplinary approach. This case demonstrates that sequential endodontic therapy followed by regenerative periodontal surgery can effectively resolve infection, preserve the affected tooth, and promote favorable clinical healing even in the presence of external root resorption. The use of sticky in conjunction with gelatin sponge and Placentrex® provided satisfactory clinical outcomes by facilitating periodontal wound healing and regeneration. Although the findings are encouraging, long-term clinical studies with larger patient cohorts are required to validate the effectiveness of these regenerative adjuncts and establish predictable treatment protocols for complex endodontic-periodontal lesions.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given consent for clinical information and images to be reported in the journal. The patient understands the names and initials will not be published and that every effort will be made to conceal identity, although anonymity cannot be guaranteed.

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