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Case Report

A Step-Ladder Approach for Management of Perio-Endo Lesion of a Radix Entomolaris: A Case Report

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Received: January 31, 2023; **Published:** June 17, 2023

DOI: 10.31080/ecde.2023.22.02036

Abstract

An inter-disciplinary approach helps to make a correct diagnosis, a well-planned and sequenced treatment with multidisciplinary approach, selection of the appropriate materials and the optimal execution of the treatment plan with recommended techniques. An endo-perio lesion can have a varied etiology which ranges from quite simple to relatively complex. Precise knowledge of these disease pathogenesis is of utmost significance for better prognosis and treatment planning. This enables the construction of a suitable treatment plan; where unnecessary, prolonged or even detrimental treatment can be refrained. The following is the case of Grade III endo-perio lesion with grade II furcation involvement distally surrounded by advanced circumferential bone loss treated by a regenerative approach.

Keywords: *Perio-Endo Lesion; Vertical Defect; Furcation Involvement; Regenerative Therapy; Bone Graft; Periodontal Pocket; Advanced Bone Loss*

Introduction

Dentistry comprises of numerous specialities that are interconnected to each other and when intertwined help provide best treatment to the patients. For decades together, dental professionals have carried out studies that confirm relationship between endodontics and periodontics. The interrelationship between the pulp and the periodontal disease primarily occurs by the way of intimate anatomic and vascular connections [1].

A endo-perio lesion is defined as follows [2]:

1. The tooth involved must be pulp-less.
2. There must be destruction of the periodontal attachment apparatus from the gingival sulcus to either the apex of the tooth or to the area of an involved lateral canal. There should be a defect in the attachment that can be probed.
3. Both root canal treatment and periodontal therapy are required to resolve the entirety of the lesion.

The first classification of endodontic-periodontal lesions based on pathology of origin was as follows [3]:

a) Primary endodontic lesions

b) Primary periodontal lesions

c) Primary endodontic lesions with secondary periodontal involvement

d) Primary periodontal lesions with secondary endodontic involvement

e) True combined lesions.

A new endodontic- periodontal inter-relationship classification, based on the primary disease with its secondary effect is suggested as follows [4]:

1) Retrograde periodontal disease

2) Primary periodontal lesion

3) Primary periodontal lesion with secondary endodontic involvement

4) Combined endodontic-periodontic lesion

5) Iatrogenic periodontal lesion.

An endo-perio lesion shows simultaneous existence of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning and affect the sequence of treatment to be performed. Periapical changes may be confined to the apical periodontium or may extend coronally and communicate with the oral cavity via a sinus track along the root surface or through mucosa. Periodontal disease tends to extend apically where as periapical lesions can extend apically or coronally. The term "pulpodontic-periodontic" syndrome can be commonly used to define a syndrome involving inflammation or degeneration of the pulpal tissues surrounded with a periodontal pocket. The foci of infection could be either pulpal or periodontal or combined; accordingly its management is advised [5,6].

The healing of primary endodontic lesions takes place solely post endodontic therapy while primary periodontal lesions often heal by periodontal therapy. However, the combined lesions require an imperative treatment plan. Following endodontic and periodontal therapy, prosthetic rehabilitation of such teeth is necessary for better prognosis of the affected tooth [7,8].

Although, periodontal health can be altered by pulpal disease, a thorough understanding of the pulpo-periodontal lesions and their management is of great significance. Simultaneous management of complex concomitant endo-perio lesions possess a challenge till date. The following is the case of Primary Periodontal lesion with secondary endodontic involvement.

As a result, the aim of the present case report was to treat the perio-endo lesion and the involved furcation of a radix entomolaris with a regenerative approach.

Case Presentation

A 38-year-old male patient complained of gnawing pain with occasional episodes of food impaction in lower right back region of jaw since last 6 - 8 months presented to dental clinics in Western Maharashtra. Medical history and dental history were not contributory. Pt was initially asymptomatic one year ago. He then started experiencing food impaction in lower right back region of jaw since last 6 - 8 months. Occasionally pain and bleeding was experienced with removal of the food particles. He did not experience dentinal hypersensitivity and did not seek any dental treatment nor did take any medication for the same.

Radiographic examination was carried out with Intra-operative Periapical radiograph (IOPA). It was interpretated as periodontally deep vertical bone loss and endodontically tooth showing taurodont tooth with supernumerary root distally i.e. radix entomolaris along with calcification in the pulp chamber with attached pulp stone. A radix entomolaris of periodontal pocket of 11 mm with grade II furcation defect as per Glickman's Classification of furcation involvement with 46 was appreciated on radiographic examination. Intra-oral peri-apical radiographs were taken at 90º and Head tilt 30º position.

Upon intraoral examination, clinically, the lower right first molar tooth had no caries but periodontal pockets ranging from 9 - 11 mm. Mobility of the tooth was in physiologic limits. Electric Pulp Testing was carried out for evaluation of pulpal vitality status, the tooth showed delayed response to electric pulp testing and as a result was regarded as non-vital. The initial line of treatment was Phase I therapy included ultrasonic scaling and root planning followed by 2 weeks of maintenance with proper brushing techniques and patient was advised oral mouth rinse of 0.12% chlorhexidine mouthwash twice a day for a week. Routine haematological investigations were performed and a written informed consent was obtained from the patient before initiating any endodontic and periodontal therapy.

In surgical phase, local anaesthesia was administered using 2% lignocaine hydrochloride via inferior alveolar nerve block. Single tooth isolation was maintained using rubber dam technique. Access opening was initiated from the centre of the tooth using round bur followed by safe end bur to enlarge the access cavity. Statec ultrasonic tips were used for excavation of pulp stone and for locating the orifices. Two mesial canals were located (mesio-buccal and mesio-lingual) and two distal canals (disto-buccal and disto-lingual). Mani 10k hand file were used for the patency of the canal and then 15k file were used for determination of working length. was used for Working length determination carried out with electronic apex locator (J Morita) and cross evaluated with the working length radiograph.

A multidisciplinary approach was formulated to salvage the affected tooth. Initial endodontic therapy was performed followed by periodontal therapy. On clinical examination; it was observed that there was no alteration in the periodontal measurements post non-surgical periodontal therapy. At the end of second month, radiograph was taken with 47 which showed that the furcation involvement still prevailed.

Therefore, periodontal regenerative surgery was planned for treatment of furcation defect post 3 months of completion of endodontic treatment. Stringent asepsis and sterilization protocol was followed for periodontal surgery. The area selected for surgery was anesthetized using lignocaine with adrenaline 1:100000 using inferior alveolar nerve block. First crevicular incision was placed and full thickness muco-periosteal flap was elevated buccally and lingually. After complete degranulation, an intra-bony defect of vertical dimension of 9 mm post non-surgical periodontal therapy was present. Open Flap Debridement of defect area using Gracey's curette # 13 and 14 was carried out. Bone grafts (Hydroxyapatite (Sybograf) + Miner-Oss XP (BioHorizons) infused with PRF used to fill the defect, followed by 2nd layer of PRF was placed over it as a membrane and sutured with interrupted 4-0 non-resorbable sutures.

Patient was recalled for suture removal and simultaneous assessment of wound healing at one week, and the healing was found to be uneventful. At 11 months follow up, a 60% gain in clinical attachment and gain in vertical facial height was appreciated. CBCT analysis confirms bone formation within the defect. Finally, prosthetic rehabilitation with porcelain fused to metal crown was carried out to restore the case functionally as well as aesthetically.

Clinical images

Pre-operative intra-oral view

Figure 1

Pre-operative radiograph

Figure 2

Endodontic treatment: Access opening

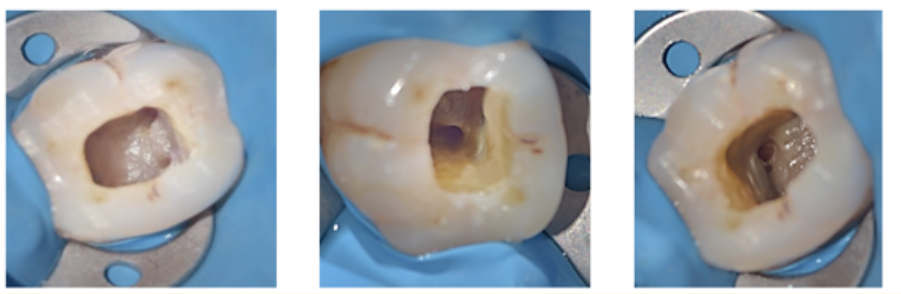

Figure 3

Working length determination

Figure 4

Master cone selection

Figure 5

Obturation

Figure 6

Incision and flap reflection and debridement

Figure 7

Placement of (Sybograf + Miner-OSS XP) within the defect

Figure 8

Placement of PRF as a membrane

Figure 9

Interrupted suturing with 3-0 black silk sutures

Figure 10

Follow-up (1 week)

Figure 11

Follow-up (6 months) intraoral view

Figure 12

Follow-up (6 months) radiograph

Figure 13

Prosthetic rehabilitation with 46 intra-orally

Figure 14

Follow-up (1 year): Intra-oral view

Figure 15

Follow-up (1 year): IOPA (Radiographic view)

Figure 16

CBCT analysis at 1 year follow-up

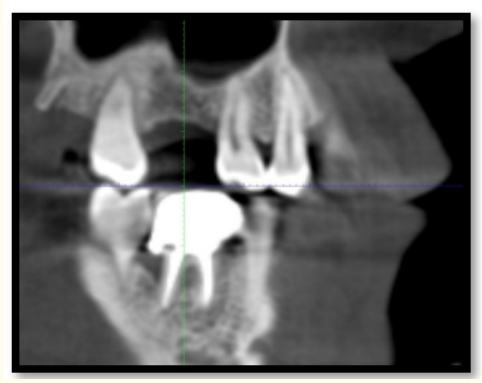

Figure 17

Provisional diagnosis: Primary periodontal lesion (According Simon's Classification 1972).

Final diagnosis: Grade III endo-perio lesion (According to 2017 classification of periodontal diseases and conditions).

Differential diagnosis: Chronic apical periodontitis.

Discussion

Radix entomolaris is an entity described by Bolk in 1915. The interrelationship between radix entomolaris and periodontal destruction seldom has been stated in the literature published till date. Failure to appreciate the supernumerary root aids in more periodontal destruction. In the present case, the radiographs taken pre-operatively showed supernumerary root. In the present case, of Grade III

endo-perio lesion with grade II furcation involvement distally surrounded by advanced circumferential bone loss was treated by a regenerative approach.

The diagnosis and treatment of EPLs are complicated by variations of this condition and difficulties distinguishing EPLs from other diseases. The incision and flap design should be chosen according to clinical and radiographic parameters, including condition, biotype and width of gingival tissues, presence of a restoration margin, location and extent of the periapical lesion, and patient's aesthetic demands [8].

Moreover, treatment outcomes are dependent on several factors, including the skill of the dentist, patient compliance, healing ability, and the quality of the supportive periodontal therapy program. Patient-associated factors, including smoking habits, diabetes, parafunction, and socioeconomic status, are involved in the pathogenesis of periodontitis. Similarly, iatrogenic errors during endodontic treatment can influence the prognosis of affected teeth [9]. The re-evaluation of endodontic healing before nonsurgical and/or surgical periodontal therapy for EPL is therefore important.

The success rate ranges from 27% to 37% with open flap debridement without the regenerative therapy. According to Rodrigues., *et al*. 2017, the non-incised papilla approach (NIPSA) results in marked improvements in periodontal pocket depth, reversal of the clinical loss of attachment [10]. On the contrary, the present case was treated with the conventional open flap debridement that aids in 77.5% success of endo-perio lesions with furcation involvement. Bone grafts used in the present case were Hydroxyapatite containing (Sybograf) for strengthening root dentin followed by Miner-Oss XP (BioHorizons) for regenerative therapy. Bone grafts were used in combination and infused with PRF (Platelet rich fibrin) to enhance wound healing in presence of growth factors.

A study carried out by Huang, Lin and Lee., *et al*. stated the presence of disto-lingual root contributes to plaque accumulation distally and further invade distal furcation [11]. While Parolia and Quackenbush., *et al*. 2002 noted, a supernumerary root unilaterally occurring on right side in approximately 40% of the cases [12]. Similarly, Schafer., *et al*. 2009; carried out a study that showed incidence of 1.52% in women and 1.15% in men. The results of this study were in accordance with the study carried out by Tratman 1938; Schafer 2009 and Sachdeva 2012 [13].

Moreover, Ferraz., *et al*. 1992 stated the presence of 3 rooted mandibular first molars was common in females of Mongolian, Caucasian and Negro origin [14]. Recent systematic reviews carried out by Oktawati Sri., *et al*. 2020 [15], Pinto., *et al*. 2020 [16], Sarnada., *et al*. 2021 [17], Liu TJ., *et al*. 2021[18] stated root canal treatment (RCT) combination with bone graft was mostly used than the other treatment option in endo-perio lesions. Similar treatment modality was used in the present case and marked improvements in the follow-up period were seen.

Conclusion

Even though dentistry is divided into multiple specialities, in order to achieve the best outcome for cases involving pulp and periodontium, a combined approach is essential. Diagnosis of teeth with perio-endo lesions may be difficult to establish, hence, requiring proper history, and use of various diagnostic aids to obtain accurate diagnosis. Lesions with combined causes often require both endodontic and periodontal therapy. In addition, regenerative techniques, root resection and hemi sections offer alternative approaches, thus enhancing clinician's ability to deal with these complex clinical problems. However, with the advent of new regenerative materials however, successful periodontal treatment of such lesions has been possible as a result, regeneration was the treatment of choice in the present case.

Conflict of Interest

None.

Bibliography

1. Rotstein I and Simon JH. "The endo-perio lesion: a critical appraisal of the disease condition". *Endodontic Topics* 13.1 (2006): 34-56.
2. Shenoy N and Shenoy A. "Endo-perio lesions: Diagnosis and clinical considerations". *Indian Journal of Dental Research* 21.4 (2010): 579.
3. Simon JH and Werksman LA. "Endodontic-periodontal relations". Pathways of the pulp. Los Angeles: Mosby (1994): 513.
4. Al-Fouzan KS. "A new classification of endodontic-periodontal lesions". *International Journal of Dentistry* (2014).
5. Aksel H and Serper A. "A case series associated with different kinds of endo-perio lesions". *Journal of Clinical and Experimental Dentistry* 6.1 (2014): e91.
6. Peeran SW., *et al*. "Endo-perio lesions". *International Journal of Scientific and Technology Research* 2 (2013): 268-274.
7. Solomon C., *et al*. "The endodontic-periodontal lesion: a rational approach to treatment". *The Journal of the American Dental Association* 126.4 (1995): 473-479.
8. Dakó T., *et al*. "Endo-perio lesions: Diagnosis and interdisciplinary treatment options". *Acta Stomatologica Marisiensis Journal* 3.1 (2020): 257-261.
9. Patil VA., *et al*. "Endo-perio lesion: An interdisciplinary approach". *International Journal of Dental Clinics* 1.1 (2009): 32-36.
10. Moreno Rodríguez JA., *et al*. "Periodontal reconstructive surgery of deep intraosseous defects using an apical approach. Non-incised papillae surgical approach (NIPSA): A retrospective cohort study". *Journal of Periodontology* 90.5 (2019): 454-464.
11. Huang RY., *et al*. "Mandibular disto- lingual root: A consideration in periodontal therapy". *Journal of Periodontology* 78 (2007): 1485-1490.
12. Parolia A., *et al*. "Three rooted, four canalled mandibular first molar (radix entomolaris)". *Kathmandu University Medical Journal (KUMJ)* 7 (2009): 289-292.
13. Schafer E., *et al*. "The prevalence of three rooted mandibular permanent first molars in German population". *The Journal of Endodontics* 35 (2009): 202-205.
14. Ferraz JA and Pecora JD. "Three rooted mandibular molars in patients of Mongolian, caucasian and negro origin". *Brazilian Dental Journal* 3 (1992): 113-117.
15. Oktawati S., *et al*. "Endodontic–periodontic lesion management: A systematic review". *Medicina Clínica Práctica* 3 (2020): 100098.
16. Pinto D., *et al*. "Long-term prognosis of endodontic microsurgery-a systematic review and meta-analysis". *Medicina* 56.9 (2020): 447.
17. Sarnadas ML. The influence of periodontal attachment loss on the outcome of endodontic microsurgery: a systematic review and meta-analysis. The influence of periodontal attachment loss on the outcome of endodontic microsurgery: a systematic review and meta-analysis (2021).
18. Liu TJ., *et al*. "Impact of different regenerative techniques and materials on the healing outcome of endodontic surgery: a systematic review and meta-analysis". *International Endodontic Journal* 54.4 (2021): 536-555.

Volume 22 Issue 7 July 2023