IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 11 Ser. 4 (November. 2024), PP 01-04
www.iosrjournals.org

Beyond The Usual Suspects: A Challenging Case Of Radix Entomolaris With Endodontic-Periodontal Lesion: A Case Report.

Dr Satya Kamal V
3rd Year Post Graduate,
Department Of Conservative Dentistry And Endodontics.
The Oxford Dental College, Bangalore
Karnataka.

Dr Srirekha A
Professor And Head Of The Department,
Department Of Conservative Dentistry And Endodontics.
The Oxford Dental College, Bangalore
Karnataka.

Dr Samiha Shariff
2nd Year Post Graduate,
Department Of Conservative Dentistry And Endodontics.
The Oxford Dental College, Bangalore
Karnataka.

Dr Champa C
Professor,
Department Of Conservative Dentistry And Endodontics.
The Oxford Dental College, Bangalore
Karnataka.

Dr Sai Kiran DK
2nd Year Post Graduate,
Department Of Conservative Dentistry And Endodontics.
The Oxford Dental College, Bangalore
Karnataka.

Abstract
The purpose of this case report is to present an unusual endodontic periodontal lesion along with radix entomolaris in tooth 46 in a 31-year-old female patient with intermittent pain and sensitivity to hot and cold stimuli. Clinical examination revealed deep dentinal caries and periodontal pocket depth of 5mm in tooth #46.The radiographic examination revealed an extra distal root with a periapical radiolucency in tooth #46. patient was diagnosed with irreversible pulpitis and chronic apical periodontitis, with secondary periodontal involvement due to an endodontic-periodontal lesion. Non-surgical root canal treatment was performed, followed by canal obturation with resin-based sealer and final restoration with a porcelain fused to metal crown. After a 3-month follow-up, the patient remained asymptomatic, radiographs showed bone reposition, and periodontal probing depth decreased, indicating successful treatment.

Keywords: *Endodontic periodontal lesion (EPL), radix entomolaris (RE), root canal treatment (RCT).*

Date of Submission: 28-10-2024 Date of Acceptance: 08-11-2024

I. Introduction

An endodontic-periodontal lesion consists of concurrent pulpal and periodontal disease in the same tooth. The spread of infection between the dental pulp and the periodontal ligament can occur through the apical foramen, lateral canals and dentinal tubules.[1]

When a tooth is involved by a carious process or restorative procedures, oral bacteria or their components can arrive at the pulp via dental microtubules. Often in these cases, some typical signs of a periodontal involvement can be observed. In addition to thermal hypersensitivity, pain caused by percussion, a slight enlargement of the periapical periodontal space may be radiographically detected.[1]

When the pulp becomes necrotic, there is a direct inflammatory response by the periodontal ligament at the apical foramen and/or opening of accessory canals. Inflammatory byproducts of pulpal origin may leach out through the apex, lateral and accessory canals and dentinal tubules to trigger an inflammatory vascular response in the periodontium.[2]

Pulpal infection can drain through the periodontal ligament space and give an appearance of periodontal destruction, termed retrograde periodontitis. Similarly, both pulpal and periodontal infections can coexist in the same tooth, termed combined lesions, where the treatment depends on the degree of involvement of the tissues.[3]

Moreover, non anatomic factors can have a role in this communication such as iatrogenic root canal perforations or a vertical root fracture. These pathways cause the spread of infection and bone destruction in a coronal-to-apical direction in the case of periodontal infection or in an apical-to-coronal direction in the case of endodontic infection.[4]

Endodontic Periodontal Lesion's (EPL) etiology must be correctly identified to achieve a successful treatment plan. Before doing any advanced restorative or surgical work, the prognosis of the tooth must be weighed carefully. Extraction should be considered if the patient has a low motivation and refuse lengthy, invasive, and expensive treatment. If the tooth is non-functional or adequate root canal treatment (RCT) is not possible, there is no point in keeping the tooth. In most cases, root canal therapy should be performed before periodontal treatment. Periodontal treatment can be in the form of bone grafting and guided tissue regeneration, hemisection, or root amputation.[5]

The main objective of root canal treatment is the thorough mechanical and chemical cleansing of the entire pulp cavity and its complete obturation with an inert filling material and a coronal filling preventing ingress of microorganisms. One of the main reasons for failure of root canal treatment in molars is because the clinician has not removed all the pulp tissue and microorganisms from the root canal system. It is known that the mandibular first molar can display several anatomical variations; endodontic therapy of mandibular molars has always been an endodontic dilemma. [6-7]

Anatomical variations are an acknowledged characteristic of mandibular permanent molars. Permanent mandibular first molars usually have 2 roots placed mesially and distally and 3 root canals, but variations in the number of roots and in canal morphology are not uncommon. The presence of a third root in the permanent first molar is the major variant in this group.[8]

Radix entomolaris (RE) is one of the anatomical variants found in a permanent mandibular molar and was first described by Carabelli.[9] It is characterized by the presence of an additional or extra third root, which is typically found distolingually. The incidence of RE among the Indian population is found to be very low and only 0.2%. However, it is reported higher prevalence of RE, with a range from 2.19-13.3%, among the Indian population.[9]

This case report aims to present the diagnosis and the management of endo-perio lesion along with radix entomolaris in mandibular right first molar teeth with a 3 month follow up.

II. Case Report

A 31-year-old female patient with no medical history was referred to the department of Conservative Dentistry and Endodontics complaining of pain since a week. The pain was moderate and intermittent. Sensitivity to hot and cold items was present.

Clinical examination revealed disto-occlusal deep dentinal caries, tender on percussion and showed delayed response to cold and electric pulp testing. The periodontal examination showed a pocket of 5mm depth in the mesiobuccal (MB) aspect of tooth #46, with a grade I tooth mobility. Radiographic examination revealed a peri-apical radiolucent area involving the distal aspect of the mesial root, together with the mesial aspect of the radix and the furcation region (FIG.1).

Based on the clinical and radiographic examination, a final pupal diagnosis of irreversible pulpitis and chronic apical periodontitis of tooth #46 was made, while the periodontal status was apical, bifurcation and buccal bone resorption at the #46 tooth area associated with 5 mm mesiobuccal depth pocket. The case was classified according to endodontic-periodontal lesions classification, as a primary endodontic lesion with secondary periodontal involvement. In view of the periodontal involvement on top of the endodontic lesion, the patient was counseled for root canal treatment.

The treatment plan was discussed with the patient and informed consent was obtained. The area is anesthetized with 2% lignocaine 1:80,000 epinephrine, followed by rubber dam isolation, caries driven approach for access cavity design was followed.

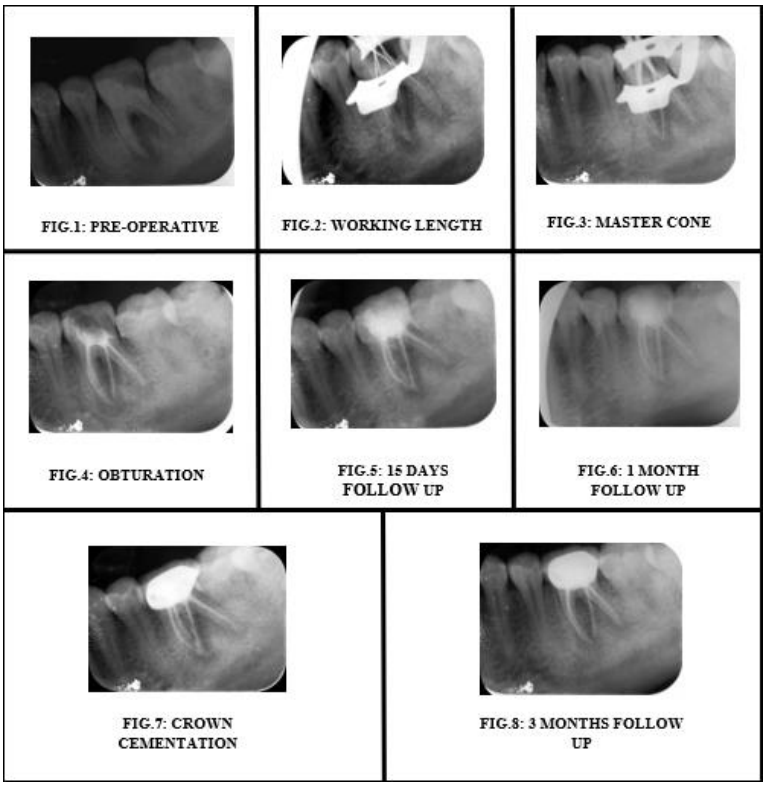
The coronal pulp tissue was excavated. Using the DG16 endodontic explorer, the detection of four root canal orifices were performed mesiobuccal [MB], mesiolingual [ML], distobuccal [DB], Radix entomolaris [RE]). The working length was determined using an electronic apex locator and confirmed with the periapical radiograph (FIG.2). The canals were initially instrumented using the ISO 10K hand file. A glide path preparation was done using rotary path file instruments (BlueFlex, S-One files) adapted on the endodontic micromotor. The final instrumentation of the canals was performed using Nickel titanium rotary instruments up to size 30, 4% taper in all the canals.

The irrigation was done using a 24-gauge needle with saline and 3% sodium hypochlorite. Sonic irrigation activation of the 3% sodium hypochlorite was applied using sonic activator tip. Canals were temporized with calcium hydroxide as an intra canal medicament and the coronal cavity was temporized with zinc oxide eugenol cement. The patient was given a prescription for anti-inflammatory drugs with instructions to take for pain only if needed and to inform the doctor immediately in case of discomfort.

During the 2-week follow-up, the patient reported that all the symptoms had resolved. On examination, the gingival tissue showed proper healing and a normal response to percussion. Gutta-Percha cones fitting and confirmation of the working length were performed with a periapical radiograph (FIG.3). Root canals were obturated with resin-based sealer. Finally, a post obturation periapical radiograph was taken for obturation confirmation (FIG.4).

After 15 days of observation, the patient remained asymptomatic. A repeated periapical radiograph showed bone healing in the apical and root bifurcation areas (FIG.5). Porcelain fused to metal crown was fabricated for the final coronal restoration during 1 month follow up (FIG.6) (FIG.7).

The 3 month follow up, patient remained asymptomatic. A repeated periapical radiograph showed bone healing in the apical and root bifurcation areas. The periodontal examination showed decreased probing depth in the mesiobuccal aspect to 4 mm, with absence of tooth mobility (FIG.8).



III. Discussion

The management of endodontic-periodontal lesions is a true challenge for the dentist because of the deleterious effects on the tooth structure and the supporting periapical structures. The key to success in treating these cases depends on taking a correct history to determine the cause and reach an exact diagnosis of the case development. In addition, a clinician's ability to classify a lesion makes the treatment strategy very clear and precise.[4]

After an initial phase in which the pathologic phenomenon expands itself from the apical part of the pulp to the periapical tissue, the second phase may evolve in two possible ways: the formation of an acute abscess or the establishment of a balance between the bacterial challenge and the host response.[2]

The success rate of joined endodontic-periodontal lesions without a regenerative procedure is between 27% and 37%. These rates are much lower than the success rate of 95% with conventional non-surgical root canal therapy.[1]

Before doing any advanced restorative or surgical work to treat EPL, the prognosis of the tooth must be weighed carefully. Extraction should be considered if the patient has a low motivation and refuse lengthy, invasive, and expensive treatment. In most cases, root canal therapy should be performed before periodontal treatment. Periodontal treatment can be in the form of bone grafting and guided tissue regeneration, hemisection, or root amputation.[5]

The risk of infection is heightened if periodontal treatment is delayed, especially when a "combined lesion with communication" exists between the two sites. Sterility is more likely while there is a medicated dressing like calcium hydroxide in the canal for 15 days for a good balance between effective disinfection and minimizing potential side effects of prolonged use. Hence, in some cases, it might be prudent to delay the root filling until the periodontal infection has been eliminated.[3]

Anatomical variations of the root canal system in molars are not appreciated by a great number of general practitioners. The variability of root canal anatomy in the distal root of mandibular molars may not be common knowledge. Next to the second distolingual canal, a third distolingual root in mandibular molar teeth, with an incidence ranging from 24% is possible in Indian populations.[6]

These variations in distal root anatomy may be identified through careful reading of angled radiographs. On the contrary, completing a thorough radiographic study of the involved tooth with exposure from three different horizontal projections, the standard buccal-to-lingual projection, 20 from the mesial, and 20 from the distal reveals the basic information regarding the anatomy of the tooth in order to perform endodontic treatment. However, using the buccal object rule with two radiographs with different horizontal angulations may suffice to determine the position of a lingual root. [6]

Modification of the conventional triangular access to obtain rectangular or trapezoidal outline form assists in locating the orifice of radix entomolaris. Since canal entrances are equidistant from a line drawn in a mesio distal (MD) direction through the pulp chamber floor and lie on a line perpendicular to this MD line across the center of the floor of the pulp chamber, following the laws of symmetry helps in both detecting and locating an radix entomolaris. Further, following a dark line on the floor of the pulp chamber may act as a visual aid to indicate the position of an RE canal orifice.[9]

IV. Conclusion

The case highlights the challenge in managing lesions affecting both the dental pulp and periodontal ligament, emphasizing the importance of accurate diagnosis and classification for successful treatment. It underscores the significance of recognizing anatomical variations like RE in mandibular molars, which can impact endodontic treatment outcomes.

The report details a successful non-surgical root canal treatment alone resulting in symptomatic relief and improved periodontal health over a 3-month follow-up and also serves as a reminder for clinicians to be aware of anatomical variations and the potential combined endodontic-periodontal lesions, advocating for thorough diagnostic radiographs and careful treatment planning.

References

[1] Alquthami H, Almalik Am, Alzahrani Ff, Badawi L. Successful Management Of Teeth With Different Types Of Endodontic-Periodontal Lesions. Case Rep Dent. 2018, 29;2018:1–7.

[2] Rotstein I, Simon Jhs. Diagnosis, Prognosis And Decision-Making In The Treatment Of Combined Periodontal-Endodontic Lesions. Periodontol 2000. 2004 ;34(1):165–203.

[3] Shenoy N, Shenoy A. Endo-Perio Lesions: Diagnosis And Clinical Considerations. Indian J Dent Res. 2010;21(4):579.

[4] Dwiyanti S. A Multi-Disciplinary Approach In The Management Of Endo-Perio Lesions: A 4-Year Follow-Up Case Report. Case Rep Dent. 2023;2023:1–9.

[5] Sartori S, Silvestri M, Cattaneo V. Endoperiodontal Lesion. J Clin Periodontol. 2002; 29(8):781–3.

[6] Roeland De Moor, Christophe Deroose, Filip Calberson. The Radix Entomolaris In Mandibular First Molars: An Endodontic Challenge. Int Endod J. 2004; 37(11):789–99.

[7] Sarangi P, M Uppin V. Mandibular First Molar With A Radix Entomolaris: An Endodontic Dilemma. J Dent (Tehran). 2014;11(1):118–22.

[8] Agarwal M, Trivedi H, Mathur M, Goel D, Mittal S. The Radix Entomolaris And Radix Paramolaris: An Endodontic Challenge. J Contemp Dent Pract.2014;15(4):496–9.

[9] Vivekananda Pai Ar, Colaco Ashwini S, Jain R. Detection And Endodontic Management Of Radix Entomolaris: Report Of Case Series. Saudi Endodontic Journal. 2014;4(2):77-82.

[10] Alshawwa H, Wang Jf, Liu M, Sun Sf. Successful Management Of A Tooth With Endodontic-Periodontal Lesion: A Case Report. World J Clin Cases. 2020 26;8(20):5049–56.