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Case Report **Oral Medicine**

Endodontic Periodontal Lesion Due to Inadequate Endodontic Treatment: an Alert for Dental Practitioners: A Case Report

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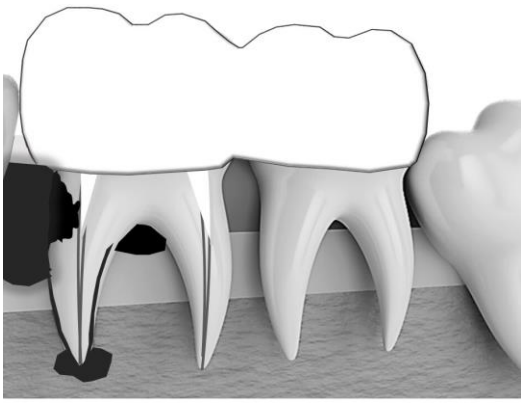
Abstract

The complex intercommunication between the pulpal and periodontal tissues may result in the formation of endodontic periodontal lesions. The relationship between the pulpoperiapical and periodontal microflora explains the possibility of infection spreading between the root canal and the periodontal pocket. The associated tooth has periodontal involvement in the form of either pocket, clinical attachment loss, furcation loss, or other infrabony defects and also pulpoperiapical disease. The diagnosis of endodontic periodontal diseases can sometimes be challenging to make an accurate diagnosis. We report a case of a 34 years old female patient with an endo-perio lesion in the right lower second molar # 47 which was previously treated with endodontic therapy followed by prosthetic rehabilitation. We highlight the need for adequate endodontic management and the importance of maintaining proper prosthetic contour for the prevention of endodontic periodontal lesions. In our case, the endodontic periodontal was the result of inadequate endodontic treatment by the dental clinician. Hence with this case, we reiterate the importance of adequate and complete endodontic treatment and also the need to follow the tooth contours during prosthetic rehabilitation as a preventive protocol for endodontic periodontal lesions.

Keywords: Endodontic periodontal lesions, endo- perio lesions, furcation bone loss, periapical radiolucency, root canal therapy, case report.

INTRODUCTION

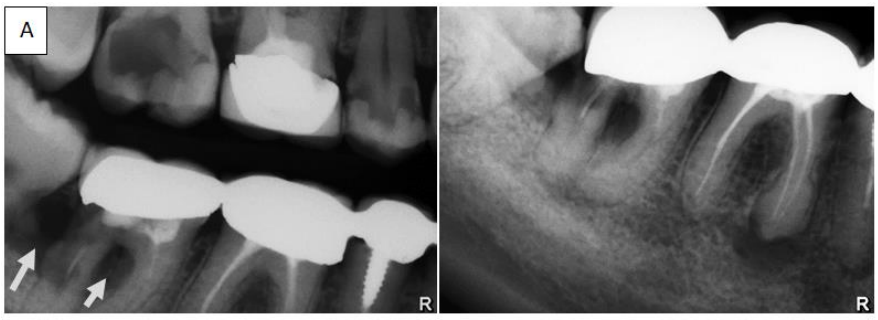
The endodontium and periodontium are closely related structures in the dental apparatus. Diseases of one of these structures may lead to the involvement of the other. The endo-perio lesion is a condition characterized by the association of periodontal and pulpal disease in the same dental element [1]. When the pulp becomes inflamed/infected, it elicits an inflammatory response of the periodontal ligament at the apical foramen and/or adjacent to openings of accessory canals [2]. Three main avenues for the exchange of infectious elements and other irritants between the two compartments are created by (1) dentinal tubules, (2) lateral and accessory canals, and (3) the apical foramen [3]. The most common signs and symptoms associated with a tooth affected by an endo-perio lesion are deep periodontal pockets reaching or close to the apex and negative or altered response to pulp vitality tests [4].



Pictorial representation of Endodontic Periodontal lesion due to inadequate root canal treatment and overcontoured prosthesis

CASE REPORT

A 34 years old female visited the dental university clinic with the complaint of pain in the upper right teeth region for 2 weeks. The pain was spontaneous in onset lingering for few minutes but worsened during sleep. Family medical history revealed her grandmother had hypertension. The patient reports a past dental history of multiple composite restorations undergone 4 to 6 years in teeth no.#17,#15,#12,#11,#23,#24; root canal treatment followed by capping of multiple 5-6 years back for teeth no.#16,#25,#27,#37#44,#45,#46,#47; tooth no.#24 was root canal treated followed by composite restoration since during the same time; extraction of teeth were done 2-3 years back for teeth no. #26, #28, #38; tooth no. #36 was congenitally missing. Intraoral examination revealed a fistula in the attached mucosa with tooth no. #47. Since it had undergone prior endodontic treatment with crown/bridge, the vitality test for the tooth was negative. The percussion test was negative vertically and horizontally. On periodontal probing of tooth #47 (mesiobuccal 2mm, buccal 2mm, distobuccal 8mm, mesio-lingual 3mm, lingual 3mm,distolingual:6mm), distal root clinical attachment loss of more than 5mm was noted. The tooth was nonmobile with grade II furcation involvement. On radiographic examination using periapical and bitewing radiographs in the region of #45,46,47,48 (Figure A and Figure B), tooth no.#47 interdental craters in the region of teeth #47, 48 was found to have moderate horizontal bone loss, radiolucency in the distal alveolar crest and furcation area with the widening of the pdl space all along the distal root. Distal root caries were also noted with inadequate root canal treatment and prosthetic crown. More than 2/3rd of the root canal length was not prepared or obturated. Internal and external root resorption was also another finding in the distal root. Hypercementosis of both the roots were noted with periapical rarefaction and destruction of lamina dura around the apical region of both roots. The periodontal bone loss, furcation bone loss, and periapical bone loss with root resorption were all continuous with each other with the widening of distal pdl space as mentioned above. Tooth #46 was also endodontically treated with a crown. Blunting of the alveolar crest with the widening of pdl space in the crestal region indicated early periodontal bone chances in tooth #46. The mesial root canal was inadequately filled. A well-defined periapical radiolucency with the destruction of lamina dura and hypercementosis of apical 1/3rd of the mesial root was seen in tooth #46. Mesial root caries in tooth #48 were also noted. Ill-defined periapical radiopacities were also seen suggestive of reactive bone formation.



A diagnosis of an endo –perio lesion with Stage III Periodontitis combined with Periapical abscess due to endodontic failure for tooth # 47 was given and Periapical granuloma due to endodontic failure in tooth # 46 was given. A management plan of extraction of tooth # 47, 48 due to poor prognosis and re-root canal treatment for tooth #46 was carried out. The patient was followed up for 3 months with adequate bone healing.

DISCUSSION

An endodontic periodontal lesion is defined as endodontic and periodontal involvement of the same tooth. An established endo-perio lesion is always associated with varying degrees of microbial contamination of the dental pulp and the supporting periodontal tissues. The relationship between periodontal and endodontic disease was first described by Simring and Goldberg in1964 [5]. The penetration of bacteria through dentinal tubules is considered to be a matter of controversy and infection of the endodontic-periodontal route niche is not well understood [6]. The similarity between the endodontic and periodontal microbiota indicated the possibility of infection spreading between the root canal and the periodontal pocket [7]. The environmental effect as a direct consequence of periapical and periradicular radiolucencies associated event may promote the development of marginal bone loss and consequently should be regarded as a risk factor in periodontitis progression [8]. This proves the fact that either one of these diseases occurs and progresses to the other or they develop independently and get associated at an advanced stage of disease progression. Endodontic-periodontal lesions present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned [9]. The diagnosis of such lesions is commonly viewed and treated as separate entities which make its diagnosis and management critical [9, 10]. The microorganisms and by-products from the infected root canal may cross accessory and furcal canals and

determine sinus tract and loss of attachment [9, 11]. David Herrera (2018) proposed that an established endo- perio lesion is always associated with varying degrees of microbial contamination of the dental pulp and the supporting periodontal tissues [4]. Simon *et al*., in 1972 classified the endodontic periodontal lesions based on their primary cause of origin into 5 categories.

1. Primary endodontic lesions
2. Primary endodontic lesion with secondary periodontal involvement
3. Primary periodontal lesions
4. Primary periodontic lesions with secondary endodontic involvement
5. True 'combined' lesions

This is the most widely used classification of endo-perio lesions [9]. Endodontic-periodontal lesions always present difficulty to the dental clinician in its diagnosis and management [9]. A recent study by Das AC *et al*., (2020) reported the existence of correlation among the targeted endodontic and periodontal bacterial species levels from coexisting endodontic-periodontal diseases [13]. The management of endo perio lesions also requires a multidisciplinary and precise sequence of steps to be followed for successful treatment, especially in the esthetic zone [14]. Management can be done using a laterally positioned flap (LPF) (partial thickness / full-thickness flap) with subepithelial connective tissue grafts especially for a tooth with a single recession [14]. Titanium-prepared platelet-rich fibrin or guided tissue regeneration with open flap debridement along with endodontic therapy is also a treatment option [15]. Biosynthesized silver nanoparticles have also been found to be efficacious against Porphyromonas gingivalis, Bacillus pumilus, and Enterococcus faecalis in endo perio lesions [16]. Ozone therapy is another proposed treatment for cases with narrow periodontal bone loss and pockets in aggressive periodontitis with a poor prognosis [17]. Hemi section with root canal therapy is also a possible treatment plan for multi-rooted teeth with a sound periodontium in the unaffected root [18] to be Simultaneous management in the appropriate sequence for endodontic and periodontal surgical therapy was suggested by Tewari S *et al*., (2018) to be a better option for patient compliance and less duration of treatment [19]. However, factors like smoking, multirooted teeth, generalized periodontitis, high probing depth with clinical attachment loss are poor prognostic factors for grade 2 and 3 endo-periodontal lesions [20].

CONCLUSION

Here we report a case of iatrogenic induced endo perio lesion leading to early partial edentulousness and thereby dental morbidity. Also, we have discussed the possible management options for an endo perio lesion for consideration. Many a time an adequate endodontic therapy or maintaining proper tooth contours during prosthetic or restorative rehabilitation to facilitate proper flushing action of saliva are overlooked by dental practitioners. Hence this case also highlights the importance of preventive protocol for endo periodontal lesion by the rightful dental practice.

Statement of ethical consent: The patient has given verbal consent to use de-identified patient data to report this case.

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