

Management of Endodontic-Periodontic Lesion: A Systematic Review

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Abstract: ***Objective:** The aim of this systematic review was to understand the management of endodontic–periodontic lesion. **Methods:** PubMed and Wiley online searches were conducted to identify articles published in dental journals till April 2018. Manual searches of published articles and related reviews were performed afterwards. **Result:** A total 16 articles were selected with 22 patients as subjects. All studies shown improvement in probing depth (PD) after treatment or healing of the lesion. All studies included treatment using root canal treatment (RCT) alone or RCT combination with bone graft or RCT with platelet rich fibrin (PRF). **Conclusion:** Treatment using root canal treatment (RCT) combined with bone graft was widely used than the other treatment option in endo-perio lesion.*

Keywords: Bone grafting, Endodontic–periodontic lesion, Endodontic treatment, Periodontitis.

1. Introduction

There is a relationship between endodontic and periodontal structures. This relationship promotes the spread of infection, resulting in typical manifestations of endo-periolesions which often remain free of symptoms for long periods, until it starts acute symptoms of inflammation and/or increased pain. (1) The differential diagnosis of endodontic and periodontal diseases can be difficult otherwise a correct diagnosis has a vital importance so that appropriate treatment can be provided. (2) The endo-perio lesions have been characterized by the involvement of pulp and periodontal disease in the same tooth. Secondary infection or periodontal tissue breakdown can be occurred as result of Infection in pulp tissue. In the other hand, severe periodontal disease may initiate or exacerbate inflammatory changes in pulp tissue. (3) There are some difficulties in treatment endo-perio lesions especially when a severe loss of periodontal attachment and osseous structure occurs. (4)

Classification of endodontic–periodontic lesions:

- Primary pulpal infection, lead to chronic periapical periodontitis by a periapical radiolucency (PARL) can develop and migrate cervically.
- Primary periodontal infection that lead to breakdown of alveolar crest bone that migrates from cervical area to the apex.

- Both primary pulpal and primary periodontal infection occur simultaneously in an endodontic–periodontic lesion “independent” which exhibit the characteristics of both.
- Primary pulpal and primary periodontal infections, occur extensively in “combined” endo-perio lesion. (5)

Understanding the pathogenesis as well as the clinical and radiographic manifestations of endo-perio lesions lead to successful treatment of endo-perio lesions. (1) Several examinations can help to obtain the diagnosis between endodontic and periodontal disease:

- Vitality test: In endodontic disease, the tooth is non-vital while in periodontal disease, the tooth is vital in most cases.
- Plaque/calculus: In endodontic disease, plaque or calculus may present, but they are not the primary cause of the disease while in periodontal disease, plaque or calculus is the primary cause.
- Pocket/probing depth: In endodontic disease, a single and narrow pocket may present while in periodontal disease, generalized periodontal pockets may present and they are located relatively wide and coronally.
- d. Radiographic: bone loss in endodontic disease is localized and mostly in the apical area while in periodontal disease, bone resorption is more generalized and mostly located at the crestal bone. (6)

2. Methods

This systematic review was written according to the guidelines of PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) for reporting studies evaluating healthcare interventions. PICO question (population, intervention, control, outcome) of the this systematic review was: P: patient with endo-perio lesion I: endo-perio treatment C: treated with RCT and flap operation + bone graft O: the treatment mostly used and the best result based on probing depth.

Search strategy

A study protocol was established by Initial PubMed and Wiley search of the English language literature. These searches were conducted to identify studies published in dental journals until April 2018 which focusing on study endo-perio treatment. Periodontics– endodontics lesion” and “endo-perio treatment were the keywords used in searching were. The search limits applied to the electronic search were the Article types and search period. Manual searches of published articles and related reviews were performed afterwards. There are 34 studies have shown in Pubmed, and 160 studies in Wiley, with only 16 studies met the inclusion criteria. Specific keywords were used to identify the appropriate study's needs and followed the characteristics of PICO questions.

Eligibility criteria

Inclusion criteria were:

- Language of article was English.
- Full text article.
- Case report that published until April 2018.
- Studies reported endodontic and periodontics lesion.
- Studies that include case report or case studies.

The exclusion criteria were:

- Animal studies.
- Systematic review and meta-analysis studies.
- The studies didn't report the probing depth.

Selections of study

Two participating authors used a specific keyword resulted the selection of the papers based on reading of abstract and full-texts. Independently, the two authors selected the paper based on inclusion criteria formerly set. Then, all abstracts and full-texts were downloaded and individually evaluated. The criteria were used to identify the articles that will be used for this systematic review.

Extraction of data

All data were retrieved by two reviewers regarding following parameters: authors, year of publication year, number of patients, technique, and objective. All full-text articles which met the inclusion criteria were read independently by two reviewers and evaluated to formulate this systematic review.

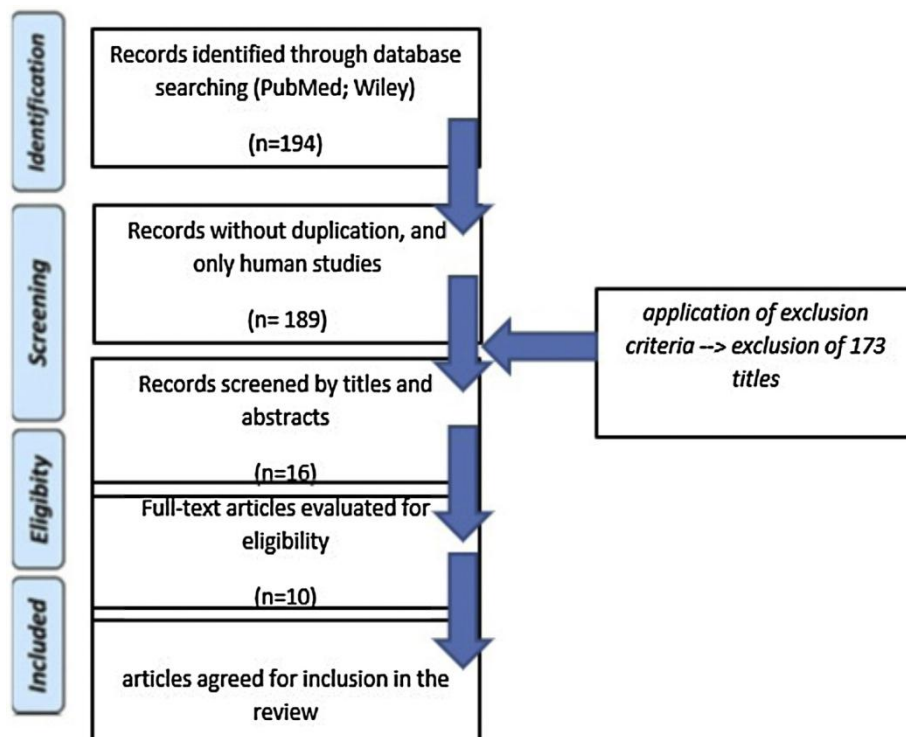


Figure 1: Article selection flow chart.

3. Result

The database search yielded 194 articles, including 34 from PubMed and 160 from Wiley. After removing duplicates articles, there were 189 studies remained. The titles and

abstracts were reviewed afterward. The full-text articles then be reviewed by the investigators and yielded 10 articles which met the inclusion criteria. The flowchart of selected article is shown in with selected articles from initial yield of 194 studies by electronic literature search (Fig.1).

All articles were selected for full-text review. A total 10 articles were selected for inclusion. All the studies showed decreased probing depth after treatment or healing of the lesion. All the included studies were case report with treatment using RCT alone or RCT combination with bone graft or RCT with PRF.

4. Discussion

There is a direct inflammatory response when the pulp becomes necrotic by the periodontal ligament in the area of the apical foramen or accessory canals. These are similar pathogens in periodontal infections. On the opposite site, the effect of periodontal disease on the pulp is degenerative in nature including an increase in calcifications, fibrosis and collagen resorption. (11) Inadequate coronal seal leading to microleakage which can be one of the reasons for the failure of the root canal treatment. Teeth that have been periodontal surgery had a more favorable healing response with the gain of connective tissue attachment when occlusal trauma was relieved. (10)

The disease primary endodontic with secondary periodontal involvement should first be treated with an endodontic therapy. The severity of periodontal involvement, periodontal treatment and patient response are important in determine the Prognosis. The differential diagnosis is difficult when there is sinus tract originating from the endodontic lesion may drain along periodontal ligament. Therefore, a primary endodontic lesion and drainage from attachment apparatus should be initially treated by an endodontic therapy. (3)

Endodontic treatment is highly predictable and successful rate once performed well. Tooth may have hopeless prognosis if large bony support has been lost from periodontitis regardless of predictability of endodontic therapy. In multi-rooted teeth Regeneration, root resection and hemi section are indicated as a part of strategic treatment. (8)

The etiology and diagnosis of dental abscesses are based on clinical, radiographic findings and patient history. Vitality test can detect the changes of sensation caused by pulpal inflammation and necrosis. If there is pulpal disease with periodontal bone loss, the endodontic treatment should be completed first and then the patient should be reevaluated. In some cases, clear periodontal pathology including bone loss, suppuration, and pocket depth resolves when the pulpal lesion that has been successfully treated endodontically. In addition, successful regeneration of periodontal defects is possible in endodontically treated teeth. (9)

Bone graft materials can be classified into natural and synthetic types. Natural type includes allograft, autogenous bone and xenograft, while the synthetic bone graft is commonly known as alloplastic materials. (12) Hydroxyapatite (HA) has been used for many years as a bone replacement material which has excellent biocompatibility, high osteogenic potential and anti-infection capacity. (2)

Hydroxyapatite (HA) was found to be a useful material in the reconstruction of periodontal defects because of its ability to dissolve, break down, and allow new bone formation and remodeling required to attain optimal mechanical strength without interference. (2) One month required for epithelial attachment to establish and six months for complete bone formation after periodontal surgery. (7, 13)

An accurate diagnosis is mandatory for the successful treatment of endodontic-periodontic lesions. This diagnosis must include both endodontic and periodontal component of the lesion. If the primary aspect cannot be evaluated, endodontic treatment should be given precedence then wait-and-see approach until a decision for any additional endodontic surgical and/or periodontal procedure can be performed. (1)

5. Conclusion

Root Canal Treatment combined with bone graft was widely used than other treatment option in endodontic-periodontic lesion.

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