Implementing The 2017 Efp/Aap Periodontal Disease Classification in the Diagnosis and Management Of Endo-Periodontal Lesions (Case Report)

Penerapan Klasifikasi Periodontal Efp/Aap 2017 dalam Diagnosis dan Penatalaksanaan Lesi Endo-Periodontal (Laporan Kasus)

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ABSTRACT
Endo-periodontal lesions (EPL), characterized by the involvement of both pulpal and periodontal tissues, present diagnostic and therapeutic challenges in dental practice. This case report highlights the successful management of an EPL in a 52-year-old female patient with the guidance of the 2017 EFP/AAP Classification. Tooth 43 was incidentally found to be necrotic with symptomatic apical periodontitis and was subsequently root canal treated. However, at 15 months post-obturation, the tooth was presented with acute periodontal swelling at the buccal gingiva with deep pockets, bleeding-on-probing, calculus deposition, and periapical radiolucency. Using the 2017 EFP/AAP Classification, without root damage was diagnosed in non-periodontitis patients with Grade III. This report facilitates better and more accurate diagnosis-making for effective EPL treatment outcomes.
Keywords: Endo-periodontal lesion, EFP/AAP classification, periodontal abcess, root surface debridement

ABSTRAK
Lesi endo-periodontal (EPL), yang dicirikan oleh keterlibatan jaringan pulpa dan periodontium, adalah merupakan cabaran diagnostik dan terapi dalam praktik kedokteran gigi. Laporan kasus ini menyoroti pengelolaan yang berhasil dari EPL pada seorang pasien perempuan berusia 52 tahun dengan panduan Klasifikasi Penyakit Periodontium dan Peri-Implantitis yang terkini (2017 EFP/AAP). Gigi 43 secara kebetulan ditemukan dalam keadaan nekrosis dengan apikal periodontitis yang bergejala dan kemudian menjalani perawatan saluran akar. Namun, pada 15 bulan setelah obturasi, gigi tersebut menunjukkan pembengkakan periodontal akut pada gingiva bukal bersamaan dengan kantong-kantong dalam yang signifikan saat diuji tekan, penumpukan karang gigi, dan radiolusensi periapikal. Dengan menggunakan Klasifikasi 2017 EFP/AAP, diagnosis EPL tanpa kerusakan akar pada pasien bukan-periodontitis Tingkat III telah dibuat. Laporan kasus ini dapat membantu perawat membuat diagnosa yang lebih tepat dan seterusnya menghasilkan perawatan EPL yang lebih berhasil.
Kata Kunci: Lesi endo-periodontal, klasifikasi EFP/AAP, abses periodontal, debridemen permukaan akar

INTRODUCTION

Endo-periodontal lesion (EPL) results from infection and inflammation involving both pulpal and periodontal tissues as an entity. [1] Communication pathways between the anatomically and physiologically intimate pulp and periodontal tissues serve as a passage for which inflammation of one spreads to another.[1] Such pathways include apical foramen, accessory canals, and dentinal tubules with periodontal ligament space.[1] Due to this complex anatomical communication, EPL often challenges diagnosis-making and management planning as their clinical signs and symptoms can be confusing.[2] This scenario can inevitably result in misdiagnosis and inappropriate treatment, leading to delayed healing and/or worsened prognosis.

Previous endodontic and periodontal disease classifications[3-5] focused on identifying primary lesions of the EPL. The most used classification was proposed by Simon et al.[4], where EPLs were categorised into primary endodontic lesions, primary endodontic lesions with secondary periodontal involvement, primary periodontal lesions, primary periodontal lesions with secondary endodontic involvement, and combined lesions. These classifications limit non periodontitis patients, the decision-making options and do not readily suggest comprehensive treatment options for EPL cases when concerning the patients' status and cause of EPL. Recently, the 2017 Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions (2017 EFP/AAP)[6] classifies EPL with or without root damage. EPL with root damage can occur in root fractures, root canal perforations, and external root resorption. EPL without root damage can be further classified into periodontitis or non-periodontitis patients, then graded into Grade 1, 2, or 3, depending on the extension of deep pocket(s). This new classification system offers a more straightforward care pathway for treatment planning in different case scenarios. In contrast with the previous classification, the current classification system also emphasises the status of the tooth and disease at the site of the lesion, allowing better prognostication, management, and more predictable treatment outcomes. This case report shares an EPL case management in the clinic using 2017 EFP/AAP classification of EPL using a step-by-step diagnosis and treatment approach.

Table 1. Summary of the 2017 EFP/AAP Classification of Endo-periodontal lesions

EPL
with root damage
Root fracture/ cracking
Root canal perforation
External root resorption
EPL
without root damage
EPL in periodontitis patients
Grade I – narrow, deep periodontal pocket in 1 tooth surface
Grade II – wide, deep periodontal pocket in 1 tooth surface
Grade III – deep periodontal pockets in >1 tooth surface
EPL in non- periodontitis patients
Grade I – narrow, deep periodontal pocket in 1 tooth surface
Grade II – wide, deep periodontal pocket in 1 tooth surface
Grade III – deep periodontal pockets in >1 tooth surface

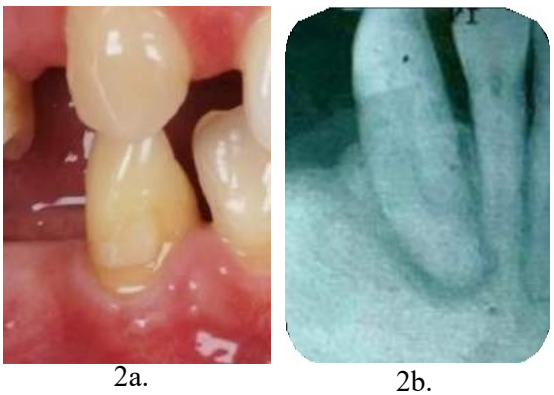
Figure 1. Pre-op clinical photographs showing no sign suggesting EPL

CASE REPORT

A 52-year-old female patient with no underlying medical condition requested a pair of dentures. She was presented with multiple edentulous spaces on both maxillary and mandibular arches but has never worn any dentures. She had been a symptomatic dental attendee and had experienced several dental treatments, including dental extractions, restorations, and a full metal crown that was placed in May 2019. She did not practice flossing and was a non-smoker.

No abnormality was found during the examination of the head and neck. Intraoral examination revealed distolingually rotated 43, which was planned to be used as an abutment tooth for the new cobalt-chromium removable partial denture. The highest Basic Periodontal Examination (BPE) score was 2 in all sextants (Figure 1). Further investigation on tooth 43 revealed no response to pulp sensibility tests: electrical pulp test (EPT) and cold test. It was tender to percussion and palpation. The tooth has normal physiologic mobility and has no deep periodontal pockets more than 4mm. There was no occlusal contact between 43 and the opposing 13 (Figure 2a).

Radiographically, periapical radiolucency extends from the apex to the distal aspect of tooth 43, with the lesion being more evident at the apical aspect and vaguer at the distal aspect. Widened lamina dura can also be seen (Figure 2b).



2a. 2b.

Figure 2a. Pre-op clinical photograph of tooth 43. Figure 2b . Pre-op periapical radiograph of tooth 43

Tooth 43 was diagnosed with pulpal necrosis with symptomatic apical periodontitis based on AAE Diagnostic Terminology[7] with *EPL without root damage in non- periodontitis patients, grade I* as differential diagnosis. (1)

Root canal treatment was performed using the ProTaper Universal System (Dentsply Sirona, Charlotte, NC, USA). Ultracal™ XS Calcium Hydroxide Paste medication (Ultradent, South Jordan, UT, USA) was used as an inter-appointment medicament. Obturation was done using a single gutta-percha cone technique and AH Plus sealer (Dentsply Sirona) (Figure 3a).

The tooth was reviewed three weeks post-obturation, and permanent composite resin restoration was placed as there was no enlargement of the radiolucency. (Figure 3b) However, denture fabrication had to be suspended due to the outbreak of the COVID-19 pandemic.

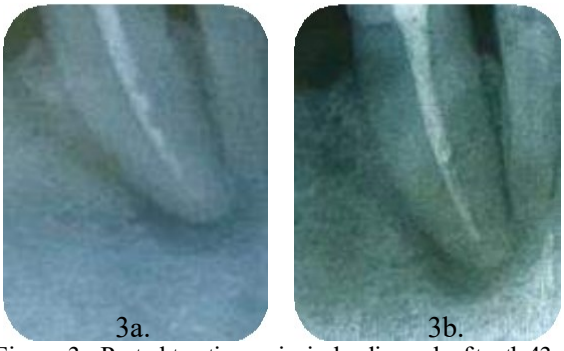


Figure 3a. Post-obturation periapical radiograph of tooth 43. Figure 3b . Post-obturation radiograph at 3 weeks showing no changes to the apical radiolucency.

After 15 months, the patient presented at the clinic with an oval-shaped swelling on the buccal attached gingiva at 43. The tooth was firm, but six-point periodontal charting reveals a 10 mm pocket at the mesiobuccal site and 9 mm at the mid-buccal site. (Table 2) No sinus opening was present. No deep pockets > 4 mm were found in other teeth (Figure 4a). Radiographically, the lesion at the distal surface of the root has improved, but the apical radiolucency has enlarged (Figure 4b).

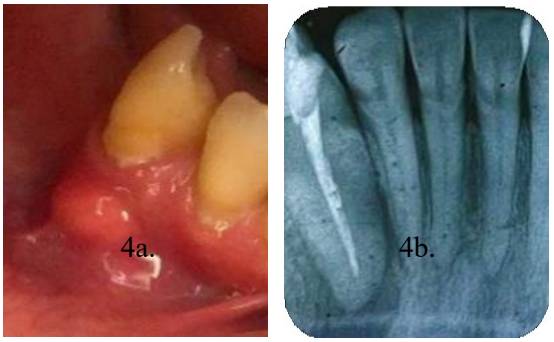


Figure 4a (left). Clinical photograph showing acute periodontal abscess at tooth 43 after 15months of obturation. Figure 4b (right). Periapical radiograph showing extended radiolucency

Tooth 43 was diagnosed as *EPL without root damage in a non-periodontitis patient grade III*.[1] Differential diagnosis includes vertical root fracture (VRF), especially considering the presence of narrow, deep pockets with a history of attempted root canal treatment, which are both characteristics of VRF.8 VRF was eventually ruled out as the tooth responded well to periodontal treatment, and no crack line was present.

Full mouth scaling and prophylaxis were done, and root surface debridement with Gracey's curette was performed. The pockets were then flushed with 0.12% chlorhexidine. During the review, the swelling had resolved one week after root surface debridement, and the periodontal pockets at mesiobuccal and buccal sites were reduced to 6 mm and 7 mm, respectively, with bleeding on probing. (Table 2) 0.12% chlorhexidine was used to flush the pockets again.

Subsequently, the next periodontal reassessment was delayed after four months due to the second outbreak of COVID-19, and the patient could not access dental treatment because of movement restrictions in the country. During the reassessment, tooth 43 presented with no mobility, no deep pockets of > 3mm and no bleeding on probing (Table 2), indicating a favourable periodontal outcome. (Figure 5)

Figure 5. Clinical photograph at the periodontal reassessment visit. Showing resolution of abscess after scaling and root surface debridement.

Following the resolution of EPL at tooth 43, the denture fabrication plan was resumed. The patient received her denture a week later. (Figure 6) The tooth remained functional and asymptomatic, and the treatment outcome was successful.

Figure 6. Post-op clinical photograph showing complete resolution of the periodontal abscess and pocket after delivery of cobalt chrome denture.

EPL is a clinical condition where pulp and periodontal tissues are involved in the same environment.[1] Disease to periodontium and pulp tissues can occur concurrently as a combined lesion or lesions independent of each other, and patients may present with varying clinical presentations, making the diagnostic process even more confusing. They also share similar risk factors and can complicate each other: untreated periodontitis can lead to histological changes in the pulp;[10] untreated endodontic infection can promote periodontal destruction in teeth with pre-existing periodontitis.[11]

Despite earlier classifications emphasising the primary source of lesion,[3-5] the latest 2017 EFP/AAP classification[1] viewed that identification of the primary source of lesion is "not practical" as treatment to both endodontic and periodontal tissues is necessary irrespective of the primary source. Besides, it may be impossible to ascertain which infection precedes another.

The current classification is based on clinical findings at the time of diagnosis, e.g., the presence of fractures and perforations, periodontitis, and the extent of the periodontal destruction – therefore simplifying the diagnostic and prognostic process.[1]

Table 2. Six-point probing pocket chart of tooth 43

Second re-assessment	3	2	3
First re-assessment	3	2	3
Initial visit (with periodontal abscess)	3	2	3
Surfaces	DL	L	ML
	DB	B	MB
Initial visit (with periodontal abscess)	3	9*	10*
First re-assessment	3	7*	6*
Second re-assessment	3	2	3

** indicates bleeding on probing*

DISCUSSION

Accurate diagnosis is a prerequisite in formulating a treatment plan and dictating prognosis. Diagnosing EPL is often difficult as it involves two different origins, i.e., endodontic and periodontic. Although endodontics and periodontics are often studied as separate entities, an intimate anatomical relationship through communication sach.

EPL as lateral canals and apical foramen. Clinical findings of disease in either one can mimic the other.[9] The diagnosis of EPL is indicated by the presence of periodontal pockets reaching or close to the apex combined with the absence of pulp vitality. Steps in diagnosing EPL involve history, clinical examination, periodontal assessment and assessing severity of the lesion (Figure 7).

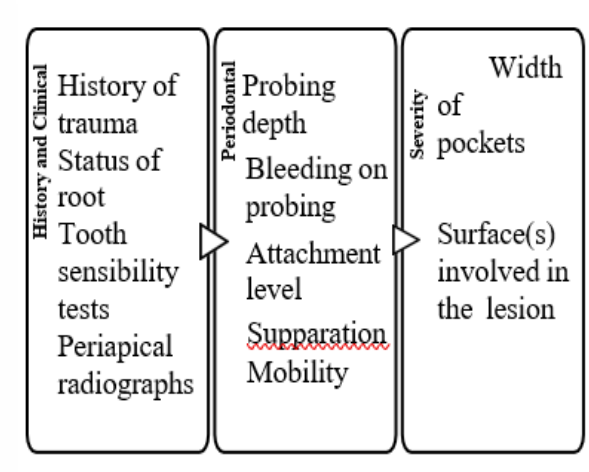


Figure 7: Steps in Diagnosing EPL

The prognosis of non-surgical treatment of EPL grade II-III is determined by smoking status, probing depth, clinical attachment loss, periodontitis severity and number of root canals regardless the periapical index[17].This case has a good prognosis with the given parameters.

CONCLUSION

Applying the new EFP/AAP 2017 classification system of EPL tooth provides a clearer diagnosis and more comprehensive approach to managing EPL in this patient, leading to predictable and better treatment outcome.

In this patient, the pre-operative radiographic features suggest *EPL without root damage in non-periodontitis patient, Grade I*, but this diagnosis was only made retrospectively as there were no deep pockets found in the initial visit. Several reasons may be attributed to the absence of deep pockets during initial visit. First, the narrow deep pocket may be present but was missed by the clinician. Isolated deep pockets are easily missed during routine examinations.[12] It is critical to perform a comprehensive periodontal probing assessment all around the tooth instead of an "in-out" six-point probing.[13]Secondly, since periodontal destruction starts at the root apex and progresses cervically, probing depths can appear normal until a circumscribed location presents with deep pockets.[14]

Treatment of EPL involves both endodontic and periodontic treatment. Abbott and Salgado[15] suggested that endodontic treatment should be commenced prior to periodontal treatment as the latter removes the protective cementum layer and exposes the dentinal tubules, allowing the release endotoxin from the infected pulp system if the they were not already sterile.

In this case, periodontal treatment was delayed due to COVID-19, and this has led EPL to progress from grade I (a narrow deep pocket in one tooth surface) to grade III (deep pockets in more than one root surface) within fifteen months. Narrow, deep pockets contribute to subgingival plaque accumulation, creating an anaerobic environment conducive to bacterial colonisation and subsequent periodontal destruction.[16]

SUGGESTIONS

The first limitation is the short follow-up period after the management of EPL as patients could not attend subsequent visits. Such cases should consider a longer follow-up and reassessment of periodontal conditions to assess the stability of treatment outcomes. Furthermore, only a periapical radiograph was taken in this case, which is prone to inconsistent film positioning and is bidimensional in nature. Utilising CBCT imaging may provide better visualisation of the disease process.

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