

Surgical Treatment of Endo-Periodontal Lesion – a Case Report

Ivan Ivanov¹, Antoaneta Mlachkova¹

¹ Department of Periodontology, Faculty of Dental Medicine, Medical University of Sofia, Sofia, Bulgaria

Corresponding author: Ivan T. Ivanov, Department of Periodontology, Faculty of Dental Medicine, Medical University of Sofia, 2 St Georgi Sofiyski Blvd., Sofia, Bulgaria; Email: ivan.ivanov.dmd@gmail.com; Tel.: +359 883 392 964

Received: 8 May 2021 ♦ **Accepted:** 28 June 2021 ♦ **Published:** 31 Dec 2022

Citation: Ivanov I, Mlachkova A. Surgical treatment of endo-periodontal lesion – a case report. Folia Med (Plovdiv) 2022;64(6):985-990. doi: 10.3897/folmed.64.e68427.

Abstract

The interrelationship between periodontium and pulp makes the treatment of combined endo-periodontal lesions (EPL) more challenging. It involves successful elimination of both periodontal and endodontic lesion. The current case report represents the efficacy of regenerative potential of enamel matrix derivatives (Emdogain®) in endo-periodontal lesion after successful endodontic treatment. A 39-year-old woman presented with EPL on a left first mandibular molar. After the initial 3 months of healing, the clinical examination showed that the furcation involvement still prevailed. A decision was made to use a regenerative procedure using Emdogain®. Fourteen months after the procedure, full periodontal regeneration can be seen on the X-ray. The results demonstrated the synergetic effect of the endodontic and periodontal therapy that changed the prognosis for the tooth.

Keywords

Emdogain, endodontic lesion, furcation involvement, periodontal therapy, periodontal regeneration

INTRODUCTION

The relationship between periodontium and the pulp has been well addressed. The embryonic, anatomical, and functional interrelationships are defined by the dentinal tubules, lateral and accessory canals, and apical foramen and they might be assumed for the combined problems responsible for more than 50% of tooth mortality.^[1]

CASE REPORT

A 39-year-old woman complained of swallowing and pain around tooth #36 associated with pus discharge for 2 weeks. At the first visit, the existing crown of the tooth was removed and systemic antimicrobial therapy (amoxicillin 750 mg) was administered for seven days. During the detailed clinical examination after 1 week, the buccal furcation of tooth #36 presented with a 5-mm horizontal pocket with Naber's probe

(PPD=5 mm) and vertical probing was measured with UNC 15 probe – 4 mm, while the lingual furcation was not probable (PPD=1 mm). Mesially and distally to the tooth, there was no clinical attachment loss.

The level of oral hygiene was measured using the following indexes: full mouth plaque score = 14.29% and full mouth bleeding score = 10.71%.

The radiographic assessment demonstrated periapical endodontic lesion of tooth #36 and furcation lesion (Fig. 1). In the cone-beam computed tomography (CBCT) scan (Fig. 3), a clear communication could be seen between the apical and the buccal furcation lesions, while the lingual furcation was not involved.

The diagnosis was made by the presence of periapical endodontic lesion and grade II furcation involvement and a communication between them. The final diagnosis was endodontic-periodontal lesion and the differential diagnosis was sinus tract and root fracture of tooth #36.

Treatment planning was done taking into consideration

that the tooth presented with combined endo-periodontal lesion, grade II vestibular furcation involvement on a mandibular tooth. The endodontic treatment was performed first (Fig. 2) and the patient was followed-up for three months (Fig. 4). At the end of the third month, an X-ray was taken of tooth #36 which showed that the furcation involvement still prevailed. On clinical examination, it was observed that there was no change in the soft tissue measurements from the initial periodontal status (Fig. 5). Therefore, periodontal regenerative surgery using enamel matrix derivate and specifically in this case Emdogain® was planned for treatment of the furcation defect.

Surgical procedure

After anesthetizing with local anesthesia: ubistesin 4% with adrenaline 1:200 000, a full thickness flap was reflected (Fig. 6) starting with intrasulcular incision from the distal line angle of #35 to the mesial line angle of #37 at the buccal aspect and a vertical hokey-stick incision in the keratinized tissue was performed at the mesial aspect of the flap – between the papilla of teeth #35 and #36. The reflection of the

full thickness flap extended to the residual alveolar bone. After reflection, thorough degranulation and debridement was done at the defect area using Gracey's curette #13 and #14. Also, thorough scaling and root planning was carried out on the exposed root surface area of the defect (Fig. 7). Conditioning and removing the smear layer was done using 24% EDTA gel for 2 minutes on the exposed root surfaces. After thorough rinsing with saline, enamel matrix derivate (Emdogain®) was introduced into the defect. The flap was repositioned to its original position and sutured with single interrupted resorbable 6/0 sutures (Fig. 8).

The patient was advised for proper plaque control using ultra soft toothbrush and prescribed 0.12% chlorhexidine mouthwash for rinsing twice daily for 2 weeks.

The patient was scheduled to have a regular recall each 3 months. After 7 months, the probing depth was 3 mm with UNC 15 probe. The first post-op radiograph after 7 months (Fig. 10) demonstrated significant regeneration in the furcation defect and 14 months after the regenerative procedure on the X-ray can be seen periodontal bone filling, which means periodontal regeneration: new cementum, new alveolar bone, and attachment (Fig. 11).

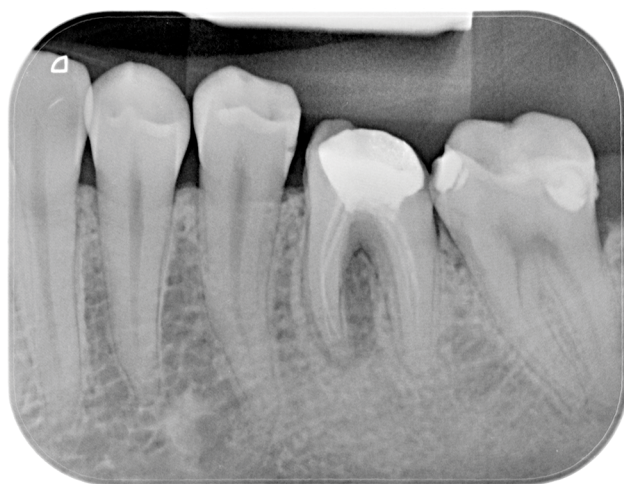


Figure 1. Initial X-ray.

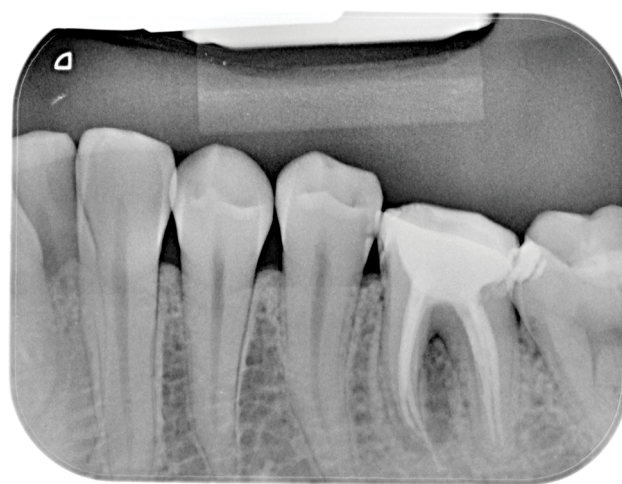


Figure 2. Immediately after retreatment (05.06.2019).

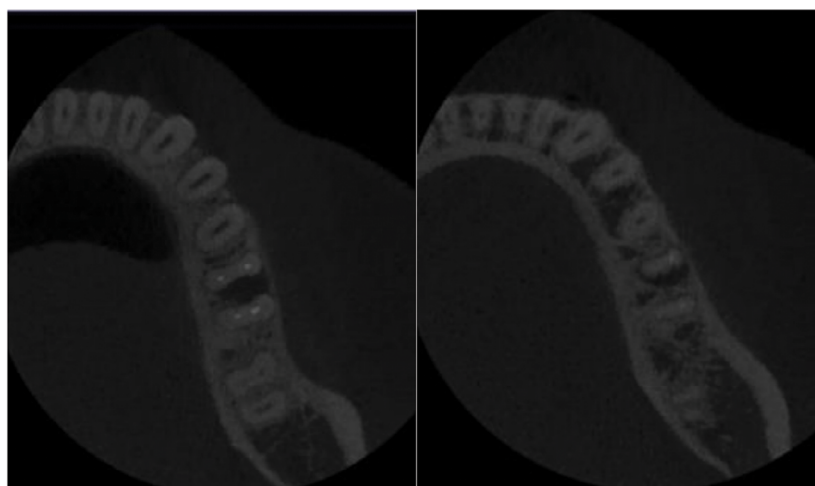


Figure 3. Axial CBCT.

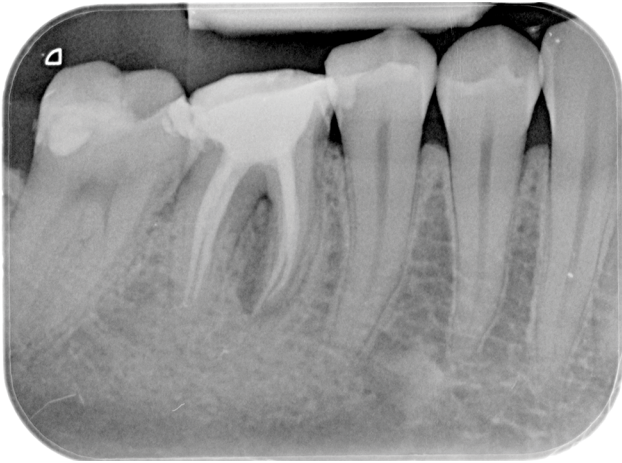


Figure 4. Three months after retreatment (27.09.2019).



Figure 5. Clinical examination after three months with Neber's probe – 5 mm horizontal probing on tooth #36.



Figure 6. Flap reflection (13.02.2020).

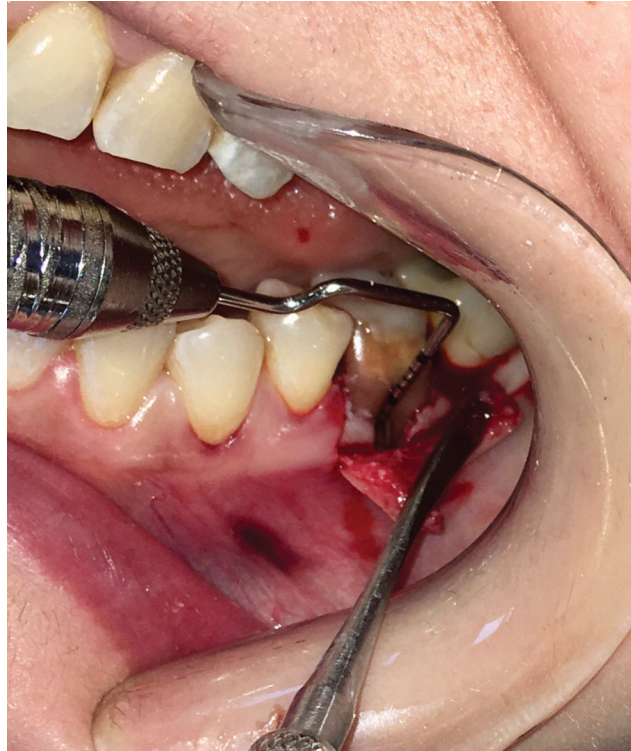


Figure 7. Degranulation of the defect and measuring the intrabony component of the defect – 7 mm with UNC 15 probe.



Figure 8. Suturing.



Figure 9. Two weeks postoperative view (27.02.2020). Primary intention wound healing is established.



Figure 10. 7 months after surgery (08.09.2020).



Figure 11. 14 months after surgery (09.04.21).

DISCUSSION

Endo-periodontal lesions (EPL) can develop by the extension of either the periodontal destruction apically combining at the same time with an existing apical periapical lesion or with non-existing apical lesion. According to the new proposed classification of the periodontal and peri-implant diseases and conditions^[2], they are classified in two main groups: EPL with root damage and EPL without root damage. In our case, the EPL can be classified as EPL without root damage in non-periodontitis patient. Correct definitive diagnosis is the key factor for accurate treatment modality. For instance, the root fracture of the tooth changes its prognosis as “hopeless” and the extraction is the method of choice. If the tooth had a sinus tract, the treatment is related to the endodontic infection. In case of iatrogenic perforation in the furcation area, the prognosis of the tooth is related to the time between the occurrence of the perforation and the appropriately performed treatment, the size of perforation and the used material for sealing that impacts the final prognosis of the tooth.^[3]

In the current case report, 3 months after the endodontic treatment, the lesion was still present and the tooth was asymptomatic. After this period, the tooth was radiographically evaluated and clinical parameters such as horizontal probing depth with Naber's probe did not improve. The clinical examination, together with the X-ray and particularly CBCT confirmed a secondary periodontal involvement together with primary endodontic lesion. The regenerative periodontal procedure was done taking into consideration that the tooth presented combined endo-periodontal lesion, grade II furcation involvement and the regenerative protocol was done using enamel matrix derivate and specifically in this case Emdogain®. This material is well studied^[4] in the literature and it has the potential for a true periodontal regeneration by means of forming new cementum, new bone, and new periodontal ligament with inserting collagen fibers.

Navanoti et al.^[5] reported a similar clinical case with combined regenerative protocol by using decalcified freeze dried bone allograft and barrier membrane (DFDBA along with guided tissue regeneration). Their results demonstrated a significant amount of bone fill and reduction of horizontal probing depth.

For the purpose of resolving similar periodontal lesion, Narung et al.^[1] used particulated bioactive glass with osteoconductive properties for enhancement of bone formation. Authors concluded that they achieved bone fill and reduction of the initial horizontal probing depth.

More recent approach^[6] for the management of endo-periodontal lesions consists in the use of autologous platelet-rich fibrin (PRF). They used growth factors in periodontal regenerative procedures. Platelet-rich substitute enriched with platelets and growth factors can regulate the proliferation, chemotaxis, and differentiation of the locally derived progenitor cells in the defect site. The preparation procedure consists in collecting 10 ml of blood in a 10-ml test tube without an anticoagulant and centrifuged immediately for 12 min at 2400 rpm in a tabletop centrifuge. PRF was obtained in the form of a membrane by squeezing out the fluids in the fibrin clot. Thus, faster healing process was documented. Autologous platelet derivatives offer several advantages such as better tissue handling, release of growth factors, faster healing, and stabilization of graft if such is used. The authors combined PRF as a barrier membrane with bioactive glass graft material. They concluded that significant bone fill and clinical attachment level gain were observed in furcation and intrabony defect.

CONCLUSIONS

The correct definitive diagnosis is the key factor for the accurate treatment modality of endo-periodontal lesions. The complete multidisciplinary approach of both aspects of EPL is important for the successful long-term results. In our particular case the results demonstrate the synergistic effect of the endodontic and periodontal therapy that changed the poor prognosis of the tooth.

REFERENCES

1. Narang S, Narang A, Gupta R. A sequential approach in treatment of perio-endo lesion. *J Indian Soc Periodontol* 2011; 15:177–80.
2. Herrera D, Retamal-Valdes B, Alonso B, et al. Acute periodontal lesions (periodontal abscesses and necrotizing periodontal diseases) and endo-periodontal lesions. *J Periodontol* 2018; 89(Suppl 1):S85–102.
3. Tsesis I, Fuss Z. Diagnosis and treatment of accidental root perforations. *Endod Top* 2006; 13:95–107.
4. Sculean A, Alessandri R, Miron R, et al. Enamel matrix proteins and periodontal wound healing and regeneration. *Clin Adv Periodontics* 2011; 1:101–7.
5. Nanavati B, Bhavsar N, Mali J. Endo-periodontal lesion – a case report. *J Adv Oral Research* 2013; 4:23–7.
6. Goyal L, Gupta N, Gupta ND. Autologous platelet-rich derivatives along with alloplastic bone substitute in the management of complex perio-endo cases. *J Indian Soc Periodontol* 2020; 24:182–5.

Хирургическое лечение эндопародонтального поражения – клинический случай

Иван Иванов¹, Антоанета Млачкова¹

¹ Кафедра пародонтологии, Факультет дентальной медицины, Медицинский университет – София, София, Болгария

Адрес для корреспонденции: Иван Т. Иванов, Кафедра пародонтологии, Факультет дентальной медицины, Медицинский университет – София, бул. „Георги Софийски“ № 2, София, Болгария; E-mail: ivan.ivanov.dmd@gmail.com; Тел.: +359 883 392 964

Дата получения: 8 мая 2021 ♦ **Дата приемки:** 28 июня 2021 ♦ **Дата публикации:** 31 декабря 2022

Образец цитирования: Ivanov I, Mlachkova A. Surgical treatment of endo-periodontal lesion – a case report. Folia Med (Plovdiv) 2022;64(6):985-990. doi: 10.3897/folmed.64.e68427.

Резюме

Взаимосвязь между периодонтом и пульпой делает лечение комбинированных эндопародонтальных поражений (EPL) более сложным. Он предполагает успешное устранение как пародонтального, так и эндодонтического поражения. В настоящем клиническом случае представлена эффективность регенеративного потенциала производных эмалевого матрикса (Emdogain®) при эндопародонтальном поражении после успешного эндодонтического лечения. 39-летняя женщина обратилась с EPL на левом первом моляре нижней челюсти. После первых 3 месяцев заживления клиническое обследование показало, что вовлечение фуркаций всё ещё преобладает. Принято решение провести регенеративную процедуру с использованием Emdogain®. Через четырнадцать месяцев после процедуры на рентгенограмме можно увидеть полную регенерацию пародонта. Результаты продемонстрировали синергетический эффект эндодонтического и пародонтологического лечения, что изменило прогноз для зуба.

Ключевые слова

Emdogain, эндодонтическое поражение, поражение фуркаций, пародонтотерапия, пародонтальная регенерация
