KnE Medicine

NaSSiP 6
The International Online Seminar Series on Periodontology in conjunction with Scientific Seminar
Volume 2022

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Research article

# Periodontal Treatment in Patients with Perio-Endo Lesions: A Case Report

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**Abstract.**

**Background:** Periodontal tissue and pulp are interconnected anatomically. In some circumstances, the inflammation may extend from the periodontal region to the pulp or vice versa. In perio-endo lesions, an appropriate treatment plan is required to obtain a predictable and reliable treatment prognosis. The development and progression of these perio-endo lesions can be influenced by many factors such as bacteria, fungi, viruses, trauma, root resorption, perforation and dental malformations. An appropriate treatment plan for perio-endo lesions can provide a good prognosis.

**Objective:** To describe periodontal treatments performed in patients with perio-endo lesions.

**Case Report:** A 39-year-old man presented to Hasanuddin University Dental and Oral Hospital with a chief complaint of uncomfortable left posterior maxillary teeth during mastication. Clinical examination showed vital, non-caries, pocket depth of ±9mm on tooth 26. Radiographic examination showed a radiolucent lesion that extended to the apically. Regenerative periodontal treatment was performed using a combination of platelet-rich fibrin (PRF) with demineralized freeze-dried bone xenograft (DFDBX).

**Results:** During the observation period, pocket depth was reduced, and the pain was absent. **Conclusion:** Periodontal inflammation that extends to the pulp tissue can be prevented by regenerative periodontal treatment using a combination of PRF and DFDBX, which shows promising results.

**Keywords:** endo-perio lesions, periodontal regenerative, periodontal surgery

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Published: 25 April 2022

Publishing services provided by Knowledge E



Selection and Peer-review under the responsibility of the NaSSiP 6 Conference Committee.

## 1. Introduction

The pulp tissue and periodontal tissue have a close relationship, both anatomically and functionally. Pulp disease and apical disease are initiated by many external factors, including microorganisms, trauma, excessive heat, restorative procedures, restorative agents, and malocclusions. In determining the diagnosis, prognosis, and treatment plan for teeth with diseases with periodontal-endodontic lesions, it is essential to ensure that the initial lesions originate from pulp tissue or periodontium tissue [1,2].

There are various classifications of endodontic-periodontic lesions, one of which is primer periodontal lesions. Primary periodontal lesions, which are usually caused by periodontal pathogenic bacteria. In the process, chronic marginal periodontitis spreads apically along the root surface. Generally, the pulp vitality test will show a normal pulp response. Plaque and calculus are also often found in pockets, causing the pockets to widen. Root canal treatment will not produce changes because these lesions do not originate from the pulp. The prognosis of these lesions depends entirely on periodontic treatment [3,4,5].

Regeneration is the process of repairing damaged or injured parts. This biological process is an increase in architectural and tissue functions. The periodontal regeneration process consists of alveolar bone restoration, periodontal ligament, and cementum. GTR has been widely used in the periodontium regeneration process for decades. This process is a regenerative surgical technique that involves procedures to repair mucogingival flaps around the affected tooth, scale and plot the root surface and place a temporary barrier under the gingiva. The biological basis of the GTR technique is to block the growth of apical epithelium into space above the exposed root surface by using a barrier membrane so that PDL cells and osteoblasts can form PDL tissue and alveolar bone [6,7].

Bone graft is material that is placed in the space between or around broken or deformed bones. The main functions of all bone graft agents are osteoconduction, osteoinduction, and osteogenesis. As osteoconduction, the graft acts as a pattern or net to guide bone formation. In contrast, as osteoinduction, the graft stimulates new bone formation, and as osteogenesis, the graft cell produces new bone [6].

Bone grafting is defined as a surgical technique to replace lost bone by using bone graft material. The ideal bone graft material must have the potential to keep cells alive, not cause an immunologic reaction, be easily obtained, provide strength around the bone, and not spread disease. Demineralized freeze-dried bone xenograft (DFDBX) is used as a graft material for bone damage in animals and humans. This material is an alternative material that is recommended as a substitute for autograft bone graft material [8,9].

PRF can be considered as an autologous healing biomaterial incorporated in an autologous fibrin matrix. Leukocytes, platelets and growth factors are taken from simple blood samples. PRF is the second generation of platelet concentrates first presented by Choukroun et al., In 2001. Preparation or application of PRF is easy, minimal cost, and lack biochemical modification (no thrombin or bovine anticoagulation required). PRF consists of an autologous fibrin matrix containing large amounts of platelet cytokines

and leukocytes. PRF has been used to treat gingival recession, intrabony defects, and periapical lesions [11,12].

This case report aims to describe the regenerative approach in treating endo-perio lesion with periodontal primer lesion, with bioabsorbable barriers and combining bone graft and PRF for regeneration of periodontal defects in the maxillary molars region.

## 2. Case Report

**Case:** A 39-year-old male patient presented to the periodontology Department in Hasanuddin University Dental and Oral Hospital with a chief complaint of uncomfortable left posterior maxillary teeth during mastication. The patients had no history of systemic disease, drug allergies and had never received dental treatment before. Clinical examination showed vital, non-caries, 26 with a pocket depth of ± 9mm and grade one mobility. Radiographic examination showed a radiolucent lesion that extended to the apically. The patient's general condition is healthy, and he agrees to have his teeth treated. The treatment plan will be carried out by scaling and root planing as initial therapy, followed by flap operation with regenerative periodontal treatment such as Platelet Rich Fibrin (PRF) and Demineralized Freeze-Dried Bone Xenograft (DFDBX). It is hoped that with this treatment, the pocket depth was reduced, and the patient's teeth are healthy again. In this case, the prognosis is good, and the patient is expected to be cooperative so that maximum results are obtained.

**Diagnosis:** Endo- Perio Lesion with Primary periodontal lesion on teeth 26 (According to Simon et al.,1972)

**Methods**: Flap operation with regenerative periodontal treatment such as Platelet Rich Fibrin (PRF) and Demineralized Freeze-Dried Bone Xenograft (DFDBX).

## 3. Treatment Plan

Treatment begins after a vital sign checked and filled in informed consent. It is known that the patient's vital sign is within normal limits. Deep periodontal pocket with mobile grade one in tooth 26 (Fig:1,2). Initial therapy with scaling and root planing.

In the surgical procedure, extraoral and intraoral disinfection was performed with a 2% povidone-iodine solution, infiltrating local anaesthesia with lidocaine HCL anaesthetic and epinephrine 1: 80,000 was performed. Periodontal flap surgery was planned concerning 26; a full-thickness mucoperiosteal flap was raised by giving sulcular and

vertical incisions, which were performed using the no.15 blade. Then, the flap was exposed using rasparatorium to extending into the alveolar mucosa (fig: 3).

PRF preparation with Intravenous blood was taken, then stored in a sterile tube without anticoagulant and immediately centrifuged at a speed of 2700 rpm for 12 minutes (Fig: 4a,4b,4c).

The defect area was thoroughly debrided and cleaned with Gracey curettes followed by ultrasonic scalers (Fig:5). After this, the defect area was condensed with the DFDBX and PRF then covered by bioabsorbable GTR membrane (fig:6,7). Flaps were then repositioned and sutured. The periodontal dressing was applied over the site (fig:8,9).

Antibiotics and analgesics were prescribed for one week, and post-operative instructions were given. The patient was recalled for periodontal dressing and suture removal after one week and controlled one month post-operative, and there are no adverse and unexpected events.

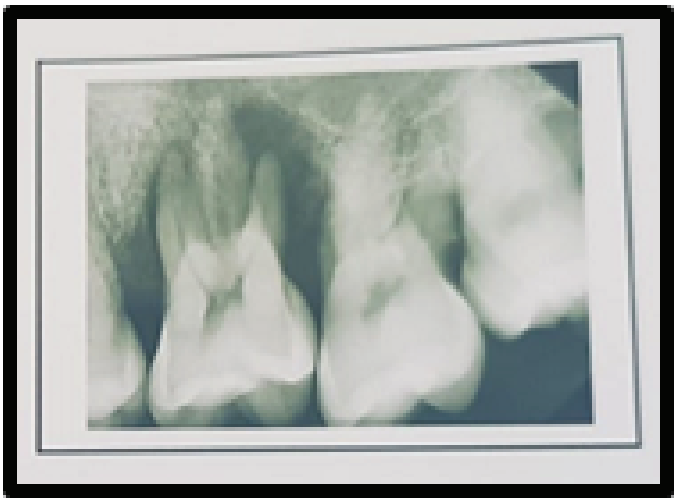

**Figure** 1: Pre-operative IOPA.

## 4. Discussion

In this case, patients with primary periodontal lesions on tooth 26 showed promising results, extensive bone loss from cervical to apical, so regenerative periodontal treatment was performed. The primary purpose of periodontal treatment is to regenerate damaged tissue. The prognosis of a case depends on the degree of disease and the effectiveness of the treatment carried out. Periodontal regeneration therapy performed in this case by using a combination of bone graft and PRF with GTR membrane gives satisfactory results for treating primary periodontal lesions. The bone graft material that is used is DFDBX (bovine graft). Bone grafting is based on the possibility of bone

**Figure** 2: Pre-operative view.

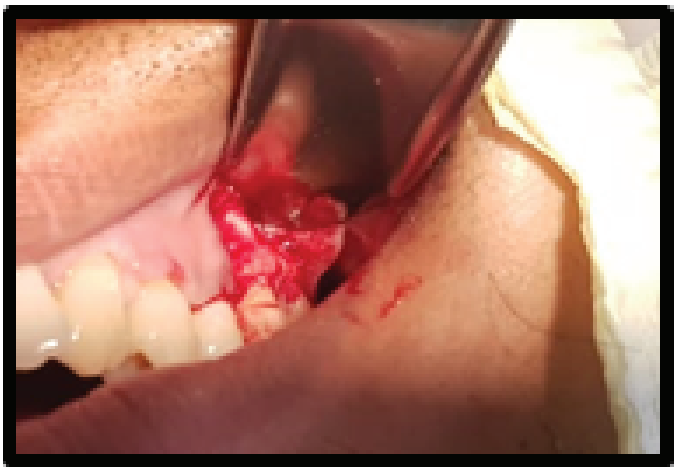

**Figure** 3: Flap reflection.

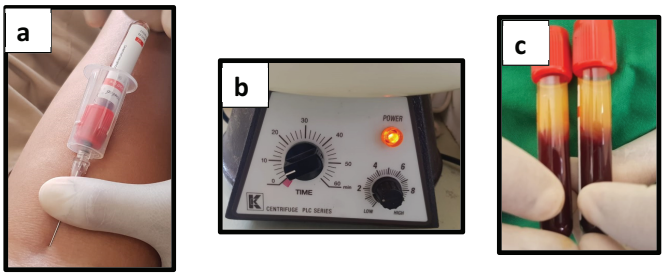


**Figure** 4: a. Intravenous blood was taken, b. Processing of PRF, centrifuged at a speed of 2700 rpm for 12 minutes, c. Layers formed after centrifugation

induction through the ability of bone graft material to attract multipotential cells from recipients around them. According to I Wayan Wirata et al., this can occur because bone grafts contain osteoinduction mediators called bone morphogenetic proteins (BMPs), a hydrophobic protein in the bone matrix that affects the differentiation of mesenchymal cells into osteoblasts and chondroblasts that participate in the healing process of new bones. DFDBBX is a bone graft material derived from bovine bones, which undergoes a

**Figure** 5: Flap reflection.

**Figure** 6: Blend of bone graft + PRF.

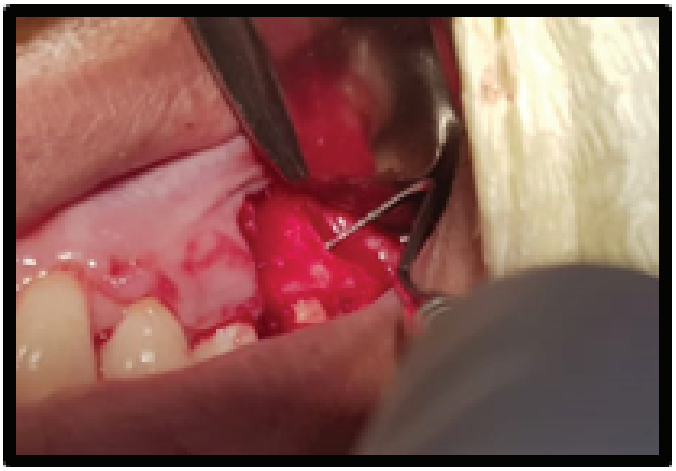

**Figure** 7: Bonegraft+PRF placed by GTR.

process of demineralization by cooling, then thawed with hydrochloric acid to show the bone matrix components associated with collagen fibrils called BMPs. Inorganic material from bovine bone graft can support the attachment and proliferation of osteoblast cells, which is the first step for osteogenesis. An article comparing the use of allograft and

**Figure** 8: Flaps were then repositioned and sutured.

**Figure** 9: Periodontal dressing.

xenograft material concluded that there was no difference in bone regeneration results after treatment [9,10].

On the other hand, PRF in periodontal therapy is an upcoming trend that shows optimistic and promising results. In this case, the use of PRF is expected to accelerate the process of periodontal tissue regeneration. In a similar study, Hasanuddin et al. said that PRF could be used to treat gingival recession, intrabony defects, and periapical lesions. Several studies have shown PRF use in combination with bone grafts to treat teeth with periodontal lesions. Regenerative therapy, using a combination of PRF and bovine graft using a membrane barrier, is expected so that the barrier membrane can prevent epithelial tissue from growing in areas where new bone growth is desired. Prevention of epithelial migration is one type of guided tissue regeneration (GTR). The membrane can be resorbable or non-resorbable. Resorbable membranes include natural membranes

such as collagen; and synthetic membranes such as aliphatic polyester. Non-resorbable membranes include expanded polytetrafluoroethylene (e-PTFE) and alginate [7,8,13].

After ten days of suture removal, the healing process seems satisfactory. Oral hygiene was observed. Control is re-scheduled after one month. Periodontal examination one month later showed a decrease in pocket depth and normal soft tissue contour. They probed pocket depths to 4 mm in the distal aspect 26 and 3 mm in the mesial aspect. In terms of mobility, it was observed that there was no mobility in the teeth 26. The patient felt comfortable and satisfied with the treatment results because his complaints about discomfort at the time of chewing and mobility were resolved.

Management of primary periodontal lesions with regenerative therapy shows a high success rate. A mixture of PRF and bone graft provides good stability and retention and a smaller chance of displacement. This is an essential prerequisite for successful regeneration, which leads to improved treatment and bone filling results in this case.

The limitation in this case report was that the patient could not fully feel the scheduled recall one month after surgery because he lives far from the treatment area. It is difficult for an author to recognized bone level reduction.

## 5. Conclusion

Endo period lesion has a complex pathogenesis and requires great skill to identify and treat. The inflammation expansion from periodontal tissue to pulp tissue can be prevented by regenerative e periodontal treatment. The treatment procedure combined with the use of PRF and DFDBX showed promising outcomes in treating perio-endo lesions.

## 6. Acknowledgements

The author thanks to all the lecturers Departement Periodontology Dentistry Faculty of Hasanuddin University for their help in the preparation of this manuscript. The author reports no conflicts of interest related to this case report.

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