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Clinical Outcome of Periodontal Regenerative Therapy in Chronic Periodontitis: A Case Report

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Abstract.

Background: Chronic periodontitis is an infectious disease resulting in inflammation within the supporting tissues of the teeth, progressive attachment loss and bone loss. Conventional treatment is the first-line treatment in this case, however, in moderate to advanced periodontitis cases, conventional treatment alone is not sufficient to regenerate the periodontal tissue, so a surgical therapy is required.

Objective: To explain the procedures and results of surgical periodontal treatment with bone xenograft and the barrier membrane of a patient with chronic periodontitis.

Method: A 33-year-old man presented to the Department of Periodontia RGSM Unhas with the primary complaint of teeth mobility of the lower left jaw, the patient had also been scaled one week prior. On intraoral examination, tooth 35 had mobile °1, recession 3 mm and pocket 6 mm, and tooth 36 had mobile °2, recession 2 mm and pocket 7 mm. Treatment was performed using flap operation with bone graft and membrane barrier applications.

Results: Control was performed six months after the treatment and the results showed normal gingival tissue with good tissue attachment, pocket reduction.

Conclusion: Treatment of chronic periodontitis using bone xenograft and membrane barrier is one of the surgical therapies that can contribute to periodontal regeneration.

Keywords: barrier membrane, bone graft, flap operation

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1. Introduction

Chronic periodontitis is an infectious disease that shows clinical signs characterized by microbial biofilm formation (dental plaque), periodontal inflammation (bleeding on probing, gingival swelling,), alveolar bone damage and loss of attachment. Periodontitis is a disease with a high prevalence of development and affects approximately 10.5% to 12% of the world's population. [1,2] The main etiology of chronic periodontitis is plaque accumulation so conventional treatment is the initial treatment in this case, namely by controlling plaque and scaling and root planning (SRP), but for cases with moderate

to advanced periodontitis, conventional treatment alone is not enough to regenerate periodontal tissue to its original form so that surgical treatment is needed.[3]

Periodontal surgical therapy can be in the form of flap surgical procedures and regenerative therapy. For regenerative procedures, many techniques that can be done, one of which is Guided tissue regeneration (GTR),[4] where GTR is a surgical procedure to regenerate lost periodontal tissue through tissue response, to form forming cementum, attachment of periodontal tissue and new bone in teeth with periodontal defects. The GTR technique can use bone graft which is a bone replacement material that is lost and serves to stimulate the formation of new bone, Various kinds of graft materials can be used in periodontal regeneration, one of which is xenograft. These grafts exhibit osteoconductive properties and are free of risk of disease.[5] Membrane barrier placed around the periodontal defect, serves to prevent epithelial growth and trans fibroblast growth into the wound space, so maintain space for periodontal tissue regeneration.[6,7,8]

The use of bone graft and membrane barrier is expected to be able to regenerate and reconstruct periodontal tissue in cases of periodontitis that have experienced signs of bone damage and loss of attachment. The purpose of this case report is to explain the procedures and results of

surgical periodontal treatment with bone graft and the barrier membrane of a patient with chronic periodontitis.

2. Case Report

A 33-year-old man came to the Makassar UH RSGM periodontia with the the chief complaint tooth mobility of mandibular left back. There were no abnormalities on extra-oral examination and no history of systemic disease, history of allergies and blood clotting disorders and no bad habits such as smoking. On intra-oral examination, grade 1 mobile was found on tooth 36 with a distobuccal pocket depth of 6 mm and a recession of 3 mm in tooth 35, and mobile grade 2, with a mesiobuccal pocket depth of 7 mm and a recession of 2 mm (Figure 1). The panoramic radiograph revealed a distinct radiolucent area in the lower third of the roots of teeth 35 and 36 (Figure 2). Based on clinical and radiological examination, this patient was diagnosed with chronic localized periodontitis with a good prognosis.

In this case, periodontal treatment is performed non-surgical and surgical procedures. Non-surgical treatment by scaling and root planning which is then controlled 1 weeks afterward and proceed with surgical procedures. Before the surgery is performed, the preparation of tools and materials is done and the operator explains the treatment

Figure 1: Clinical features of teeth 35 and 36.

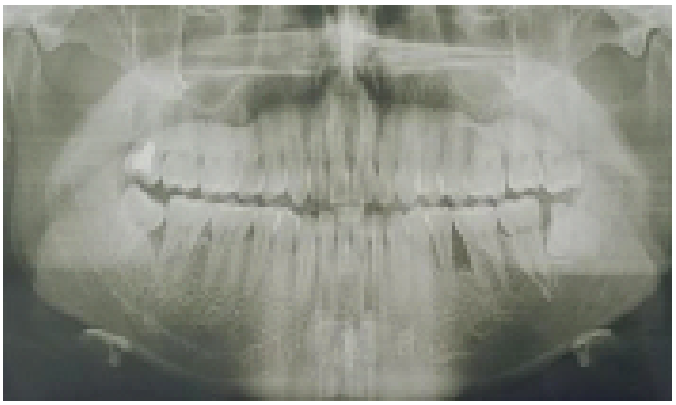

Figure 2: Panoramic radiographic.

procedures to be performed, then the patient signs an informed consent. The first step is to disinfect the work area with iodine solution (Figure 3),

then proceed with local anesthesia with *pehacaine* (*lidocaine* and *epinephrine* 1: 80,000) in the mucobuccal fold region of 35 to 36 (Figure 4). Sulcular incisions are made using scalpel no 15 in the buccal areas of teeth 35 and 36, then open the gingiva to see the bone using a rasparatorium (Figures 5 and 6). After looking at the bone surface, curettage and scaling (Figure 7) are performed, irrigation using sterile saline. Then bone graft application, in this case we used Freeze Dried Bovine Xenograft and continued with bovine pericardium membrane which contain collagen of bone extracellular matrix, placed in the buccal teeth 35 and 36 (Figures 8 and 9). Then return the flap and stabilize it by suturing, then periodontal pack installation (Figures 10 and 11). The operator then provided postoperative education and prescribed Amoxicillin 500 mg, 3 times a day for 5 days, Ibuprofen 400 mg, 3 times a day if needed, Chlorhexidine Digluconate 0.12%, 3 times a day for 4 weeks.

Figure 3: Disinfection of work area.

Figure 4: Local anesthesia.

Figure 5: Sulcular Incision.

One week after surgery, periodontal packs were removed, gingival appearance showed good wound healing and there were no visible complications after surgery such as infection (Figure 12), then the patient was instructed for control 6 months later.

Figure 6: Open the gingiva to see the bone.

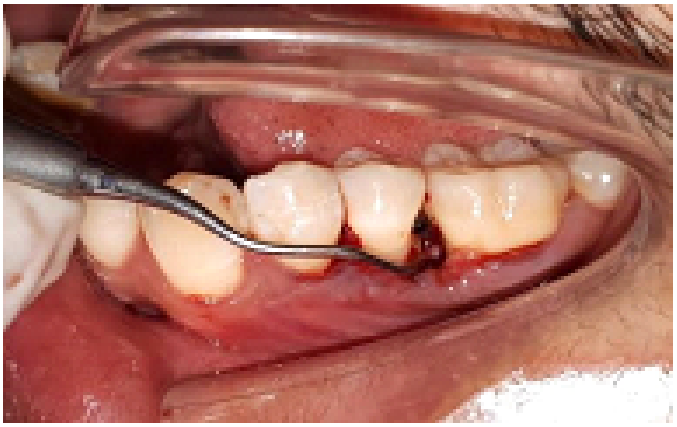

Figure 7: Curating and Scaling.

Figure 8: Bone graft application.

3. Discussion

There are four biological principles for periodontal tissue regeneration, namely primary wound closure aims to ensure uninterrupted healing, angiogenesis to provide nutrition and blood supply, maintenance of space for new bone growth and prevent soft-tissue growth into hard tissues, and wound stabilization to include clot formation. Periodontal

Figure 9: Membrane barrier application.

Figure 10: The flap stabilized with sutures.

Figure 11: Dressing Periodontal application.

regeneration is aimed at the occurrence of new formations in the supporting tissues of the teeth, including cementum, periodontal ligament (PDL) and alveolar bone. The use of bone graft as a bone graft material is a surgical procedure that aims to replace the missing bone with material from the patient's own body, synthetic, artificial or natural substitutes. In this case, a Xenograft type of bone graft is used, namely bone grafts derived from species other than humans, such as bovine. Bone grafting is possible

Figure 12: Control 1 week after surgery.

because bone tissue has the ability to fully regenerate if space is provided to grow. According to Nyman and Karring, humans lose their ability to regenerate periodontal tissue so that a technique and material are needed. which can help regenerate periodontal tissue.[9,10,11] Several clinical studies have shown that the use of membrane barrier and a bone graft is more effective in achieving increased clinic attachment (CAL) and reduction in probing in pocket depth than if only OFD is done.[10]

This is consistent with the results obtained in this case report, where there is a significant improvement in clinical results. Six months after surgery, patients come for radiographic control

and examination. patients are satisfied with the results of the treatment that has been given. From the intraoral examination, clinical results showed a significant increase where the depth of the distobuccal pocket was reduced from 6 mm to 3 mm in 35 teeth and the depth of the mesiobuccal pocket 36 teeth was reduced from 7 mm to 5 mm and grade mobility of teeth 35 and 36 is no longer found, although the recession is still visible (Figures 13 and 14). Radiographic periapical appearance showed significant bone formation characterized by a decrease in the radiolucent area reaching half of the roots of teeth 35 and 36 (Figure 15).

4. Conclusion

Treatment of chronic periodontitis with regenerative surgical techniques using bone graft and membrane barrier is one of the surgical therapies that can help periodontal regeneration and in this case report shows satisfactory results on the clinical results of periodontal tissue.

Figure 13: Six months after surgery.

Figure 14: Control pocket depth.

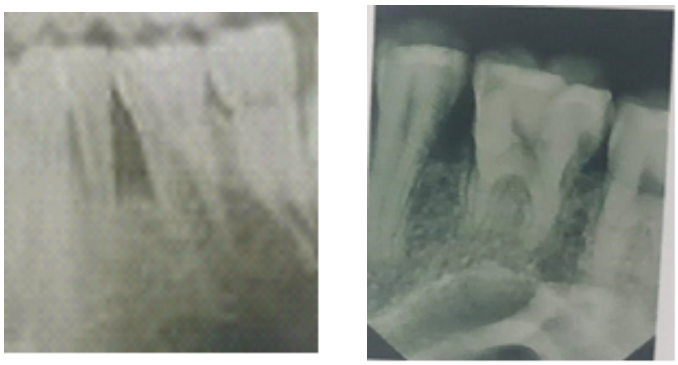

Figure 15: Radiological features before and after 6 month treatments.

5. Acknowladgments

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References

[1] Newman M, Takei H, Klokkevold P, Carranza F. Carranza clinical periodontology. 13th ed. 2019. Elsevier: USA.

[2] Djais AI, Nurfaisah N. Combination of platelet rich fibrin and carbonate hydroxyapatite alloplastic bone graft as periodontal tissue engineering in management of chronic periodontitis: A case report. Journal of Dentomaxillofacial Science. 2020;5(1):62. https://doi.org/10.15562/jdmfs.v0i0.753

[3] Adam M, Utami S, Oktawati S, Gani AHA. Treatment of generalized aggressive periodontitis with guided tissue regeration and bone grafting: A systematic review. Journal of International Dental and Medical Research. 2019;12(4):1636–1639.

[4] Munadziroh E, Meizarini A, Universitas G. Penggunaan bone graft pada perawatan kerusakan tulang periodontal. Jurnal Kedokteran Gigi Universitas Indonesia. 2003. 10: 520-526.

[5] Cohen, Edward S. Atlas cosmetic and reconstructive periodontal surgery. 3rd ed. Hamilton; 2007. BC Decker Inc.: Ontario.

[6] Sam, G., Pillai, B.R.M., Evolution of barrier membranes in periodontal regeneration - “Are the third generation membranes really here?”. Journal of Clinical and Diagnostic Research. 2014;8(12):14-17. https://doi.org/10.7860/JCDR/2014/9957.5272

[7] Sheikh Z, Qureshi J, Alshahrani AM et al. Collagen based barrier membranes for periodontal guided bone regeneration applications. Odontology. 2017; (1): 105-112. https://doi.org/10.1007/s10266-016-0267-0

[8] Osathanon T, Chanjavanakul P, Kongdecha P, Clayhan P, Huynh NC-N.

[9] Polycaprolactone-based biomaterials for guided tissue regeneration membrane.

[10] Periodontitis - A useful reference. *Intech Open Book Series*, 198. 2017. https://doi.org/10.5772/intechopen.69153

[11] Ausenda F, Rasperini G, Acunzo R, Gorbunkova A, Pagni G. New perspectives in the use of biomaterials for periodontal regeneration. Materials. 2019;12(13):1-20. https://doi.org/10.3390/ma12132197

[12] Melcher AH. On the repair potential of periodontal tissues. Journal of Periodontology. 1976;47(5):256–260. https://doi.org/10.1902/jop.1976.47.5.256