

Guided Tissue Regeneration on a Mandibular Molar with a “Beyond the Apex” Periodontal Defect

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Received Date: 01 December 2021 | Accepted Date: 21 January 2022 | Published Date: 01 February 2022

Citation: F Amato. (2022). Guided Tissue Regeneration on a Mandibular Molar with a “Beyond the Apex” Periodontal Defect. Dentistry and Oral Maxillofacial Surgery. 5(2); DOI: [10.31579/2643-6612/028](https://doi.org/10.31579/2643-6612/028)

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Abstract

This case report clinically shows complete regeneration on a perio-endo lesion that caused a crater-like defect extending beyond the apex on a mesial root of a mandibular left first molar. The regeneration was obtained using a collagen membrane (Bioguide) in combination with an alloplastic bone graft (Endobone3i Biomet).

The Patient presented a 13 mm periodontal pocket mesially and buccally and a grade III furcation involvement on tooth # 36, which was the distal abutment of a three-unit bridge.

After raising a flap and performing a thorough debridement of the defect, clinical observation revealed a crater-like defect 15 mm deep that involved the mesial root and extended beyond the apex. Alloplastic bone particles were used to fill the defect and recreate the original bone architecture. The graft was then covered with a resorbable membrane shaped to be adapted to the mesial area buccally as well as lingually, then the flap was sutured.

A 5-year follow-up radiograph shows the complete defect fill, a pocket depth reduction to 2 mm and stable tissue conditions.

This case clinically shows the possibility to regenerate periodontal tissues on a defect that extended beyond the apex of a molar root.

Key Words: guided tissue regeneration; apex; alloplastic graft; resorbable membrane

Background

Periodontally compromised teeth can be treated predictably with different modalities and long term results have been well documented [1]. When the periodontal disease involves a molar, the dentist has to face a greater challenge because of the furcation [2]. In fact thorough instrumentation of the area is difficult for the operator as well as oral hygiene for the patient [3-4]. Furthermore molars with furcations involvement are treated according to the amount of horizontal and vertical defect [5].

For this reason various classifications have been proposed based on the horizontal and vertical size and shape of the lesion [6-5].

It has been proven that molars with Grade I and II furcation involvement can be successfully treated with GTR [7-8].

For molars with grade III and IV, although some reports have shown tissue regeneration, resective surgery appears to be more predictable, but it has unfavorable long term results [9].

So different treatment options have been proposed: root-amputation, tunneling or ultimately extraction.

Guided tissue regeneration is the ideal treatment to recreate the periodontal attachment that has been lost on a tooth due to periodontal disease, but applying a membrane to a molar defect may involve some difficulties [10-11]. In fact size and shape of the molar trunk do not always allow for good adaptation of the membrane thus resulting in post-operative infection, premature membrane exposure and loss of the graft [12].

In this clinical case even if the size and the shape of the defect would suggest to treat the tooth with resective surgery or extraction to ensure predictable results, guided tissue regeneration has been applied successfully with stable 3-year follow-up results [13].

Clinical Presentation

In January 2010 a 60 years old male presented after recurrent episodes of abscess in the left mandibular molar area. The previous dentist had treated the patient with scaling, root planing, an open flap debridement and prescribing antibiotics, but the abscess episodes were recurring and the patient had constant discomfort.

The medical history revealed that the patient was in good health and a nonsmoker.

The dental history revealed full compliance with the hygiene maintenance program.

The clinical examination showed good oral conditions, adequate plaque- control in all the mouth, tooth # 36 was the distal abutment of

a three-unit bridge replacing the missing second premolar.

Periodontal examination revealed 13 mm probing depth mesially and buccally on tooth # 36 (see figure. 1a, b) and a grade III furcation involvement.



Figure 1a



Figure 1b

The X-ray examination showed severe bone loss on the mesial root that involved the mesial surface of the distal root and extended a few millimeters beyond the root apex on tooth #36 (see fig. 2).



Figure 2: Endodontic test showed that the tooth was vital.

Localized severe periodontal disease with a vertical component on the mesial root on tooth #11 was diagnosed. This was probably due to an overhanging on the margin of the crown fabricated on a tilted molar. The patient was informed of the extreme condition of the tooth and although he was informed that extraction was the most predictable way to solve the problem, he wanted to try to save the tooth anyway because it was supporting the bridge. Guided tissue regeneration periodontal surgery was proposed and an informed consent was signed by the patient.

Case Management

The first procedure was to replace the old bridge with a new better fitting provisional.

72 hours before periodontal surgery, the patient underwent initial therapy and was asked to start using chlorhexidine rinse three times a day to be continued for two weeks after.

Antibiotic coverage (amoxicilline 1 gr.) was prescribed for the patient to take twice a day for ten days starting 12 hours prior to surgery.

After local infiltration with Articaine 1:100.000 (Ubistesin 3M ESPE) an intrasulcular incision was carried out on the mandibolar molars buccally and lingually extending mesially up to the 1st premolar.

A full thickness mucoperiosteal flap was raised both buccally and lingually.

After a thorough degranulation a 15mm osseous vertical defect with a 10 mm crater-like infra-bony component was visible on the mesial and

buccal aspect of the tooth with a through and through furcation involvement extending 4 mm beyond the apex of the mesial root (see figure 3) .

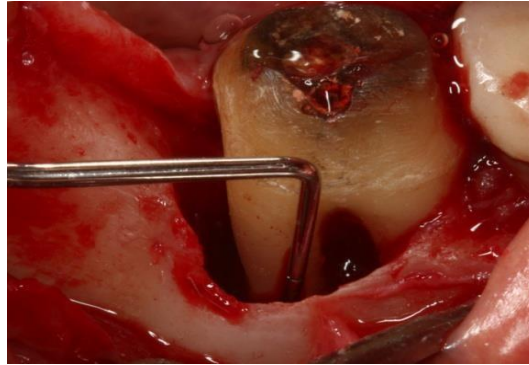


Figure 3: A careful debridement of the root surface and of the defect was performed using rotary instruments, ultrasonic tips (Piezosurgery Mectron™) and manual curettes (Hartzel and Son) (see figure 4).



Figure 4: Although instrumentation resulted very difficult, care was taken to fully debride the area beyond the apex and the inter-radicular area (see figure 5).

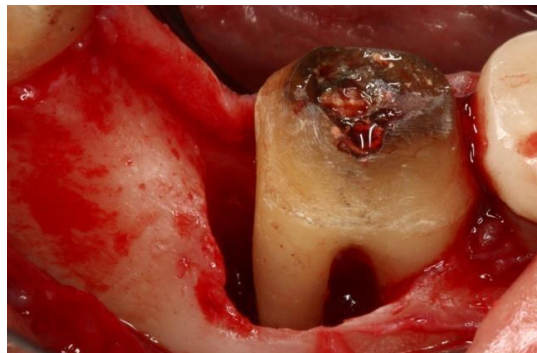


Figure 5: Alloplastic bone particles (Endobone Xenograft Granules Biomet 3i) were used to fill the defect. The graft particles were hydrated with saline solution (see figure 6),



Figure 6: packed in the defect and molded in the attempt to recreate the original bone architecture of the inter-radicular and mesial alveolar bone (see figure 7).



Figure 7: A resorbable membrane (Bioguide 15x30 Geistlich) was trimmed and shaped to adapt to the molar trunk and to fully cover the graft material on the buccal, mesial and lingual sides (see figure 8).



Figure 8: Periosteal scoring incisions were performed to allow flap release and to ensure tension free flap closure.

The flap was then closed with interrupted suture (4-0 Ethicon Johnson & Johnson). In the same visit the decay was cleaned and the root-canal therapy was completed (see figure 9).



Figure 9: One month later a post and core was done.

The patient was then seen once a week for the following three weeks for suture removal and hygiene maintenance in the wound area and then once a month for recall visits.

Clinical Outcome

Five years follow-up recall visit showed stable healthy conditions.

Clinical and radiographic examination revealed complete defect filling, full graft integration (see Figure. 10), absence of inflammation and three mm probing depth mesially and buccally on tooth # 36 (see Figure 11a,b).

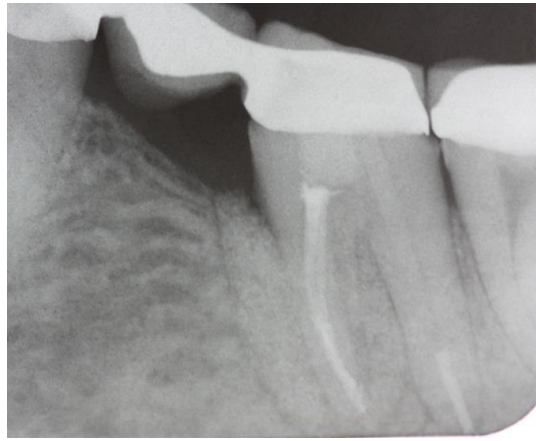


Figure 10

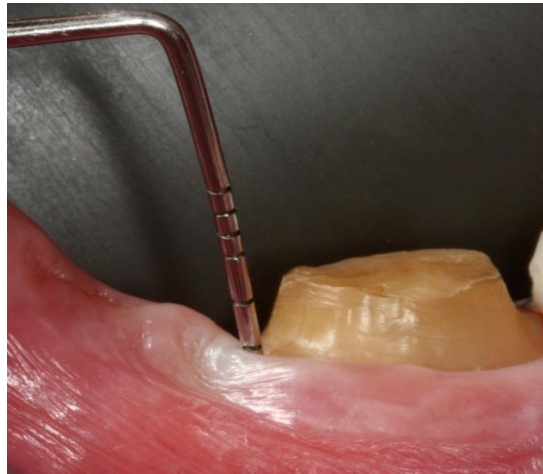


Figure 11a



Figure 11b

Discussion

The possibility to regenerate periodontal tissue in the molar furcation area represents a great challenge for the periodontist, especially in grade III furcation involvement with deep lesions [14].

Deep biological knowledge, good skills and appropriate surgical tools represent the key to predictable success.

In this case all the following elements may have played a role in the clinical success: careful debridement and root planing in the inter-radicular as well as in the apex area with piezosurgical tips purposely

shaped, together with the use of a solid scaffold graft and a membrane that allowed for tissue maturation [15].

Summary

Molar lesions with furcation involvement and extending beyond the apex of one of the roots can be successfully treated with guided tissue regeneration.

More data, larger number of cases and longer-term follow-up are necessary to further validate this clinical study.

References

1. Jepsen S, Eberhard J, Herrera D, Needleman I. (2002). A systematic review of guided tissue regeneration for periodontal furcation defects. What is the effect of guided tissue regeneration compared with surgical debridement in the treatment of furcation defects? *J Clin Periodontol.* 29(S3):103-116.
2. Newell DH. (1998). The diagnosis and treatment of molar furcation invasions. *Dent Clin North Am.* 42(2):301-337.
3. Bower RC. (1979). Furcation morphology relative to periodontal treatment. Furcation root surface anatomy. *J Periodontol.* 50(7):366-374.
4. Lindhe J, Nyman S. (1975). The effect of plaque control and surgical pocket elimination on the establishment and maintenance of periodontal health. A longitudinal study of periodontal therapy in cases of advanced disease. *J Clin Periodontol.* 2(2):67-79.
5. Hamp SE, Nyman S, Lindhe J. (1975). Periodontal treatment of multirrooted teeth. Results after 5 years. *J Clin Periodontol.* 2(3):126-135.
6. Tarnow D, Fletcher P. (1984). Classification of the vertical component of furcation involvement. *J Periodontol.* 55(5):283-284.
7. Pontoriero R, Nyman S, Lindhe J, Rosenberg E, Sanavi F. (1987). Guided tissue regeneration in the treatment of furcation defects in man. *J Clin Periodontol.* 14(10):618-620.
8. Caffesse RG, Nasjleti CE, Plotzke AE, Anderson GB, Morrison EC. (1993). Guided tissue regeneration and bone grafts in the treatment of furcation defects. *J Periodontol.* 64(11 S):1145-1153.
9. Basten CH, Ammons WF Jr, Persson R. (1996). Long-term evaluation of root-resected molars: a retrospective study. *Int J Periodontics Restorative Dent.* 16(3):206-219.
10. Needleman I, Tucker R, Giedrys-Leeper E, Worthington H. (2002). A systematic review of guided tissue regeneration for periodontal infrabony defects. *J Periodontol Res.* 37:380-388.
11. Gottlow J, Nyman S, Karring T, et al. (1984). New attachment formation as the result of controlled tissue regeneration. *J Clin Periodontol.* 11(8):494-503.
12. Villar CC, Cochran DL. (2010). Regeneration of periodontal tissues: guided tissue regeneration. *Dent Clin North Am.* 54(1):73-92.
13. Pontoriero R, Lindhe J. (1995). Guided tissue regeneration in the treatment of degree III furcation defects in maxillary molars. *J Clin Periodontol.* 22(10):810-812.
14. Pontoriero R, Lindhe J, Nyman S, et al. (1989). Guided tissue regeneration in the treatment of furcation defects in mandibular molars. A clinical study of degree III involvements. *J Clin Periodontol.* 16(3):170-174.
15. Paolantonio M. (2002). Combined periodontal regenerative technique in human intrabony defects by collagen membranes and anorganic bovine bone. A controlled clinical study. *J Periodontol.* 73(2):158-166.



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DOI: [10.31579/2643-6612/028](https://doi.org/10.31579/2643-6612/028)

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