DOI: 10.7860/JCDR/2022/55638.16442

Case Report

Dentistry Section

Biodentine and Amniotic Membrane to Treat the Hidden Villain- A Rare Case of Labiocervical Vertical Groove

TAMIL SELVAN KUMAR[1], THANGAKUMARAN SUTHANTHIRAN[2], MS RAVI SANKAR[3], GOKULVATHI RAJKUMAR[4], NJ NAGARAJ[5]

ABSTRACT

This case report signifies the importance of complications and early diagnosis of radicular groove and to discuss the treatment of combined endo-perio lesion using bone graft mixed with Platelet Rich Fibrin (PRF), amniotic membrane and biodentine. Labiocervical Vertical Groove (LCVG) presents various complications to the patients, especially if it extends to the pulpal space. Labiocervical vertical groove originating near the cervical area of tooth can extend to the radicular surface. These grooves can be mild, moderate or deep based on its extent and depth. This case report deals with the complications, degree of destruction and treatment of an intrabony defect associated with LCVG in maxillary central incisor in a 35-year-old male patient, who reported to the Department of Periodontics and Implantology with the chief complaint of mobility of teeth over a period of past two months. In this case report, authors have highlighted the advantages of saucerisation, PRF, amniotic membrane and biodentine to treat the bone loss along with restoration of the groove.

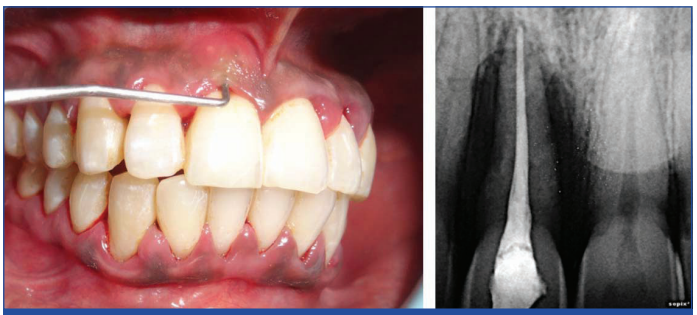
Keywords: Endo-perio lesion, Intrabony defect, Platelet rich fibrin, Saucerisation

CASE REPORT

A 35-year-old male patient reported to the Department of Periodontics and Implantology, with a chief complaint of mobile tooth in the upper front teeth region for past two months. Patient was informed about the procedure of examination and consent was obtained for examining the patient. Consent for the treatment was obtained after the treatment planning was made. On history of presenting illness, patient reported that the tooth mobility was mild and associated with pain which was of mild in nature, intermittent, nonradiating, aggrevated during mastication and relieved at rest. Patient did not have any significant past medical or dental history.

On intraoral clinical examination in relation to 11, 12, 21 and 22 under dental chair light, gingiva was reddish, soft and edematous in relation to 11 (right maxillary central incisor). The position of the marginal gingival was below the cementoenamel junction in 11. Stippling was absent in 11 region on examination under visible light. Mild groove was seen labially on the right maxillary central incisor. On examination with Williams Periodontal probe, there was a pocket depth of more than 10 mm on the buccal aspect of 11 as shown in [Table/Fig-1]. Tooth mobility determined with the help of back end of mouth mirror and Williams Periodontal probe handle and there was grade I mobility in relation to 11 according to Miller's classification of mobility [1]. Fremitus test was done by placing wet ungloved finger partially over the teeth and partially over the gingival in maxillary anterior teeth region [2]. Patient was asked to clench his teeth and the test was positive. There was mild vibration felt by the operator.

On intraoral periapical radiographic examination, vertical bone loss was significant around the tooth 11 [Table/Fig-2], extending from cervical region of the tooth to near the apical portion of the tooth. Pulp vitality testing was done using electric pulp tester and the tooth was detected non vital. The condition was provisionally diagnosed as primary periodontitis with secondary endodontic lesion. Under local anaesthesia, access opening was done and root canal was debrided and irrigated with hydrogen peroxide. Calcium hydroxide was placed as an intracanal medicament. Obturation was done after one week by lateral condensation method and postoperative intraoral periapical radiograph was taken as shown in the [Table/Fig-2]. Treatment plan included root canal treatment in 11, splinting of teeth in relation to 13, 12, 11, 21, 22 and 23. Kirkland flap was advised for accessibility and restoration of the groove and bony defect. Teeth were splinted with twisted ligature wire prior to the reflection of flap using periosteal elevator to facilitate the surgical procedure.

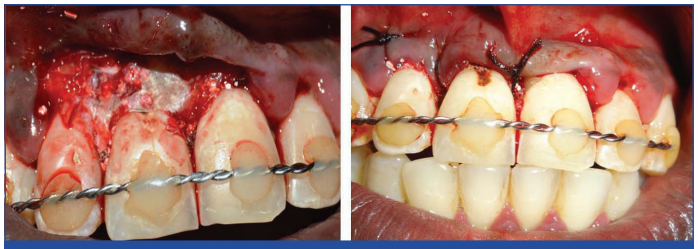


[Table/Fig-1]: Periodontal pocket depth. **[Table/Fig-2]:** Root canal treated 11 with angular bony defect. (Images from left to right)

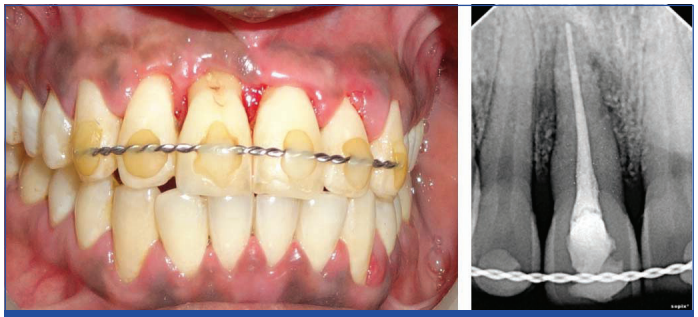
Following root canal treatment, patient was asked to report after one week for review and flap surgery. Local anaesthesia (lignocaine hydrochloride) was injected through infiltration technique. Sulcular incision was given in relation to 12, 11, 21 and 22 using Bard Parker blade size number 12. Vertical incision was given in the distal aspect of 12 for proper accessibility. Following thorough debridement, the radicular groove was well appreciated and was saucerized with the help of diamond coated ultrasonic tip as shown in [Table/Fig-3]. The Labiocervical Vertical Groove (LCVG) was restored with the biodentine material. The bony defect was filled with bone graft (osseograft-xenograft material) mixed with Platelet Rich Fibrin (PRF) [Table/Fig-4]. Which was then stabilized with amniotic membrane (TATA Memorial Hospital, Tissue Bank, Mumbai) as shown in [Table/Fig-5]. The Flap was repositioned using sling suture followed by the placement of coe-pak [Table/Fig-6]. Postoperative instructions were given to the patient. Patient was instructed to do mouth rinse twice a day for one week. Patient was recalled after 10 days for suture removal and the area was irrigated using normal saline. Wound

healing was found to be satisfactory. Patient was asked to come at 3rd and 6th month for clinical and radiographical examination. Splinting was removed at 3rd month after surgery. Mobility was reduced and bone fill was seen in the intraoral radiograph during follow-up [Table/Fig-7,8].

[Table/Fig-3]: Saucerisation of Labiocervical Vertical Groove (LCVG).
[Table/Fig-4]: Platelet rich fibrin. (Images from left to right)



[Table/Fig-5]: Placement of biodentine, bone graft and amniotic membrane.
[Table/Fig-6]: Immediate postoperative image. (Images from left to right)



[Table/Fig-7]: 3rd month postoperative wound healing.
[Table/Fig-8]: 3rd month follow-up radiograph. (Images from left to right)

DISCUSSION

A successful periodontal treatment should essentially result in esthetic improvement, which depends on maintaining the gingival position and the level of the interdental papilla throughout and after the periodontal surgery [3]. Radicular groove is one of the anamolies which may cause clinical relevant problems by creating a discontinuation of the epithelial closure around the tooth surface, thereby creating a niche for bacterial accumulation [4]. Labiocervical vertical groove is one of the reason for bone loss and localized periodontitis. Labiocervical vertical groove is rare when compared to palate radicular groove with prevalence rate of 3 to 6.5% [5]. Labiocervical vertical groove is due to anamoly in the enamel organ and Hertwigs epithelial root sheath on the labial aspect of the teeth [6]. The LCVG is found mostly in the central incisors [7]. Aswini S et al., reported a unilateral labiocervical vertical groove on the maxillary left central incisor which was restored with glass ionomer cement and guided tissue regeneration technique was done to regenerate the lost periodontal tissues [8]. Various treatment modalities are available for the treatment of such defects which includes subgingival curettage, odontoplasty, saucerisation and filling of the grooves with restorative materials [9]. In this case report, the defect was successfully managed by combined periodontic and endodontic procedures. Root canal treatment and splinting was done prior to the periodontal surgery.

Full thickness flap was reflected in relation to 11, 12, 21 and 22 for accessibility and visualisation of the intrabony defect which was evident from the intraoral periapical radiograph. Vertical relieving incision was placed in the mesial line angle of 12 in such a way that the base of the flap is wide to provide clear vision, good access, wide exposure and rich vascular supply to the reflected flap [10]. The defect was saucerized using a diamond coated ultrasonic tip to prevent future accumulation of the bacterial deposits in the groove. The diamond coated sonic tips have been shown to provide a smooth surface after saucerisation procedure, thereby aiding in good oral hygiene maintenance [11].

The radicular groove was restored with biodentine- a bioactive cement which have been found to possess superior handling characteristics, excellent biocompatibility and ideal biomaterial for periodontal regeneration. Biodentine have been compared with Mineral Trioxide Aggregate (MTA) and studies have shown its preference over MTA due to its short setting time which can prevent flap shrinkage and poor marginal seal [12]. In this present case report, the angular bony defect was filled with autoplastic bone graft. The graft material induces host undifferentiated mesenchymal cells to differentiate into osteoblasts which subsequently aids in the formation of new bone in the defect region [13].

Platelet rich fibrin membrane was placed along with the graft materials which favours the bony regeneration by providing the essential growth factors [14]. Amniotic membrane have been used in this case over other guided tissue membranes because of its excellent physiological seal with the host tissues, thereby precluding the bacterial contamination [15]. Kumar KA et al., reported a successful resolution of the interradicular lesion and radiographic bone fill upon the placement of amniotic membrane over periodontal defect [16]. Studies have suggested the usage of amniotic membranes not only because of its structural and anatomic contable/figureuration, but also due to its healing enhancement properties by providing a rich source of stem cells and reduced postoperative scarring [17,18]. Kumar A et al., have investigated the effect of amniotic membrane on periodontal tissue regeneration and reported better result when the amnion membrane was plaved in combination with bone graft (test group) compared to bone graft (control group) alone [19].

CONCLUSION(S)

Combined endo-perio lesion requires careful diagnosis, treatment and frequent monitoring of the condition to prevent the recurrence of the disease. This case report shows a successful management of vertical bony defect associated with labiocervical vertical groove. The combination of the bonegraft, PRF and amniotic membrane have resulted in a significant reduction in pocket level, increase in Clinical attachment level and bony regeneration at six month follow-up suggesting a successful interdisciplinary management of the case.

REFERENCES

[1] Sindhuja S, Balaji A. Tooth mobility. European Journal of Molecular & Clinical Medicine. 2020;7(2):6713-16.
[2] Kundapur PP, Bhat KM, Bhat GS. Association of trauma from occlusion with localized gingival recession in mandibular anterior teeth. Dent Res J (Isfahan). 2009;6(2):71-74.
[3] Krishna K, Chandrashekar M, Pudukulangara A, Senthil R, Syed S, Ashwini A. Practical periodontal surgery: An overview. Journal of Evolution of Medical and Dental Sciences. 2014;3:14398-09.
[4] Singh A, Sharma RK, Narula SC. Palato-radicular groove, diagnosis and management-a case report. Indian Journal of Dentistry. 2011;2(2):201152-56.
[5] Shpack N, Dayan T, Mass E, Vardimon A. Labio cervical vertical groove (LCVG) distribution and morphometric charactistics. Archieves of Oral Biology. 2007;52(11):1032-36.
[6] Shah MP, Gujjari SK, Shah KM. Labial-cervical-vertical groove: A silent killer-Treatment of an intrabony defect due to it with platelet rich fibrin. J Indian Soc Periodontol. 2014;18(1):98-101. Doi: 10.4103/0972-124X.128260.
[7] Thomas J. Labio cervical vertical groove. J Interdiscip Dentistry. 2021;2:145.
[8] Aswini S, Nisha S, Shetty B. Labial cervical vertical groove: Hidden route to periodontal destruction. Journal of Dental & Oro-facial Research. 2016;12(1):36-40.
[9] Jien SS. The Chinese dentition II Shovel incisors, Carabelli's cusps, groove patterns, cusp numbers, and abnormalities in morphology of the permanent teeth. Taiwan Yi Xue Hui Za Zhi. 1970;69(5):264-71.

[10] AlFotawi RA. Flap Techniques in Dentoalveolar Surgery. In: Sridharan G, Sukumaran A, Omar AE, editors. Oral diseases. London: Intech Open; 2020 [cited 2022 Feb 11]. Available from: https://www.intechopen.com/chapters/71271 doi: 10.5772/intechopen.91165.
[11] Ribeiro FV. Comparative in vitro study of root roughness after instrumentation with ultrasonic and diamond tip sonic scaler. J Appl Oral Sci. 2006;14(2):124-29.
[12] Kaur M, Singh H, Dhillon JS, Batra M, Saini M. MTA versus Biodentine: Review of literature with a comparative analysis. J Clin Diagn Res. 2017;11(8):01-05.
[13] Reynolds MA, Elizabeth M, Mays GLB. Regeneration of periodontal tissue: Bone replacement grafts. Dent Clin North Am. 2010;54(1):55-71.
[14] Mohan SP, Jaishangar N, Devy S, Narayanan A, Cherian D, Madhavan SS. Platelet-rich plasma and platelet-rich fibrin in periodontal regeneration: A review. J Pharm Bioallied Sci. 2019;11(2):126-30.
[15] Rao TV, Chandrasekharam V. Use of dry human and bovine amnion as a biological dressing. Arch Surg. 1981;116:891-96.
[16] Kumar KA, Chakravarthy M, Selvarajan S, Ramakrishnan T, Ari G. Use of an amniotic membrane as a novel barrier in a tooth with a questionable prognosis. J Indian Soc Periodontol. 2017;21(3):237-40.
[17] Fenelon M, Chassande O, Kalisky J, Gindraux F, Brun S, Bareille R, et al. Human amniotic membrane for guided bone regeneration of calvarial defects in mice. J Mater Sci Mater Med. 2018;29(6):78.
[18] Shaila V, Kothiwale P, Anuroopa AL, Gajiwala A. Clinical and radiological evaluation of DFDBA with amniotic membrane versus bovine derived xenograft with amniotic membrane in human periodontal grade II furcation defects. Cell Tissue Banking. 2009;10(4):317-26.
[19] Kumar A, Chandra RV, Reddy AA, Reddy BH, Reddy C, Naveen A. Evaluation of clinical, antiinflammatory and antiinfective properties of amniotic membrane used for guided tissue regeneration: A randomized controlled trial. Dent Res J (Isfahan). 2015;12(2):127-35.

PARTICULARS OF CONTRIBUTORS:
1. Senior Lecturer, Department of Periodontics, Rajas Dental College and Hospital, Tirupur, Tamil Nadu, India.
2. Head, Department of Periodontics, JKK Nattraja Dental College and Hospital, Namakkal, Tamil Nadu, India.
3. Reader, Department of Conservative Dentistry and Endodontics, Rajas Dental College and Hospital, Tirunelveli, Tamil Nadu, India.
4. Postgraduate Student, Department of Periodontics, Rajas Dental College and Hospital, Tirunelveli, Tamil Nadu, India.
5. Senior Lecturer, Department of Conservative Dentistry and Endodontics, Rajas Dental College and Hospital, Tirunelveli, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Tamil Selvan Kumar,
19, Rama Moorthy Nagar, 3rd Street, PN Road, Tirupur, Tamil Nadu, India.
E-mail: tamilbdstirupur@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Feb 23, 2022
- Manual Googling: Mar 14, 2022
- iThenticate Software: May 25, 2022 (5%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Feb 11, 2022**
Date of Peer Review: **Feb 25, 2022**
Date of Acceptance: **Mar 21, 2022**
Date of Publishing: **Jun 01, 2022**