

Recognition and management of palatogingival groove: Hidden trap in the tooth-A case report

Soni Bista^{1*}, Rebicca Ranjit¹, Suraksha Subedi¹, Deepa Kunwar²

¹Department of Periodontology and Oral Implantology, Gandaki Medical College, Pokhara, Nepal, ²Department of Conservative Dentistry and Endodontics, Gandaki Medical College, Pokhara, Nepal

ABSTRACT

Palatogingival groove is a developmental anomaly, usually found on the palatal surface of maxillary incisor teeth. This hidden trap harbors plaque and bacteria around the tooth, ensuing periodontal destruction with or without pulpal pathologic changes. Several treatment modalities have been proposed for its management ranging from endodontic treatment, periodontal therapy or combined. Here, we present a case of a type II palatogingival groove causing endodontic-periodontal lesion successfully managed by endodontic treatment followed by periodontal surgery with an uneventful healing. Thus, this anomaly should be recognized early with timely intervention to avoid widespread involvement.

Keywords: Endodontic-periodontal lesion, maxillary lateral incisor, palatogingival groove, papilla preservation flap, periodontal surgery.

*Correspondence:

Dr. Soni Bista
Lecturer, Department of Periodontology and Oral Implantology
College of Dental Surgery, Gandaki Medical College, Pokhara, Nepal
Email: sonibista12345@gmail.com

Submitted: February 2, 2022

Accepted: March 4, 2022

To cite: Bista S, Ranjit R, Subedi S, Kunwar D. Recognition and management of palatogingival groove: Hidden trap in the tooth- A case report. JGMC Nepal. 2022;15(1):80-3.
DOI: 10.3126/jgmcn.v15i1.41576

INTRODUCTION

Palatogingival groove (PGG) is defined as a “developmental anomaly that extends from the cemento-enamel junction in an apical direction along the palatal root”.¹ Its prevalence ranges from 2.8% to 8.5% and is most commonly seen in the maxillary lateral incisors.² The common etiologies include infolding of the inner enamel epithelium and Hertwig’s epithelial root sheath, altered genetic mechanism, and an attempt to form another root.¹

PGG is considered as a funnel shaped defect which serves as an appropriate niche for plaque accumulation leading to periodontal complications thereby, secondarily involving the pulp. Thus, timely detection and intervention of this anomaly can help in minimizing the further complications.³

In this paper, we present a case of a primary periodontal with secondary endodontic lesion⁴ complicated by type II palatogingival groove⁵ which was successfully managed by combined endodontic and surgical periodontal therapy.

CASE PRESENTATION

A female patient aged 41 years came to the Department of Periodontology and Oral Implantology at Gandaki Medical College with the chief complaint of pus discharge from the left front region of the upper jaw since three to four months. Patient’s medical and family history was non-contributory. On intra-oral examination, a sinus tract was located on the labial surface of 21 and a palatogingival

groove was present on mesio-palatal aspect in relation to 22. Pocket depth of 5 mm was detected while probing on the mesio-palatal surface of 22. Sinus tracing with gutta-percha in intraoral periapical radiograph revealed a periapical lesion extending to 22 (Figure 1). On electric pulp testing, both teeth were non-vital. The overall hygiene status of the patient appeared satisfactory. Based on clinico-radiographic findings, a diagnosis of primary periodontal with secondary endodontic lesion with type II palatogingival groove in relation to 22 was made. An endodontic treatment followed by periodontal surgery was planned for the patient.



Figure 1: Pre-operative radiograph showing radiolucency in periradicular region of 22

After explaining the details of the treatment procedures to the patient, a written informed consent was taken. The patient underwent non-surgical periodontal therapy including scaling and root planing with meticulous oral hygiene instructions. First, the endodontic treatment was carried out by access opening in respect to 21 and 22 with Endo Z (DENTSPLY Sirona) bur followed by working length determination. The biomechanical preparation was done with Hyflex CM file (Coltene) up to 0.04/40 followed by irrigation with normal saline and sodium hypochlorite (3% Prime Dental product). Obturation was done using hyflex gutta percha (Coltene) with AH plus sealer (DENTSPLY Sirona). The final restoration was done with glass ionomer cement (GIC) (Fuji II, GC corporation).

A complete hemogram was done which depicted values within normal limits. Phase II therapy was carried out two weeks after the endodontic therapy. On the day of surgery, a complete protocol for surgical preparation was followed. The patient was asked to perform preprocedural mouthrinse using 2 ml of 0.2% chlorhexidine solution,

and 5% povidone-iodine solution (Betadine) was used to perform extra-oral antiseptics. Left infra-orbital nerve block and nasopalatine nerve block using 2% lignocaine with adrenaline 1:200,000 was administered. A crevicular incision was made around 11, 21, 22 and 23 without splitting the interdental papilla with the help of #12 surgical blade. This was followed by palatal semilunar incision extending 5mm from the crest of interdental papillae. The preserved papillae were incorporated to the facial flap. The full thickness mucoperiosteal flap was reflected using Molt's No. 9 periosteal elevator. The papilla preservation flap (PPF) technique prevents papillary shrinkage, ultimately avoiding the formation of black triangle in the anterior region. After raising the flap, the palatogingival groove was isolated to its most apical extent. (Figure 2). Thorough debridement around the groove was performed by meticulous scaling and root planing. Granulation tissue was debrided using Gracey curette numbers #1-2 and #3-4 (Hu-Friedy Manufacturing Co., Chicago, IL) to leave the soft tissue more conducive to regeneration. Next, the groove was contoured with high-speed round diamond bur under continuous air-water spray and blended smoothly with the adjoining surface to receive the type II GIC restoration. During the setting phase, the tissues were kept hydrated using moist gauze piece. The flap was approximated and sutured using 4-0 silk suture (Figure 3). Tablet Ibuprofen 400 mg as analgesic was prescribed three times daily for three days, and the patient was given regular oral hygiene instructions including 0.2% chlorhexidine (10 ml) mouth rinse, twice daily for a week.



Figure 2: Intra-operative view showing palatogingival groove after flap reflection



Figure 3: Intra-operative view showing GIC restoration in

the defect and sutures placed

Suture removal was done after a week. The healing was uneventful and a complete soft tissue closure in the defect-associated interdental area was demonstrable. When chlorhexidine was discontinued, full mechanical interproximal cleaning in the surgically treated area was reinstated. The patient was recalled periodically for professional tooth cleaning and oral hygiene reinforcement. A radiograph taken six months after the surgery revealed satisfactory healing in the periradicular area around the lateral incisor (Figure 4).



Figure 4: Post-operative radiograph after six months

DISCUSSION

According to Withers et al., PGG is located in maxillary lateral incisors in 94% cases.^{6,7} This was in line with our case report, where PGG was reported in maxillary lateral incisor. Since this groove acts as a concealed area for plaque formation, a communication between the root canal system and the periodontium may be formed. Lee et al.⁸ described the possibility of a secondary endodontic involvement with periodontal disease in cases where the groove occurs along the entire extension of the root.

Various treatment modalities have been advocated by Kerezoudis et al.⁹ to manage shallow PGG. The multidisciplinary approach includes surgical removal of granulation tissue and irritants, gingivectomy, and apically positioned flaps, surgical exposures and flattening of the groove by grinding, with or without application of guided tissue regeneration techniques, positioning a restoration in the groove, and orthodontic extrusion of the tooth. In the present case, management of the defect was carried out in two surgical phases: endodontic approach followed by periodontal phase. The rationale behind the selected treatment plan was saucerization of the groove, cleaning, and sealing of the entire extension, which eventually prevents the bacterial recolonization.¹⁰ This helps in

pocket elimination and also enhances the periodontal regeneration. Our treatment option was supported by previous reports¹¹⁻¹³ as they also instituted similar approach for successful management of such cases.

Various materials such as composite and amalgam have been used in previous studies to fill the PGG.¹⁰ Glass ionomer cement was preferred in this case because of its added advantages of having an antibacterial effect, chemical adhesion to the tooth structure, adequate seal ability, and promoting epithelial and connective tissue attachment.¹⁰ This was in accordance with a previous case report.¹³

In the past, the tooth involved with PGG were recommended for removal as the prognosis was considered to be poor.⁴ Although the palatal surgical approach is difficult to perform, saving the tooth is a more radical decision. Moreover, the tooth was in the esthetic zone, and the papillary reconstruction would have been difficult after extraction and implant placement.¹⁰ Therefore, an approach for treating the tooth with an interdisciplinary approach was chosen in the present case instead of any other complex and costlier procedures.

CONCLUSIONS

This case reported the successful management of an endodontic-periodontal lesion precipitated and complicated by the presence of PGG. Thus, clinicians should timely recognize the existence of such “hidden traps” and employ several available approaches to ensure the survival of such tooth.

REFERENCES

1. Kim HJ, Choi Y, Yu MK, Lee KW, Min KS. Recognition and management of palatogingival groove for tooth survival: a literature review. *Restor Dent Endod.* 2017;42(2):77-86. DOI: 10.5395/rde.2017.42.2.77 PMID: 28503472.
2. Kogon SL. The prevalence, location and conformation of palato-radicular grooves in maxillary incisors. *J Periodontol.* 1986;57(4):231-4. DOI: 10.1902/jop.1986.57.4.231 PMID: 3457145.
3. Sharma S, Deepak P, Vivek S, Dutta SR. Palatogingival groove: recognizing and managing the hidden tract in a maxillary incisor: A case report. *Journal of International Oral Health.* 2015;7(6):110. PMID: 26124612.
4. Simon JH, Glick DH, Frank AL. The relationship

- of endodontic-periodontic lesions. *J Periodontol.* 1972;43(4):202-8. DOI: 10.1902/jop.1972.43.4.202 PMID: 4505605.
5. Gu YC. A micro-computed tomographic analysis of maxillary lateral incisors with radicular grooves. *J Endod.* 2011;37(6):789-92. DOI: 10.1016/j.joen.2011.03.002 PMID: 21787490.
 6. Withers JA, Brunsvold MA, Killoy WJ, Rahe AJ. The relationship of palatogingival grooves to localized periodontal disease. *J Periodontol.* 1981;52:414. DOI: 10.1902/jop.1981.52.1.41 PMID: 6937650.
 7. CasteloBaz P, RamosBarbosa I, MartínBiedma B, DablancaBlanco AB, VarelaPatiño P, BlancoCarrión J, et al. Combined endodonticperiodontal treatment of a palatogingival groove. *J Endod.* 2015;41:1918-22. DOI: 10.1016/j.joen.2015.08.008 PMID: 26395912.
 8. Lee RW, Lee EC, Pooh RY. Palato-gingival grooves in maxillary incisors: a possible predisposing factor to localized periodontal disease. *Brit Dent J.* 1968;2:14-18. PMID: 5235230.
 9. Kerezoudis NP, Siskos GJ, Tsatsas V. Bilateral buccal radicular groove in maxillary incisors: case report. *Int Endod J.* 2003;36:898-906. DOI: 10.1111/j.1365-2591.2003.00695.x PMID: 14689959.
 10. Attam K, Tiwary R, Talwar S, Lamba AK. Palatogingival groove: endodontic-periodontal management—case report. *J Endod.* 2010;36(10):1717-20. DOI: 10.1016/j.joen.2010.06.025 PMID: 20850685.
 11. Ballal NV, Jothi V, Bhat KS, Bhat KM. Salvaging a tooth with a deep palatogingival groove: an endo-perio treatment—a case report. *Int Endod J.* 2007;40(10):808-17. DOI: 10.1111/j.1365-2591.2007.01289.x PMID: 17714466
 12. Castelo-Baz P, Ramos-Barbosa I, Martín-Biedma B, Dablanca-Blanco AB, Varela-Patiño P, Blanco-Carrión J. Combined endodontic-periodontal treatment of a palatogingival groove. *J Endod.* 2015;41(11):1918-22. DOI: 10.1016/j.joen.2015.08.008 PMID: 26395912.
 13. Prakash P, Raveendran S, Raghu R, Venkatesan K. Palatogingival groove: A diagnostic and treatment challenge. *SRMJRDS.* 2018;9(2):87. DOI:10.4103/srmjrds.srmjrds_4_18