

A Case Report on Electrocautery Gingivectomy for Gingival Enlargement with Nitrous Oxide Sedation to Enhance Patient Comfort

SADJ NOVEMBER 2025, Vol. 80 No.10 P555-P558

Ruvín Haidar¹, Muneera²

ABSTRACT

Background

Gingival enlargement characterised by the overgrowth of gingival tissue, can be caused by various factors, including medications, systemic conditions, or poor oral hygiene. Surgical intervention, such as gingivectomy, is required when conservative treatments fail. Electrocautery has become a popular method due to its precision and ability to minimise bleeding. Nitrous oxide sedation can enhance patient comfort, especially in anxious individuals. This report presents a case of gingival enlargement managed with electrocautery gingivectomy under nitrous oxide sedation, resulting in effective treatment and a positive patient experience.

Case Presentation

A 35-year-old Female non-smoker and non-alcoholic with generalised gingival overgrowth due to idiopathic causes sought treatment for aesthetic and functional concerns. The patient, who had a history of dental anxiety, was treated with electrocautery gingivectomy under nitrous oxide sedation. The procedure was successful, with minimal postoperative discomfort and no complications.

Conclusion

Electrocautery gingivectomy combined with nitrous oxide sedation is an effective and well-tolerated treatment for gingival enlargement. This approach improves both the clinical outcomes and patient experience, making it a viable option for those requiring surgical intervention for gingival overgrowth.

INTRODUCTION

Gingival enlargement, or the abnormal enlargement of gingival tissues, can significantly impact both the function and aesthetics.¹ The condition may result from systemic factors, such as use of certain medications (e.g., calcium channel blockers, phenytoin) or diseases like leukemia, or it may be idiopathic in nature.^{1,2} In cases where non-surgical

interventions like scaling and improved oral hygiene do not yield results, gingivectomy becomes a necessary treatment option.^{1,4}

Among the various techniques used to perform gingivectomy, electrocautery offers several advantages, including precise tissue removal, better control over bleeding, and quicker recovery.⁵ Furthermore, dental patients often experience anxiety before undergoing surgical procedures. Nitrous oxide sedation is a widely used technique to alleviate anxiety, ensuring that patients remain calm and relaxed during dental treatments.^{6,7} This case report discusses the management of gingival enlargement using electrocautery-assisted gingivectomy, combined with nitrous oxide sedation, to optimise both clinical and psychological outcomes.

Case Presentation

A 35-year-old Female non-smoking and non-alcoholic presented with complaints of gingival overgrowth that had progressively worsened over the past year. The gingival enlargement was most noticeable in the anterior maxillary region, affecting her appearance and impeding proper oral hygiene. The patient was suffering from social anxiety due to gummy smile. The Patient had no history of systemic diseases, nor was she on medications known to cause gingival overgrowth, such as phenytoin or calcium channel blockers. Her medical history was otherwise unremarkable, and she denied any known allergies.

The patient expressed significant anxiety about dental procedures, particularly surgery, which had delayed her seeking treatment. Given her concerns, nitrous oxide sedation was planned to reduce her anxiety and ensure a comfortable experience during the procedure.

Clinical Examination

Upon examination, the patient exhibited generalised gingival enlargement, primarily affecting the anterior segments of the maxillary arch.⁹ The gingival tissue was erythematous, swollen, and fibrotic, extending over few millimetres of the crowns of the teeth. Probing depths were within normal limits ($\geq 4\text{mm}$), and there was no evidence of periodontal attachment loss.^{10,11} Despite the enlarged gingiva, the patient had no active signs of inflammation, and her oral hygiene was average plaque disposition noticed but hindered by the overgrowth. Periodontal chart, plaque and BOP indexes are prepared before narrative diagnosis. Based on clinical findings, the diagnosis of gingival enlargement was made.^{12,13,14.}

Authors' information:

1. Ruvín Haidar. Affiliation: University of Siena.
ORCID: 0000-0001-5344-9598.

2. Muneera. Affiliation: Aaliya Dental Center.
ORCID: 0009-0004-0707-6961.

Corresponding author:

Name: Ruvín Haidar.
Email: ruvinhaidar@gmail.com

Authors contributions:

1: Ruvín Haidar – 60%
2: Muneera – 40%



Fig 1: Right side



Fig 2: Left side



Fig 3: Bite showing Probing depth



Fig.5: Digital Treatment stimulation outcome

Treatment Plan

Given the extent of the gingival enlargement and the patient's anxiety, a treatment plan was devised that incorporated both surgical and psychological management.^{6,15,16} Electrocautery was chosen as the preferred surgical technique due to its precision and ability to achieve haemostasis, which reduces postoperative complications and recovery time.¹⁷ Nitrous oxide sedation was recommended to alleviate the patient's anxiety, allowing her to remain relaxed and cooperative throughout the procedure.⁷ Virtual artificial intelligence (AI) driven try

in was done by using digital temple on preparative intraoral photographs. Patient was satisfied with the treatment stimulation outcome.^{18,19}

The treatment goals were:

- To remove the excessive gingival tissue and restore a natural gingival contour.
- To minimise patient anxiety and discomfort through nitrous oxide sedation.
- To ensure a smooth and complication-free recovery.



Fig 4: Nitrous oxide sedation machine

Surgical Procedure

Preoperative Preparation: Prior to the surgery, the patient was instructed to use a 0.12% chlorhexidine mouthwash for a week to reduce the bacterial load in the oral cavity. On the day of the procedure, local anesthesia (2% lidocaine with 1:100,000 epinephrine) was administered bilaterally to ensure sufficient numbness. In addition, nitrous oxide sedation was administered at a concentration of 50%, achieving a calm and relaxed state for the patient, while allowing her to remain conscious and responsive during the procedure.⁶

Electrocautery Gingivectomy

Anesthesia and Sedation: After confirming that the patient was adequately anesthetised, nitrous oxide-oxygen inhalation sedation was administered using a standard titration technique. The concentration of nitrous oxide was initially set at 30% and gradually increased to a maximum of 50% during the active phase of the procedure to achieve optimal relaxation while maintaining verbal responsiveness. Continuous monitoring of oxygen saturation, pulse, and respiration was performed throughout the surgery. At the conclusion of the procedure, 100% oxygen was administered for 5 minutes to prevent diffusion hypoxia and to ensure full recovery. The surgical area was isolated using sterile gauze to maintain asepsis, and the patient remained calm and comfortable with no signs of distress throughout the intervention.

Tissue Removal: monopolar Electrocautery was used for gingivectomy. The settings typically range between 6-12 watts. The tissue was excised in layers, starting from the gingival margin and extending down to the base of the hyperplastic

tissue. The electrocautery unit was set to a low power to prevent unnecessary thermal damage to surrounding tissues, and the removal was done with careful precision to achieve optimal contouring of the gingiva.

Haemostasis: The electrocautery unit provided excellent haemostasis, cauterising blood vessels as tissue was removed. This significantly minimised bleeding during the procedure, reducing the need for other haemostatic interventions.

Postoperative Care: The surgical site was inspected for complications, and none were observed. No sutures were necessary, as the tissue edges approximated well. The patient was given instructions for postoperative care, including guidance on pain management, use of 0.12 % chlorhexidine mouthwash, and oral hygiene practices.



Fig 6: Left side post-operative



Fig 7: Right side post-operative



Fig 8: Bite post-operative

RESULTS

Follow-Up Visits

1 Week Post-Operatively: At the 1-week follow-up, the patient reported mild discomfort, which was easily managed with over-the-counter analgesics. There was minimal swelling, and no signs of infection were present. The gingival tissue was healing well, and the patient was able to maintain better oral hygiene due to the reduction in gingival overgrowth.

2 Weeks Post-Operatively: By the second follow-up, the gingiva had healed significantly. The patient resumed normal eating and oral hygiene practices without difficulty. The surgical site showed minimal erythema, indicating ongoing healing.

1 Month Post-Operatively: At the 1-month follow-up, the gingiva had fully healed, and there was no recurrence of the overgrowth. The patient was very satisfied with both the functional and aesthetic results of the procedure. He reported no pain or discomfort and was able to perform normal daily activities with improved confidence.

DISCUSSION

Gingival enlargement, particularly in its severe form, can create significant functional and aesthetic issues for patients. Surgical intervention, particularly gingivectomy, is often required when conservative treatments such as scaling and improved oral hygiene are insufficient.²¹ Electrocautery-assisted gingivectomy provides several benefits, including enhanced precision, better control over bleeding, and a faster recovery period when compared to traditional scalpel methods.²²

Nitrous oxide sedation is commonly used in dental procedures to alleviate anxiety and improve patient comfort. It allows patients to remain conscious and cooperative while providing significant relaxation.^{6,7} The combination of electrocautery and nitrous oxide sedation is ideal for managing anxious patients, as it addresses both their surgical and psychological needs.

In this case, the patient experienced a smooth recovery with minimal discomfort. The combination of these two approaches – electrocautery gingivectomy and nitrous oxide sedation – proved highly effective, both functionally and aesthetically, and contributed to a positive treatment outcome.^{22, 23}

CONCLUSION

Electrocautery gingivectomy, when combined with nitrous oxide sedation, offers an effective and patient-friendly solution for managing gingival enlargement. This approach not only ensures precision and reduced postoperative discomfort but also helps address the psychological needs of anxious patients. The success of this case underscores the benefits of using this combined technique in dental surgery, particularly for patients requiring gingivectomy.

REFERENCES

1. Lai B, Muenzer J, Roberts MW. Idiopathic gingival hyperplasia: a case report with a 17-year followup. *Case Rep Dent.* 2011;2011:986237. doi: 10.1155/2011/986237. Epub 2011 Jul 3. PMID: 22567452; PMCID: PMC3335718.
2. Kavvadia K, Pepelassi E, Alexandridis C, Arkadopoulos A, Polyzois G, Tossios K. Gingival fibromatosis and significant tooth eruption delay in an 11-year-old male: a 30-month follow-up. *Int J Paediatr Dent.* 2005 Jul;15(4):294-302. doi: 10.1111/j.1365-263X.2005.00646.x. PMID: 16011789.
3. Ahmed dardir mohamed, lama h. marssafy. clinical evaluation for treatment of chronic inflammatory gingival enlargement using diode laser versus electrocautery gingivectomy. *Egyptian dental journal*, January, 2020 vol. 66, 225:235.
4. Hunasgi S, Koneru A, Vanishree M, Marvikar V. Assessment of reactive gingival lesions of oral cavity: A histopathological study. *J Oral Maxillofac Pathol.* 2017 Jan-Apr;21(1):180. doi: 10.4103/jomfp.JOMFP_23_16. PMID: 28479713; PMCID: PMC5406807.
5. Kumar P, Rattan V, Rai S. Comparative evaluation of healing after gingivectomy with electrocautery and laser. *J Oral Biol Craniofac Res.* 2015 May-Aug;5(2):69-74. doi: 10.1016/j.jobcr.2015.04.005. Epub 2015 Jun 12. PMID: 26258017; PMCID: PMC4523585.
6. Khinda V, Rao D, Sodhi SPS. Nitrous Oxide Inhalation Sedation Rapid Analgesia in Dentistry: An Overview of Technique, Objectives, Indications, Advantages, Monitoring, and Safety Profile. *Int J Clin Pediatr Dent.* 2023 Jan-Feb;16(1):131-138. doi: 10.5005/jp-journals-10005-1807. PMID: 37020786; PMCID: PMC10067981.
7. Mohan R, Asir VD, Shanmugapriyan, Ebenezer V, Dakir A, Balakrishnan, Jacob J. Nitrous oxide as a conscious sedative in minor oral surgical procedure. *J Pharm*

- Bioallied Sci. 2015 Apr;7(Suppl 1):S248-50. doi: 10.4103/0975-7406.155939. PMID: 26015724; PMCID: PMC4439684.
8. Trond Inge Berge, Nitrous oxide in dental surgery, Best Practice & Research Clinical Anaesthesiology, Volume 15, Issue 3, 2001, Pages 477-489, <https://doi.org/10.1053/bean.2001.0175>
 9. Agrawal AA. Gingival enlargements: Differential diagnosis and review of literature. World J Clin Cases. 2015 Sep 16;3(9):779-88. doi: 10.12998/wjcc.v3.i9.779. PMID: 26380825; PMCID: PMC4568527.
 10. Mihai LL, Parlatescu I, Calin A, Burcea A. Gingival overgrowth approached using recent mechanical and laser technologies: A case report. Exp Ther Med. 2024 Jan 8;27(2):84. doi: 10.3892/etm.2024.12374. PMID: 38274335; PMCID: PMC10809356
 11. Reiniger APP, Maier J, Wikesjö UME, Moreira CHC, Kantorski KZ. Correlation between dental plaque accumulation and gingival health in periodontal maintenance patients using short or extended personal oral hygiene intervals. J Clin Periodontol. 2021 Jun;48(6):834-842. doi: 10.1111/jcpe.13448. Epub 2021 Mar 23. PMID: 33751652.
 12. De David SC, Mário TG, De Freitas GC, Kantorski KZ, Wikesjö UME, Moreira CHC. Correlation between plaque control and gingival health using short and extended oral hygiene intervals. Clin Oral Investig. 2018 Sep;22(7):2593-2597. doi: 10.1007/s00784-018-2358-5. Epub 2018 Feb 15. PMID: 29450737.
 13. Murakami S, Mealey BL, Mariotti A, Chapple ILC. Dental plaque-induced gingival conditions. J Periodontol. 2018 Jun;89 Suppl 1:S17-S27. doi: 10.1002/JPER.17-0095. PMID: 29926958.
 14. Lang NP, Bartold PM. Periodontal health. J Periodontol. 2018 Jun;89 Suppl 1:S9-S16. doi: 10.1002/JPER.16-0517. PMID: 29926938.
 15. Shadab H, Nawabi A, Anwari A, Nejabi MB, Ghafari ES, Karimi S, Ahmadi ME. Surgical Management of Hereditary Gingival Fibromatosis: Case Series. Clin Cosmet Investig Dent. 2024;16:307-319 <https://doi.org/10.2147/CCIDE.S480490>.
 16. Ballini A, Scattarella A, Crincoli V, Carlaio RG, Papa F, Perillo L, Romanazzo T, Bux MV, Nardi GM, Daturi A, Cantore S, Pettini F, Grassi FR. Surgical treatment of gingival overgrowth with 10 years of follow-up. Head Face Med. 2010 Aug 12;6:19. doi: 10.1186/1746-160X-6-19. PMID: 20704737; PMCID: PMC2931464.
 17. Bashetty K, Nadig G, Kapoor S. Electrosurgery in aesthetic and restorative dentistry: A literature review and case reports. J Conserv Dent. 2009;12(4):139-144. doi:10.4103/0972-0707.58332.
 18. Kelekis-Cholakakis A, Wiltshire WA, Birek C. Treatment and long-term follow-up of a patient with hereditary gingival fibromatosis: a case report. J Can Dent Assoc. 2002 May;68(5):290-4. PMID: 12019039.
 19. Coachman C, Paravina RD. Digitally Enhanced Esthetic Dentistry - From Treatment Planning to Quality Control. J Esthet Restor Dent. 2016 Mar;28 Suppl 1:S3-4. doi: 10.1111/jerd.12205. PMID: 27113295.
 20. Levi YLAS, Cota LVS, Maia LP. Digital smile design for gummy smile correction. Indian J Dent Res. 2019 Sep-Oct;30(5):803-806. doi: 10.4103/ijdr.IJDR_132_18. PMID: 31854378.
 21. Liboon J, Funkhouser W, Terris DJ. A comparison of mucosal incisions made by scalpel, CO2 laser, electrocautery, and constant-voltage electrocautery. Otolaryngol Head Neck Surg. 1997 Mar;116(3):379-85. doi: 10.1016/S0194-59989770277-8. PMID: 9121794.
 22. Carew JF, Ward RF, LaBruna A, Torzilli PA, Schley WS. Effects of scalpel, electrocautery, and CO2 and KTP lasers on wound healing in rat tongues. Laryngoscope. 1998 Mar;108(3):373-80. doi: 10.1097/00005537-199803000-00012. PMID: 9504610.
 23. Sinha UK, Gallagher LA. Effects of steel scalpel, ultrasonic scalpel, CO2 laser, and monopolar and bipolar electrosurgery on wound healing in guinea pig oral mucosa. Laryngoscope. 2003 Feb;113(2):228-36. doi: 10.1097/00005537-200302000-00007. PMID: 12567074.

Online CPD in 6 Easy Steps



The Continuing Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.

