

Conservative Internal Bevel Flap Approach for the Excision of Gingival Verruciform Xanthoma: A Case Report with histopathological insight

*Dr. Balaji V¹, Dr. Sanjay Venugopal², Dr. Praveen B Kudva³, Dr. Ganganna Kokila⁴, Dr. Roopavathi K M⁵

¹Post graduate, Department of Periodontology and Implantology, Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

²Professor and Head of the department, Department of Periodontology and Implantology, Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

³Professor and Dean, Department of Periodontology and Implantology, Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

⁴ Professor and Head of the department, Department of Oral and Maxillofacial Pathology , Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

⁵Reader, Department of Periodontology and Implantology, Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

***Corresponding Author:** Dr. Balaji V, Post graduate, Department of Periodontology and Implantology, Sri Siddhartha Dental College and Hospital, Sri Siddhartha Academy of Higher Education, Tumkur, India

Abstract :

Verruciform xanthoma (VX) is a rare benign oral lesion often resembling other verrucous or papillary pathologies, requiring histopathological confirmation. A 40-year-old female tobacco chewer presented with diffuse gingival enlargement from 41 to 46, severe attrition, spacing, and tooth mobility. Histopathology showed parakeratinized epithelium with verrucous hyperplasia, foamy macrophages, and mild-to-moderate dysplasia, confirming VX. Excision via an internal bevel flap enabled complete removal with preservation of gingival contour and primary closure. Healing was uneventful, with no recurrence after six months. Prosthetic rehabilitation restored function and esthetics, while tobacco cessation counseling and oral hygiene reinforcement supported long-term management. This case highlights the value of early diagnosis, flap-assisted excision, and comprehensive rehabilitation in achieving optimal outcomes.

Keywords: *internal bevel flap approach, tobacco use, epithelial dysplasia, gingival lesion, verruciform xanthoma*

Introduction:

Verruciform xanthoma (VX) is an uncommon, benign papillary lesion of the oral cavity that was first described by Shafer in 1971 and has since been recognized as a distinct clinicopathological entity [1]. It is most frequently encountered in masticatory mucosa, particularly the gingiva and alveolar mucosa, although cases have been reported in the palate, buccal mucosa, and tongue. Histologically, VX is defined by the presence of papillary or verrucous epithelial hyperplasia supported by elongated connective tissue papillae that contain aggregates of lipid-laden foamy macrophages (xanthoma cells), a hallmark feature that distinguishes it from other papillary or verruciform lesions [2,3].

Despite extensive investigation, the precise etiopathogenesis of VX remains uncertain. Earlier studies suggested a possible viral association, particularly with human papillomavirus; however, subsequent molecular analyses have failed to consistently demonstrate viral DNA, weakening this hypothesis [4]. Current evidence favors a reactive or inflammatory pathogenesis, with epithelial damage, chronic irritation, periodontal inflammation, trauma, or immune dysregulation acting as inciting factors for the accumulation of lipid-containing macrophages in the connective tissue papillae. The lesion is not regarded as a true neoplasm and unlike other verruciform lesions of the oral cavity, it carries no malignant potential [5].

Clinically, VX presents as a slow-growing, solitary, well-circumscribed lesion with a verrucous, papillary, or granular surface. The lesion typically ranges in color from white to yellowish or pink, depending on the degree of keratinization and vascularity [6]. Because of its clinical similarity to other exophytic lesions such as squamous papilloma, verruca vulgaris, leukoplakia, verrucous carcinoma, and even early squamous cell carcinoma, establishing a definitive diagnosis requires histopathological evaluation [7]. In large case series and systematic reviews, VX has shown a predilection for middle-aged and older individuals, with no consistent gender predilection. The gingiva is one of the most commonly involved intraoral sites, and its involvement often poses a clinical challenge, as lesions may extend into both marginal and attached gingiva, thereby complicating surgical excision and subsequent periodontal esthetics [8].

Prognostically, VX is considered highly favorable, with simple surgical excision typically curative and recurrences rarely reported. When recurrence occurs, it is often attributed to incomplete excision or persistent local trauma. Because the lesion is benign and has no premalignant potential, the surgical goal is complete removal with conservation of adjacent structures [9]. While most reported cases have been managed with conventional scalpel excision, some authors have described excision with electrosurgery, cryotherapy, or lasers. However, reports of periodontal flap-based excision, especially internal bevel flap approaches, are scarce in the literature despite their potential advantages in lesions located at esthetically and functionally sensitive sites such as the marginal and attached gingiva. This technique not only ensures precise removal of the lesion but also allows for preservation of gingival contours, maintenance of keratinized gingiva, and improved wound healing outcomes.

Given these considerations, the present case report highlights the successful management of an uncommon gingival VX using an internal bevel periodontal flap approach. The aim of this case

report is to emphasize the importance of conservative, architecture-preserving surgical strategies in treating VX involving the gingiva, demonstrating that periodontal flap-assisted excision can achieve both oncologic adequacy and optimal functional-esthetic outcomes.

Case Presentation :

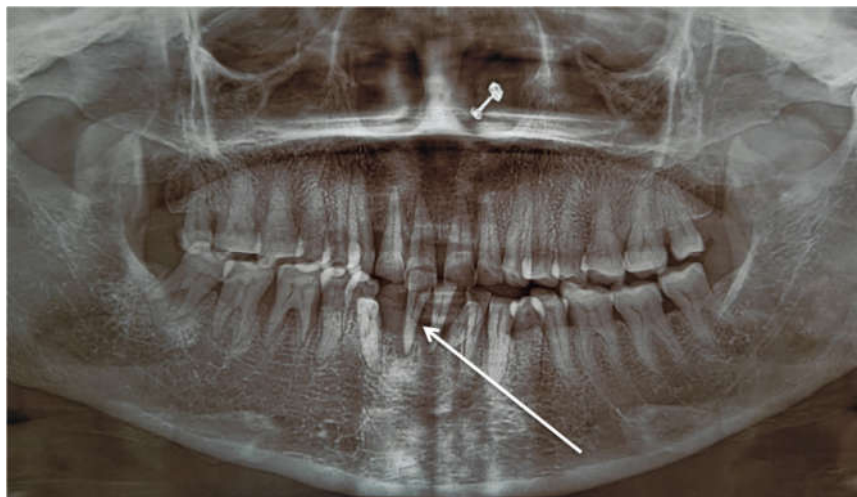
A 40-year-old female patient reported to the Department of Periodontology with a chief complaint of swelling in the lower right anterior and posterior gingival region, persisting for nearly six months. The swelling had an insidious onset, was initially asymptomatic and gradually enlarged to involve multiple teeth. The patient denied any associated pain or bleeding. Medical and family histories were non contributory. However, she disclosed a 15-year history of habitual tobacco chewing. Intraoral examination revealed a solitary, ill-defined, sessile, diffuse gingival mass extending from teeth 41 to 46. The lesion measured approximately 4.0×1.0 cm in the region of 41-43 and about 1.5×1.0 cm near 46. The surface appeared irregular with focal areas of ulceration and a pale pink coloration (Figure 1).



Intraoral view showing a solitary, sessile, diffuse gingival mass extending from 41 to 46, with an irregular surface, focal ulceration, and pale pink coloration.

Figure 1: Pre-operative

The dentition exhibited severe generalized attrition with spacing and pathological mobility noted in relation to 41, 42, 43, 46 and 31(Figure 2).



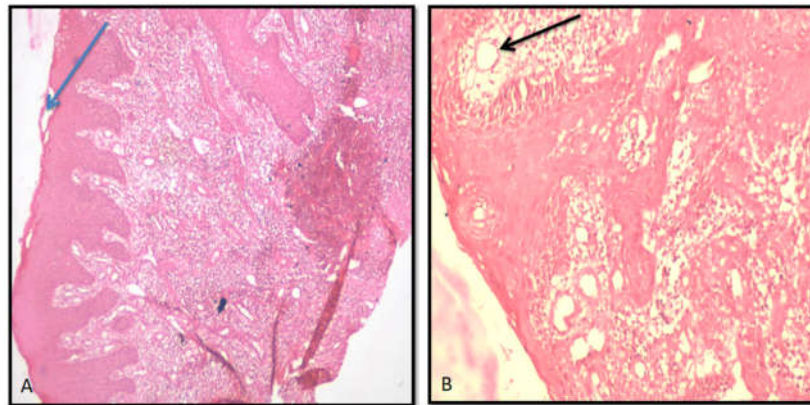
Orthopantomogram view revealing bone loss in relation to 41, 42, 43, 46 and 31 correlating clinically with pathological mobility of the involved teeth.

Figure 2: OPG

Extraoral examination showed a symmetrical facial profile with competent lips. No deviation or abnormal joint sounds were detected during temporomandibular joint (TMJ) movement. Regional lymph nodes were not palpable. Based on the clinical presentation, a provisional diagnosis of gingival hyperplasia was established.

Treatment:

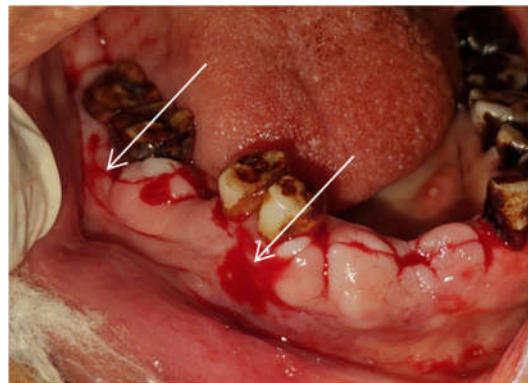
As the first step in management, atraumatic extraction of the mobile teeth was performed. During the same appointment, an incisional biopsy was undertaken by excising a representative wedge of the gingival lesion that included lesional tissue along with a margin of adjacent clinically normal mucosa. The specimen was fixed in 10% neutral buffered formalin and submitted for histopathological analysis. Microscopic examination showed parakeratinized stratified squamous epithelium with surface irregularities, focal ulceration, and features consistent with mild-to-moderate epithelial dysplasia. The underlying connective tissue exhibited densely packed collagen bundles, chronic inflammatory infiltrate, proliferating blood vessels, and aggregates of lipid-laden foamy macrophages within the connective tissue papillae. Based on these findings, a diagnosis of verruciform xanthoma with epithelial dysplasia was established (Figure 3).



(A) Section showing parakeratinized stratified squamous epithelium with surface irregularities, focal ulceration, and mild epithelial dysplasia (H&E stain, $\times 10$). (B) Higher magnification demonstrating connective tissue papillae with aggregates of lipid-laden foamy macrophages (foam cells) characteristic of verruciform xanthoma (H&E stain, $\times 40$).

Figure 3: Histopathology

Two weeks following histopathological confirmation, definitive surgical excision of the residual lesion was performed using an internal bevel flap approach. After administration of local anesthesia (2% lignocaine with 1:80,000 adrenaline), an internal bevel incision was made approximately 2-3 mm away from the gingival margin using a 15 size Bard-Parker blade, directed coronally toward the alveolar crest, ensuring that the entire extent of the lesion was encompassed within the planned excision margins (Figure 4).



Intraoperative view showing placement of an internal bevel incision approximately 2–3 mm away from the gingival margin directed coronally toward the alveolar crest to ensure complete excision of the lesion within defined margins.

Figure 4: Incision

This was followed by a crevicular incision along the gingival sulcus and a horizontal interdental incision to separate the collar of gingival tissue containing the lesion. A full-thickness mucoperiosteal flap was then carefully elevated to expose the underlying connective tissue and ensure complete visibility of the surgical field. The lesion along with surrounding tissue was completely excised with clear margins. The underlying connective tissue bed was curetted to eliminate any residual abnormal cells (Figure 5).



Figure 5: Complete excision of the lesion by using internal bevel flap approach

Hemostasis was achieved, and the flap was repositioned and adapted to its original location. Interrupted sutures with 4-0 black braided silk were placed to secure primary closure while maintaining gingival contour and architecture (Figure 6).



Figure 6: Suturing

Postoperatively, the patient was prescribed a 5 day regimen consisting of amoxicillin 500 mg three times daily, ibuprofen 400 mg three times daily and 0.12% chlorhexidine gluconate mouth rinse twice daily. Sutures were removed after seven days, revealing uneventful healing. The patient was subsequently reviewed at one, three, and six months, with satisfactory healing and no clinical evidence of recurrence during the follow-up period (Figure 7). Given the presence of epithelial dysplasia, the patient was advised for long-term surveillance.



Figure 7:Post-operative at 3rd month

After adequate healing of the surgical site, prosthetic rehabilitation was carried out to restore both function and esthetics. A removable partial prosthesis with individualized characterization was fabricated to blend seamlessly with the adjacent dentition and gingival contours (Figure 8). This rehabilitation not only enhanced mastication and appearance but also supported periodontal health by ensuring favorable occlusal load distribution and minimizing the risk of secondary trauma.



Figure 8: Prosthetic rehabilitation

Discussion :

Verruciform xanthoma (VX) is an uncommon benign lesion of the oral cavity, initially described by Shafer in 1971. Although rare, the gingiva is the most frequently affected site followed by the alveolar mucosa, palate, and tongue. Clinically VX usually appears as a solitary, well-demarcated, verrucous or papillary growth, often mimicking conditions such as squamous papilloma, verruca vulgaris, leukoplakia, verrucous carcinoma or early squamous cell carcinoma. Owing to this significant clinical overlap, histopathological examination is indispensable for establishing a definitive diagnosis [9].

Histologically, VX is characterized by parakeratinized stratified squamous epithelium showing verrucous hyperplasia and elongated rete ridges. The hallmark feature is the presence of connective tissue papillae filled with lipid-laden foamy macrophages (xanthoma cells) [10]. Current literature supports a reactive or inflammatory pathogenesis rather than a viral or true neoplastic origin. Potential predisposing factors include chronic irritation, periodontal disease, tobacco use, lichen planus, and graft-versus-host disease. In the present case, the patient's long-standing tobacco chewing habit combined with chronic periodontal inflammation likely contributed to lesion development [11].

Although VX is generally regarded as benign with no premalignant potential, occasional cases demonstrating epithelial dysplasia have been reported [12]. In our case, histopathology revealed mild-to moderate epithelial dysplasia, an unusual finding that warrants cautious long-term monitoring. The patient's chronic tobacco use and persistent local irritation may have played a role in these dysplastic alterations, underscoring the importance of addressing modifiable risk factors as part of comprehensive management.

Surgical excision is considered the gold standard treatment, typically associated with an excellent prognosis and rare recurrence if the lesion is completely removed. While scalpel excision is usually sufficient, VX lesions located on the marginal and attached gingiva pose functional and esthetic challenges [13,14]. In this case, an internal bevel periodontal flap approach was adopted, enabling complete excision under direct vision while preserving keratinized gingiva, maintaining gingival contours and ensuring primary closure. This technique adheres to periodontal surgical principles and offers superior esthetic and functional outcomes compared to conventional open excision. The patient exhibited uneventful healing with no recurrence at six months of follow-up, reinforcing both the favorable prognosis of VX and the advantages of flap-based surgical techniques in esthetically sensitive regions.

In addition to surgical management, holistic care must include functional rehabilitation and modification of risk factors. Given the patient's significant tooth loss and mobility, prosthetic rehabilitation was undertaken to restore masticatory function, occlusal stability, and esthetics. Timely replacement of missing teeth improves oral function, enhances quality of life and supports long-term periodontal health. Furthermore, considering the established link between tobacco use, VX development and dysplastic changes, tobacco cessation counseling was an integral part of postoperative care. Regular follow-up visits remain essential not only for monitoring recurrence but also for early detection of any malignant transformation, particularly in cases where epithelial dysplasia is present on histopathological examination.

Conclusion :

Verruciform xanthoma is a rare, benign lesion of the oral cavity that closely resembles several other papillary and verrucous pathologies thereby necessitating histopathological confirmation for definitive diagnosis. Although generally non-premalignant, the occurrence of epithelial dysplasia as noted in this case underscores the need for vigilant long-term follow-up. Surgical excision remains the treatment of choice and when performed with flap-based techniques, can achieve both functional and esthetic preservation. Comprehensive care should further incorporate prosthetic rehabilitation and modification of contributory risk factors such as tobacco use to enhance prognosis and overall oral health.

Acknowledgements:

The authors thank Dr. Abinaya, Postgraduate, Department of Prosthodontics and Crown and Bridge, Sri Siddhartha Dental College and Hospital for her assistance in fabricating and characterizing the removable partial denture for the patient's prosthetic rehabilitation.

References:

1. Philipsen HP, Reichart PA, Takata T, Ogawa I. Verruciform xanthoma--biological profile of 282 oral lesions based on a literature survey with nine new cases from Japan. *Oral Oncol.* 2003;39(4):325-336. doi:10.1016/s1368-8375(02)00088-x
2. Belknap AN, Islam MN, Bhattacharyya I, Cohen DM, Fitzpatrick SG. Oral Verruciform Xanthoma: A Series of 212 Cases and Review of the Literature. *Head Neck Pathol.* 2020;14(3):742-748. doi:10.1007/s12105-019-01123-0
3. de Andrade BA, Agostini M, Pires FR, et al. Oral verruciform xanthoma: a clinicopathologic and immunohistochemical study of 20 cases. *J Cutan Pathol.* 2015;42(7):489-495. doi:10.1111/cup.12500
4. Ryu DJ, Lee SH, Yuk JI, Kim HJ, Huh JK, Park KH. Verruciform xanthoma of the palatal gingiva: a report of two cases. *J Korean Assoc Oral Maxillofac Surg.* 2013;39(6):292-296. doi:10.5125/jkaoms.2013.39.6.292
5. Hegde U, Doddawad VG, Sreeshyla H, Patil R. Verruciform xanthoma: A view on the concepts of its etiopathogenesis. *J Oral Maxillofac Pathol.* 2013;17(3):392-396. doi:10.4103/0973-029X.125205
6. Tamialakis P, Theofilou VI, Tosios KI, Sklavounou-Andrikopoulou A. Oral verruciform xanthoma: Report of 13 new cases and review of the literature. *Med Oral Patol Oral Cir Bucal.* 2018;23(4):e429-e435. Published 2018 Jul 1. doi:10.4317/medoral.22342
7. Balasundaram, T. & Chattopadhyay, P.K. & Desai, Ajay & Semi, Ravinder & Kamalpathey, K.. (2020). Rare case of large verrucous xanthoma of oral cavity managed with nasolabial flap and review of literature. *Oral and Maxillofacial Surgery Cases.* 6. 100170. Doi:10.1016/j.omsc.2020.100170.

8. Shahrabi Farahani S, Treister NS, Khan Z, Woo SB. Oral verruciform xanthoma associated with chronic graft-versus-host disease: a report of five cases and a review of the literature. *Head Neck Pathol*. 2011;5(2):193-198. doi:10.1007/s12105-011-0246-2
9. Shafer WG. Verruciform xanthoma. *Oral Surg Oral Med Oral Pathol*. 1971;31(6):784-789. doi:10.1016/0030-4220(71)90134-4
10. Capocasale G, Panzarella V, Tozzo P, et al. Oral verruciform xanthoma and erythroplakia associated with chronic graft-versus-host disease: a rare case report and review of the literature. *BMC Res Notes*. 2017;10(1):631. Published 2017 Nov 28. doi:10.1186/s13104-017-2952-7
11. Shetty A, Nakhaei K, Lakkashetty Y, Mohseni M, Mohebatzadeh I. Oral verruciform xanthoma: a case report and literature review. *Case Rep Dent*. 2013;2013:528967. doi:10.1155/2013/528967
12. Mostafa KA, Takata T, Ogawa I, Ijuhin N, Nikai H. Verruciform xanthoma of the oral mucosa: a clinicopathological study with immunohistochemical findings relating to pathogenesis. *Virchows Arch A Pathol Anat Histopathol*. 1993;423(4):243-248. doi:10.1007/BF01606886
13. MONTEIRO, Maria & Furuse, Cristiane & CÊ, Larissa & SANTANA, Alexandre & Araújo, Vera. (2016). Verruciform xanthoma: case report. *RGO - Revista Gaúcha de Odontologia*. 64. 79-82. 10.1590/1981-863720160001000111075.
14. Hiraishi Y, Tojyo I, Kiga N, Tanimoto K, Fujita S. A Case of Verruciform Xanthoma Arising in the Tongue. *J Clin Diagn Res*. 2016;10(12):ZD07-ZD08. doi:10.7860/JCDR/2016/22157.8965