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Management of Oral Squamous Cell Papilloma by Diode Laser: A Case Report

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Abstract

Oral squamous cell papilloma is a benign epithelial proliferation commonly associated with human papillomavirus (HPV) types 6 and 11. It represents about 2.5% to 4% of all oral mucosal lesions. Clinically, it appears as a slow-growing, exophytic, pedunculated, or sessile mass with a characteristic cauliflower-like surface. The most frequent intraoral sites include the tongue, soft palate, uvula, lips, and gingiva. It is most commonly observed in adults between the third and fifth decades of life, with no significant gender predilection, although some studies indicate a slight female predominance. The lesion is usually solitary and asymptomatic, and surgical excision is the treatment of choice with minimal recurrence.

Keywords: Oral Squamous cell papilloma (OSP), Benign tumours, Oral histopathology, Oral soft tissue lesion, Excisional tissue biopsy

Introduction

Oral squamous cell papilloma (OSP) is a benign exophytic proliferation of stratified squamous epithelium characterized by papillary or verrucous architecture and is widely considered to arise in association with human papillomavirus (HPV) infection (particularly low-risk types), although not all lesions are HPV-positive[1,2]. The lesion's viral aetiology is supported by detection of HPV

DNA or viral proteins in subsets of lesions, though the rate of such detection is variable and occasionally low[3,4]. The precise role of HPV in lesion initiation versus incidental presence remains a subject of investigation[2,5].

Clinically, OSP usually presents as a slow-growing, painless papule or nodule, often with a verrucous "cauliflower-like" or granular surface and may exhibit a sessile or pedunculated base[6,7]. The colour may range from pink to white — the latter appearance depending on the degree of surface keratinization[6,8]. Lesions are often small (commonly ~1 cm or less), well-circumscribed, and solitary; however, multiple lesions are occasionally encountered, especially in immunocompromised individuals9. Although OSP can occur on any intraoral mucosal surface, common predilection sites include the soft palate, uvula, tongue, vermilion border of lips, and gingiva[7,10].

Histopathologically, OSP is composed of finger-like papillary projections of stratified squamous epithelium that typically exhibit orderly maturation, minimal cytologic atypia, and a central fibrovascular core; surface hyperkeratosis or parakeratosis is frequently present[11]. Koilocytosis or koilocyte-like changes may be observed in the superficial epithelial layers, which serve as suggestive but not definitive indicators of HPV effect[12]. Occasional basal or parabasal hyperplasia is seen, but true dysplasia is uncommon in classic OSP. Immunohistochemical and molecular studies have frequently shown low detection rates of HPV or p16 in OSPs, underlining that not all papilloma's share a clear HPV aetiology[13].

The standard management of OSP is complete surgical excision down to the lesion base, which is both diagnostic and curative. Recurrence is rare if excision margins are clear. In recent years, adjunctive diagnostic tools such as widefield optical fluorescence have been explored to better delineate lesion margins or detect subclinical components[6].

Here, we present a case of oral squamous cell papilloma located at the upper left front region of hard palate, which had been present and ignored for over 5 years. Despite its long-standing duration, the lesion showed no signs of malignant transformation. It was managed successfully by complete surgical excision using diode laser, and histopathologic evaluation confirmed the diagnosis of Oral squamous papilloma. The patient demonstrated uneventful healing and no recurrence during follow-up, highlighting the benign nature and excellent prognosis of this entity when appropriately treated.

Case presentation

A 19-year-old male patient reported to outpatient division of the department of periodontics at SMBT IDSR, Dhamangaon, Nashik, with the complain of swelling in the upper left front region of palate. The patient had no known relevant familial history or history of drug allergies or any adverse habits.

The patient noticed the lesion 5 years ago which was small in size like a papule, with no history of pain, inflammation, or previous infection. Head and neck examination revealed no abnormalities, tenderness, or swelling. Intraoral examination revealed normal hard and soft tissues in the vestibule, buccal mucosa, floor of the mouth, and tongue. However, severe supra and sub-gingival calculus was present and he also noticed bad breath. He reported that the lesion started expanding in size, since last 2- years, which brought the concern. But as it was painless it was ignored.

The intraoral image shows a soft tissue lesion in the upper left front region of palate. (Figure 1) The lesion was 10*15mm in size, well-defined, warty- cauliflower like, sessile, pedunculated, pink in color, and firm in consistency.

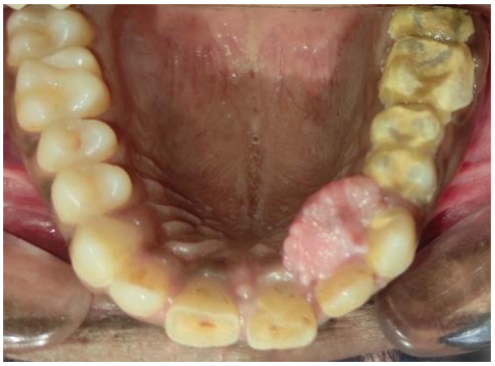

Figure 1: Intraoral image showing a pink lesion at the upper left front region of palate, with severe supragingival calculus due to unilateral chewing

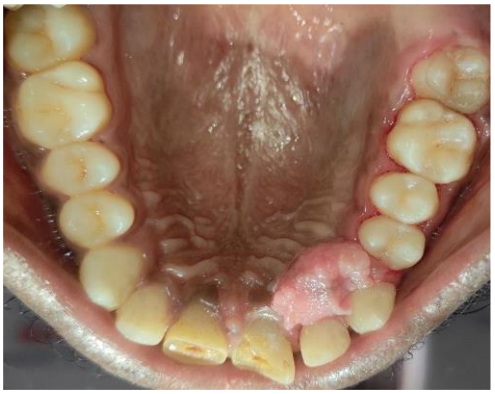

Figure 2: Intraoral image showing lesion after scaling and polishing

The patient underwent a Diode laser assisted excisional biopsy of the pedunculated palatal lesion under local anaesthesia. 2% lidocaine & Adrenaline was used, and excision was performed using Diode laser tip at 940 nm wavelength from the base of the lesion. The lesion was then completely excised (Figure 3). The excision site was inspected, curetted and irrigated with normal saline. The procedure was well tolerated by the patient without any intraoperative or postoperative complications. Follow-up evaluations were scheduled at one week, three months and 6 months post-surgery. During these visits, the patient reported no pain or discomfort. Clinical examination revealed satisfactory healing, with no signs of inflammation, infection, discharge, or lesion recurrence.

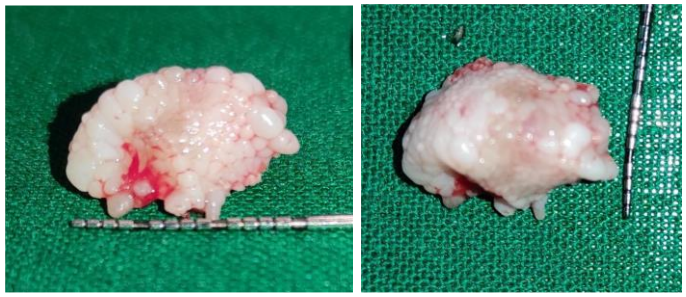

Figure 3: Image shows the excised intraoral lesion.

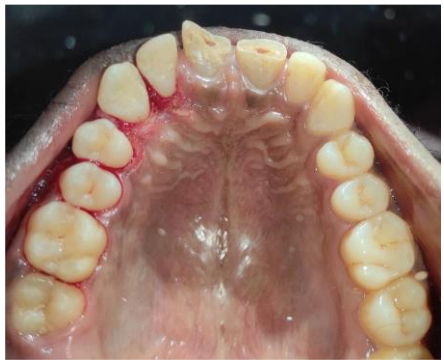

Figure 4: Showing immediate post-operative after excision of lesion, curettage and gingival contouring

Macroscopic histopathology examination revealed the presence of a specimen measuring approximately 1.5cm × 1cm, finger-like papillary projections lined by stratified squamous epithelium with fibrovascular connective tissue cores beneath. There are hyperkeratosis and acanthosis visible in the epithelial layer. Features are consistent with a benign papillary epithelial lesion, suggestive of oral squamous cell papilloma. The epithelium exhibits acanthosis and hyperkeratosis without evidence of dysplasia or malignancy. (Figure 5)

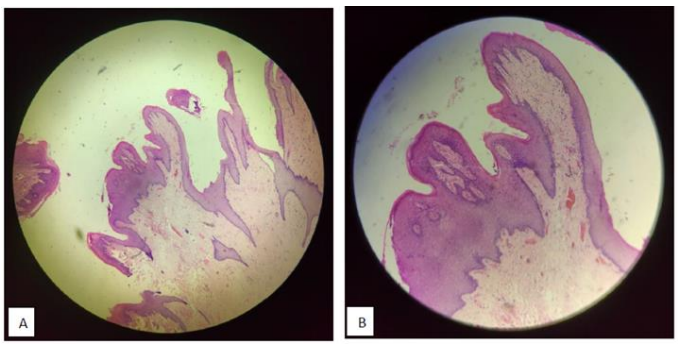

Figure 5: (A) Showing Histopathologic low-power image of the biopsy shows the lesion cores lined by Para keratinized stratified squamous epithelium.

(B) Showing Histopathologic image shows hyperkeratosis with focal basal cell melanosis and Acanthosis

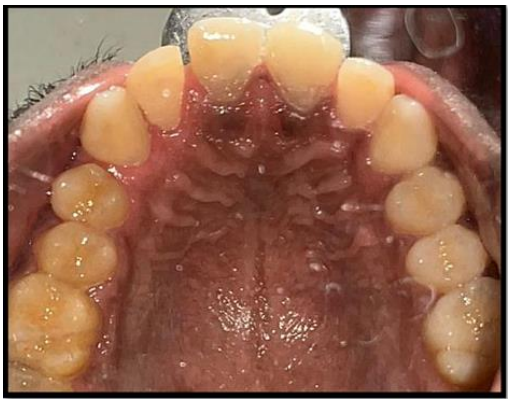

Figure 6: Showing 6 Month follow up

Discussion

Oral squamous cell papilloma (OSP) is a benign epithelial neoplasm arising from the stratified squamous epithelium of the oral mucosa. According to the most recent World Health Organization (WHO) classification, oral squamous papilloma is defined as a benign, localized epithelial proliferation presenting as an exophytic growth with a verrucous or cauliflower-like surface, which may arise on either a sessile or pedunculated base[14]. Typically, the lesion is around 1 cm in diameter, and its colour ranges from pale pink to whitish, influenced by the degree of surface keratinization and underlying vascularity. It is generally a slow-growing, non-invasive lesion most frequently observed on the tongue, palate, uvula, vermilion border of the lips, and gingiva. Although oral squamous papilloma's are considered benign, lesions occurring on the gingiva or those exceeding 10 mm in size have been reported to possess a slightly increased potential for malignant transformation[15].

In the present case, the lesion appeared as a slow-growing, painless, warty mass on the soft palate. The clinical presentation — a solitary, well-defined, cauliflower-like exophytic growth — corresponds closely with descriptions in the literature. OSP commonly involves sites such as the tongue, soft palate, uvula, and lips; the palate accounts for approximately 15–20% of intraoral cases. The lesion's dimensions (1.0 × 1.5 cm) in this case are consistent with the typical size range reported for oral papilloma's, which rarely exceed 1 cm but may occasionally enlarge if neglected.

The exact aetiology of oral squamous cell papilloma (OSP) remains multifactorial. The most widely accepted cause is infection by low-risk human papillomavirus (HPV), primarily HPV types 6 and 11, which are responsible for inducing epithelial proliferation through viral oncoproteins E6 and E7. These viral proteins interfere with cell-cycle regulation, leading to localized hyperplasia without malignant transformation. Transmission of HPV to the oral cavity may occur through direct contact, autoinoculation, or oro-genital contact.

In addition to viral infection, several co-factors may contribute to lesion development or persistence. These include chronic mucosal irritation, poor oral hygiene, local trauma, and immunosuppression. The present case demonstrated poor oral hygiene with heavy supra- and subgingival calculus, which may have acted as a chronic irritant predisposing to localized epithelial proliferation. However, the long-standing, solitary nature of the lesion without recurrence or dysplasia further supports its benign viral or reactive aetiology rather than a premalignant one.

Histopathologically, OSP is characterized by finger-like projections of stratified squamous epithelium supported by fibrovascular connective tissue cores. The epithelial cells generally exhibit normal maturation with minimal atypia, and koilocytosis may be seen in the upper layers, indicative of HPV-induced cytopathic effect[16]. Similar

features were observed in the present case, confirming the diagnosis.

Differential diagnoses for OSP include-

1. Verruca vulgaris
2. Condyloma acuminatum
3. Focal epithelial hyperplasia (Heck's disease)
4. Verruciform xanthoma

Verruca vulgaris is often associated with HPV-2 and typically affects the lips or labial mucosa, while condyloma acuminatum tends to present as multiple lesions with broader bases and larger size. Verruciform xanthoma can be ruled out histologically by the presence of foam cells in the connective tissue papillae.

The benign course of OSP is well-documented, with very low recurrence rates following complete surgical excision. Incomplete removal, persistent local irritation, or immunosuppression may contribute to recurrence. Thus, this case reinforces the indolent behaviour and excellent prognosis of oral squamous papilloma when appropriately diagnosed and treated. Nonetheless, clinicians should remain vigilant in monitoring long-standing lesions for any signs of recurrence or dysplastic change, especially in high-risk sites or in immunocompromised patients.

Conclusion

Oral squamous cell papilloma is a benign, slow-growing lesion with characteristic exophytic and verrucous features. Early diagnosis and appropriate management are essential to prevent lesion progression and patient discomfort. In this case, complete excision using a diode laser provided a minimally invasive, precise, and bloodless approach, resulting in uneventful healing, minimal postoperative discomfort, and no recurrence during follow-up. This report reinforces the efficacy of diode laser therapy as a safe and effective treatment modality for oral squamous cell papilloma's, particularly for lesions in anatomically sensitive areas such as the palate. Regular follow-up remains important to monitor for potential recurrence, although the prognosis for completely excised lesions is excellent.

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