University J Dent Scie 2026; Vol. 12, Issue 2

Pediatric Oral Squamous Papilloma of the Lower Lip Managed with Diode Laser: A Case Report.

Abstract:
Oral squamous papilloma (OSP) is an uncommon benign epithelial lesion in pediatric patients and is associated with low-risk human papillomavirus infection, particularly when arising at unusual intraoral sites such as the lower lip. The present case report describes the treatment of oral squamous papilloma in a 12-year-old boy presenting with a painless, exophytic papillary growth on the inner aspect of the lower lip. Based on clinical examination, a provisional diagnosis of oral squamous papilloma was made, and the lesion was excised using a diode laser under local anesthesia. Histopathological evaluation confirmed the diagnosis, demonstrating papillary projections with fibrovascular cores and koilocytosis. The procedure was well tolerated with minimal bleeding and uneventful healing. No recurrence was observed during follow-up. Diode laser excision offers a minimally invasive, effective treatment option with favorable healing and improved patient comfort in pediatric patients.

Key-words: Oral squamous papilloma, Pediatric patient, Diode laser

Introduction:

Oral squamous papilloma (OSP) is a benign proliferation of stratified squamous epithelium commonly associated with low-risk human papillomavirus (HPV) infection. Clinically, it presents as an exophytic, papillary lesion that may be sessile or pedunculated, often exhibiting a cauliflower-like surface. These lesions are usually less than 1 cm in diameter and may appear white, pink, or mucosal-colored depending on the degree of keratinization.[1] OSP most frequently affects the tongue, palate, lips, and buccal mucosa, while its occurrence in the pediatric population is relatively uncommon compared with adults.[2]

The etiology of OSP is strongly linked to HPV, particularly genotypes 6 and 11. In children, viral transmission may occur through direct contact, autoinoculation, or vertical transmission, with early exposure allowing for possible persistence of the virus in the oral mucosa.[3] OSP demonstrates considerable clinical and histopathological variability, which may complicate diagnosis and highlights the importance of histopathological confirmation.[4]

Evidence suggests that HPV DNA can be detected in the oral cavities of clinically healthy children, indicating early-life exposure and potential viral latency.[5] These findings emphasize the need for awareness and early recognition of HPV-associated oral lesions in pediatric patients, especially when lesions present at uncommon sites such as the lower lip. The present report describes a rare case of oral squamous papilloma of the lower lip in a pediatric patient and highlights diode laser excision as a minimally invasive treatment modality.

[1]ANUSHA DIXIT, [2]ASHISH SAXENA, [3]MADHU RATHE, [4]RESHAMA BANSAL, [5]VISHAL KHANDELWAL,
[1-5]Department of Pediatric and Preventive Dentistry, Government College of Dentistry, Indore

Address for Correspondence: Dr. Anusha Dixit
Department of Pediatric and Preventive Dentistry
Government College of Dentistry, Indore, MP, India
Email: anushadixit1234@gmail.com

Received : 10Feb.., 2026, **Published :** 30 June, 2026

Access this article online

Website:
www.ujds.in

DOI:
https://doi.org/10.21276/ujds.2026.12.2.27

How to cite this article: Dixit, D. A., Saxena, D. A., Ratre, D. M., & Bansal, D. R. (2026). Pediatric Oral Squamous Papilloma of the Lower Lip Managed with Diode Laser: A Case Report. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 12(2).

Case Report:

A 12-year-old male presented with a small, painless growth on the inner aspect of the lower lip, first noticed two weeks earlier. The lesion gradually increased in size, but the patient reported no discomfort, bleeding, or interference with mastication or speech. There was no history of trauma, biting habits, previous infections, or similar lesions. Medical history was unremarkable.

On clinical examination, a solitary exophytic lesion measuring approximately 5 × 5 mm was observed on the lower labial mucosa. The lesion displayed a papillary, cauliflower-like surface and appeared pale pink in color. It was soft on palpation, non-tender, non-pulsatile, non-compressible, and showed no ulceration or discharge. The surrounding mucosa appeared normal.

Based on the clinical findings, a provisional diagnosis of oral squamous papilloma was considered. Following parental consent, excision of the lesion was performed using a diode laser (Faith Innovations, Roorkee, India; FD10B, 980 nm, 2 W, pulse 30 ms, continuous contact mode) under local anesthesia. The procedure was completed with minimal bleeding, and the patient tolerated it well.

Histopathological examination revealed parakeratinized stratified squamous epithelium forming blunt papillary projections supported by fibrovascular cores. The underlying connective tissue showed collagen bundles, engorged blood vessels, spindle-shaped fibroblasts, and a chronic inflammatory infiltrate predominantly composed of lymphocytes and plasma cells. Koilocytosis and acanthosis were also evident. These features were consistent with oral squamous papilloma.

Postoperative healing was uneventful, and no recurrence was observed during follow-up visits.

Fig 1: Preoperative intraoral photograph showing an exophytic, papillary lesion on the inner aspect of the lower lip

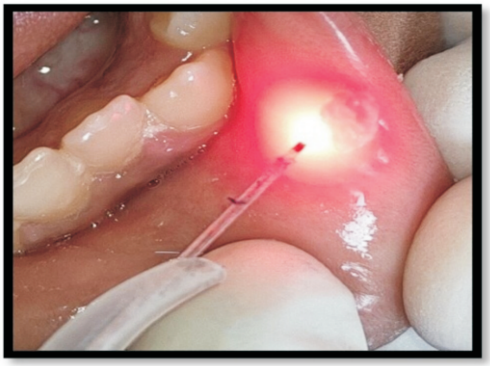

Fig 2: Intraoperative view demonstrating excision of the lesion using a diode laser

Fig 3: Immediate postoperative intraoral view showing the surgical site with minimal bleeding

Fig 4: Gross specimen of the excised papillary lesion following diode laser excision

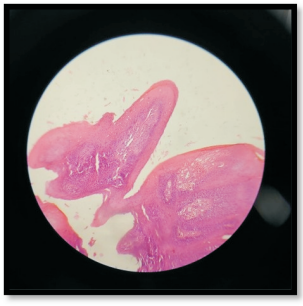

Fig 5. Histopathological photomicrograph (H&E stain, ×10) showing papillary stratified squamous epithelium with fibrovascular cores consistent with oral squamous papilloma.

Fig 6: Two-week postoperative follow-up showing satisfactory healing of the surgical site

Fig 7: One-month postoperative follow-up demonstrating complete mucosal healing

Fig 8: Six-month postoperative follow-up showing normal mucosa with no evidence of recurrence

Discussion:

Oral squamous papilloma is a benign epithelial lesion associated with HPV infection, most commonly genotypes 6 and 11. Although it may occur at various intraoral sites, its presentation in pediatric patients is relatively uncommon, particularly on the lower lip.[1,2] The present case emphasizes the importance of careful diagnostic evaluation when encountering exophytic oral lesions in children.

Several lesions were considered in the differential diagnosis. Verruca vulgaris, associated with HPV genotypes 2 and 4, typically presents as a rough, hyperkeratotic lesion with finger-like projections.[3] The smooth surface and absence of marked keratinization, along with histopathological findings, ruled out this diagnosis.

Condyloma acuminatum generally presents as larger, broader-based, and often multiple lesions and is commonly linked to sexual or perinatal transmission.[4] The solitary and small nature of the lesion in the present case excluded this possibility.

Focal epithelial hyperplasia (Heck's disease) usually manifests as multiple flattened or nodular lesions involving the labial and buccal mucosa in children.[5] The presence of a single exophytic lesion ruled out this condition.

Reactive lesions such as irritation fibroma and inflammatory papillary hyperplasia were excluded based on the papillary morphology of the lesion and the absence of predisposing factors such as trauma or denture use.[6]

Verrucous carcinoma, a low-grade variant of squamous cell carcinoma, was considered due to its papillary appearance. However, the absence of invasive growth, cellular atypia, and malignant features on histopathological examination ruled out this diagnosis.[7]

The histopathological features observed—papillary projections with fibrovascular cores, parakeratinization, acanthosis, and koilocytosis—are characteristic of oral squamous papilloma and are consistent with previously reported clinicopathological findings.[4,8]

Surgical excision remains the treatment of choice for OSP. Laser-assisted excision has gained popularity due to advantages such as excellent hemostasis, reduced postoperative pain, minimal tissue damage, and improved patient cooperation, particularly in pediatric patients.[9] These benefits were evident in the present case, with uneventful healing and no recurrence.

Although malignant transformation of OSP is rare, isolated cases have been reported, underscoring the importance of histopathological confirmation and long-term follow-up. Recurrence, though uncommon, has been documented in pediatric patients, particularly following incomplete excision.[10]

Conclusion:

Oral squamous papilloma is an uncommon lesion in children, particularly when located on the lower lip. Accurate diagnosis supported by histopathological examination is essential to distinguish it from other papillary lesions. Diode laser excision provides a minimally invasive and effective treatment option with excellent healing outcomes and high patient acceptance. Regular follow-up is recommended to monitor for possible recurrence.

Pediatric practitioners should consider oral squamous papilloma in the differential diagnosis of exophytic mucosal lesions in children. Early recognition, understanding of HPV-associated etiology, and the use of minimally invasive treatment modalities such as diode lasers can enhance patient comfort and improve clinical outcomes.

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