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Case Report

Epidermoid Cyst: How to Reach the Diagnosis and What is the best Treatment Approach

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Abstract

Benign ectodermal-based lesions, such as epidermoid cysts, occur only rarely in the oral environment, most frequently affecting the submandibular and sublingual regions, and rarely involving the upper lip. After signing the informed consent, a 17-year-old male patient with a painless swelling in the left upper lip underwent excision under local anesthesia. The lesion displayed a well-defined capsule and keratinous content, consistent with an epidermoid cyst. Postoperative recovery was uneventful, and the patient has remained recurrence-free after seven years of follow-up. Early diagnosis and complete excision are essential for a favorable prognosis and prevention of recurrence.

Keywords: Dentistry, Epidermoid cyst, Oral pathology, Oral diagnosis

1. Introduction

Characterized by a lining of keratinized stratified squamous epithelium and a core of keratinous debris, epidermoid cysts are non-malignant formations. While these lesions can manifest throughout the body, their presence in the head and neck is infrequent, and they are notably scarce within the lips or oral cavity. Statistically, dermoid and epidermoid cysts represent less than 0.01% of all oral-based cysts and under 7% of those found in the head and neck, typically favoring the floor of the mouth. While the literature extensively covers submental and sublingual presentations, upper lip involvement remains exceptionally rare, documented primarily in limited case series or isolated reports. Consequently, a diagnostic gap exists where these cysts are frequently overlooked in favor of more prevalent labial pathologies, such as mucoceles or minor

salivary gland tumors. Reporting these atypical cases is therefore essential to refine clinical differential diagnosis and prevent diagnostic delay.[1-5]

From an etiopathogenic perspective, epidermoid cysts may be congenital, resulting from the entrapment of epithelial remnants along embryonic fusion lines, or acquired, such as post-traumatic or iatrogenic 'inclusion cysts.' Clinically and histologically, the congenital and acquired forms are indistinguishable. Occurrence in the upper lip has been reported in both infants (suggesting congenital origin) and adults after repeated microtrauma, supporting a heterogeneous etiology.[5-10] Despite this, there is a lack of recent, aggregated data specifically addressing the diagnostic pitfalls of upper-lip presentations in young patient populations.

Clinically, epidermoid cysts of the lip show slow growth, a round or oval shape, elastic consistency, a smooth surface, and intact mucosal color. They may be asymptomatic or cause aesthetic and functional discomfort. Differential diagnoses for upper lip swellings include mucoceles, microcysts of minor salivary glands, nasolabial cysts, lipomas, fibromas, hemangiomas, pyogenic granulomas, keratoacanthomas, and odontogenic or infectious lesions extending to the vestibule. Due to the rarity of this specific anatomical site, clinicians may underutilize advanced imaging, such as computed tomography (CT) or Magnetic Resonance Imaging (MRI), which is advised for extensive or deep-seated lesions. Such diagnostics are essential for mapping the lesion's boundaries, identifying the proper surgical plane, and assessing its proximity to neighboring anatomical structures.[2,4,6,10,11]

Histopathological examination remains the gold standard for a conclusive diagnosis. An epidermoid cyst is identified by a cystic space lined with Ortho keratinized stratified squamous epithelium that lacks dermal appendages. In contrast, the presence of skin structures-such as sebaceous glands, sweat glands, or hair follicles-indicates a dermoid cyst. Finally, if the lesion contains elements derived from multiple germ layers, it is classified as a teratoid cyst. Fine-needle aspiration may reveal keratinous material and aid management, but complete excision with adequate margins is both diagnostic and therapeutic.[9,11]

Total surgical removal remains the gold standard for management. Depending on the cyst's dimensions and anatomical position, the procedure may be performed via either an intraoral or extraoral surgical route; recurrence is rare when complete removal is achieved. Postoperative follow-up should consider initial differential diagnoses, lesion site, size, and any traumatic predisposing factors.[1,3,5,7] The rationale for this case report is to highlight the clinical presentation and successful surgical management of a rare upper-lip epidermoid cyst, thereby contributing to the limited body of evidence on its occurrence at this site and assisting clinicians in distinguishing it from common labial lesions.

2. Case Presentation

This case report followed the CARE guidelines.[12] Evaluation of a 17-year-old male with melanoderma presented to the Oral Surgery Clinic of the School of Dentistry, revealed a slow-growing, asymptomatic mass in the left upper lip of six months' duration. The patient denied any associated pain, discharge, or bleeding. An extraoral assessment confirmed mild facial asymmetry resulting from the localized labial expansion. On palpation, the lesion was soft, well-

circumscribed, mobile over deeper tissues, and covered by normal mucosa. The patient's general health status was unremarkable, allowing for ambulatory surgical intervention. The advanced imaging CT/MRI was not performed because the lesion was superficial, well-circumscribed, and mobile, allowing for a safe surgical plane without further mapping. The guardian/responsible signed the informed consent, and an IRB exemption was granted for this case report.

Based on the clinical features (lesion's dimensions of 6 mm, and in the vermilion border of the left side), an excisional biopsy was indicated for diagnostic and therapeutic purposes. The provisional diagnosis was benign ectodermal-based lesions and "Differential Diagnosis" (e.g., Nasolabial cyst). Local anesthesia was achieved by blocking the left infraorbital nerve using 0.9 mL of 4% Articaine with 1:100,000 epinephrine (DFL®, Rio de Janeiro, RJ, Brazil), delivered through a 27G long dental needle (DFL®, Rio de Janeiro, RJ, Brazil) attached to a metallic aspirating syringe (Rhosse®, Ribeirão Preto, SP, Brazil). The injection was performed slowly, with aspiration to prevent intravascular administration. After 15 minutes, complete anesthesia of the operative field was confirmed, and the procedure commenced.

Standard biosafety protocols were followed. Intraoral antisepsis was performed with 0.12% chlorhexidine mouth rinse for one minute, followed by extraoral cleansing with 2% chlorhexidine soap in the perioral region. Sterile draping was applied. The lesion was stabilized with a Desmarres dermatological retractor (Rhosse®, Ribeirão Preto, SP, Brazil), which also aided in mechanical hemostasis. A linear incision of approximately 1 cm was made with a No. 15 scalpel blade (Descarpack®, São Paulo, SP, Brazil), extending through the mucosa and submucosa to the cystic capsule. Dissection revealed a fibrous, well- encapsulated, whitish cyst that separated easily from surrounding tissues via blunt dissection. The lesion was removed intact, with no rupture or injury to adjacent anatomical structures such as the orbicularis oris muscle or parotid duct (Figure 1).

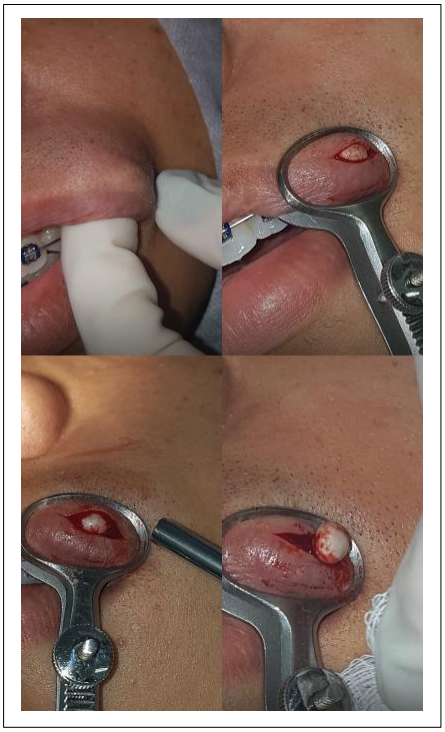

Figure 1. Step-by-step surgical procedure for lesion removal.

Following removal, the surgical site was cleansed with sterile saline, and hemostasis was achieved with pressure. The wound was closed primarily using 5-0 nylon interrupted sutures (Ethicon®, Johnson & Johnson, São Paulo, SP, Brazil). Subsequently, the tissue was preserved in a 10% formalin solution and sent for microscopic analysis. Follow-up evaluations at 7, 14, and 21 days showed satisfactory healing without dehiscence, pain, or inflammation. Upon microscopic evaluation, the specimen exhibited a cystic space encapsulated by keratinized stratified squamous epithelium, with no adnexal structures (sebaceous glands or hair follicles). The presence of laminated keratin flakes within the lumen confirmed the diagnosis of an epidermoid cyst (Figure 2).

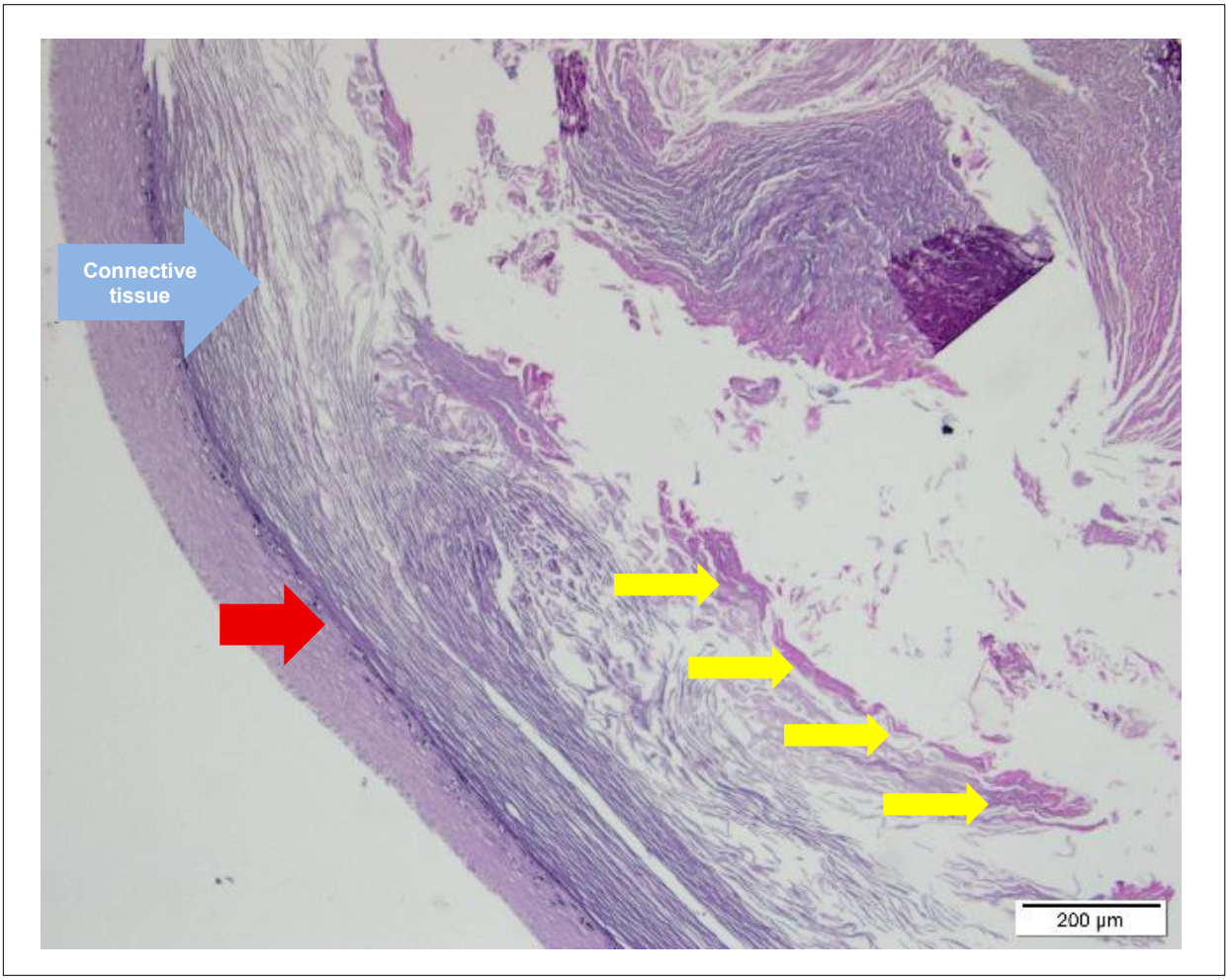

Figure 2. Photomicrograph of an epidermoid cyst characterized by an internal lumen filled with layers of lamellar keratin (yellow arrow), all encapsulated by an epithelial lining of the keratinizing stratified squamous variety (red arrow). Hematoxylin and eosin (H&E) staining. Original magnification, 200 x.

The patient remained under clinical observation for a seven-year period, during which no signs of relapse, fibrosis, or esthetic sequelae were identified, and maintained complete functional and morphological integrity of the upper lip.

3. Discussion

Epidermoid cysts of the upper lip are exceedingly rare entities that can clinically mimic other

benign oral lesions, which often lead to diagnostic challenges. Most epidermoid cysts of the head and neck region, particularly those that manifest in the upper lip, pose a specific diagnostic challenge due to the density of minor salivary glands and specialized adnexal structures in this area.[1,7,9] Compared to previously published cases of upper-lip epidermoid cysts, which often present in the second to fourth decades of life, our case presents in a young patient. The literature review indicates that these lesions typically range from 0.5 to 2.5 cm in diameter; our findings regarding lesion site and size are consistent with these reports, although some authors note that upper-lip variants may be detected earlier due to aesthetic concerns compared with floor-of-the-mouth lesions.[3,5,10]

The etiology of epidermoid cysts remains controversial. Some authors suggest a congenital origin, arising from the entrapment of ectodermal remnants along embryonic fusion lines,[5,7] while others describe acquired forms, resulting from post-traumatic or iatrogenic epithelial implantation within the submucosal tissue.[4,5,8] Although this distinction does not directly alter the clinical management, understanding the developmental mechanism aids in anticipating possible recurrence and guiding surgical planning, as in the reported case.

Accurate diagnosis depends on the correlation of clinical, radiographic, and histopathological findings. Imaging modalities such as CT and MRI are useful in delineating lesion boundaries, assessing their extension, and differentiating cystic from solid masses, particularly in atypical or voluminous presentations.[3,5,6] Although fine-needle aspiration cytology can offer preliminary insights by detecting keratinous debris, definitive confirmation relies on histopathology. This gold-standard approach typically identifies a cystic space encapsulated by orthokeratinized stratified squamous epithelium, with no dermal appendages.[2,6]

A critical aspect of managing upper-lip swellings is the systematic exclusion of more prevalent pathologies. The differential diagnosis can be categorized into salivary, mesenchymal, and developmental lesions: (1) salivary gland lesions: mucoceles are the most common mimics but are statistically more frequent in the lower lip; in the upper lip, a minor salivary gland tumor (such as pleomorphic adenoma) must be ruled out. Unlike the elastic and mobile epidermoid cyst, pleomorphic adenomas tend to be firmer and slower growing; (2) developmental cysts: the nasolabial cyst is a primary differential; however, it is typically situated deeper within the nasofacial fold, often causing elevation of the alar base, which was not observed in this case;[10,12] and (3) mesenchymal tumors: lipomas and fibromas can present similarly, but lipomas often exhibit a characteristic yellowish hue and the “slip sign” upon palpation, whereas epidermoid cysts maintain a more consistent cystic tension.[11]

The clinical exclusion of these entities is further supported by imaging and aspiration. While fine-needle aspiration may provide a preliminary clue through the presence of keratinous debris, distinguishing it from the mucous content of a mucocele, definitive differentiation relies on the absence of glandular or adipose tissue in the final histopathology.

Regarding treatment, total surgical excision remains the definitive approach. In the reported cases of upper-lip involvement, the intraoral route is almost universally preferred over the extraoral approach to avoid facial scarring and provide direct access to the submucosal plane. [2,9] Our approach aligns with the literature, emphasizing blunt dissection to maintain the integrity of the

cystic capsule. Recurrence of these cysts in the lip is virtually non-existent in literature, provided that complete enucleation is achieved without capsule rupture.[3,10]

The prognosis for upper-lip epidermoid cysts is excellent. While potential complications such as infection or hematoma are theoretically possible, they are rarely reported at this anatomical site due to the region's robust vascularity and accessibility.[2,8] The present case corroborates that a high index of clinical suspicion, followed by conservative surgical enucleation, provides optimal functional and aesthetic outcomes. This report adds to the limited body of evidence, suggesting that clinicians should include epidermoid cysts in the primary differential of any non-fluctuant, slow-growing nodule of the upper lip. Extended clinical surveillance is advised to monitor for infrequent relapses or the development of lingering fibrosis.

The present case corroborates the findings of previous studies, demonstrating that careful clinical evaluation, appropriate imaging assessment, and complete surgical excision provide excellent prognosis, functional preservation, and optimal esthetic results. Advances in surgical instrumentation and anesthetic control in outpatient settings have further improved outcomes for these lesions, supporting early diagnosis and conservative excision as the cornerstone of management for oral and maxillofacial epidermoid cysts.[1,3,4,7,10,11]

In summary, reaching an accurate diagnosis of an upper-lip epidermoid cyst necessitates a stepwise clinical and histopathological approach. The initial step requires a thorough clinical assessment to exclude more common mimics, such as mucoceles, minor salivary gland tumors, and developmental cysts. While advanced imaging or fine-needle aspiration may guide the surgical planning of deeper or atypical masses, definitive diagnosis invariably relies on histopathological confirmation of a keratin-filled cystic space lined by stratified squamous epithelium. Once the clinical suspicion is established, the optimal treatment approach is total conservative surgical excision. An intraoral approach is highly recommended, utilizing blunt dissection to achieve complete enucleation without rupturing the capsule. This specific surgical strategy prevents recurrence, ensures complete functional preservation of the orbicularis oris, and yields optimal aesthetic outcomes by avoiding extraoral scarring.

4. Conclusion

This case underscores the importance of thorough clinical and histopathological investigation of cystic lesions in the upper lip. Minimally invasive techniques have improved treatment safety, ensuring long-term success and minimal morbidity.

Abbreviation	Full Form
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
CARE	CAse REport (guidelines)
IRB	Institutional Review Board

Declarations:

Supplementary Materials: Not applicable.

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