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Comparison of Sublabial vs Transnasal Surgical Approaches in the Management of Nasolabial Cysts: A Retrospective Comparative Study

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ABSTRACT

Background: Nasolabial cyst is a rare, benign, non-odontogenic soft tissue cyst arising in the nasolabial fold. Surgical excision remains the definitive treatment, with sublabial excision traditionally considered the gold standard. Transnasal endoscopic marsupialization has emerged as a minimally invasive alternative; however, comparative evidence remains limited.

Methods: This retrospective comparative study included 30 patients with nasolabial cyst treated surgically at a tertiary care center between January 2020 and December 2025. Patients were divided into Group A (sublabial excision, n=25) and Group B (transnasal marsupialization, n=5). Demographic characteristics, postoperative complications, recurrence, recovery, and hospital stay were analyzed. Statistical analysis was performed using Fisher's exact test and independent t-test, with $p<0.05$ considered statistically significant.

Results: Among 30 patients, 25 (83.3%) underwent sublabial excision and 5 (16.7%) underwent transnasal marsupialization. Recurrence was lower in the sublabial group than in the transnasal group (4% vs 20%; p=0.306). Temporary numbness was more frequent following sublabial surgery (44% vs 20%; p=0.627), while scar formation occurred only in the sublabial group. Complete recovery was observed in 96% and 80% of patients, respectively. Mean hospital stay was significantly longer in the sublabial group (2.1 ± 0.6 vs 1.4 ± 0.5 days; p=0.018).

Conclusion: Sublabial excision demonstrated superior recurrence-free outcomes and remains the preferred surgical approach for nasolabial cyst despite slightly higher minor complications and longer hospitalization..

Key-words: Nasolabial cyst, Sublabial excision, Transnasal marsupialization, Surgical outcomes, Recurrence

INTRODUCTION

Nasolabial cyst is a rare, benign, non-odontogenic developmental cyst located within the soft tissue of the nasolabial fold, typically beneath the alar base and adjacent to the upper lip.

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It represents less than 1% of all maxillofacial cysts and is considered an uncommon lesion in otorhinolaryngology and maxillofacial surgical practice. [1,2] Although its exact pathogenesis remains controversial, two major theories have been proposed: origin from embryonic epithelial remnants trapped during fusion of the lateral nasal, globular, and maxillary processes, or derivation from remnants of the nasolacrimal duct epithelium. [1,2]

Nasolabial cysts are more commonly observed in middle-aged adults, with a notable female predominance. These cysts are usually unilateral, although bilateral cases have occasionally been reported. [2,3] Clinically, patients often present with a slowly enlarging swelling in the nasolabial

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region, leading to facial asymmetry, cosmetic concerns, nasal obstruction, pain, or difficulty breathing through the affected nostril. Secondary infection may further result in tenderness, erythema, and rapid enlargement. [3]

Diagnosis is primarily clinical but is frequently supported by imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI), which help define cyst size, anatomical extension, and its relationship with surrounding soft tissues and bony structures. [4] Radiologically, nasolabial cysts typically appear as well-circumscribed, non-enhancing soft tissue lesions localized to the nasal vestibular floor or nasolabial region.

Surgical intervention remains the definitive treatment for nasolabial cyst. Traditionally, complete excision via the sublabial approach has been regarded as the gold standard because it allows direct visualization and complete removal of the cyst wall, thereby minimizing recurrence. [5] However, the sublabial approach may be associated with postoperative pain, edema, temporary numbness, scar formation, and relatively prolonged recovery.

In recent years, transnasal endoscopic marsupialization has gained popularity as a minimally invasive alternative. This approach offers several advantages, including reduced surgical trauma, shorter operative time, decreased postoperative discomfort, and shorter hospital stay. [6] Nevertheless, concerns remain regarding incomplete removal or inadequate marsupialization of the cyst wall, which may contribute to higher recurrence rates.

Despite the availability of these surgical approaches, comparative evidence evaluating postoperative complications, recurrence rates, and recovery outcomes remains limited, particularly in retrospective clinical settings. Therefore, the present study was conducted to compare sublabial excision and transnasal marsupialization in the management of nasolabial cyst, with emphasis on postoperative outcomes, complication profiles, recurrence rates, and overall clinical recovery.

MATERIALS AND METHODS

Study Design and Setting- This retrospective comparative study was conducted at a tertiary care teaching hospital and referral center to evaluate surgical outcomes in patients diagnosed with nasolabial cyst. Medical records of eligible patients treated between January 2020 and December 2025 were reviewed.

Study Population- A total of 30 patients diagnosed with nasolabial cyst and managed surgically during the study period were included in the analysis. Diagnosis was established based on clinical examination and radiological confirmation using computed tomography (CT) and/or magnetic resonance imaging (MRI), wherever indicated.

Inclusion Criteria

- Age ≥18 years
- Clinically and radiologically confirmed nasolabial cyst
- Surgical management via either sublabial excision or transnasal endoscopic marsupialization
- Minimum postoperative follow-up of 12 months

Exclusion Criteria

- Previous surgical intervention for nasolabial cyst
- Recurrent cyst at presentation
- Incomplete medical records
- Postoperative follow-up of less than 12 months

Group Allocation- Patients were categorized into two groups based on the surgical approach employed. Group A included patients who underwent sublabial surgical excision (n=25), while Group B consisted of patients treated with transnasal endoscopic marsupialization (n=5). The choice of surgical approach was determined based on surgeon preference, cyst size, anatomical location, and patient-related factors.

Data Collection- Data were retrieved from hospital records and operative notes. Variables collected included demographic characteristics such as age and sex, clinical presentation, cyst laterality and size, surgical approach, postoperative complications, recovery status, duration of hospital stay, and recurrence during follow-up.

Surgical Techniques- Patients undergoing sublabial excision were operated under general anesthesia. A sublabial incision was made in the gingivolabial sulcus, followed by careful soft tissue dissection to expose the cyst. Complete excision of the cyst wall was performed while preserving surrounding vital structures. Hemostasis was achieved, and the incision was closed using absorbable sutures.

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For transnasal endoscopic marsupialization, the procedure was performed under endoscopic guidance. After adequate visualization of the cyst bulge into the nasal cavity, a wide opening was created in the cyst wall. Marsupialization was completed by establishing a patent drainage pathway into the nasal cavity to minimize the risk of recurrence.

Outcome Measures- Primary outcome measures included recurrence rate, postoperative complications, complete recovery rate, and duration of hospital stay. Postoperative complications assessed included temporary numbness, scar formation, bleeding, and infection. Recurrence was defined as clinical and/or radiological evidence of cyst reappearance during the follow-up period.

Statistical Analysis- Data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. Comparisons between the two groups were performed using independent t-test for continuous variables and Fisher's exact test for categorical variables. A p-value of <0.05 was considered statistically significant.

Ethical Approval- Ethical approval for the study was obtained from the Institutional Ethics Committee prior to the commencement of the study. The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants after explaining the purpose and procedures of the study.

RESULTS

A total of 30 patients diagnosed with nasolabial cyst who underwent surgical management were included in the study. Of these, 25 patients underwent sublabial excision, while 5 patients underwent transnasal endoscopic marsupialization. The baseline demographic and clinical characteristics of the study population are summarized in Table 1. The mean age of patients in the sublabial group was 44.8 ± 9.6 years, compared to 42.4 ± 8.9 years in the transnasal group (p=0.612). Female predominance was observed in both groups, with females accounting for 72% of patients in the sublabial group and 80% in the transnasal group.

Regarding lesion laterality, right-sided cysts were observed in 48% of patients in the sublabial group and 40% in the transnasal group, while left-sided cysts accounted for 52% and 60%, respectively. The mean cyst size was 2.8 ± 0.7 cm in the sublabial group and 2.5 ± 0.5 cm in the transnasal group (p=0.338). Cosmetic swelling was the most common presenting complaint, observed in 88% of patients in the sublabial group and 80% in the transnasal group. Nasal obstruction was present in 64% and 60% of patients, respectively. No statistically significant differences were observed in baseline characteristics between the two groups as seen in Table 1.

Table 1: Baseline Demographic and Clinical Characteristics

Variable	Sublabial (n=25)	Transnasal (n=5)	p-value
Age (years)	44.8 ± 9.6	42.4 ± 8.9	0.612
Female, n (%)	18 (72%)	4 (80%)	0.721
Male, n (%)	7 (28%)	1 (20%)	0.721
Right-sided cyst	12 (48%)	2 (40%)	0.754
Left-sided cyst	13 (52%)	3 (60%)	0.754
Mean cyst size (cm)	2.8 ± 0.7	2.5 ± 0.5	0.338
Nasal obstruction	16 (64%)	3 (60%)	0.873
Cosmetic swelling	22 (88%)	4 (80%)	0.641

Among the total study population, 25 patients (83.3%) underwent sublabial excision, whereas 5 patients (16.7%) underwent transnasal marsupialization as seen in Table 2.

Table 2: Surgical Approach Distribution

Surgical Approach	Number	Percentage
Sublabial	25	83.3
Transnasal	5	16.7

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Postoperative complications are presented in Table 3. Recurrence occurred in 1 patient (4%) in the sublabial group and 1 patient (20%) in the transnasal group (p=0.306). Temporary numbness was the most frequently observed postoperative complication and occurred in 11 patients (44%) in the sublabial group compared to 1 patient (20%) in the transnasal group (p=0.627). Scar formation was observed in 4 patients (16%) in the sublabial group, whereas no cases were reported in the transnasal group. Postoperative bleeding occurred in 1 patient in the sublabial group, while no bleeding events were reported in the transnasal group. No postoperative infections were observed in either group.

Table 3: Postoperative Complications

Complication	Sublabial (n=25)	Transnasal (n=5)	p-value
Recurrence	1	1	0.306
Temporary numbness	11	1	0.627
Scar formation	4	0	0.534
Bleeding	1	0	0.833
Infection	0	0	-

Clinical outcomes following surgical management are summarized in Table 4. Complete recovery was achieved in 24 patients (96%) in the sublabial group and 4 patients (80%) in the transnasal group (p=0.306). The recurrence-free rate was higher in the sublabial group (96%) compared to the transnasal group (80%). The mean duration of hospital stay was significantly longer in the sublabial group (2.1 ± 0.6 days) compared to the transnasal group (1.4 ± 0.5 days), and this difference was statistically significant (p=0.018).

Table 4: Clinical Outcomes

Outcome	Sublabial	Transnasal	p-value
Complete recovery	24 (96%)	4 (80%)	0.306
Recurrence-free rate	96%	80%	0.306
Mean hospital stay (days)	2.1 ± 0.6	1.4 ± 0.5	0.018*

**Statistically significant (p<0.05)*

DISCUSSION

Nasolabial cyst is an uncommon benign developmental lesion of the maxillofacial region, and owing to its rarity, comparative evidence regarding optimal surgical management remains limited. The present study compared postoperative outcomes between two commonly employed surgical approaches like sublabial excision and transnasal endoscopic marsupialization—in patients undergoing surgical treatment for nasolabial cyst. [3,5,7]

The primary finding of this study was that sublabial excision demonstrated superior recurrence-free outcomes compared with transnasal marsupialization. Recurrence was observed in 4% of patients in the sublabial group compared to 20% in the transnasal group. Although this difference did not achieve statistical significance, likely due to the relatively small sample size and imbalance in group distribution, the observed trend suggests better long-term disease control with the sublabial approach. [8,9]

The lower recurrence associated with sublabial excision can be attributed to complete surgical removal of the cyst wall. Complete excision minimizes the possibility of residual epithelial lining, which is considered a major factor contributing to recurrence. These findings are consistent with previous studies reporting excellent long-term outcomes and recurrence rates below 5% following complete sublabial excision. [3,5,10,11]

In contrast, transnasal marsupialization offers a minimally invasive approach with several perioperative advantages. In the present study, the transnasal group demonstrated a significantly shorter hospital stay compared with the sublabial group (1.4 ± 0.5 days vs 2.1 ± 0.6 days, p=0.018). This finding supports previous literature suggesting that endoscopic approaches are associated with reduced surgical trauma, shorter recovery duration, and lower postoperative discomfort. [6,12,13]

However, the higher recurrence observed in the transnasal group remains an important concern. One possible explanation is incomplete marsupialization or insufficient opening of the cyst cavity into the nasal cavity, particularly in larger lesions or anatomically challenging cases. Residual cyst lining may allow re-accumulation of secretions and eventual recurrence. Similar concerns have been raised in previous studies

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evaluating endoscopic management of nasolabial cysts. [4,6,12,13]

Postoperative complications in both groups were generally minor and manageable. Temporary numbness was the most common complication, particularly in patients undergoing sublabial excision. This may be explained by soft tissue dissection and manipulation near sensory nerve branches in the upper gingivolabial region. Importantly, these symptoms were transient and resolved during follow-up. Scar formation was observed exclusively in the sublabial group, although no cases resulted in significant functional or cosmetic morbidity.

The demographic characteristics observed in this study were consistent with existing literature. Female predominance and middle-aged presentation were noted in both groups, aligning with earlier reports that nasolabial cysts occur more commonly in women during the fourth and fifth decades of life. [1,2] Cosmetic swelling and nasal obstruction were the most common presenting symptoms, which also corresponds with previously published clinical patterns.

From a clinical perspective, the choice of surgical approach should be individualized based on cyst size, anatomical location, surgeon expertise, and patient preference. While transnasal marsupialization offers superior short-term recovery benefits, sublabial excision appears to provide more reliable long-term disease control and lower recurrence risk.

STRENGTHS

The present study provides a direct comparison of two commonly employed surgical approaches for the management of nasolabial cyst, a relatively rare clinical entity for which comparative evidence remains limited. One of the major strengths of this study is the inclusion of both perioperative and long-term clinical outcomes, including postoperative complications, recurrence, recovery status, and duration of hospital stay. Additionally, all included patients had adequate postoperative follow-up, allowing reliable assessment of recurrence and long-term surgical success. The study also reflects real-world clinical practice, thereby enhancing its practical relevance for surgeons involved in the management of nasolabial cyst.

LIMITATIONS

Despite its strengths, this study has several limitations. Despite its strengths, this study has several limitations. First, the retrospective design introduces inherent risks of selection bias, information bias, and incomplete data collection. Second, the overall sample size was relatively small, particularly in the transnasal group, which may have reduced statistical power and limited the ability to detect significant differences between groups. Third, the unequal distribution of patients between the two surgical groups may have influenced comparative analysis. Finally, this was a single-center study, which may limit the generalizability of the findings to other institutions and patient populations. Future multicenter prospective studies with larger and more balanced sample sizes are warranted to validate these findings and establish stronger evidence regarding the optimal surgical approach for nasolabial cyst management.

CONCLUSIONS

Sublabial excision remains the preferred surgical approach for nasolabial cyst, demonstrating superior recurrence-free outcomes and excellent long-term disease control compared with transnasal marsupialization. Although the transnasal approach offers shorter hospital stay and faster recovery, it may carry a higher risk of recurrence. Surgical approach should be individualized based on cyst characteristics, surgeon expertise, and patient factors. Larger prospective multicenter studies are needed to further validate these findings.

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