Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 32s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

A Comparative Study Of Intraoral Sublabial Excision Of Nasolabial Cyst With And Without Unilateral Nasal Packing

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Cite this paper as: Dr. Sindhuja Nagisetty, Dr. Kukkapalli Prathap Kumar, Dr. Jagruthi Koduru, Dr. B.S. Sindhu, (2025) A Comparative Study Of Intraoral Sublabial Excision Of Nasolabial Cyst With And Without Unilateral Nasal Packing. *Journal of Neonatal Surgery*, 14 (32s), 3281-3286.

ABSTRACT

Background: Nasolabial cysts also known as Klestadt's cysts are relatively rare benign epithelial non-odontogenic soft tissue cysts that arise from the nasal alar region. Sublabial excision or transnasal endoscopic marsupialization is the standard treatment. Sublabial resection of the nasolabial cyst with unilateral nasal packing is considered as the most effective surgical modality of treatment.

Objective: The main aim of this study is to compare between both the methods to assess the intra-and post-operative outcomes and complications. To evaluate the clinical presentation, diagnosis and best modality of treatment of nasolabial cyst at our medical college hospital.

Patients And Methods: This is a retrospective study of 28 cases of nasolabial cysts managed between 2021 to 2024. Twenty eight patients presented by unilateral nasolabial cyst were included in this study and divided into two equal groups: Sublabial excision with Nasal packing (Group A – 14 patients) and Sublabial excision without Nasal packing (Group B – 14 patients). For all patients, postoperative pain, postoperative complications and recurrence of the nasolabial cyst were documented.

Results: Out of 28 patients of the nasolabial cyst, females were predominant 67.8%. Left side is more common 18 (64.2%) than Right side 10 (35.8%). All cases presented with nasal swelling and cosmetic disfigurement, unilateral nasal obstruction in 23 (82.15%), and pain in 3 (10.7%). Surgical site hematoma is less in group A 2 (7.14%) compared to group B 6 (21.4%). Nasal mucosal perforation during follow-up is less in group A 1 (3.57%) compared to group B 3 (10.7%). The overall complications were significantly lower in group A 3 (21.4%) when compared to group B 6 (42.8%). During 12 to 24 months of follow-up, no recurrence was detected in both the groups.

Conclusion: Nasolabial cysts are not a common clinical entity and present with swelling over the upper lip and nasal obstruction. Intraoral sublabial approach is the most common surgical techniques for excision of the nasolabial cyst. After surgical excision, unilateral nasal packing will prevent further postoperative complications and chance of recurrence are rare.

Keywords: *Nasolabial cyst, Nasal obstruction, Surgical site hematoma, Swelling, Sublabial excision, Nasal packing.*

1. INTRODUCTION

Nasolabial cysts are benign non-odontogenic cysts that originate at the anterior maxillary area [1,2]. This cyst usually develops between the nasal vestibule and upper lip [1,2]. Nasolabial cysts were first documented by Zuckerkandl in 1882 and were also called 'Nasoalveolar cysts' [3,4]. In 1953, Klestadt [5] studied about the nasolabial cysts in depth after which the lesion became named as Klestadt's cyst. Thoma suggested the term nasoalveolar cyst, but it was Rao in 1951 used the term nasolabial

cyst[6]. The nasolabial cyst accounts for 0.7% of all the nonodontogenic cyst [7,8]. They are usually found submucosally in the anterior nasal floor and can displace the inferior turbinate medially [7]. There are two hypothesis with regard to the pathogenesis of nasolabial cyst. According to the first hypothesis, the cyst is derived from the epithelial cells retained in the mesenchyme after fusion of medial and lateral nasal processes at approximately 4th week of intrauterine life. The second hypothesis suggests that persistence of the epithelial remnants. This cyst is commonly found in females, in 4th to 5th decades of life [9]. The Nasolabial cyst is usually unilateral. However, bilateral existence was reported in about 10% of the patients [13,14]. Patients often presents as painless asymptomatic swelling in the nasolabial region which results in obliteration of nasolabial sulcus, nasal vestibule and maxillary labial sulcus, which is slow, progressive, painless seen over several years, but the patient may manifest with an acute painful swelling if the nasolabial cyst becomes infected [10]. When palpated the lesion is soft and fluctuant in consistency. Patients generally reports to the clinician for the cosmetic reason or problem of nasal obstruction. Their extra-osseous origin and location establish the nasolabial cysts under the alae nasi. Sometimes infected nasolabial cysts may mimic dental abscess, or nasal furuncle [11]. Surgical excision through a sublabial approach has been the most popular and well-established procedure for the management of nasolabial cysts as it provides wide surgical field with complete excision of the cyst with less chances of recurrence [14]. It is thought that its incidence is more than reported in the medical literature; although, indexes are limited due to high rates of misdiagnosis [9]. This study aims to assess the outcomes of the nasolabial cyst excision with and without unilateral nasal packing at medical college teaching hospital.

2. AIM OF THE STUDY

It is to compare between the post-operative outcomes of with and without unilateral nasal packing in patients who underwent sublabial surgical excision of the nasolabial cyst.

3. MATERIALS AND METHODS

This is a retrospective study where 28 patients with nasolabial cysts were enrolled. This study was done at the Department of E.N.T and Head and Neck surgery at medical college hospital from November 2021 to January 2024. This study was approved by the Institutional Ethical Committee (IEC). Patients with a progressive facial swelling and/or nasal obstruction with clinical confirmation of nasolabial cyst were eligible for inclusion. They were equally and randomly allocated into one of two groups: the first included those who underwent sublabial excision with unilateral nasal packing (group A) and those who underwent sublabial excision without nasal packing (group B). All patients had unilateral nasolabial cyst. CT scan of the nose and paranasal sinuses was done to confirm the diagnosis of the nasolabial cyst. Informed consent was obtained from the patients who participated in this study. The histopathological study of the nasolabial cyst of all the patients was reviewed and confirmed for the diagnosis. The surgical procedure was done under local or general anesthesia according to the patient's request. At first, 2% lidocaine containing 1: 100,000 epinephrine was used and injected at the site of intraoral sublabial incision. The incision was carried out at upper gingivobuccal sulcus just below the pyriform aperture, and the dissection of tissues was completed till the nasal floor to expose the smooth, well circumscribed cystic lesion. Then, the Nasolabial cyst was completely detached without leaving any remnant cystic wall or epithelium. The incision was then closed with 4.0 Vicryl sutures and a compression dressing was applied to reduce soft tissue swelling along with unilateral nasal packing in group A patients. Patients were discharged 48 hours after the procedure and removal of nasal pack. The patients in each group were counseled and asked to come for follow-up at the end of the first week, and then every week till the end of the first month and then at 3rd and 6th months postoperatively. For all patients, postoperative pain, postoperative complications like surgical site hematoma, nasal mucosal perforation, nasal bleeding and recurrence of the nasolabial cyst were documented. The postoperative pain was assessed by scoring, where zero denoting no pain; mild pain:1, moderate:2 and severe:3 according to verbal rating scale (VRS). Symptoms like facial pain, cheek swelling, tingling or numbness of teeth or gingiva were asked for during follow-up visits and documented. Statistical package for the social science (SPSS) Statistics for Windows, version 20, was used for all statistical analyses (IBM-SPSS Inc., Chicago, IL, USA).

4. RESULTS

In this study, out of 28, there were 19 females and 09 males with a female to male ratio of 2.1:1. Out of 19 females, 10 (71.5%) females were included in group A and 09 (64.28%) in group B. Among 09 males, 04 (28.5%) males were included in group A and 05 (35.72%) in group B. The age range of the participants was 30 to 50 years. Out of 28 cases of the nasolabial cyst, 18(64.2%) were seen on the left side, 10(35.8%) were seen on the right side. The duration of the symptoms at the presentation ranges from 20 days to 1 years. Out of 28 patients, 16 (57.15%) presented with swelling in the nasolabial area and 10 (35.7%) with nasal obstruction and pain in 2 (7.15%). There was no significant difference between both groups as regard to main clinical presentation, as swelling, pain, and obstruction (Table 1).

All 28 patients, underwent CT scan, report showing a space-occupying lesion at the inferior nasal alar region which exhibits isodense to hypodense texture with mass effect upon the maxilla, resulting in scalloping. There was no enhancement or bone erosion. The radiological findings favoured the diagnosis of the nasolabial cyst. Surgical excision of the nasolabial cysts was done by Intraoral sublabial approach with unilateral nasal packing in group A – 14 (50%) and without nasal packing in group B – 14 (50%) . The cysts were completely removed with dissection from the attachment to the underlying bone by Intraoral

sublabial excision of the cyst with unilateral nasal packing for 24 hrs. Histopathological study showed cysts were lined by pseudostratified columnar (n=22; 78.57%), stratified squamous (n=5; 17.85%), mixed respiratory squamous epithelium (n=1; 3.57%). The most common postoperative complication was postoperative facial swelling.

Table 1: Patient characteristics and clinical presentation among the studied population

Variable		Group A	Group B
Age (30-50Y)	30 – 40 Y	09 (64.28%)	08 (57.2%)
	40 – 50 Y	05 (35.72%)	06 (42.8%)
Sex	Male	04 (28.5%)	05 (35.72%)
	Female	10 (71.5%)	09 (64.28%)
Main clinical presentation	Swelling in the nasolabial area	08 (57.15%)	08 (57.15%)
	Nasal obstruction	05 (35.7%)	05 (35.7%)
	Pain	01 (7.15%)	01 (7.15%)

In the present work, all patients in both groups were operated under local anaesthesia. After surgery, complications were compared between both the groups. Post-operative pain was graded as zero-no pain, 1-mild, 2-moderate, 3-severe pain according to verbal rating scale (VRS). Out of 14 cases in group A, 02 (14.28%) had no pain, 06 (42.8%) complained mild pain, 05 (35.72%) moderate pain & 01 (7.2%) had severe pain. In group B 01 (7.2%) had no pain, 08 (57.2%) complained mild pain, 03 (21.4%) had moderate pain & severe pain in 02 (14.2%). There was no statistically significant in post-operative VRS pain. Other complications like Nasal bleeding was noted in 01 (7.2%) in group A, compared to 06 (42.8%) in group B. Nasal mucosal perforation was seen in 01 (7.2%) in group A, compared to 03 (21.4%) in group B. Surgical site hematoma was seen in 02 (14.2%) in group A, compared to 08 (57.2%) in group B. The overall complications were significantly lower in group A (21.4%) when compared to group B (42.8%). All complications were managed conservatively and resolved (Table 2).

Table 2: Post-operative complications among studied population

Post – operative complications		Group A	Group B
Post – operative pain (VRS)	0 (No pain)	02 (14.28%)	01 (7.2%)
	1 (Mild)	06 (42.8%)	08 (57.2%)
	2 (Moderate)	05 (35.72%)	03 (21.4)
	3 (Severe)	01 (7.2%)	02 (14.2%)
Nasal bleeding		01 (7.2%)	06 (42.8%)
Nasal mucosal perforation		01 (7.2%)	03 (21.4%)
Surgical site hematoma		02 (14.2%)	06 (42.8%)
Facial swelling		07 (50%)	08 (57.2%)
Overall		03 (21.4%)	06 (42.8%)

5. DISCUSSION

The nasolabial cysts are thought to be developmental and they are said to be originated from the non-odontogenic epithelium [7,8]. However, the exact cause of origin is controversial. Two important theories have been postulated about the pathogenesis of nasolabial cyst [7]. The first theory suggests that the nasolabial cysts originate as inclusion cysts derived from the epithelial cells that are retained in the mesenchyme after the mixing of medial and lateral nasal processes and maxillary prominence in facial skeleton development. The second theory suggests that nasolabial cysts originate from the persistent epithelial

remnants of the nasolacrimal duct that extend between the lateral nasal process and the maxillary prominence [15]. For its classical location, the cyst may grow in the three possible directions such as towards the nasolabial fold, the vestibule of the mouth, and the vestibule of the nose [7]. The most common clinical presentation in nasolabial cysts is facial asymmetry [16]. The patient may show a swelling of the midfacial soft tissue that is either intranasal or perinasal. The size of the nasolabial cyst ranges from 1 to 5 cm in diameter [7].

The nasolabial cysts are unilateral in majority of the cases [17]. The nasolabial cyst often arises on the left side compared to right and can be bilateral also [9]. When the nasolabial cysts are small in size & uncomplicated, the diagnosis may not be easy. Although the nasolabial cyst is developmental in origin, it usually does not manifest until adulthood [16]. Patients typically present with chronic painless swelling at the nasolabial area with or without nasal blockage. If the nasolabial cyst is infected, patients may complain of pain at the site of origin. The infected nasolabial cyst may rupture spontaneously and drain into the oral cavity or nose [11,18]. In this study, no patient was presented with an infected state of the nasolabial cyst. The patient with a nasolabial cyst may present with nasal blockage due to its proximity to the inferior turbinates and the cyst may be diagnosed as hypertrophy of the inferior turbinate [19]. So, these patients may be treated for turbinate hypertrophy. On clinical examination, the nasolabial fold is obliterated and the nasal alae are displaced anteriorly. Anterior rhinoscopy shows raised floor of the nasal cavity and obliteration of the gingivobuccal sulcus which is usually obliterated on the affected side. The nasolabial cysts are best palpated bimanually with one finger on the floor of the nasal vestibule and the other in the labial sulcus [7]. The palpation of the mass/nasolabial cyst shows a firm smooth, fluctuant, spherical, non-tender, and fluid-filled swelling.

Different imaging studies are helpful for diagnosis of the nasolabial cysts. The imaging modalities include ultrasonography, radiography, computed tomography (CT), and magnetic resonance imaging (MRI) [20]. CT and MRI are more useful imaging for the diagnosis of the nasolabial cyst. The most commonly used imaging is a CT scan for diagnosis. Before performing a CT scan, the majority of cases used radiographs to image the nasolabial cyst [19]. CT scan is helpful to determine whether the cyst is hyperdense or hypodense, homogenous, non-odontogenic, with or without any bony erosion [10]. In MRI, the nasolabial cyst is described as a homogeneous mass with varying intensities with respect to T1 and T2 weighted images that do not enhance with contrast [21]. Ultrasonography is useful in the diagnosis of the nasolabial cyst but cannot accurately depict the bone erosion or lesions [22]. As ultrasonography is operator-dependent, the most important factor for detecting the borders of the nasolabial cyst via ultrasonography is the experience of ultrasonography [23]. The diagnosis of the nasolabial cyst is confirmed by a histopathological study. The characteristic of histopathology study in the nasolabial cyst is the respiratory epithelium and pseudostratified ciliated columnar epithelium with goblet cells. The differential diagnosis of the nasolabial cyst includes non-odontogenic masses like neoplasms and odontogenic mass like follicular periodental, and residual cysts [24].

The treatment of choice in the nasolabial cyst is surgical excision of the cyst. The indication of the surgery is to establish the diagnosis, relieve nasal obstruction and to improve the cosmetic deformity [25]. Surgery is equally curative and diagnostic by helping histopathological examination. At our centre intraoral sublabial approach with unilateral nasal packing is the mainstay of the treatment of nasolabial cysts. The most commonly performed approach for removal of the nasolabial cyst is intraoral sublabial excision [25].

In this study, the surgical excision of the nasolabial cysts was done by intraoral sublabial approach in 28 patients. Out of 28, we did nasal packing in 14 patients, named as group A, 14 without nasal packing named as group B. This surgery allows complete excision of the cyst and is performed under local anaesthesia. This surgical approach allows a surgical field to be wider and guarantees complete excision without major complications. Grossly, the nasolabial cyst appears as a cystic mass surrounded by a thick fibrous capsule. Most of the cysts contain mucoid or yellow serous fluid. There may be brown fluid in the nasolabial cyst, due to hemorrhage and mucopurulent material when associated with acute infection. In the histopathological study of the nasolabial cyst, there is pseudostratified columnar epithelium lining in the majority of cases, although stratified squamous and cuboidal epithelium, and goblet cells may be seen [10]. The supporting connective tissue of the nasolabial cyst is fibrous, and usually contains components of the adjacent skeletal muscles.

Common postoperative complications following sublabial excision of the nasolabial cyst are facial swelling and facial numbness, surgical site hematoma, nasal mucosal perforation, nasal bleeding. As the nasolabial cysts are found near the floor of the nasal cavity, perforation of the nasal mucosa (01 in group A; 7.2% and 03 in group B; 21.4%) during excision can occur. This complication is not rare and once it happens, it should be closed with sutures if it is large for avoiding oronasal fistula formation or by nasal packing if there is no mucosal loss. The recurrence following sublabial excision of the nasolabial cyst is very rare. There was no significant difference between both groups as regard to main clinical presentation as swelling, nasal obstruction and pain represented 57.15%, 35.7% and 7.15% in both the groups. These results are comparable to those reported by Kajla *et al.* [27] who have proposed that patients seek therapy when there is deformity, nasal obstruction or infection caused by NLC. In addition, Sheikh *et al.* [28] reported that the most common presenting symptoms was facial swelling, seen in 70.9%, and nasal obstruction in 17.3%, and 3.1% were infected NLC, while it was discovered accidentally in 1.0%.

In the present work, Intraoral sublabial excision followed by unilateral nasal packing results in minimal surgical site hematoma and low postoperative pain. These results are comparable to those reported by **Lee *et al.*** [29] who firstly compared sublabial surgical excision to the endoscopic transnasal marsupialization, and found that, endoscopic marsupialization had shorter operating time, less postoperative pain, and low complication rate. In addition, the endoscopic approach was advocated in other circumstance – not encountered in the present study- such as if there is a risk of adhesion formation between the cyst roof and the previous skin incision as described by **Imre *et al.*** [30].

Complications reported in the present work are in agreement with previous literature. Where it was reported that, after sublabial surgical excision, there could be some complications which include facial swelling, facial pain, hematoma, and numbness of gingiva and teeth. **Sheikh *et al.*** [28] in their systematic review reported that complication rate of 27.2% was reported in patients who underwent intraoral sublabial excision; while in transnasal marsupialization, the complications rate was 13.9%. The most common complication seen in both groups were facial swelling in 07(50%) patients and 08(57.2%) patients, respectively. There were no significant differences between both groups.

6. CONCLUSION

The nasolabial cyst is an uncommon clinical entity that manifests cosmetic deformity and nasal obstruction. Clinical features and imaging are helpful for the diagnosis and are confirmed by the histopathological study. There are two surgical options are available for the treatment of nasolabial cysts such as intraoral sublabial excision and intranasal sublabial marsupialization. Sublabial excision followed by unilateral nasal packing results in less number of post – operative complications like surgical site hematoma, nasal mucosal perforations and nasal bleeding compared to those who underwent excision without nasal packing. So, hence we conclude that sublabial excision with unilateral nasal packing is an effective treatment option for the nasolabial cyst.

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