

Management of Nasoalveolar Cyst by Transnasal Endoscopic Marsupialization

<https://doi.org/10.47210/bjohns.2023.v3i1i.946>

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ABSTRACT

Introduction

A nasoalveolar cyst is a benign nonodontogenic mass situated in the anterior region of the maxilla. They are often located submucosally in the anterior nasal floor giving rise to swelling in the nasolabial area at the base of nasal alae. Traditionally, the approach of choice was intraoral sublabial marsupialization, however the trend is shifting to lesser invasive and scarless transnasal endoscopic marsupialization.

Materials and Methods

This is a retrospective observational study comprising of 16 patients who underwent microdebrider assisted endoscopic transnasal marsupialization of nasoalveolar cyst.

Results

16 patients underwent endoscopic transnasal marsupialization under general anaesthesia. They were followed up for 6-16 months (mean 9.43) and none of them had any recurrence.

Conclusion

The traditional treatment for the same has been by external approach. However, a scar in this area of face is not acceptable for many. Also, it is not easy to excise the whole cyst in toto. In our experience, microdebrider assisted endoscopic transnasal marsupialisation is an easier, faster, safer, and equally efficacious technique to treat nasolabial cyst without any recurrence.

Keywords

Nasoalveolar Cyst; Nasolabial Cyst; Endoscopic Marsupialization

A nasoalveolar cyst is a benign nonodontogenic mass situated in the anterior region of the maxilla. Nasoalveolar cysts comprise 0.7% of all nonodontogenic cysts.¹ They are often located submucosally in the anterior nasal floor giving rise to swelling in the nasolabial area at the base of nasal alae. These cysts can elevate the inferior turbinate and displace it medially.² The first study of this entity was performed in 1882 by Emile Zuckerkandl. It is also known as Klestadt's cyst and nasolabial cyst.³ African Americans have a higher prevalence of Klestadt's cysts with a female preponderance of 4:1.^{1,4} Nasoalveolar cysts commonly arise on the left side but can present bilaterally in 10% of cases.⁵

Patients tend to complain of chronic non-painful

nasolabial swelling along with nasal obstruction or cosmetic defects. The cyst may also become infected and cause painful swelling in the nasolabial area. An array of imaging studies are typically performed to assist in the diagnosis of nasoalveolar cysts. The most common imaging modalities are ultrasound, radiography, computed tomography (CT), and magnetic resonance imaging (MRI).

Confirmation of diagnosis is based on histology. There should be presence of characteristic pseudostratified

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ciliated columnar epithelium with interspersed goblet cells.⁶ The first histopathological description was given by Brown-Kelly in 1898. Differential diagnosis comprises of odontogenic cysts or neoplasms.⁷

Two treatments are recommended in the literature. The intraoral sublabial approach has been described as the main treatment for nasoalveolar cysts. Until in 1999, Su et al. described a novel less invasive treatment for these cysts by endoscopic transnasal marsupialization.⁸ Other possible treatments include post-excision cryotherapy, injection of sclerosing agents, cauterization, aspiration, incision and drainage.⁹ Through this study we attempt to throw light on microdebrider assisted transnasal excision

of nasolabial cysts, as this is still a relatively unexplored approach for management of these cysts.

Materials and Methods

A retrospective observational study was conducted in the ENT Department at a tertiary care hospital in India from 1st January 2020 to 31st March 2022. Sixteen patients of Nasoalveolar cyst were included in the study. Relevant preoperative blood workup, diagnostic nasal endoscopy and non-contrast computed tomography scan were done for all the patients. Written informed consent was taken. Institutional ethics committee clearance was obtained. (Fig.1 & 2)

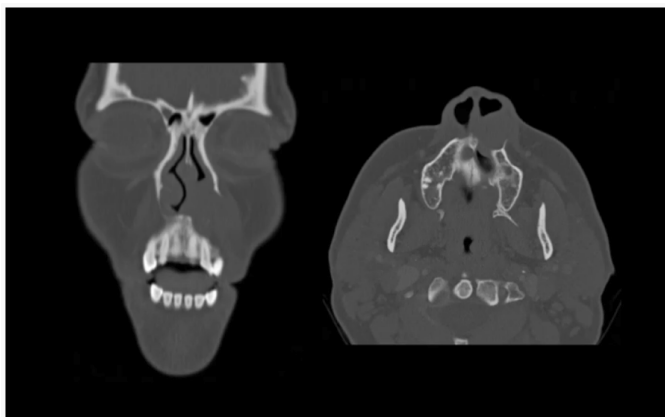


Fig. 1. NCCT nose and PNS showing left sided nasoalveolar cyst

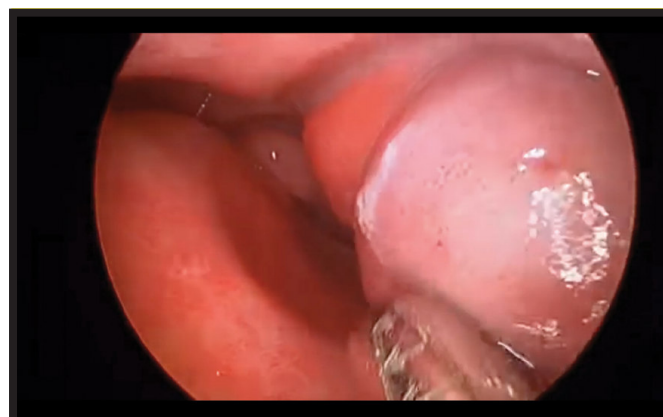


Fig. 2. Nasal endoscopy showing a nasoalveolar cyst in left inferior meatus displacing inferior turbinate medially

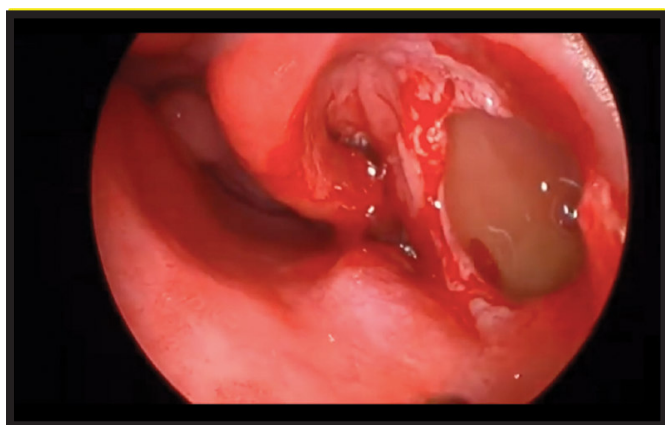


Fig. 3. Marsupialized nasoalveolar cyst



Fig. 4. Nasoalveolar cyst becomes a separate sinus after marsupialization.

All patients were subjected to general anaesthesia. Nasal decongestion was done with saline and adrenaline nasal packing. Inferior turbinate was medialised. Using a sickle knife, an incision was taken on the most prominent part of the cyst. Mucoïd content was suctioned out and the sac walls were marsupialized with microdebrider. Microdebrider was used to trim the roof of the cysts. The microdebrider was fitted with straight (3.5 and 2.9 mm) or curved (3.5 mm) sinus blades that spun at 2000–3000 rpm. The nasal mucosa and the cyst lining were trimmed to closely match one another. This allows wider stoma and aids in creating an additional self-draining paranasal sinus once epithelialization is completed. The diagnosis was confirmed histopathologically in all cases. Patients were followed up for a period of at least six months. (Fig. 3 & 4)

Results

In our study we included 16 patients, ten patients were males and six were females. The mean age of presentation was 34.4 years and median age was 37.5 years. The nasoalveolar cysts were located on the right side in nine patients and on the left side in seven patients. All sixteen patients presented with a unilateral swelling on the floor of nasal cavity. Nasal obstruction was present in six patients out of which three presented with pain in the nasolabial region.

All patients underwent endoscopic microdebrider assisted marsupialization. Post-operative follow-up of the patients was done for at least six months with the maximum being sixteen months, with the mean follow-up for 9.43 months. No recurrence was observed in any of the patients. The surgery being endoscopic, did not produce any scar in any of the patients. (Table I)

Table I: Operative data of patients who underwent Endoscopic Marsupialization surgery

NO.	AGE (YEARS)	GENDER	SIDE	CLINICAL FEATURES	SURGERY DONE	FOLLOW-UP (MONTHS)	RECURRENCE
1	24	Male	Right	Nasal Swelling	Endoscopic Marsupialization	6	No
2	56	Male	Left	Nasal Swelling	Endoscopic Marsupialization	12	No
3	17	Female	Right	Nasal Swelling+ Nasal obstruction	Endoscopic Marsupialization	6	No
4	45	Male	Left	Nasal Swelling	Endoscopic Marsupialization	9	No
5	55	Male	Right	Nasal Swelling	Endoscopic Marsupialization	8	No
6	28	Female	Left	Nasal Swelling + Nasal obstruction + Nasal pain	Endoscopic Marsupialization	16	No
7	16	Male	Right	Nasal Swelling	Endoscopic Marsupialization	10	No
8	39	Female	Right	Nasal Swelling	Endoscopic Marsupialization	6	No

Table I : Contd.

Table I (Contd) : Operative data of patients who underwent Endoscopic Marsupialization surgery

NO.	AGE (YEARS)	GENDER	SIDE	CLINICAL FEATURES	SURGERY DONE	FOLLOW-UP (MONTHS)	RECURRENCE
9	42	Male	Left	Nasal Swelling	Endoscopic Marsupialization	12	No
10	26	Female	Left	Nasal Swelling + Nasal obstruction	Endoscopic Marsupialization	12	No
11	29	Male	Right	Nasal Swelling	Endoscopic Marsupialization	7	No
12	39	Female	Left	Nasal Swelling	Endoscopic Marsupialization	11	No
13	36	Male	Right	Nasal Swelling	Endoscopic Marsupialization	8	No
14	44	Female	Right	Nasal Swelling + Nasal obstruction + Nasal pain	Endoscopic Marsupialization	6	No
15	41	Male	Left	Nasal Swelling + Nasal obstruction	Endoscopic Marsupialization	6	No
16	14	Male	Right	Nasal Swelling + Nasal obstruction + Nasal pain	Endoscopic Marsupialization	7	No

Discussion

Nasolabial cysts represent about 0.7% of all cysts in the maxillofacial region and 2.5% of non-odontogenic cysts.¹⁰ This lesion grows slowly and measures between 1.5 to 3.0 cm. It is characterized clinically by a floating tumefaction in the nasolabial sulcus which elevates the upper lip. The diagnosis is essentially based on the clinical findings. Bidigital palpation usually reveals fluctuance between the floor of nasal vestibule and the gingivobuccal sulcus which helps to confirm the diagnosis.¹¹ Clinically, the cysts appear as smooth fluctuant soft-tissue masses between the upper lip and nasal aperture with obliteration of the nasolabial fold and elevation of the nasal ala.

The differential diagnosis for a painless vestibular soft tissue swelling include odontogenic lesions such as canine

space abscess; follicular, periodontal and residual cysts, and salivary gland neoplasms. Only one case of carcinoma progressing from a nasolabial cyst has been described in literature.¹¹ Nasolabial cysts are characterized by a homogeneous non-enhancing cystic mass anterior to the pyriform aperture, showing no erosion or separation of the underlying maxilla on CT and readily distinguishable from vestibular or odontogenic abscesses, odontogenic cysts, or other nonodontogenic maxillary cysts.

A study by Pruna et al. concluded that when a tumor in the anterior region of the nose is suspected, specific ultrasound with Doppler may help define the anatomical origin, local extension and the correct diagnosis in undefined cases.¹² Curvei, Osguthorpe & Van Tassel presented MRI images of two nasolabial cyst cases that

showed relative hyperintensity in T1-weighted images and isointensity in T2-weighted images which was different from those of Raphael Navarro Aquilino et al.¹³

On MRI, they present as homogeneous intermediate intensity T1 signals and homogeneous high intensity T2 signals which is similar to glandular odontogenic cysts and radicular cysts.¹⁴ Ultrasonography (USG) is a method often used for detecting soft tissue lesions, which may be used intraorally as well. In a case report, Acar et al. concluded that USG was useful in diagnosing a suspected nasolabial cyst.¹⁵

These cysts mostly remain asymptomatic. Although, El-Hamd reported that complications, when they occur, generally cause nasal obstruction and aesthetic concern. Cohen & Hertzanu have stated that patients only seek therapy when there is deformity, nasal obstruction or infection caused by this lesion.¹⁶ Thus, currently, indications for surgery include prevention of secondary infection and correction of facial deformity. Management options for nasolabial cysts include needle aspiration, injection of sclerosing agents, cauterization, and incision followed by drainage or surgical excision by sublabial or transnasal approach.⁹

The results following sublabial approach are generally good, with a wider surgical field and better assurance of complete excision; yet, risk of general anaesthesia, hematoma, soft tissue swelling, wound infection and oronasal fistula remains maybe concerning.¹⁷ In the patients operated by the sublabial approach, a study reports the wounds healed within 2 to 3 weeks and postoperative sequelae included toothache, numbness of the perinasal area and swelling of the upper lip.¹⁷

In 1999, Su *et al.* described the use of transnasal endoscopic marsupialization in the management of nasolabial cyst.⁸ Although the microdebrider has gained widespread use in the field of rhinolaryngology, the common current trend of management of a nasolabial cyst is surgical excision *via* a sublabial approach or a transnasal marsupialization using traditional surgical instruments.^{18,19} The microdebrider in this case gains advantage by avoiding excessive scarring, synechiae formation and postoperative complications including ostium stenosis and recurrence.²⁰ In our study, we have reviewed 16 cases over 2 years

that were operated using a microdebrider to marsupialize the nasoalveolar cyst. All diagnoses, surgeries and clinical follow-ups of nasoalveolar cysts were done or supervised by a single surgeon. The microdebrider is a rotary shaving device that precisely resects mucosa and the continuous suction through the instrument minimizes the need for withdrawal and reintroduction of bite forceps and suction tubes. With the recent introduction of different blades, the microdebrider is becoming more versatile and is applied to respiratory papillomatosis, hypertrophic adenoids, tonsils and inferior turbinates.¹⁷ Another study also reiterates that larger cysts were difficult to excise by sublabial approach and rather the transnasal approach seemed suitable here. In our experience, when compared with the traditional approaches, the opening could be easily widened, especially at the lateral and anterior overhanging edges, as is echoed by Chia-Nan Chen et al.¹⁷

After transnasal marsupialization, the nasolabial cyst is converted to an air-containing sinus with its opening at the nasal floor. It has been observed that the newly created sinus possesses ciliated respiratory epithelium that may act like an accessory paranasal sinus and it even possesses ventilation and drainage functions via a small ostium. Another study, confirmed the presence of a functional air-containing sinus with stoma stenoses on the nasal floor when viewed in a post-operative CT examination. Radiologically, it mimics an accessory paranasal sinus in the premaxillary area with the ostium at its top.¹⁸

After marsupialization of a nasolabial cyst, epithelialization will occur between the cut edges of the nasal mucosa and the epithelium lining of the cyst. Theoretically, if only a small window is made on the cyst, the annular scar surrounding the ostium will shrink rapidly and may be soon followed by recurrence of the cyst. For this reason, the marsupialization must be designed to ensure the patency of the ostium by producing an adequate opening surrounded by a minimal amount of scar tissue during wound healing.

The trans-nasal marsupialization has many benefits over the conventional intraoral approach, but there is no difference with regard to post-operative swelling, pain, or overall recurrence rate. Therefore, more studies with

longer follow-up periods are needed to analyse the two different techniques in depth.²¹

A modification of the above mentioned method has been suggested where the cyst is aspirated before enucleation which, according to the authors, exhibits lower recurrence rates. Cryosurgery has also been tried as an alternative treatment method on nasolabial cysts. Janardhan et al. performed cryosurgery after a sub-labial incision in four patients. No complications or recurrence has been reported with this method.^{22, 23}

Conclusion

Nasoalveolar cysts are uncommon cysts of head and neck region. Traditional treatment for the same was by external approach. However, a scar in this area of face is not acceptable for many. Also, it is not easy to excise the whole cyst in toto. In our experience, microdebrider assisted endoscopic transnasal marsupialization is an easier, faster, safer, and equally efficacious technique to treat nasolabial cyst without any recurrences.

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