Management of Nasolabial Cysts by Transnasal Endoscopic Marsupialization

Wei-Chieh Chao, MD; Chi-Che Huang, MD; Po-Hong Chang, MD; Ying-Lin Chen, MD; Chiang-Wen Chen, MD; Ta-Jen Lee, MD

Objective: To evaluate hospitalization rates and duration of surgery associated with transnasal endoscopic marsupialization compared with sublabial excision in treating nasolabial cysts.

Design: Retrospective clinical series.

Setting: Large urban community hospital.

Patients: Consecutive sample of 57 patients with nasolabial cysts treated from January 1, 2000, to February 29, 2008.

Interventions: Sublabial excision in 23 patients (sublabial group) and transnasal endoscopic marsupialization in 34 patients (transnasal group). Among 57 patients, 47 underwent preoperative computed tomography.

Main Outcome Measures: History, clinical presentation, preoperative condition, histopathologic findings, treatment, complications, and outcomes.

Results: The mean duration of surgery was 91.3 minutes in the sublabial group and 29.5 minutes in the transnasal group ($P = .003$). The hospitalization rate was 100% (23 of 23) in the sublabial group and 59% (20 of 34) in the transnasal group ($P < .001$). The medical costs were significantly lower in the transnasal group than in the sublabial group ($P = .002$). The follow-up period ranged from 6 to 85 months. Neither group of patients experienced any major complications or recurrences during the follow-up period.

Conclusion: Transnasal endoscopic marsupialization is an effective treatment for nasolabial cysts, is less costly, and has fewer complications than sublabial excision.

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NASOLABIAL CYSTS ARE A rare disorder observed primarily among persons of African ancestry in the Western world. Most patients are women aged 40 to 60 years. Diagnosis is made on the basis of clinical features such as midfacial asymmetric swelling and nasal obstruction. The painless cysts develop slowly, but patients may be seen with an acutely painful swelling if the cyst becomes infected. In some patients, facial cellulites may develop after expansion of a secondary infection. 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.

Thus far, surgical excision through a sublabial approach has been the most popular and well-established procedure for the management of nasolabial cysts. Although promising results with low recurrence rates have been reported, complications include hematoma, soft-tissue swelling, wound infection, and oronasal fistula. Su et al described the use of transnasal endoscopic marsupialization as an option in managing nasolabial cysts. Although the procedure has been performed easily and safely in patients, to our knowledge, no large-scale studies of this technique have been conducted. The objective of this study was to compare traditional sublabial excision with transnasal endoscopic marsupialization in the management of nasolabial cysts. Our study represents the largest series of patients with nasolabial cysts among the Chinese population to date. It is also the first study to define the cost-effectiveness and efficiency of transnasal endoscopic marsupialization for the treatment of nasolabial cysts.

Methods

This study was approved by the Institutional Review Board of Chang Gung Memorial Hospital. Sixty patients diagnosed as having naso-
Nasolabial cysts were treated at the Department of Otolaryngology, Chang Gung Memorial Hospital in Taiwan from January 1, 2000, to February 29, 2008. Three patients were excluded from the study because of additional sinus surgery. Clinical medical records of the remaining 57 patients were reviewed for history, clinical presentation, preoperative condition, histopathologic findings, treatment, complications, and outcomes. Surgical specimens from all patients were reviewed by a pathologist.

Diagnosis was made on the basis of anatomic location, radiologic findings, and histopathologic examination. The 57 patients had 59 nasolabial cysts (2 bilateral cases). Patients were divided into 2 groups according to whether they underwent sublabial excision (sublabial group) or transnasal endoscopic marsupialization (transnasal group). A total of 47 patients (82%) underwent preoperative computed tomography (CT).

We performed transnasal endoscopic marsupialization as documented by Su et al. The nasal cavity was shrunk with irrigated gauzes (Bosmin; Daiichi Pharmaceutical Inc, Tokyo, Japan) for 5 minutes. Under endoscopic guidance, an incision was made along the anterior border of the protruding cyst. The roof of the cyst wall and the nasal mucosa above it were excised. The opening of the cyst was widened. Meanwhile, the edges of the nasal mucosa and the cyst lining were trimmed smooth. Loose nasal packing was then applied.

Statistical analysis was performed using commercially available software (SPSS, version 13.0; SPSS Inc, Chicago, Illinois). \( \chi^2 \) Test and Fisher exact test were used to calculate significant differences between the 2 groups. Group differences were analyzed using the \( t \) test for continuous variables. The level of significance for analysis was \( p < .05 \).

### RESULTS

The transnasal group comprised 9 men and 25 women with a mean age of 48.6 years; the sublabial group comprised 6 men and 17 women with a mean age of 49.3 years. Most patients had a history of intermittent swelling over the nasolabial area, usually characterized as a painless lump located beneath the unilateral ala of the nose. In some patients, the lump protruded from the upper lip or effaced the nasolabial fold, resulting in minor discomfort.

Cyst diameter varied from 6 to 40 mm as estimated by CT. The maximum cyst diameter in the transnasal group was significantly larger than that in the sublabial group (\( p = .001 \) (Table 1).

![Figure 1. Postoperative sinus computed tomogram of a right nasolabial cyst. Three years after transnasal endoscopic marsupialization, sinus-containing air has replaced the previous cyst with a patent stoma at the anteronasal floor (arrowhead).](image)

The follow-up period ranged from 6 to 85 months. Both operations were successful in all patients. There were no major complications in either group of patients.

Operations for 14 of 34 patients in the transnasal group were performed on an outpatient basis. In the sublabial group, all patients were hospitalized for the operation. The duration of surgery for patients in the transnasal group was significantly shorter than that for patients in the sublabial group. The medical costs in the transnasal group were significantly less than those in the sublabial group (Table 1). The medical costs included all expenses incurred from the operation and postoperative hospitalization.

There was no evidence of recurrence among 57 patients followed up for at least 6 months. Within 3 to 4 weeks after marsupialization, endoscopy revealed complete epithelialization over the edge of the new opening. Postoperative endoscopy and CT showed that the nasolabial cyst was replaced by a ventilated sinus with a well-epithelialized ostium at the anterior or anterolateral nasal floor even 3 years after surgery (Figure 1 and Figure 2). In the sublabial group, the wounds healed within 2 to 3 weeks, and postoperative sequelae included toothache, numbness of the perinasal area, and swelling sensations of the upper lip. In the transnasal group, a patient experienced a nasal clicking sound when she compressed the alar area (Table 2). Endoscopy revealed a stricture orifice of marsupialized cavity with mucous retention. The patient refused further treatment because there were no obvious discomforts.

### COMMENT

Nasolabial cysts account for only 0.7% of all maxillary and mandibular cysts. Biologist Emile Zuckermandl first described a nasolabial cyst in 1882. These cysts are most

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<th>Table 1. Characteristics of Patients Having Nasolabial Cysts Treated With Sublabial Excision vs Transnasal Endoscopic Marsupialization</th>
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<td><strong>Characteristic</strong></td>
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<td>----------------------</td>
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<tr>
<td>Male to female ratio</td>
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<tr>
<td>Age, mean (SD), y</td>
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<tr>
<td>Left side to right</td>
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<td>Maximum cyst diameter, mean (SD), mm</td>
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<td>Duration of surgery, mean (SD), min</td>
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<td>Hospitalization rate, No. (%)</td>
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<td>Medical cost, mean (SD), NT$</td>
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Two main hypotheses for formation of nasolabial cysts have been proposed. One suggests that they result from entrapped embryonic nasal respiratory epithelium in a facial cleft formed by the merging maxillary, medial, and lateral nasal processes. Hence, nasolabial cysts are also classified as fissural cysts. Another theory posulates that nasolabial cysts originate from the nasolabial incision, with acceptable physiologic function. Ciliated respiratory epithelium is the most common cell type in nasolabial cysts, and the lining of most of these cysts typically features many goblet cells. However, Su et al12 observed no tufts of cilia over the nasolabial cyst epithelium cells during scanning electron microscopy. Instead, the luminal surfaces of all superficial epithelial cells demonstrated numerous short wide microvilli. In our study using only light microscopy, all specimens showed respiratory epithelium with microvilli. In our study using only light microscopy, all specimens showed respiratory epithelium with microvilli. In our study using only light microscopy, all specimens showed respiratory epithelium with microvilli.

Table 2. Comparison of Numbers of Postsurgical Complications in the Patient Groups

<table>
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<tr>
<th>Complication</th>
<th>Sublabial Group (n=23)</th>
<th>Transnasal Group (n=34)</th>
<th>P Value</th>
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<tr>
<td>Facial swelling</td>
<td>6</td>
<td>1</td>
<td>.005</td>
</tr>
<tr>
<td>Facial numbness</td>
<td>4</td>
<td>0</td>
<td>.008</td>
</tr>
<tr>
<td>Toothache</td>
<td>5</td>
<td>0</td>
<td>.002</td>
</tr>
<tr>
<td>Nasal clicking sound</td>
<td>0</td>
<td>1</td>
<td>.44</td>
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Table 2 illustrates a comparison of complications in the patient groups following surgery for nasolabial cysts. The transnasal group had fewer complications, especially facial swelling and numbness, compared to the sublabial group. The transnasal approach was associated with a significantly lower rate of recurrence and shorter duration of surgery. The medical costs were also significantly lower in the transnasal group. These findings support the use of the transnasal endoscopic marsupialization technique for larger cases, demonstrating shorter duration of surgery and lower medical costs. The transnasal endoscopic marsupialization technique is much easier to perform on larger cysts and reduces hospitalization rates. The procedure is also associated with less blood loss and improved patient outcomes. Su et al10 reported the transnasal endoscopic marsupialization technique as a cost-effective procedure for the treatment of nasolabial cysts. In our experience managing nasal sinus mucoceles, the transnasal approach appears to be a simple, effective, and less invasive option. Creating a sufficiently large orifice is crucial to prevent the accumulation of mucus or recurrence of the disease after transnasal endoscopic marsupialization.

Figure 2. A well-epithelialized ostium at the anterior or anterolateral nasal floor persisting 3 years after marsupialization (arrow).

Figure 2 represents a large-scale study of nasolabial cysts treated in a single institute for more than 8 years. There are 2 main hypotheses for formation of nasolabial cysts. One theory presumes that the cysts originate from entrapped embryonic nasal respiratory epithelium in a facial cleft formed by the merging maxillary, medial, and lateral nasal processes. Hence, nasolabial cysts are also classified as fissural cysts. Another theory postulates that the cysts may emanate from misplaced epithelium of the nasolacrimal duct because their location and histologic findings are identical. Therefore, CT is a useful tool for diagnosis and determination of the surgical approach.

Indications for surgery include prevention of secondary infection and correction of facial deformity. Previously, the most commonly used surgical method of sublabial excision had a low rate of recurrence but often caused defects of the nasal floor, although most heal quickly. Su et al9 initially reported transnasal endoscopic marsupialization for nasolabial cysts in 1999, describing the procedure as a simple, effective, and less invasive operation. They compared the 2 procedures in a bilateral case, demonstrating shorter duration of surgery and less blood loss with transnasal endoscopic marsupialization. In recent years, transnasal endoscopic marsupialization has been performed frequently in Taiwan. To our knowledge, this study is the first attempt to contrast the 2 procedures using a statistical evaluation in a large group. In our study, the transnasal group benefited from a significantly shorter duration of surgery, a reduced hospitalization rate, and lower medical costs. The medical costs were significantly lower in the transnasal group mainly because of their lower hospitalization rate and shorter duration of surgery. As summarized in Table 1, transnasal endoscopic marsupialization is a cost-effective procedure for the treatment of nasolabial cysts. In our experience managing nasal sinus mucoceles with endoscopic marsupialization, one does not need to remove the lining mucosa of nasolabial cysts. A patent stoma is similar to a newly created paranasal sinus with ciliated nasal mucosa. Ciliated respiratory epithelium is the most common cell type in nasolabial cysts, and the lining of most of these cysts typically features many goblet cells. However, Su et al12 observed no tufts of cilia over the nasolabial cyst epithelial cells during scanning electron microscopy. Instead, the luminal surfaces of all superficial epithelial cells demonstrated numerous short wide microvilli. In our study using only light microscopy, all specimens showed respiratory epithelium with ciliated pseudostratified columnar and goblet cells. Further electron microscopic examination may be needed to reveal more detail. However, ciliated respiratory epithelium or microvilli-like surface epithelium can help transport and prevent retention of mucus when the created orifice is sufficiently large. As a consequence, a well-marsupialized nasolabial cyst could be integrated into a part of the nasal cavity, with acceptable physiologic function. We suggest that creating a sufficiently large stoma is crucial to preventing the accumulation of mucus or recurrence of the disease after transnasal endoscopic marsupialization.

Smaller cysts can be difficult to detect. In our study, some smaller cysts were found incidentally during an imaging evaluation for sinusitis. Nasolabial cysts may be elusive with radiography, but CT allows a definite diagnosis. Nasolabial cysts are characterized by a homogenous nonenhancing 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 that occur in identical locations. Therefore, CT is a useful tool for diagnosis and determination of the surgical approach.

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Su et al10 reported that the transnasal endoscopic marsupialization technique is much easier to perform on larger cysts. In our patients, protrusion of the cyst in the nasal cavity was the main consideration in selecting an appropriate surgical approach. Creating a sufficiently large stoma for drainage is facilitated by performing transnasal endoscopic marsupialization in larger protrusive cases.
With smaller lesions, it is difficult to find the cyst in the nasal cavity using an endoscope. We further found that the size of the cyst closely parallels that of the protruding part in the nasal cavity (mostly in the nasal floor). In the present study, the mean cyst diameter was significantly larger in the transnasal group than in the sublabial group ($P = .001$). Therefore, the size of the cyst and the related protruding part in the nasal cavity were important considerations when making decisions about an appropriate surgical approach. Based on this, sublabial excision may be a better choice of operation in patients with smaller lesions.

Transnasal endoscopic marsupialization can be performed safely in an outpatient setting. Nasal packing was not required in our patients. Minimal blood loss during surgery was noted, and no postoperative bleeding was encountered. Nevertheless, as a safety precaution, we initially admitted most of our earlier patients undergoing transnasal endoscopic marsupialization into the hospital, and only 14 patients in this group were treated in an outpatient surgery setting.

The mean duration of surgery for transnasal endoscopic marsupialization was longer in our study than in the study by Su et al. This may be because the cyst mucosal lining was removed as much as possible to minimize recurrence in our earlier patients, resulting in a longer duration of surgery.

Complications of sublabial excision of nasolabial cysts reported in the literature include postsurgical hemotoma, oronasal fistula, and infection. However, our patients experienced no major complications. In the sublabial group, postsurgical sequelae included toothache, swelling, and numbness of the nasal alar area. Some symptoms are indistinct and may persist for more than 3 months. One patient in the transnasal group described an air bubble–like sensation when she pressed over the previous site of the cyst, which possibly occurred because the stoma was not large enough for sufficient drainage. Finally, the transnasal group experienced fewer postsurgical sequelae than the sublabial group.

There are several limitations to our study that require further investigations. First, this study is retrospective, with patient selection that is not randomized. Second, a postoperative follow-up questionnaire should be mandatory and may improve evaluation in our future studies. Third, further prospective studies may be needed to compare these different surgical approaches, especially the duration of surgery and postsurgical complications.

In conclusion, transnasal endoscopic marsupialization is a cost-effective and less burdensome option for the surgical treatment of nasolabial cysts compared with sublabial excision, especially for patients with large lesions. Transnasal endoscopic marsupialization can be performed in an outpatient setting, with fewer postsurgical sequelae than those associated with sublabial excision.

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Author Contributions: All authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Huang, C.-W. Chen, and Lee. Acquisition of data: Huang, Y.-L. Chen, and C.-W. Chen. Analysis and interpretation of data: Chao, Chang, and Y.-L. Chen. Drafting of the manuscript: Chao and Y.-L. Chen. Critical revision of the manuscript for important intellectual content: Huang, Chang, C.-W. Chen, and Lee. Statistical analysis: Huang, Y.-L. Chen, and C.-W. Chen. Administrative, technical, and material support: Chao, Huang, Chang, Y.-L. Chen, and Lee. Study supervision: C.-W. Chen.

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