

Bilateral endoscopic endonasal marsupialization of nasopalatine duct cyst

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Abstract

Nasopalatine duct cysts are the most common non-odontogenic cysts in the maxilla, and are conventionally treated through a sublabial or palatine approach. Recently, the endoscopic approach has been used, but experience is extremely limited. We treated a 29-year-old male with nasopalatine duct cyst by endoscopic marsupialization, but paresthesia of the incisor region occurred after surgery. This paresthesia gradually remitted within 6 months. The nasopalatine nerve, which innervates the upper incisor region, enters two lateral canals separately at the nasal floor and exits the central main canal at the palate. Damage to the bilateral nasopalatine nerves might lead to paresthesia, so we recommend careful examination for nerve fibers during endoscopic surgery, especially if fenestration is performed on both sides.

Introduction

Nasopalatine duct cyst (NDC) is a benign non-odontogenic lesion arising from the nasopalatine duct, which probably originates from the epithelial remnants of the nasopalatine duct stimulated to proliferate by trauma, infection, or mucous retention.¹ NDC, also known as incisor canal cyst, nasopalatine canal cyst, nasopalatine cyst or median palate cyst, is the most common non-odontogenic cyst in the maxilla, occurs in 1% of the population, and is most common in middle age.^{1,2} The standard treatment for NDC is complete removal through a sublabial or palatine approach.^{1,3,4} Since NDC is not a tumor, simple marsupialization to the nasal cavity is another treatment option. We treated a 29-year-old male with NDC by endoscopic endonasal marsupialization from the bilateral nasal cavities. Postoperatively, the patient complained of paresthesia of the incisor region. The cause of the paresthesia and its prevention are discussed.

Case Report

A 29-year-old male with pain in the palate was referred to our department. He had no history of maxillofacial trauma, or genetic disorders. Computed tomography showed an egg-shaped round radiolucent area on the midline of the maxilla (Figure 1A-C). Sagittal T2-weighted magnetic resonance imaging showed a high intensity area in the nasopalatine duct (Figure 1D). These neuroimaging findings were consistent with NDC. Surgery was performed with the endoscope under general anesthesia. Bulging of the corner of the nasal septum and nasal floor was seen only on the right side (Figure 2A, B). The mucoperiosteal flap was elevated and the bone exposed (Figure 2C, D). The bony wall was drilled with a diamond burr. The cyst wall was incised and white cloudy fluid was drained. The cyst wall facing the nasal cavity was resected whereas the cyst wall facing palate was preserved. The bony edge was covered with flaps (Figure 2E, F). Although the pain had disappeared postoperatively, the patient noticed paresthesia of the upper incisor area. Sensation of upper incisor area remained but he felt discomfort. Oral vitamin B12 was prescribed to facilitate recovery. The paresthesia remitted over 6 months. Fenestration of the cyst remains open on both sides.

Discussion

Recently, three cases of NDC were treated with endoscopic endonasal marsupialization but had no paresthesia after endoscopic surgery.⁵ In contrast, our patient complained of postoperative paresthesia of the upper incisor area. Previously, NDC was treated with external incision so that some paresthesia was considered to be a common postoperative sequela and was not a matter of concern.

The nasopalatine duct contains the nasopalatine nerve and the terminal branch of the descending palatine artery.⁶ The nasopalatine nerve is the sensory nerve of the upper incisor area. The nasopalatine nerve is a branch of the maxillary division of the trigeminal nerve, which passes through the pterygopalatine ganglion, enters the sphenopalatine foramen, and passes medially across the roof of the nose to the upper part of the posterior border of the nasal septum, then passes forward in the mucous membrane of the nasal septum, slopes down to and passes through the incisor canal to reach the hard palate (Figure 3). The upper incisor area is co-innervated with the nasopalatine nerve and anterior palatine nerve. Blocking of the anterior palatine nerve did not change either light touch or pin-

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Key words: endoscope, incisive canal, nasopalatine duct, nasopalatine nerve, sensation.

Contributions: YH, interpretation of data for the work and manuscript writing; KN, interpretation of data for the work, conception or design of the work, operator, and manuscript writing; HO, operator and revising manuscript critically for important intellectual content; YT, drawing schema and revising manuscript critically for important intellectual content; HH, expert on external approach, gave useful advice and revising manuscript critically for important intellectual content. YK, gave advice for operative approach and revising manuscript critically for important intellectual content. All authors approved final version to be published AND agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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prick threshold.⁷ Our patient treated with endoscopic endonasal surgery suffered from long-lasting paresthesia of the upper incisor region. The previous three cases treated by endoscopic endonasal marsupialization were apparently fenestrated from only one side.⁵ To reduce the possibility of stenosis of fenestration, we chose bilateral fenestration to open the NDC as far as possible. The paresthesia was probably a result of nasopalatine nerve injury during the operation.

The nasopalatine canal is Y-shaped. The orifices of two lateral canals are present on the nasal floor side, which descend and merge to form the main canal that opens on the hard palate as a single nasopalatine foramen (Figure 3).⁶ Unilateral damage of nasopalatine nerve may not cause any sensory abnormality but damage of both nerves may result in paresthesia. Since the sensory innervation of the upper incisor region is not exclusively served by the nasopalatine nerve but also by the ante-

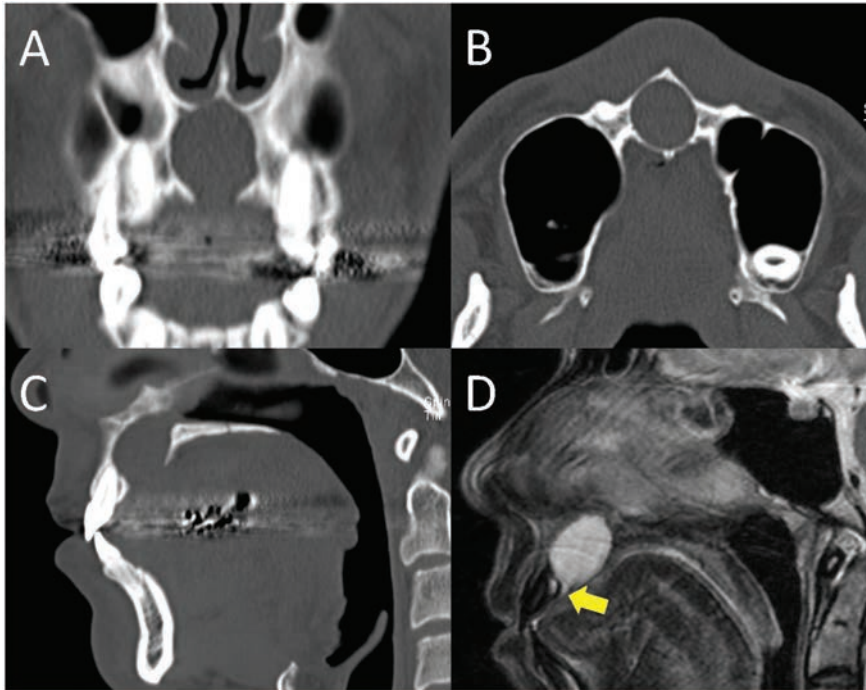


Figure 1. Preoperative computed tomography scans and T2-weighted magnetic resonance image. Coronal (A), axial (B) and sagittal (C) views demonstrating the radiotransparency at the upper maxillary midline, and a homogeneous high intensity area in the nasopalatine duct (D). The nasopalatine duct (arrow) is observed at the bottom of the cyst.

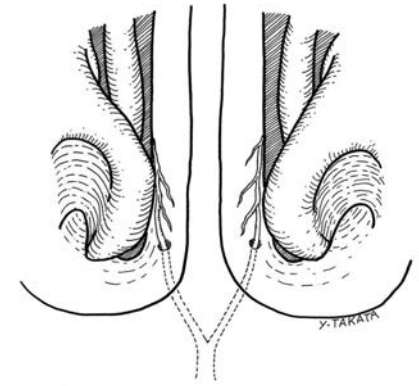


Figure 3. Schema of nasopalatine nerve. The nasopalatine nerve runs medially across the roof of the nose to the upper part of the posterior border of the nasal septum, then passes forward in the mucous membrane of the nasal septum, slopes down to and passes through the incisor canal to reach the hard palate. The nasopalatine canal is Y-shaped.

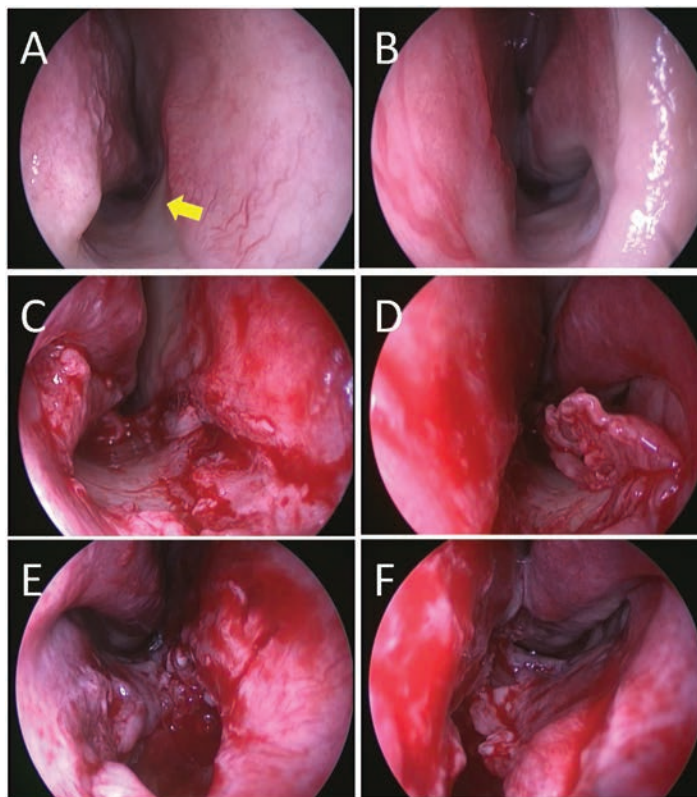


Figure 2. Intraoperative photographs. (A) Right nasal cavity at the beginning of the operation. A bulge (arrow) is seen at the angle of the nasal septum and floor. (B) Left nasal cavity at the beginning of the operation. No apparent abnormality is seen. Mucoperiosteal flap is elevated on the right nasal cavity (C). Mucoperiosteal flap is elevated on the left nasal cavity (D). The flap was replaced to cover the exposed bone on both sides (E, right side; F, left side).

rior palatine nerve,⁷ complete loss of sensation may not occur. Our patient complained of discomfort but sensation remained. His discomfort gradually resolved in 6 months.

This case illustrates the risk of paresthesia after endoscopic endonasal marsupialization of NDC. Paresthesia after endoscopic endonasal marsupialization was considered unlikely.⁵ This single case report does not establish how the likelihood of paresthesia after bilateral marsupialization of NDC, but this complication is possible after damage to the bilateral nasopalatine nerves.

In conclusion, endoscopic endonasal fenestration of NDC is a simple and less invasive treatment. However, bilateral fenestration of the NDC carries the risk of injury to the bilateral nasopalatine nerves on the surface of the NDC, resulting in paresthesia of the upper incisor region. We recommend thorough investigation of the surface of the cyst wall and preservation of nerve fibers during this procedure.

References

1. Swanson KS, Kaugars GE, Gunsolley JC. Nasopalatine duct cyst: an analysis of 334 cases. *J Oral Maxillofac Surg* 1991;49:268-71.
2. Falci SGM, Verli FD, Consolaro A, dos Santos CRR. Morphological characterization of the nasopalatine region in human fetuses and its association to pathologies. *J Appl Oral Sci* 2013;21:250-5.
3. Escoda Francolí J, Almendros Marqués N,

- Berini Aytés L, Gay Escoda C. Nasopalatine duct cyst: report of 22 cases and review of the literature. *Med Oral Patol Oral Cir Bucal* 2008;13:E438-43.
4. Aldelaimi TN, Khalil AA. Diagnosis and surgical management of nasopalatine duct cysts. *J Craniofac Surg* 2012;23:e472-4.
 5. Kang JW, Kim HJ, Nam W, Kim CH. Endoscopic endonasal marsupialization of nasopalatine duct cyst. *J Craniofac Surg* 2014;25:e155-6.
 6. Jacobs R, Lambrichts I, Liang X, et al. Neurovascularization of the anterior jaw bones revisited using high-resolution magnetic resonance imaging. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;103:683-93.
 7. Langford RJ. The contribution of the nasopalatine nerve to sensation of the hard palate. *Br. J. Oral Maxillofac Surg* 1989;27:379-386.