

## Clinical Records

# Branchial cyst of the nasopharynx: resection via the endonasal approach

YUYA TAMAGAWA, M.D., KEN KITAMURA, M.D., MAMORU MIYATA, M.D.

### Abstract

We present a rare branchial cyst of the nasopharynx in a 57-year-old man. The cyst was located at the higher level between the roof and the left lateral band of the nasopharynx, and was removed by the endonasal approach following a preparatory septoplasty. While several cases of nasopharyngeal cysts have previously been reported, this appears to be the first case of the resection of such a cyst via the endonasal approach, and is a useful, and potentially less injurious, alternative to the transpalatal approach.

**Key words:** Branchioma; Nasopharynx; Endoscopy

### Introduction

Cystic lesions of the nasopharynx range from congenital anomalies to benign or malignant tumours. Branchial cysts are relatively rare, with several cases reported in the literature (Magnotti, 1927; Giussani, 1928; Hoogland, 1951; Taylor and Burwell, 1954; Mills, 1959; Shaheen, 1961; Canty and Dogra, 1978; Yoshimura *et al.*, 1986; Shidara *et al.*, 1993). As they possess no distinctive histological features (Singh and Pahor, 1977), the location and the relationship of the branchial cyst to the surrounding structures must be evaluated to ensure a correct diagnosis. We present a patient with a nasopharyngeal cyst that was successfully treated surgically. The sites of origin as well as the surgical approaches are discussed and the relevant literature is reviewed.

### Case report

A 57-year-old Japanese man presented in October 1992 with a five-year history of persistent, left-sided nasal obstruction. He denied having rhinorrhea. There was no history of trauma, and his medical history was unremarkable. Examination revealed a large, broad-based, smooth swelling covered with normal mucosa in the left half of the nasopharynx which obstructed the left choana. The swelling extended from the left side of the fossa of Rosenmüller to the left half of the posterior nasopharyngeal wall and the vault. Anterior rhinoscopy revealed that the nasal septum was deviated to the left. The tympanic membrane appeared normal. A computed tomographical (CT) scan demonstrated a well-circumscribed cystic mass that extended beyond the left half of the nasopharynx. T<sub>1</sub>-weighted magnetic resonance imaging with gadolinium showed a ring-enhanced homogeneous mass that displayed a decreased signal intensity (Figure 1a). The lesion demonstrated a very high signal intensity on T<sub>2</sub>-weighted images (Figure 1b). No association with intracranial structures or any extension to the parapharyngeal space was observed (Figure 2). Thus, a nasopharyngeal cyst was diagnosed.

We decided to excise the cyst by the endonasal, rather than the transpalatal, approach under endoscopic guidance. A septoplasty under local anaesthesia was initially performed to ensure access. The cyst was aspirated and a light brown serous fluid that contained no epithelial cells or debris was removed. One week later, under general anaesthesia, the cyst was excised completely via the endonasal approach. We observed no perioperative evidence of an associated tract from the cyst.

Macroscopically, the cyst was 2 cm in diameter; its wall was 3 mm thick. Microscopic examination of the wall showed sub-epithelial lymphoid aggregation and diffuse infiltration; seromucinous glands were absent (Figure 3). The wall was lined with pseudostratified ciliated epithelium without goblet cells (Figure 4). The overlying squamous epithelium appeared normal.

The patient recovered uneventfully. No sign of recurrence of the cyst has been observed in one and a half years following his discharge from hospital.

### Discussion

Cystic lesion of the nasopharynx include such rare conditions as encephalocele, sphenoid sinus mucocele, chordoma, cystic degeneration of a nasopharyngeal tumour, and the extension of a pituitary tumour (Singh and Pahor, 1977; Kwok *et al.*, 1987). Such lesions can be diagnosed by radiological examinations such as CT scans and magnetic resonance imaging (MRI). The diagnosis is confirmed by histological evaluation. However, nasopharyngeal cysts, including Tornwaldt's cysts, Rathke's pouch cysts, adenoid retention cysts, seromucinous retention cysts, and branchial cysts cannot be differentiated only by histological findings; their location and anatomical relationship to the adjacent structures must also be evaluated. Tornwaldt's cysts and a Rathke's pouch cysts are situated in the midline posterior-superior wall of the nasopharynx, the former just above the superior constrictor muscle and the latter in a more cephalad position (Kwok *et al.*, 1987). Adenoid retention cysts, usually

From the Department of Otolaryngology/Head and Neck Surgery, Jichi Medical School, Tochigi, Japan.  
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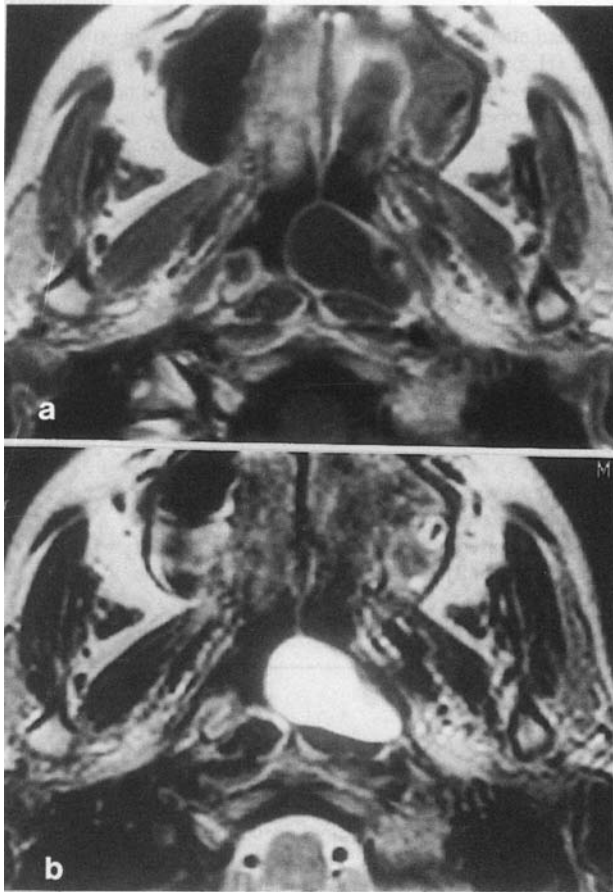


FIG. 1

Magnetic resonance images. (a) T<sub>1</sub>-weighted axial scan, with gadolinium, demonstrating ring enhancement of the homogeneous mass. (b) T<sub>2</sub>-weighted axial scan showing high signal intensity of the lesion.

found in the same region as Tornwaldt's cysts, are surrounded by abundant lymphoid tissue (Guggenheim, 1967; Battino and

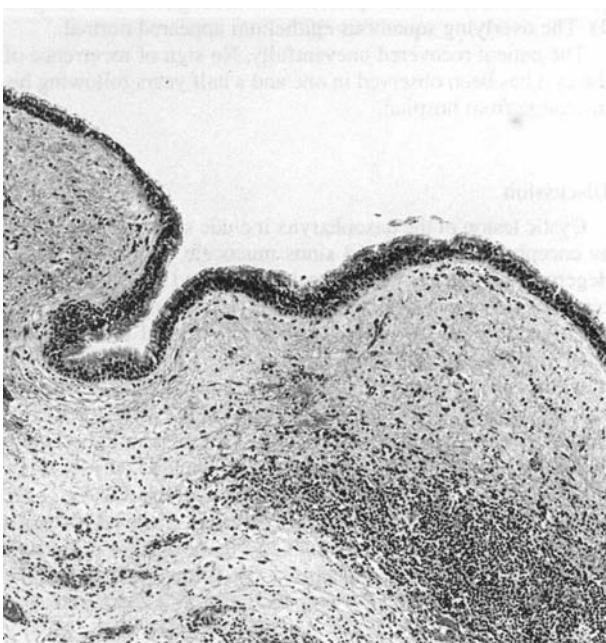


FIG. 3

Light microscopic findings of the cyst wall showing subepithelial lymphoid aggregation and diffuse infiltration. (H & E; × 20).



FIG. 2

T<sub>1</sub>-weighted sagittal scan, with gadolinium, demonstrating nasopharyngeal mass without extension into the surrounding structures.

Khangure, 1990). Seromucinous retention cysts can originate anywhere in the nasopharynx as well as in the digestive tract. These cysts, which rarely exceed 5 mm in diameter, are common in the nasopharynx and can be multiple (Guggenheim, 1967).

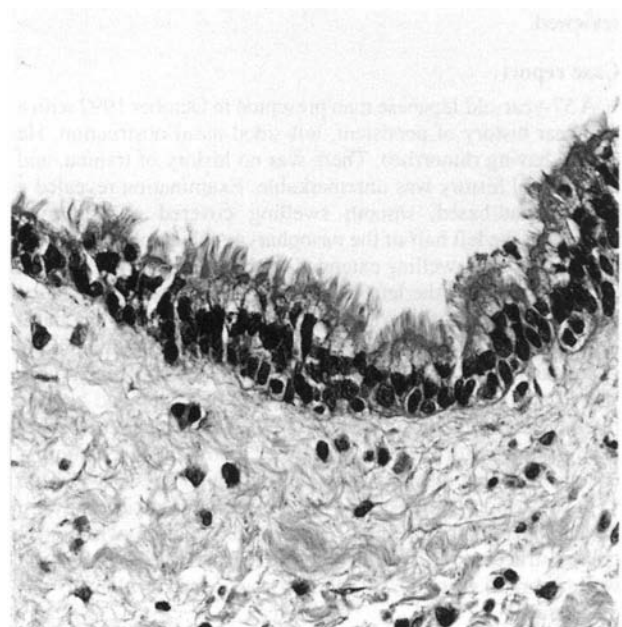


FIG. 4

The cyst wall lined with a pseudostratified ciliated epithelium. (× 100).

They project into the lumen. Taylor and Burwell (1954) described a patient with a large seromucinous retention cyst that was lined with columnar epithelium containing goblet cells. A seromucinous gland was observed to open directly into the lumen of that cyst.

Nasopharyngeal branchial cysts usually occur in the lateral wall of the nasopharynx. Previously reported cases have involved different sites of origin, which can be categorized into two groups: one includes nasopharyngeal cysts arising at a lower level and the other at a higher level. Taylor and Burwell (1954) reported three cases of nasopharyngeal cysts, two of which were situated at a lower level; i.e. from the upper pole of the tonsil to a point just below or behind the eustachian tube orifice. A cyst located in an almost identical site was documented by Canty and Dogra (1978). Mills (1959) and Shidara *et al.* (1993) also reported cysts in similar sites, with extension from the lateral wall between the fossa of Rosenmüller to the upper pole of the tonsil, and in the report by Shidara and his coworkers, nearly reaching the base of the skull.

Shaheen (1961) described two cases of bilateral branchiogenic cysts that arose at a higher level, i.e. from the vault, the fossa of Rosenmüller, and the lateral wall behind the eustachian tube orifice. That author suggests that branchiogenic cysts can develop at any point along an imaginary line drawn upward from the upper pole of the tonsil, behind the eustachian tube orifice, along the fossa of Rosenmüller, and finally, directed medially and slightly forward of the midline of the vault. Yoshimura *et al.* (1986) reported two cases of nasopharyngeal cysts, one of which was situated at the higher level between the roof and the right lateral band of the nasopharynx. In the patient reported here the cyst was found in the fossa of Rosenmüller and extended to the posterior wall and the vault of the pharynx. The wall of the cyst was lined with pseudostratified ciliated epithelium without goblet cells. Thus, the location and histological characteristics of the cyst in our patient were compatible with those of a branchial cyst.

Cysts and other lesions of the nasopharynx, especially if located at a higher level, are often excised via the transpalatal approach (Shaheen, 1961; Badrawy *et al.*, 1974; Singh and Pahor, 1977; Yoshimura *et al.*, 1986). Although this provides adequate access to the nasopharynx, it can produce some damage to the normal palate. To our knowledge, ours is the first report using the endonasal approach for resecting a nasopharyngeal cyst. The cyst was excised completely by endoscopic surgery without damaging the normal tissue. Although this technique requires some proficiency, it merits consideration as an alternative to the transpalatal approach.

## References

- Badrawy, R., Safwat, F., Fahmy, S. (1974) Cysts of the nasopharynx. *Journal of Laryngology and Otology* **88**: 571–578.
- Battino, R. A., Khangure, M. S. (1990) Is that another Thornwaldt's cyst on MRI? *Australasian Radiology* **34**: 19–23.
- Canty, D. P. C., Dogra, T. S. (1978) Branchiogenic nasopharyngeal cyst. *Journal of Laryngology and Otology* **92**: 159–162.
- Guggenheim, P. (1967) Cysts of the nasopharynx. *Laryngoscope* **14**: 2147–2168.
- Giussani, M. (1928) Cisti rinofaringea di origine branchiale. *Annali di Laringologia, Otologia, Rinologia, Faringologia* **29**: 213–226.
- Hoogland, G. A. (1951) Nasopharyngeal cyst of branchiogenic origin. *Journal of Laryngology and Otology* **65**: 515–517.
- Kwok, P., Hawke, M., Jahn, A. F., Mehta, M. (1987) Thornwaldt's cyst: clinical and radiological aspects. *Journal of Otolaryngology* **16**: 104–107.
- Magnotti, T. (1927) Cisti mucosa multiloculare della tonsilla nasofaringea; nota clinico-istologica. *Archivio Italiano di Otologia, Rinologia e Laringologia* **38**: 639–646.
- Mills, C. P. (1959) A branchiogenic cyst of the nasopharynx. *Journal of Laryngology and Otology* **73**: 191–192.
- Shaheen, O. H. (1961) Two cases of bilateral branchiogenic cysts of the nasopharynx. *Journal of Laryngology and Otology* **75**: 182–186.
- Shidara, K., Uruma, T., Yasuoka, Y., Kamei, T. (1993) Two cases of nasopharyngeal branchial cyst. *Journal of Laryngology and Otology* **107**: 453–455.
- Singh, K. P., Pahor, A. L. (1977) Congenital cyst of nasopharynx. *Journal of Laryngology and Otology* **91**: 75–79.
- Taylor, J. N. S., Burwell, R. G. (1954) Branchiogenic nasopharyngeal cysts. *Journal of Laryngology and Otology* **68**: 667–679.
- Yoshimura, H., Fujiyoshi, T., Kurono, Y., Kawauchi, H., Mogi, G. (1986) Two cases of nasopharyngeal cyst. *Practica Otologica (Kyoto)* **79**: 1815–1821.

Address for correspondence:

Dr Y. Tamagawa,  
Department of Otolaryngology/Head and Neck Surgery,  
Jichi Medical School,  
3311-1 Yakushiji,  
Minamikawachi-machi,  
Tochigi-ken,  
Japan 329-04.

Fax: 285-44-5547.