CASE REPORTS

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Endoscopic Management of a Large Tornwaldt Cyst: A Case Report

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ABSTRACT

Objective: To report successful marsupialization of a large Tornwaldt cyst using combined transnasal and transoral endoscopic surgery in a 7-year-old girl who presented with nasal obstruction.

Methods:

Design: Case Report
Setting: Tertiary Government Training Hospital
Patient: One

Result: A 7-year-old girl presented with an 11-month history of recurrent yellowish nasal discharge gradually associated with nasal obstruction. Examination revealed a large, well encapsulated, broad-based cystic mass in the nasopharynx immediately adjacent to the posterior choanae, continuing posterior to the soft palate (pushing the uvula anteriorly) and extending inferiorly to the epiglottic area. Computerized Tomography (CT) demonstrated a well-circumscribed, midline hypodense mass with fluid attenuation obstructing the nasopharyngeal area extending inferiorly to the oropharyngeal area. Endoscopic marsupialization via transnasal and transoral approach was successful, and a respiratory epithelium-lined cyst consistent with a Tornwaldt cyst was confirmed by histopathologic examination

Conclusion: Combined transnasal and transoral endoscopic marsupialization is possible a for a large symptomatic Tornwaldt cyst in a pediatric patient with relatively smaller and complex nasal cavities.

Keywords: *Tornwald cyst, Thornwaldt cyst, nasopharyngeal cyst, endoscopic marsupialization*

Tornwaldt cysts are uncommon congenital cysts of the nasopharynx, usually located in the region of the pharyngeal bursa.[1] Although most are asymptomatic throughout life, large Tornwaldt cysts may cause nasal obstruction, foreign body sensation, halitosis, post nasal discharge, headache and otitis media secondary to eustachian tube dysfunction.[2,3] A search of

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HERDIN and this journal (*Philipp J Otolaryngol Head Neck Surg*) yielded no local case reports on Tornwaldt cysts and the management of symptomatic cases. We document the case of a large Tornwaldt cyst in a 7-year-old girl who presented with chronic purulent nasal discharge and nasal obstruction, and our experience in marsupializing it using combined transnasal and transoral endoscopy.

CASE REPORT

A 7-year-old girl presented with an 11-month history of recurrent yellowish nasal discharge gradually associated with nasal obstruction. She was brought on several occasions to a pediatrician, and had been diagnosed and treated as a case of chronic sinusitis and allergic rhinitis. Antihistamines and antibiotics offered no relief. There were no other symptoms such as fever, ear fullness, hearing loss, otorrhea, dysphagia nor odynophagia noted.

Anterior rhinoscopy revealed boggy turbinates with moderate yellowish nasal discharge. Nasal endoscopy using a 0-degree rigid endoscope revealed a large, well encapsulated, cystic mass in the nasopharynx immediately adjacent to the posterior choanae. Oropharyngeal examination confirmed continuation of the broad-based cystic mass posterior to the soft palate pushing the uvula anteriorly, extending inferiorly to the epiglottic area.

A facial CT scan demonstrated a 4.8 x 2.4 x 1.8 cm well-circumscribed, midline, hypodense mass with fluid attenuation in the nasopharyngeal area significantly obstructing the nasopharyngeal lumen, extending inferiorly to the oropharyngeal area. Partial opacities (from nasal secretions) were noted in the nasal cavity and paranasal sinuses. No bony wall erosion, nasal septum deviation nor intracranial communication was demonstrated. The primary impression was a large Tornwaldt cyst. *(Figure 1)*

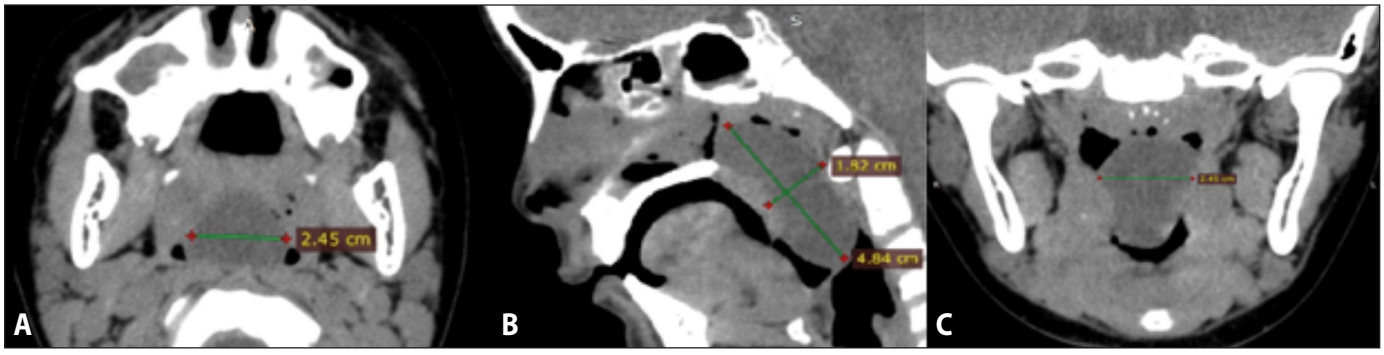

Figure 1. CT scan images, **A.** Axial; **B.** Sagittal; and **C.** Coronal showing a 4.8 x 2.4 x 1.8 cm well-circumscribed, midline hypodense mass with fluid attenuation.

She underwent endoscopic cyst marsupialization via a combined transnasal and transoral approach to the nasopharynx under general endotracheal anesthesia using a south-preformed Right Angle Endotracheal (RAE) tube for better view of the oral cavity. Guided by a 0° rigid nasal endoscope, a transnasal punch of the cyst wall using Blakesley forceps was initially done, and brownish fluid was observed to come out. This confirmed the clinical impression that it was a nasopharyngeal cyst and was unlikely containing cerebrospinal fliud. Further aspiration resulted in marked decrease in cyst size. Marsupialization of the nasopharyngeal portion of the cyst wall was performed transnasally and oropharyngeal remnants of the cyst were accessed transorally using 0° and 30° rigid nasal endoscopes. *(Figure 2)*

A powered straight and curve blade Straightshot M4 Microdebrider® (Medtronic Xomed® Jacksonville, FL USA) allowed complete marsupialization down to the base of the cyst. There was minimal bleeding noted, but anterior and posterior nasal packing were applied in anticipation of postoperative bleeding. Intraoperative intravenous tranexamic acid and dexamethasone were given and continued postoperatively for a day, along with oral ibuprofen and intravenous nalbuphine for pain control. The procedure lasted 1 hour and 30 minutes. Nasal packing was removed the next day, and she was subsequently discharged on regular weekly follow-up visits for 1 month. There was resolution of the yellowish nasal discharge, and good mucosal healing was observed during her serial follow-up visits.

Final histopathology revealed a respiratory epithelium- lined cyst. In conjunction with the clinical and radiologic findings, the diagnosis of a Tornwaldt cyst was made.

DISCUSSION

A Tornwaldt (also known as Thornwaldt) cyst is an embryologic remnant of the pharynx-to-notochord contact located at the midline posterosuperior portion of the nasopharynx. It is classified as a congenital cyst of the nasopharynx, along with the Rathke pouch cyst and dermoid cyst.[2,3] The said area, otherwise known as a pharyngeal bursa, is a sac-like depression at the posterior portion of the nasopharyngeal

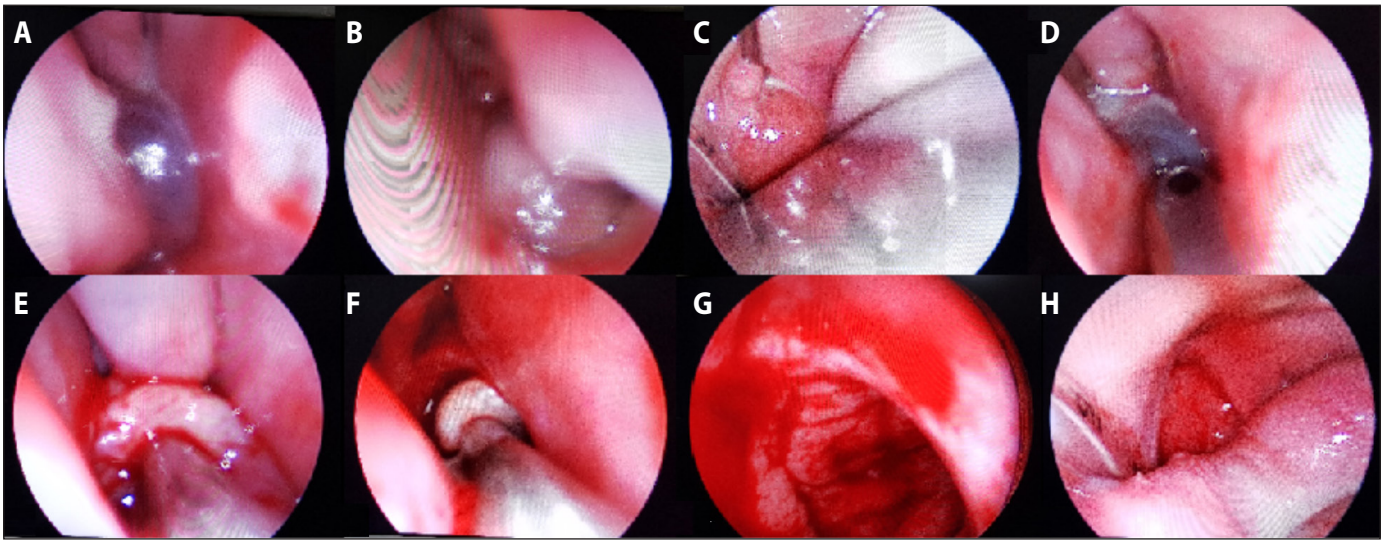

Figure 2. Endoscopic views of: **A, B.** Tornwaldt cyst (TC) through both nasal cavities; **C.** TC through the oropharynx; **D.** transnasal biopsy of the cyst wall; **E.** aspiration of the cyst; **F.** marsupialization using a microdebrider; **G.** marsupialized cyst base through the nasal cavity; and **H.** through the oral cavity.

wall that develops during sixth to tenth week of gestation, when the notochord transiently comes in contact with the superior portion of the pharyngeal mucosa.[2] Persistence of this communication forms an ingrowth of pharyngeal respiratory epithelium, which form the Tornwaldt bursa, and once the orifice is partially or totally obstructed as result of infection or after adenoidectomy, a fluid-filled potential space called a Tornwaldt cyst is formed.[4-6]

This nasopharyngeal cyst was first observed in 1840 by Mayer in autopsy specimens[7] and eventually recognized in 1885 by Gustoff Ludwig Tornwaldt as a pathologic entity.[8] In 1912, Huber postulated that a pharyngeal bursa may form in the nasopharynx where the notochord has retained its communication with the pharyngeal epithelium.[9]

This uncommon congenital cyst was found by Moody *et al*. to have a prevalence rate from 1.4 to 3.3% in autopsies, and from 0.2 to 5% in Magnetic Resonance Imaging (MRI) studies.[10] They also found that most Tornwaldt cysts are small, with an average volume of 0.66cm^3 and 0.58cm^3 on CT and MRI, respectively.[10] The cyst found in our patient was large, measuring 4.8 x 2.4 x 1.8 cm, or having a volume of 20.74 cm^3.

Tornwaldt cysts can be classified as crusting or cystic. The crusting type can spontaneously rupture and drain into the nasopharynx, but the cystic variety does not drain because its means of drainage is completely obstructed.[11] A Tornwaldt cyst may cause Tornwaldt disease if it is infected or inflamed, and causes eustachian tube dysfunction, otitis media, halitosis, pharyngitis and occipital headache.[11] Our patient qualifies as having Tornwald disease due to the persistent yellow nasal discharge that did not adequately respond to antibiotics.

MRI is optimal for investigating soft tissue masses such as nasopharyngeal cysts. Jyotimar *et al*. recommended MRI as the preoperative imaging of choice owing to the high signal created by the high cystic protein concentration and blood products.[12] Facial CT scan with contrast was requested for the patient due to its cost effectiveness, and for the information it provides to rule out bony defects of the skullbase and the cervical spine, with which the cyst was intimately related.

A 5-year retrospective study by El-Anwar *et al*. of 11 patients undergoing transnasal endoscopic approach to Tornwaldt cysts using a microdebrider noted significant improvement in headache and nasal obstruction.[13] Complete wound healing was noted within 6 weeks and no reoperation was documented.[13] There was no cyst recurrence, with resolution of symptoms (particularly ear related symptoms secondary to eustachian tube dysfunction) and normal tympanometry.[13] However, the majority of their patients were adults with relatively larger nasal cavities and smaller Thornwaldt cysts (range 5-20mm) compared to our case.

In our patient, the Tornwaldt cyst was relatively large, obstructing the nasopharyngeal airway and nasal mucociliary clearance and resulting in chronic rhinosinusitis and difficulty in breathing through the nose. These immediately resolved after the surgery. The use of combined approaches provided optimal visualization of and access to the nasopharynx. Prudence and caution dictate that an initial cyst aspiration or small punch be done to confirm that the cyst contents are indeed not cerebrospinal fluid, prior to proceeding with marsupialization. Powered

instrumentation such as the Microdebrider® allowed for precise excision of delicate cyst walls, less traumatic intranasal instrument manipulation, and visualization due to the suction feature.

This case exemplifies the need for otolaryngologic referral and evaluation of cases of chronic rhinosinusitis that do not improve with maximal medical management. Because nasopharyngeal lesions such as these are uncommon and impossible to visualize without specialized diagnostic procedures and equipment, these may go undetected as a source of chronic ear, nose, and throat conditions.

To the best of our knowledge, this is the first locally-reported case of a Tornwaldt cyst, based on our literature search of HERDIN and this journal. These cysts may not be rare, but the large size of the cyst in this case is uncommon, and our experience in the management of this case is worth documenting.

In conclusion, our experience suggests that a combined transnasal and transoral endoscopic marsupialization is a safe and effective solution for a large symptomatic Tornwaldt cyst in a pediatric patient with relatively smaller and complex nasal cavities.

REFERENCES

1. Weissman JL. Thornwaldt Cysts. *Am J Otolaryngol*. 1992 Nov 01;13(6):381-5. DOI: 10.1016/0196-0709(92)90080-D; PubMed PMID: 1443394.
2. Kulsange KL, Nagle S, Jagade M, Gupta P, Pandhare M, Parelkar K et al. Thornwaldt cyst: case report. *International Journal of Otolaryngology and Head & Neck Surgery*. 2016 Sep 30; 5(2016): 203-7. DOI: 10.4236/ijohns.2016.55032.
3. Conley LM, Phillips CD. Imaging of the central skull base. *Radiol Clin North Am*. 2017 Jan; 55(1): 53-67. DOI: 10.1016/j.rcl.2016.08.007; PubMed PMID: 27890188.
4. Magliulo G, Fusconi M, D'Amico R, Vincentis MD. Tornwaldt's cyst and magnetic resonance imaging. *Ann Otol Rhinol Laryngol* 2001; 110(9):895-896. DOI: 10.1177/000348940111000916; PubMed PMID: 11558769.
5. Kawok P, Hawke M, Jahn AF, Mehtha M. Tornwaldt's cyst: clinical and radiological aspects. *J Otolaryngol* 1987; 16: 104-107. PubMed PMID: 3599152.
6. Shank EC, Burgess LPA, Geyer CA. Tornwaldt's cyst: case report with magnetic resonance imaging. *Otolaryngol Head Neck Surg*. 1990; 102: 169-173. DOI: 10.1177/019459989010200213; PubMed PMID: 2113242.
7. Mayer AFC1. Bursa seu Cystis tubae eustachianae bei eingen saugcthieren. Neue Notizen aus dem Gebiete der Nature und heilk unde von Froe iep. 1840 ;14:1.[German]
8. Tornwaldt GL. Uberdi e Bedeutung der bursa pharygea furdieerkennung und behandlung gewisser nasen rauchenraum . Krankheiten.Weisbaden: J.E Bergmann; 1885.[German]
9. Huber GC. On the relation of the Chorda Dorsalis to the Anlage of the Pharyngeal Bursa or Median Pharyngeal Recess. *Anat Rec*. 1912 Oct; 6:373-4 04. DOI: 10.1002/ar.1090061002.
10. Moody MW, Chi DH, Mason JC, Phillips CD, Gross CW, Schlosser RJ. Tornwaldt's cyst: incidence and a case report. *Ear Nose Throat J*. 2007 Jan; 86(1): 45-7: 52. PubMed PMID: 17315835.
11. Miyahara H, Matsunaga T. Tornwaldt 's disease. *Acta Otolaryng Suppl* 1994;517 :369. DOI: 10.3109/00016489409124336; PubMed PMID: 7856446.
12. Jyotirmay H, Kumar SA, Preetam P, Manjunath D, Bijiraj VV. Recent trends in the management of Thornwaldts cyst: A case report. *J Clin Diagn Res*. 2014 Aug 20; 8(8): 3-4. DOI: 10.7860/JCDR/2014/8086.4695; PubMed PMID: 25302225; PubMed Central PMCID: PMC4190747.
13. El-Anwar MW, Amer HS, Elnashar I, Askar SM, Ahmed AF. 5 years follow up after transnasal endoscopic surgery of Thornwaldt's cyst with powered instrumentation. *Auris Nasus Larynx*. 2015 Feb; 42(1): 29–33. DOI: 10.1016/j.anl.2014.08.016; PubMed PMID: 25240946.