

Tornwaldt's cyst: Incidence and a case report

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Abstract

Tornwaldt's cyst is an uncommon type of nasopharyngeal cyst that may cause clinically significant symptoms. We reviewed reports of 31,855 computed tomography (CT) scans and 21,158 magnetic resonance imaging (MRI) scans to ascertain how many Tornwaldt's cysts were discovered incidentally. These images had been obtained between Jan. 1, 1994, and Dec. 31, 1999, at the University of Virginia Health Sciences Center. We found that 32 Tornwaldt's cysts had been incidentally detected in 20 women and 12 men. Four of these cysts had been found on CT (0.013%; mean size: 0.66 cm³) and 28 on MRI (0.13%; mean size: 0.58 cm³). The overall rate was 0.06% (32/53,013). The most common indications for imaging in these patients were headache, seizures, dizziness/vertigo, and pharyngeal symptoms. We also report the case of a patient with asymptomatic Tornwaldt's cyst whose symptoms resolved after treatment with endoscopic marsupialization. Tornwaldt's cyst should be remembered as an uncommon but potentially treatable cause of many symptoms seen in a typical otolaryngology practice.

Introduction

Tornwaldt's cysts (sometimes called Thornwaldt's cysts) develop as a result of abnormal embryologic development at the posterior wall of the nasopharynx. First noted in autopsy specimens by Mayer¹ in 1840, this cyst-like structure at the caudal end of the nasopharyngeal tonsil was established

as a pathologic entity by Tornwaldt² in 1885. Huber later described how irregular notochord regression in the sixth week of gestation leads to its formation.³ If, after reaching its most cephalic position, the notochord retains an attachment to the pharyngeal endoderm as it regresses toward the skull base, an invagination of the developing pharyngeal mucosa is created.⁴ In-growth of respiratory epithelium along this pathway creates a flat pharyngeal bursa in the area or, if the drainage pathway of the bursa becomes obstructed, a Tornwaldt's cyst.⁵ Thus, the position of Tornwaldt's cyst reflects the location of the abnormal adhesion between notochord and pharyngeal endoderm—that is, in the midline just above the fibers of the superior pharyngeal constrictor and at the same level as the fossa of Rosenmüller.⁶⁻⁸

Tornwaldt's cysts are classified as crusting and cystic. The crusting types regularly and spontaneously drain into the nasopharynx; the cystic types do not drain because the drainage pathway is completely obstructed.⁴ A Tornwaldt's cyst may progress to Tornwaldt's disease if it becomes infected or inflamed and produces symptoms such as eustachian tube dysfunction, otitis media, halitosis, pharyngitis, and occipital headache.^{4,7,9,10} Indeed, adenoidectomy and other inflammatory insults to the area have been implicated, albeit inconclusively, as mechanisms by which a pharyngeal bursa initially becomes obstructed, leading to the formation of a Tornwaldt's cyst from what was once just a potential space.^{5,11,12}

The overall incidence of Tornwaldt's cyst has not been clearly established. Some authors have reported a 1.4 to 3.3% incidence in autopsy specimens,^{13,14} and others have reported incidental findings of Tornwaldt's cyst on magnetic resonance imaging (MRI) ranging from 0.2% to as high as 5% of films reviewed.^{8,15-17}

In this article, we report the results of our own study of Tornwaldt's cysts incidentally discovered on computed tomography (CT) and MRI, and we describe the management of one particular case.

Materials and methods

We reviewed all radiology reports of head CT and MRI scans done at the University of Virginia Health Sciences Center

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between Jan. 1, 1994, and Dec. 31, 1999, for mentions of a Tornwaldt's cyst. A total of 31,855 CTs and 21,158 MRIs had been performed during that period.

The charts of patients identified as having a Tornwaldt's cyst were reviewed for demographic data, symptomatology, associated medical conditions, and previous adenoidectomy.

Results

The records revealed 32 cases of incidentally discovered Tornwaldt's cyst—4 on CT (0.013%) and 28 on MRI (0.13%). The overall rate was 0.06% (32/53,013). This group of patients was made up of 20 women and 12 men, aged 21 to 80 years (mean: 46.7). The average size of the cysts identified on CT and MRI was 0.66 cm³ and 0.58 cm³, respectively.

The most common indications for imaging were headache, seizures, dizziness/vertigo, and pharyngeal symptoms (i.e., sore throat and postnasal drip) (table). A previous adenoidectomy had been performed on 5 of the 32 patients (15.6%), but the incidence of adenoidectomy in the entire population was not determined.

Discussion

The overall incidence of Tornwaldt's cyst in our radiographic review was 0.06%, which suggests that this lesion may be much less common than the 1.4 to 3.3% rate suggested by studies done at autopsy in the 1940s to 1960s.^{13,14} It is possible that because our study was limited to a specific subgroup of the population—namely, patients who needed to undergo detailed radiographic imaging of the head—that our findings were skewed by a sampling bias. However, why such a bias would have an effect on the overall incidence of this particular pathologic entity is not clear.

It is also theoretically possible that the earlier autopsy studies^{13,14} detected Tornwaldt's cysts that were too small to be seen on MRI. However, given that the average size of the cysts detected by MRI in our study was roughly one-half of a cubic centimeter, this seems unlikely.

It is also true that pharyngeal bursae, which are essentially potential Tornwaldt's cysts, are more detectable at autopsy than on imaging, but there is no suggestion that the authors of the early incidence studies^{13,14} confused the two. Moreover, some recent MRI-based incidence studies^{8,17} confirm the autopsy reports.

Our findings are in concordance with those of some other fairly recent incidence studies done by MRI.^{15,16} Although it is possible that the incidence of Tornwaldt's cyst has fallen over time, no evidence has been presented to support this notion. Still, perhaps the incidence has indeed been lowered as a result of the increase in the use of folic acid to prevent spinal cord defects such as spina bifida. Abnormal notochord development is involved in both spinal cord defects and Tornwaldt's cyst, and folic

acid has been shown to be effective in reducing the risk of the former.¹⁸

The superiority of MRI over CT in delineating soft-tissue lesions likely explains why Tornwaldt's cysts are detected more often on MRI. These cysts are hyperintense on T2-weighted MRIs, and when the fluid content is especially protein-rich, they are hyperintense on T1-weighted images, as well.¹⁰ On the other hand, Tornwaldt's cysts do not enhance with intravenous contrast,¹⁰ so similarly sized lesions are harder to spot on CT; these cysts may simply blend in with the surrounding nasopharyngeal soft tissue. This may also explain why the average size of the Tornwaldt's cysts seen on MRI in our study was smaller than that of the cysts seen on CT.

The particular population sampled by our study—that is, patients who required detailed radiographic imaging of the head—does explain why the most common symptoms among our population were headache, seizures, dizziness/vertigo, and pharyngeal symptoms. These are common indications for imaging of the brain and brainstem, so it would not be correct to infer that these symptoms are specific to Tornwaldt's cyst. There is no immediate or obvious reason to believe that the incidence of Tornwaldt's cyst in our population would be any different from that of the population at large, with the possible caveat that Tornwaldt's cysts are sometimes responsible for occipital headaches.^{4,7} In our study, no exact descriptions of the types of headaches for which imaging was indicated were available.

The presence of several otolaryngology-related complaints in our study is of note (table). Sore throat, postnasal

Table. Characteristics of patients (n = 32) with incidentally identified Tornwaldt's cyst

Characteristic	n (%)
Headache	9 (28.1)
Seizures	8 (25.0)
Dizziness/vertigo	8
Pharyngeal symptoms*	7 (21.9)
Peptic ulcer disease	6 (18.8)
Sinus congestion	6
Nasal polyposis	5 (15.6)
Pulmonary symptoms	5
Previous adenoidectomy	5
Cranial nerve dysfunction	4 (12.5)
Eustachian tube dysfunction	4
Malaise	4
Obstructive sleep apnea	3 (9.4)

* Sore throat and postnasal drip.



Figure 1. The large Tornwaldt's cyst is seen on a midsagittal T1-weighted MRI (A), an axial T2-weighted MRI (B), and a coronal T2-weighted MRI (C).

drip, sinus congestion, eustachian tube dysfunction, and obstructive sleep apnea are all complaints that could be caused by a Tornwaldt's cyst.^{4,9} It is possible that some of these patients actually had a symptomatic Tornwaldt's cyst that had escaped the notice of their clinicians during physical examination. It is likely that the large majority of Tornwaldt's cysts, including those that cause mild symptoms, go undiagnosed as the cause of a particular discomfort because they are small and often blend with the posterior pharyngeal wall. To suggest that a Tornwaldt's cyst was causing a particular symptom, one would have to demonstrate that surgical decompression and removal of the cyst led to a resolution of the complaint. We describe one such case below.

Case report

A 28-year-old woman, an attorney, had been referred to a neurologist for evaluation of headache and dizziness. Her symptoms, which had developed over the course of 1 month, were evaluated by MRI, electroencephalography, and lumbar puncture. Her medical history included childhood pneumonia that resolved with appropriate therapy. Findings on the neurologic evaluation were inconclusive. The only abnormal finding at that point was a Tornwaldt's cyst noted incidentally on MRI (figure 1). The patient was referred to an otolaryngologist for investigation of a possible vestibular problem.

A thorough examination of the head and neck revealed only a mild amount of post-nasal drainage, and vestibular and balance testing showed mild vestibular dysfunction. A repeat neurologic examination included a repeat MRI

of the head and another lumbar puncture to rule out a demyelinating process. The MRI ruled out white-matter disease, but the Tornwaldt's cyst was again noted.

A repeat examination by the otolaryngologist identified a small, previously unnoticed bulge in the nasopharynx consistent with a Tornwaldt's cyst. After local anesthesia was administered, a small biting forceps was used to widely open the cyst. No purulence was noted, although the patient did report mild symptomatic relief. She was asked to return for follow-up 2 weeks later and to complete a course of oral antibiotics in the meantime.

At the follow-up visit, the patient reported an almost complete resolution of her headache and dizziness. She was scheduled for endoscopic marsupialization of this cyst (figure 2). In the operating room, she was administered general anesthesia, and a soft-tissue shaver was used to remove the entire anterior wall of the cyst. Surgery was complicated by diffuse oozing of blood around the cyst, and the patient had to be reintubated following surgery so that excessive bleeding could be controlled with suction cautery. She was admitted for overnight observation and discharged the following day.

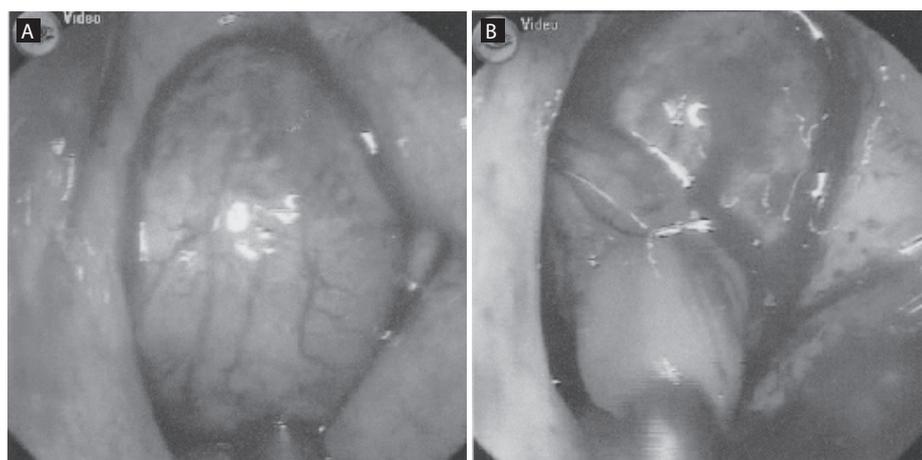


Figure 2. Endoscopy shows the large cyst before (A) and after (B) marsupialization. Note the extruding cyst contents.

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