



Thornwaldt's Cyst

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Abstract

The nasopharynx is a cuboidal compartment extending from the base of the skull to the soft palate. Thornwaldt's bursa, also known as nasopharyngeal bursa, is a recess in the midline of the nasopharynx, which is produced by persistent notochord remnants. If the opening of the bursa is occluded, benign midline nasopharyngeal mucosal cyst called Thornwaldt cyst develops. Thornwaldt cysts are almost always asymptomatic. However, if they become infected or exposed to trauma they can cause some symptoms include halitosis, occipital headache and postnasal drip. The diagnosis of this mass is usually incidental as part of a nasal endoscopic examination. Radiological and endoscopic examination can be used to diagnose the cyst. Radiographs frequently demonstrate a soft tissue mass with sharply defined margins high on the posterior pharyngeal wall. The differential diagnosis should include a meningocele or meningo-encephalocele. Various therapeutic approaches, including endoscopic, transoral, or transpalatal surgical interventions, can be used for treatment of symptomatic cysts.

Key words: Nasopharyngeal, Thornwaldt, cyst, diagnosis, MRI, treatment.

Thornwaldt Kistleri

Özet

Nazofarinks kafa tabanından yumuşak damağa uzanan küboidal bir kompartmandır. Nazofarengeal bursa olarak da bilinen Thornwaldt bursası, nazofarenks orta hattında bulunan bir çıkmaz olup persistan notokord kalıntılarından meydana gelmiştir. Bursa ağzı tıkanıp Thornwaldt kisti olarak bilinen benign mukozal nazofarenks kisti gelişir. Thornwaldt kistleri çoğu zaman asemptomatiklerdir. Bununla birlikte enfekte olduklarında veya travmaya maruz kaldıklarında halitosis, oksipital baş ağrısı ve post nazal akıntı gibi semptomlara yol açabilirler. Tanı genellikle nazal endoskopik inceleme esnasında tesadüfi olarak konur. Tanıda radyolojik ve endoskopik inceleme kullanılmakla birlikte radyografide posterior faringeal duvarın yukarısında keskin sınırlı yumuşak doku kitlesi şeklinde görülür. Ayırıcı tanıda meningo-sel ve meningoensefalosel akla gelmelidir. Semptomatik kistlerin tedavisinde endoskopik, transoral, transpalatal cerrahi girişimleri içeren çeşitli yaklaşımlar kullanılabilir.

Anahtar kelimeler: Nazofarengeal, kist, Thornwaldt, tanı, MRI, tedavi

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INTRODUCTION

In some cases notochord remnants persists and cause a midline resect at nasopharynx called nasopharyngeal bursa. Various circumstances sometimes contributes to develop a cyst from that bursa. Mayer was the first to describe a cyst-like mass in the posterior wall of the nasopharynx in 1840. In 1885, German physician Gustav Ludwig Thornwaldt, presented 26 cases of nasopharyngeal cysts and described both the clinical symptoms and his methods of treatment in detail. Traumatic manipulation and infections can cause cyst formation. The diagnosis of Thornwaldt's disease begins with a history of symptoms, followed by confirmation by nasopharyngoscopy and image study. Mass usually encountered midline and the surface is covered with intact mucosa (1). Magnetic resonance imaging (MRI) examination is more specific than computed tomography (CT) for the diagnosis of the Thornwaldt's cysts (2). There are variable benign lesions which affect the nasopharynx include juvenile angiofibroma, meningocele. The treatment of choice for Thornwaldt's cyst is surgical removal or marsupialization.

Anatomy: The nasopharynx is a cuboidal compartment extending from the base of the skull to the soft palate. The superior and posterior walls of the nasopharynx are complete and are formed by the basisphenoid, the basiocciput, the atlas, and the axis. The anterior wall is penetrated by the posterior choanae, and the lateral walls are interrupted by the eustachian tube orifices. Each eustachian tube enters the nasopharynx through the sinus of Morgagni above the superior pharyngeal constrictor muscle, and the posterior lip of each tubal orifice is a prominent cartilaginous crescent known as the torus tubarius. The fossa of Rosenmüller is located immediately superior and posterior to the torus. The dorsal surface of the soft palate forms the anterior portion of the inferior nasopharyngeal wall, and posteriorly this wall opens into the oropharynx at the isthmus. The soft tissue supporting structures of the nasopharynx are the pharyngobasilar fascia and the superior constrictor muscle, which are suspended from the basiocciput just anterior to the foramen magnum. The fascia is continuous with that of the foramen lacerum and is in close proximity to five other foramina, including the foramen ovale, the foramen spinosum, the carotid canal, the jugular foramen, and the hypoglossal canal. These relationships assume importance in the consideration of intracranial extension of nasopharyngeal disease. The mucous membrane of the nasopharynx contains lymphoid tissue, epithelial tissue,

and minor salivary glands. The lymphoid tissue component lies within and deep to the mucosa, is of the B-cell type, and contains follicles and germinal centers but does not possess a capsule or sinusoids. Efferent lymphatic flow is bilateral and is directed to the lateral retropharyngeal nodes of Rouviere, the jugulodigastric nodes, and the spinal accessory chain (3).

Histology

The epithelial component of the nasopharyngeal mucous membrane is variable and contains stratified squamous epithelium, ciliated pseudostratified epithelium, and indeterminate epithelium. The ciliated pseudostratified type predominates in infancy, but with time, metaplasia occurs and results in the transformation of the respiratory epithelium into the stratified squamous cell type. In adults, the superior and lateral walls of the nasopharynx are lined by ciliated pseudostratified epithelium, and the posterior wall is lined by stratified squamous epithelium. Because the nasopharynx (including its epithelium, lymphoid tissue, and supporting structures) contains a wide variety of cell types, many different lesions may occur. These lesions range from embryologic anomalies to benign and malignant neoplasms (3).

Epidemiology

The lesion is developmental and usually asymptomatic. Peak incidence has been variably reported between the ages of 15 and 60 years of age. In most cases it is found incidentally and as such age of diagnosis represents age of imaging of the nasopharynx. A Thornwaldt cyst has an autopsy prevalence of approximately 4%, with no gender predilection (2). Most Thornwaldt's cysts appear clinically in the second and third decades of life, with males and females affected equally.

Histopathology

If the pharyngeal segments of the primitive notochord remain connected to the endoderm in the nasopharynx, a bursa or embryonic pouch occurs. In approximately 3% of individuals, this invaginated connection persists, and the resulting sac and canal, located in the posterior midline of the nasopharynx, extends posteriorly and cephalad toward the occipital bone. If its opening becomes obstructed, possibly due to infection or a complication from adenoidectomy, a Thornwaldt's cyst might develop (5). And if the cyst becomes infected, an abscess will result. In 1912, Huber, in a description of the embryologic formation of Thornwaldt's bursa, reported that a poten-

tial space could develop in the nasopharynx at the point where the notochord retained its union with the pharyngeal endoderm. His report was the first to discuss this pathway for the ingrowth of respiratory epithelium and the formation of a potential space in the midline of the posterior superior angle of the nasopharynx (nasopharyngeal bursa) (6). The cyst is lined by respiratory epithelium and accumulates with fluid with variable proteinaceous content.

Clinical Presentation

This lesion is usually asymptomatic, although some patients may present with postnasal drip due to the extrusion of the contents of the cyst occasionally. The diagnosis of this mass is usually incidental as part of a nasal endoscopic examination. Thornwaldt classified the symptoms into proximal and associated symptoms. Proximal symptoms were defined as the results of local inflammation in the nasopharynx. Associated symptoms included alterations in nasal mucosa (hyperemia, hyperplasia, and possibly nasal polyp), ear diseases, granular pharyngitis, chronic laryngitis (in particular the involvement of the interarytenoid portion), bronchitis, chronic gastritis, reflex cough due to irritation of the larynx, bronchial asthma, chest pain in the manubrium of the sternum and headache. The three most common symptoms are persistent and notable nasal discharge, obstinate occipital headache, and halitosis (7). In cases of infection, the posterior nasal dripping will be purulent and have a foul odor. The occipital headache would be dull and exacerbated by movement of the head. Soreness and stiffness of cervical muscles may also be present. Ear fullness or pain may be caused by dysfunction of the Eustachian tube secondary to local inflammation or compression. Direct or indirect nasopharyngoscopy. Both flexible and rigid nasopharyngoscopy can be used for direct nasopharyngoscopy. Findings are that of a smooth, submucosal usually centrally located mass superior to the adenoidal pad with a yellow hue due to the cystic contents. Frequently, a central dimple or fistula is identified. Occasionally, the lesion can be darker colored due to a hemorrhage or hemosiderin content.

Radiographic Features

Radiographs frequently demonstrate a soft tissue mass with sharply defined margins high on the posterior pharyngeal wall. Other characteristics include superior location, absence of surrounding soft tissue reaction, and a lack of bony involvement. Both CT and MRI can be used

in the diagnosis of Thornwaldt's cyst. MRI is more effective than CT in detection and characterization of these lesions. A CT scan demonstrates a soft tissue mass located high on the posterior nasopharyngeal wall with sharp borders. MRI of the nasopharynx is a sensitive method for detecting and evaluating cystic lesions of the nasopharynx (8,9). The lesion usually has a characteristic high signal intensity on T2-weighted and intermediate to high signal intensity on T1-weighted MRI imaging (10,11). The variation in signal intensity on T1-weighted images may be related to differences in protein content or hemorrhage in the cyst (12). They are variable in size, ranging from a few millimetres to a few centimetres in diameter, but are typically 2 - 10mm in size (12,4). Postcontrast exams may reveal no peripheral enhancement unless an infection develops.

Differential diagnosis

When diagnosing nasopharyngeal cyst-like lesions, several cysts require differentiation: Thornwaldt's cyst, branchial cleft cyst, Rathke's pouch cyst, adenoid retention cyst, meningoceles or meningoencephaloceles, sphenoid sinus mucoceles, and nasopharyngeal carcinoma. There are also a variety of benign vascular lesions that affect the nasopharynx. These lesions include juvenile angiofibroma, haemangioma, and haemangiopericytoma. Branchial cleft cysts are usually found in the lateral site of the nasopharyngeal space, but Thornwaldt's, Rathke's pouch, and adenoid retention cysts are found in the midline site. Rathke's pouch cyst has an internal stratified squamous-lined epithelium, compared to the cylindrical ciliated epithelium in Thornwaldt's cyst and adenoid retention cyst. Thornwaldt's cyst is deep in the pharyngobasilar fascia, whereas retention cyst is usually found on the surface of the pharyngobasilar fascia. On histopathology, the walls of a Thornwaldt's cyst are found to be slightly infiltrated by lymphocytes and lack lymph follicles, while adenoid retention cysts are multiple cysts surrounded by abundant lymphoid tissue, many inflammatory cells, and germinal centers (13). Histopathology can provide useful information, especially in differentiating benign and malignant lesions. However, Thornwaldt' cyst need not be removed or biopsied if the diagnosis is apparent. When the nasopharyngeal mass is of a large size, protrudes from the nasopharyngeal cavity roof, has an erosion surface or is suspected to be malignant, complete imaging study should be performed before biopsy. When a dark coloured lesion encountered it should be removed or at least biopsied to exclude a melanoma.

Treatment

Asymptomatic cysts do not require treatment (6,14). The root of the cyst can be adherent to the underlining prevertebral fascial and complete exenteration would best be done under general anesthesia. The treatment of choice for Thornwaldt's cyst is surgical removal or marsupialization. Generally, transnasal endoscopic marsupialization provides excellent surgical visual field and avoids damage to the orifice of the Eustachian tube. The advantages of an endoscopic approach are also that it is a safe, fast, and effective treatment(15). Marsupialization under nasal endoscopic guidance provides excellent visualization during operation and is the preferred treatment of large Thornwaldt's cysts. However, transpalatal intervention, may be used for the treatment of large cysts. The wound after resection heals well, as in a case of adenoidectomy(16).

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