Abstract. Nasopharyngeal cysts are typically benign, congenital lesions filled with fluid and encapsulated from surrounding tissues. Both children and adults may present with clinical signs.

The aim of the study was to improve the efficiency of diagnostics and treatment of nasopharyngeal cysts in adults based on the differential diagnosis.

Materials and Methods. The study was carried out at the Department of Otolaryngology with the Course of Head and Neck Surgery, Ivano-Frankivsk National Medical University, Ukraine, and encompassed both outpatient and inpatient-to-outpatient observations. Fifteen (9 females, 6 males) patients with nasopharyngeal cysts at the age of 28 to 51 years were examined. All patients underwent a comprehensive assessment, including a thorough evaluation of their medical history, a standard examination of the ears, nose, and throat (ENT) using conventional and optical techniques, alongside computed tomography (CT) of the nasopharynx and paranasal sinuses, complemented by a general physical examination.

Results. Fifteen patients with nasopharyngeal cysts were examined and treated. In nine (60%) cases, the cyst appeared as a round mass with a dense wall, partially or completely obstructed by the excretory duct and containing dense content, localized in the central region of the nasopharynx. In four (26.6%) cases, the cyst ruptured. Cysts were localized laterally, originating from the fossa of Rosenmüller in three (20%) cases. All patients underwent minimally invasive surgery.

Conclusions. Endoscopic examination, CT, and magnetic resonance imaging are the most informative diagnostic methods for nasopharyngeal cysts. A definitive diagnosis can be made based on pathomorphological examination. The treatment of choice for nasopharyngeal cysts is endoscopic endonasal surgery with a microdebrider and laser coagulation.

Keywords: ENT Diseases; Nasopharyngeal Cysts; Endoscopy; Computed Tomography; Pathomorphology; Lymphoid Tissue; Eustachitis

Problem Statement and Analysis of the Recent Research

Nasopharyngeal cysts are typically benign, congenital lesions filled with fluid and encapsulated from surrounding tissues. Both children and adults may present with clinical signs. According to the literature, it is quite rare. The pharyngeal bursa was first described by Mayer in 1840. Forty-five years later, in 1885, German physician Gustav Ludwig Tornwaldt (1843-1910) reported the association of specific clinical symptoms with the pharyngeal bursa, including its occlusion, cystic changes, and subsequent inflammation, which was referred to as Tornwaldt disease. In 1934, Huber demonstrated that development of the bursa was due to anomalies occurring around the 5th to 10th weeks of embryogenesis and was associated with detachment of notochord from the pharyngeal endoderm [1-6].

Tornwaldt cyst is a nasopharyngeal midline formation in the projection of the pharyngeal orifices of the auditory tubes, and according to various sources, its prevalence ranges from 1% to 3% [1,2,5].

Endoscopic examination of the nasal cavity and nasopharynx greatly simplifies the diagnosis of pathological conditions with such localization. Inflammation of the nasopharynx-associated lymphoid tissue and nasopharyngeal tonsil, hyperplastic changes, and cysts can cause nasal breathing difficulties, discomfort, hearing loss, and become a recurrent infection in patients.

The aim of the study was to improve the efficiency of diagnostics and treatment of nasopharyngeal cysts in adults based on the differential diagnosis.

Materials and Methods

The study was carried out at the Department of Otolaryngology with the Course of Head and Neck Surgery, Ivano-Frankivsk National Medical University, Ukraine, and encompassed both outpatient and inpatient-to-outpatient observations. 15 patients (9 males, 6 females) with nasopharyngeal cysts at the age of 28 to 51 years were examined.

All patients underwent a comprehensive assessment, including a thorough evaluation of their medical history, a standard examination of the ears, nose, and throat (ENT) using conventional and optical techniques, alongside computed tomography (CT) of the nasopharynx and paranasal sinuses, complemented by a general physical examination.

Results

Upon examination, patients reported complaints of viscous postnasal drip, nasal congestion, past recurrent catarrhal or secretory otitis, halitosis, and headache. In 15 (100%) cases, endoscopic examination revealed a round, dense elastic cystic lesion measuring 0.5 cm to 1.5 cm in diameter in the midline of the posteroinferior wall of the nasopharynx or at the level of the pharyngeal orifices of the auditory tubes (Fig. 1).
In addition, cysts originating from the fossa of Rosenmüller and tori tubarii, the wall of which was less dense, were visualized. Tubal tonsil hypertrophy was noted. Such cyst localization is often the cause of eustachitis (Fig. 2).

CT and magnetic resonance imaging (MRI) revealed solitary round masses not associated with pharyngeal muscles (Fig. 3).

Nine (60%) patients underwent endoscope-assisted trans-nasal or trans-oral epipharyngeal cyst resection with a microdebrider and laser coagulation. Laser coagulation was particularly applied to patients with an open Tornwaldt bursa resulting in postnasal dripping (Fig. 4). In 4 (26.6%) cases, partial destruction of the tubal tonsils and plastic reconstruction of tubal tubarii were simultaneously performed.

The histological examination revealed intralymphatic nasopharyngeal cysts in all patients. Cyst walls were composed of lymphoid and connective tissues with lymphocytic infiltration, lined with multilayered ciliated epithelium (Fig. 5).

Fig. 1. a) a nasopharyngeal cyst; b) thick viscous cystic content; c) cyst cavity and walls.

Fig. 2. a) a cyst in the upper portion of the fossa of Rosenmüller, hypertrophied tubal tonsil; b) - cyst content.

Fig. 3. a) cone-beam CT of the nasopharynx - a cyst of the fossa of Rosenmüller; b, c) MRI - a Tornwaldt cyst.
The postoperative period was satisfactory, with patients noting improved nasal breathing and no postnasal drip by the third day following surgery. In four (26.6%) patients with secretory otitis media, audiometry and tympanometry revealed a restoration of normal hearing and Eustachian tube function one month after surgery.

Discussion

Given the presented data, it can be concluded that any nasopharyngeal formation requires thorough patient examination, including endoscopic assessment and CT. Nasopharyngeal cysts are categorized into midline or lateral, and congenital or acquired. Bronchogenic cysts are congenital lateral malformations, while oncocytic, retention, intra-adenoid, and infectious cysts are acquired lateral malformations. Congenital midline cysts include Rathke cleft cysts, Tornwaldt cysts, and dermoid cysts. Acquired midline cysts encompass retention, intra-adenoid, and infectious cysts [3,7,8].

Tornwaldt cyst is a benign, midline tumor of the nasopharynx which develops above the upper border of the superior constrictor muscle and represents the embryonic communication between mesenchymal notochord remnant and endodermal-derived nasopharyngeal mucosa [3-7]. If the opening through which the tumor drains into the nasopharynx is free, it is known as Tornwaldt bursa. If its opening becomes obstructed, possibly due to infection of the nasopharynx, injury, radiotherapy for nasopharyngeal carcinoma, the content inside the cyst is accumulated and acquired Tornwaldt disease develops. According to various sources, its prevalence ranges from 0.06% to 6% [1-7]. Tornwaldt cyst presents with both local and systemic manifestations. Local manifestations include nasopharyngeal inflammation characterized by nasal breathing difficulties, postnasal drip, Eustachian tube dysfunction, halitosis, and signs of pharyngitis. Systemic manifestations are associated with the development of laryngitis, bronchitis, bronchial asthma and involve breathing difficulties, cough, chest pain, as well as neurological symptoms, including severe persistent or throbbing headache in the occipital region radiating toward the shoulder and neck. The three main symptoms of Tornwaldt cyst are persistent postnasal discharge, occipital headache, and halitosis [1-7]. Nasal and nasopharyngeal endoscopy, MRI, nasopharyngeal CT, and histological examination of biopsy are the most informative diagnostic methods for this pathology [6-8]. Endoscopy allows visualizing a round mass with a smooth surface on the posterior pharyngeal wall, specifically in the fossa of Rosenmüller. Palpation of the cyst with a probe reveals caseous, purulent, or mucous content. Nasopharyngeal CT and MRI findings show a round mass with clear contours measuring 0.5 cm to 4 cm in diameter [6,8], which has the same signal intensity as the cerebrospinal fluid on T2-weighted images and appears hyperintense or isointense on T1-weighted images, depending on the presence of fat, mucus, pus, or protein [6,8]. On histological examination, Tornwaldt cyst is lined with cylindrical ciliated epithelium similar to retention adenoid cyst, but in contrast to intra-adenoid cyst, no pronounced lymphocytic infiltration and a small number of lymphoid follicles are observed.

In some cases, nasopharyngeal cysts may become infected resulting in retropharyngeal and prevertebral abscesses, which may manifest as nasopharyngeal cystic lesions on CT and MRI scans. Respiratory infections
of the airways and penetrating trauma to the oropharynx are considered the most common causes of their development [1-4].

Benign occlusion of the adenoid crypts may lead to cyst development within the adenoids, which occur in 6% of the population [5,7]. They are typically asymptomatic and more frequently observed in the midline. Other nasopharyngeal cysts, including Luschka pharyngeal bursa and oncocytic cysts, arise from the lateral wall. The most common nasopharyngeal cysts are retention cysts found at autopsy [8].

Surgery is the most effective method of treating nasopharyngeal cysts, while conservative therapy proves ineffective [9]. The goal of surgery is to ensure adequate drainage of the cyst while enabling the removal of its lining to prevent potential recurrences. Various methods for cyst removal exist. The first cyst removal was performed through the oral cavity during adenotomy. Currently, less invasive endoscope-assisted methods, specifically marsupialization and cyst coagulation, using a transoral or trans-nasal approach are used. Endoscope-assisted trans-nasal surgery provides excellent visualization of the surgical field, enabling maximal cyst removal with minimizing damage to healthy tissues. This approach prevents the damage to the orifices of the auditory tubes and ensures a more favorable prognosis. In infectious cysts, antibacterial agents are needed.

Conclusions
Endoscopic examination, CT, and MRI are the most informative diagnostic methods for evaluation of nasopharyngeal cysts. A definitive diagnosis can be made based on pathomorphological examination. The treatment of choice for nasopharyngeal cysts is endoscopic endonasal surgery with a microdebrider and laser coagulation.

Ethical standards: The written informed consent was obtained from patient before the treatment.

Conflict of interest: No conflicts.

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References

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