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CASE REPORT

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Hidden Behind the Headache: A Rare Case Report of Childhood Nasopharyngeal Cancer

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Abstract

Nasopharyngeal carcinoma is a rare malignancy in children, representing less than one percent of pediatric cancers, with incidence varying across regions. A fourteen-year-old boy presented with one month of right nasal obstruction, ear fullness, hearing loss, and progressive headache. Physical examination revealed a 20×20 mm mass at the level II of the neck. Anterior rhinoscopy revealed mucosal discharge and a friable mass occupying the right nasal cavity. The left nasal cavity showed inferior turbinate hypertrophy, livid mucosa, and mucous secretion, with a mass appearance suggestive of contralateral compression. Contrast-enhanced MSCT angiography of the head and neck revealed a bilateral solid nasopharyngeal mass (3.75×3.71×4.27 cm) with post-contrast enhancement, extending into the sphenoid sinus and associated with destruction of the right sphenoid and temporal bones. Because early symptoms are nonspecific, the diagnosis of nasopharyngeal carcinoma in children is often delayed. Early recognition and evaluation are essential to reduce morbidity and improve clinical outcomes.(**International Journal of Biomedicine. 2026;16(1):111-115.**)

Keywords: nasopharyngeal carcinoma • childhood • symptoms • epidemiology

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Introduction

Nasopharyngeal carcinoma (NPC) is a malignant epithelial neoplasm of the nasopharyngeal mucosa and represents a distinct clinical entity within head and neck oncology.[1-3] In the pediatric population, NPC is rare, accounting for less than 1% of all pediatric malignancies, and is particularly uncommon before the age of 10, with incidence rising during adolescence.[4,5] Reported rates are approximately 0.5 per million in those aged 10–14 years and 1.1 per million in adolescents aged 15–17 years, with a first incidence peak between 10 and 20 years and a median diagnostic age of 12–15 years.[3,6-10] In contrast, NPC in the general population is most commonly diagnosed in adults aged 40–60 years old.[3,8,9,11,12] Globally, incidence varies substantially, reaching as high as 40 per 100,000 annually in endemic regions such as southern China, Southeast Asia, Alaska, and the Mediterranean Basin, but remaining below 1 per 100,000 in most industrialized countries.[4,13,14] SEER data also show higher incidence among African American children, adolescents, and young adults compared with Caucasian individuals, underscoring the combined influence of genetic susceptibility and environmental exposures in NPC pathogenesis.[15] Nasopharyngeal carcinoma originates in deep head and neck structures, and symptoms often appear only after substantial local invasion, contributing to diagnostic delay.[3] In children and adolescents, more than 90 percent present with invasive disease, and over 80 percent are diagnosed at stage III or IV, higher proportions than in adults, although distant metastasis is less frequent.[5,7,16,17] Despite advanced presentation, outcomes in younger patients have improved significantly with combined radiotherapy and chemotherapy, yielding five-year survival rates above 80 percent and an overall better prognosis compared with adults.[18] These diagnostic challenges underscore the need for

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early recognition and timely evaluation, which are essential for optimizing treatment outcomes.

Case Presentation

A 14-year-old male presented with a one-month history of progressive right-sided nasal congestion, accompanied by ipsilateral ear fullness, conductive hearing impairment, and increasingly severe headaches. He denied epistaxis, diplopia, recent trauma, allergic symptoms, or abnormal bleeding tendencies. His past medical history was notable only for a tonsillectomy at age 5. He was a non-smoker, although his father was an active smoker. His dietary history revealed frequent consumption of grilled foods, while intake of instant foods, packaged beverages, and salted fish was infrequent.

Initially, the patient was ordered an EEG examination due to a suspicion of epilepsy. Coincidentally, upon physical examination, a 20×20 mm mass was detected at level II of the neck (Figure 1). Oropharyngeal examination showed small tonsils (T1/T1) without hyperemia or granulation. Anterior rhinoscopy revealed mucosal discharge and a friable mass occupying the right nasal cavity. The left nasal cavity showed inferior turbinate hypertrophy, livid mucosa, and mucous secretion, with a mass appearance suggestive of contralateral compression (Figure 2). Otoscopic findings were normal bilaterally.

Figure 1. *Physical examination: A mass at the level II of the neck.*

Laboratory investigations demonstrated mild thrombocytosis (platelets 554 ×10³/µL) and a mildly prolonged APTT (42.4 seconds), with all other hematological, renal, hepatic, electrolyte, and viral serologic parameters within normal limits. Contrast-enhanced MSCT revealed a bilateral solid nasopharyngeal mass (3.75×3.71×4.27 cm) with post-contrast enhancement, extending into the sphenoid sinus and associated with destruction of the right sphenoid and temporal bones (Figure 3). Intracranial extension into the extra-axial prepontine space was noted, with vascular supply arising from the right ascending pharyngeal artery (branch of the internal maxillary artery). Bilateral ethmoiditis was also identified. No arterial thrombosis, stenosis, or aneurysm was observed. A prior contrast-enhanced head MSCT had demonstrated a similar malignant nasopharyngeal mass (3.56×2.80×3.80 cm) with intracranial extension, right mastoiditis, cerebral edema, and a metastatic-appearing nodule in the right level IIB cervical region. Chest radiography showed unremarkable cardiopulmonary findings. A bilateral nasopharynx mass biopsy revealed non-keratinizing squamous cell carcinoma (NK-NPC), undifferentiated subtype.

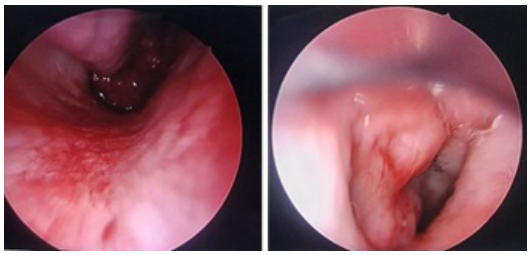

Figure 2. *Anterior rhinoscopy.*

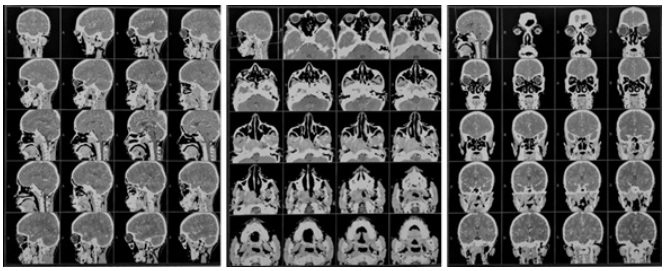

Figure 3. *Contrast-enhanced MSCT angiography of the head and neck.*

Discussion

Childhood nasopharyngeal carcinoma (NPC) is frequently diagnosed late, as its rarity, nonspecific early complaints, and anatomically deep location often keep it silent for a long time.[4,13] Initially, children with NPC present with a neck mass (60–90%), typically appearing as unilateral or bilateral, large, painless, non-inflammatory cervical lymphadenopathy.[5,14] Beyond this, additional nasal, auditory, and neurological symptoms may arise depending on the extent of primary tumor involvement. Nasal manifestations (obstruction, epistaxis, or mucous discharge) and auditory manifestations (otalgia, serous otitis media, and hearing impairment) are observed in 30-70% and 20–45% cases, respectively.[3-5] Compared with adolescents, nasal congestion was more frequently reported in younger children (36.8% vs. 9.4%), whereas ear-related symptoms were less common in this age group (15.8% vs. 53.1%). These

findings suggest that nasopharyngeal evaluation should be prioritized at initial presentation in younger children, whereas in adolescents, early assessment for auditory involvement is particularly warranted.[5] Less frequently, skull base invasion may result in cranial nerve palsies (5–22%), headaches (11–32%), and ocular symptoms (26%).[3,5,19,20] Other symptoms, such as trismus, taste disturbances, or dysphagia, are rarely described in pediatric NPC.[4] Nonspecific clinical manifestations, particularly in the absence of cervical lymphadenopathy, which is the most frequent presenting sign, may result in missed or delayed diagnosis.

In the present case, the patient presented with a one-month history of progressive right-sided nasal congestion, ear fullness, conductive hearing impairment, and worsening headaches. A 20×20 mm mass was found on examination, although the parents had not noticed or reported any neck swelling. Early symptoms of nasopharyngeal carcinoma are often misinterpreted as benign upper respiratory tract infections, underscoring the need for heightened clinical vigilance and thorough assessment of persistent or atypical symptoms in pediatric patients.

Accurate staging of pediatric NPC requires appropriate imaging and comprehensive clinical evaluation. The initial assessment should include a full physical examination of the cervical and supraclavicular lymph nodes and a thorough neurological evaluation, complemented by a contrast-enhanced MRI or CT scan of the head, neck, and supraclavicular regions.[14] MRI is generally superior to CT for evaluating the primary tumor and involved cervical and retropharyngeal lymph nodes in both adult and pediatric NPC, while CT may be useful when skull base invasion is uncertain.[21-25] In addition, chest and abdominal CT scans with iodine contrast should be performed to evaluate for distant metastases.[14] FDG PET/CT provides excellent detection of nodal and distant metastases.[26] When PET/CT is unavailable, combined CT and technetium bone scintigraphy may be used as an alternative.[27]

Staging of NPC requires precise assessment of locoregional tumor extension, skull base involvement, and distant metastases. Current staging practice follows the 8th edition of the American Joint Committee on Cancer (AJCC) Staging System, which provides standardized criteria for tumor (T), nodal (N), and metastatic (M) classifications to guide prognosis and treatment planning.[28] Nodal staging is based on clinical and radiologic findings. Lymph nodes are considered involved if the short-axis diameter exceeds 10 mm, demonstrates central necrosis or extracapsular spread on MRI/CT, or shows pathological uptake on FDG-PET.[3]

Cytological examination of enlarged nodes can aid diagnosis in ambiguous cases.[14] Histological confirmation is essential once clinical and radiological findings suggest NPC; this is preferably obtained via endoscopic exploration of the primary tumor, or alternatively, a large cervical lymph node may be biopsied. Nasopharyngeal endoscopy allows detailed evaluation of tumor location, extension, and potential complications such as bleeding. Pretreatment evaluation should include standard laboratory tests (hematological, hepatic, and renal function), oral and dental assessment, audiometry, DPD testing before 5-fluorouracil therapy, fertility preservation, serum and plasma EBV DNA evaluation, and molecular analyses.[14] Nearly all pediatric undifferentiated NPC cases show evidence of EBV infection in the primary tumor. High plasma EBV DNA levels have been identified as a negative prognostic factor in adults, and several pediatric studies have demonstrated similar trends.[3] Early-stage tumors may be subtle on endoscopy; therefore, MRI, PET/CT, and, when indicated, fine-needle aspiration of cervical nodes are commonly used. In children, diagnosis is most frequently established via biopsy of neck masses.[15,29]

According to the 4th edition of the WHO classification, NPC subtypes include keratinizing squamous cell carcinoma (KSCC, type I), non-keratinizing carcinoma (differentiated, type II; and undifferentiated, type III), and basaloid squamous cell carcinoma. KSCC, characterized by conventional squamous differentiation, intercellular bridges, and keratinization, is rare in children. Non-keratinizing undifferentiated carcinoma, the most common subtype in pediatric and young adult patients, is characterized by large tumor cells with prominent nuclei, scant cytoplasm, and high mitotic activity. KSCC accounts for less than 5% of NPCs, while non-keratinizing and anaplastic subtypes represent over 90% and are predominantly associated with Epstein-Barr virus (EBV) infection.[5,15,30-33] KSCC's relative radioresistance may contribute to poorer prognosis.[5]

This case underscores the importance of heightened clinical suspicion for NPC in children presenting with persistent unilateral nasal or otologic symptoms. Early distinction from common upper respiratory conditions is crucial. Failure to identify clinical warning signs, such as unilateral progressive obstruction, cranial nerve involvement, recurrent headaches, or epistaxis, may lead to a delayed diagnosis and significant consequences for prognosis and overall quality of life.

Conclusion

Pediatric nasopharyngeal carcinoma is rare yet frequently diagnosed at an advanced stage due to its deep location and initially nonspecific symptoms. This case highlights the need for heightened clinical suspicion when children present with persistent unilateral nasal or otologic complaints, particularly when accompanied by headaches or cranial nerve symptoms. Early recognition and timely diagnostic evaluation are essential, as prompt multimodal treatment can achieve favorable outcomes despite the typically advanced presentation.

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Competing Interests

The authors declare that they have no conflicts of interest.

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