

Nasopharyngeal Carcinoma Presenting with Cavernous Sinus Involvement, Trigeminal Neuralgia and Middle Ear Effusion

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Abstract

We reported and analyzed an unusual case of NPC (Nasopharyngeal carcinoma) where the patient had initial clinical features of cavernous sinus involvement followed by trigeminal neuralgia and middle ear dysfunction. In the present case, the initial involvement of the cavernous sinus resulted in the left sided third nerve involvement. Later on, the extension of the tumor in and around the trigeminal ganglion resulted in facial pain. Up to that point in time, a possibility of cavernous sinus lesion was considered and this caused a delay in the diagnosis. In accordance with the literature, this case illustrates that the tumor is difficult to diagnose during the early stages for multiple reasons, including: the non-specificity of the initial symptoms, and the difficulty of examining the postnasal space.

Keywords: nasopharyngeal cancer, ptosis, trigeminal neuralgia, cavernous sinus

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Introduction

Nasopharyngeal carcinoma (NPC) is a tumor arising from the epithelial cells that cover the surface and line of the nasopharynx. This tumor was first reported in 1901, and was clinically characterized in 1922 [1, 2]. Although NPC is rare in most populations, it is a leading form of cancer in a few well-defined populations, including natives of southern China, Southeast Asia, the Arctic, and the Middle East/North Africa [3]. This tumour is uncommon in India with incidence of 0.9 per million [4]. We reported and analyzed the events in chronological order in an unusual case of NPC where the patient had initial clinical features of cavernous sinus involvement followed by trigeminal neuralgia and middle ear dysfunction.

Case report

A 62-year old male patient developed a gradual onset progressively with increased left sided ptosis and inability to move the left eye ball of 5 months duration. He was further examined with a CT scan, which was reported to be normal [Fig1]. On further investigations, there was no evidence of diabetes, hypertension or any immunocompromised state. Two months later, he developed left sided facial pain, which was increasing in severity. At that point, he was investigated with magnetic resonance imaging (MRI); The MRI showed lesion in left cavernous sinus area medial to left temporal lobe adjacent to trigeminal ganglion [Figure2]. There was also an evidence of

Table 1. Clinical presentation

Structures involved	Symptoms
Metastasis	Painless cervical lymph node enlargement (most common presentation) Bone pain, organ dysfunction and rarely, a paraneoplastic syndrome of osteoarthropathy
Nasal	Large or exophytic lesions may cause nasal obstruction or epistaxis
Aural	Unilateral hearing loss from blockage of the Eustachian tube and a middle ear effusion Tinnitus Stiffness
Neurological (Cranial nerves involvement)	Xerophthalmia-involvement of the greater superficial petrosal nerve at the foramen lacerum Facial pain-Trigeminal nerve involvement Diplopia- isolated Abducens nerve injury Ophthalmoplegia-involvement of cranial nerves III, IV and VI (in the cavernous sinus or the superior orbital fissure) Horner's syndrome-injury to the cervical sympathetic chain Deficits of the lower cranial nerves (IX, X, XI, XII)-more extensive skull base involvement

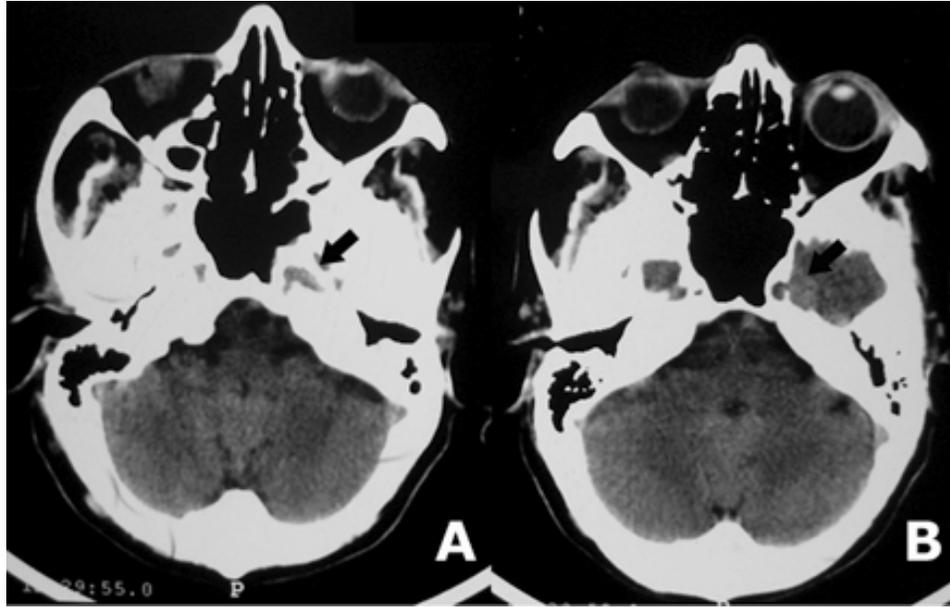


Figure 1. Initial contrast enhanced CT scan showing mild enhancing lesion in left medialtemporal area (arrow)

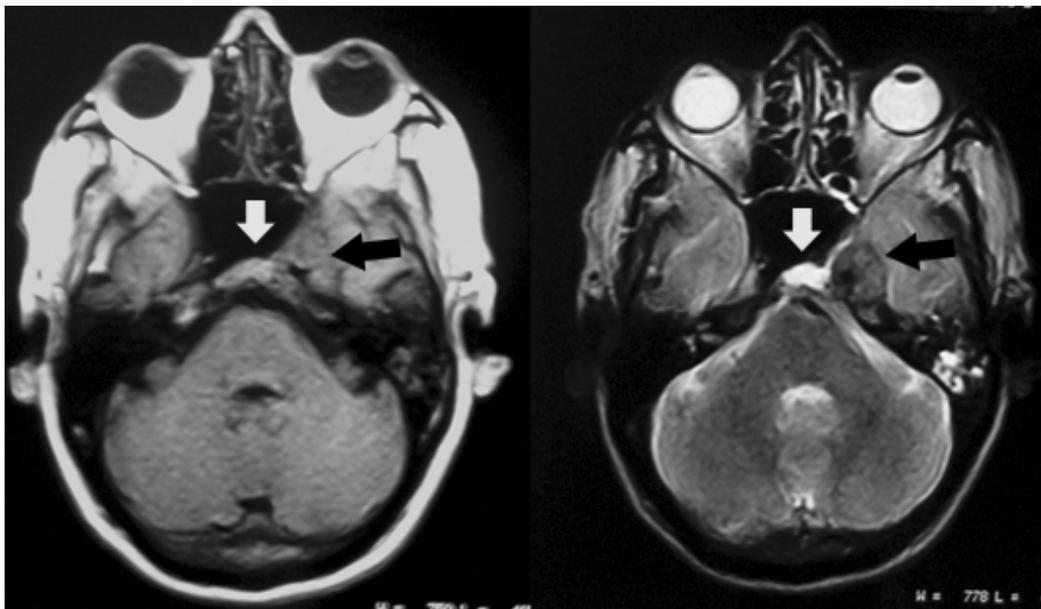


Figure 2. MRI axial T1 (left) and T2 (right) images showing the carcinoma of the nasopharynx. There are hyperintense signals in left mastoid air cells

hyperintense signal changes in the left mastoid and sphenoid sinus [Fig2, arrows]. He also complained of heaviness in his left ear with associated decrease in hearing. CT (computerized tomography) scan was performed to observe the involvement of skull base, and it showed extensive erosion of bones and further increase in the size of the lesion [Fig3]. With all these bizarre features and progressive involvement of

multiple structures, to rule out nasopharyngeal growth, the patient was planned for nasal endoscopy. On the endoscopy, growth was observed in left side of nasopharynx near to fossa of Rosenmuller [Fig4]. At the same time, biopsy was taken and it confirmed the diagnosis of lymphoepitheloid variant of nasopharyngeal

carcinoma [Fig5]. The patient was then submitted for radiotherapy; and he did well at the follow up.

Discussion

Based on the degree of differentiation, WHO has classified NPC into 3 histopathologic types: Type I (typical keratinizing squamous cell carcinomas), Type II (nonkeratinizing carcinoma) and Type III (undifferentiated carcinoma-most common). Types II and III may be accompanied by an inflammatory infiltrate of lymphocytes, plasma cells, and eosinophils and these two types have also been called lymphoepithelioma [5, 6, 7]. The majority of tumors arise in the lateral walls, especially from the fossa of Rosenmuller and Eustachian tube cushions [4, 8], and most of these neoplasms are malignant tumors showing aggressive local infiltration along the well-defined routes [9]. Tumors can grow within the nasopharynx or can spread anteriorly, laterally, posteriorly, superiorly and inferiorly to the opposite lateral wall; they can also infiltrate other structures toward the base of the skull and invade the palate, nasal cavity, or the oropharynx [4, 8, 10, 11]. Skull base invasion is the common presentation (in up to one-third of cases) [10] and can be the initial presentation [11]. NPC can spread intracranially via the foramen lacerum or foramen ovale or through both the foramen ovale and foramen lacerum, and also it can also spread by direct erosion which results in multiple cranial deficits [11,13,14]. Perineural spread through the foramen ovale is an important route, which explains why with CT scan evidence of cavernous sinus involvement (as in present case initial CT scan showed the lesion in cavernous sinus area but no bone erosion) there may be no skull base erosion [12]. Further growth of the tumor can involve the Eustachian tube (either direct involvement, invasion of

the tensor palatini muscle or because of tube displacement) leading to middle ear effusion and hearing disturbances [10, 15]. In accordance with the literature, this case illustrates that the tumor is difficult to diagnose at early stages for multiple reasons, including the non-specificity of the initial symptoms [Table-1] and the difficulty of examining the postnasal space [4, 5, 7, 8, 16]. However, on the examination of the nasopharynx, the lesion can be revealed as an exophytic mass or a smooth, mucosal covered mass with the fossa of Rosenmuller being the most common location; the diagnosis can be confirmed after histopathology [7,8]. CT scan supplemented with MRI is currently being used for accurate tumor mapping and detection of possible tumor extension, especially for the skull base and the deep facial spaces [4, 9, 10]. In the present case, MRI revealed cavernous sinus involvement and extension in and around nasopharynx [14]; and at the same time CT scan revealed the extent of bony erosion [17]. NPC is not amenable to curative surgery because of its location, but it is a highly radiosensitive lesion. Therefore, radical external beam radiotherapy is the mainstay of treatment for this neoplasm and its regional metastasis [4, 7]. Despite the aggressive radiotherapy, the 5-year survival rate for locoregionally advanced disease at presentation has approximated to 30-45% [18]. In the present case, factors associated with a poor prognosis are skull base involvement, extent of the primary tumor and cranial nerve involvement [7, 19]. In the present case, initial involvement of the cavernous sinus resulted in the left sided third nerve involvement. Later on, extension of the tumor in and around the trigeminal ganglion resulted in facial pain. In this case, the possibility of cavernous sinus lesion was considered

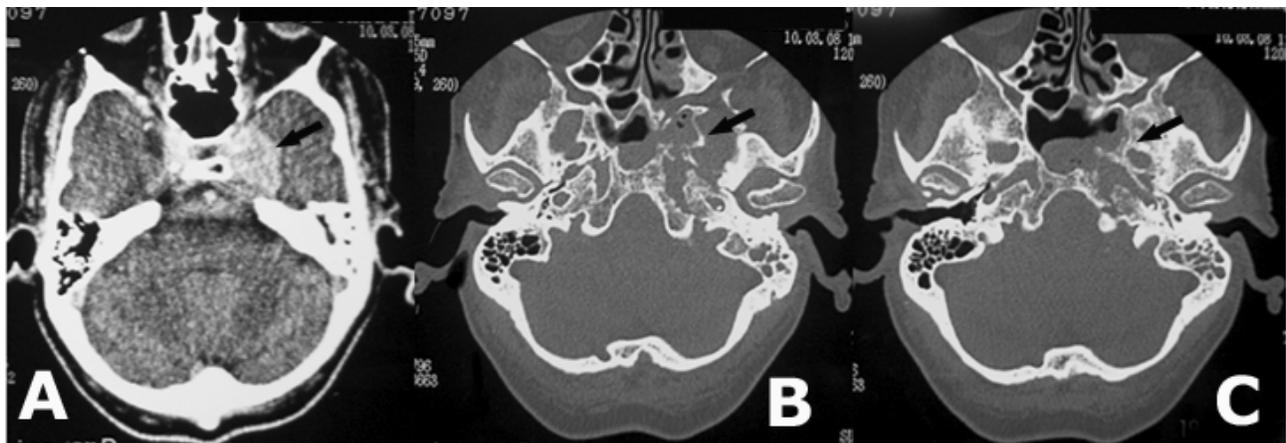


Figure3. CT scan showing the enhancement of the lesion and extensive involvement of the skull base with destruction of the bone

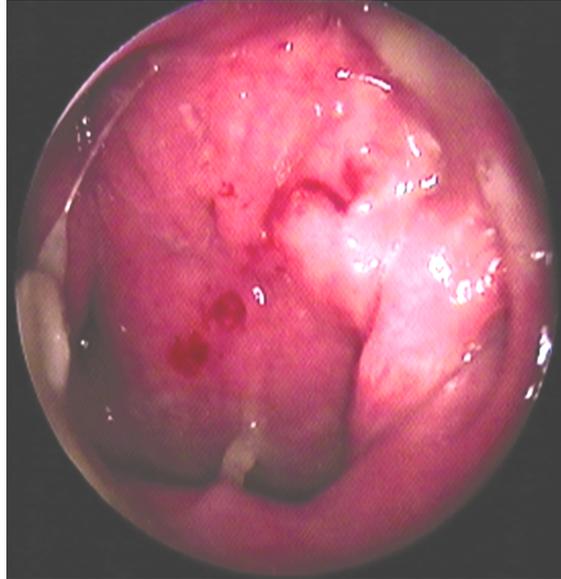


Figure4. Clinical photograph showing the growth in left side of nasopharynx

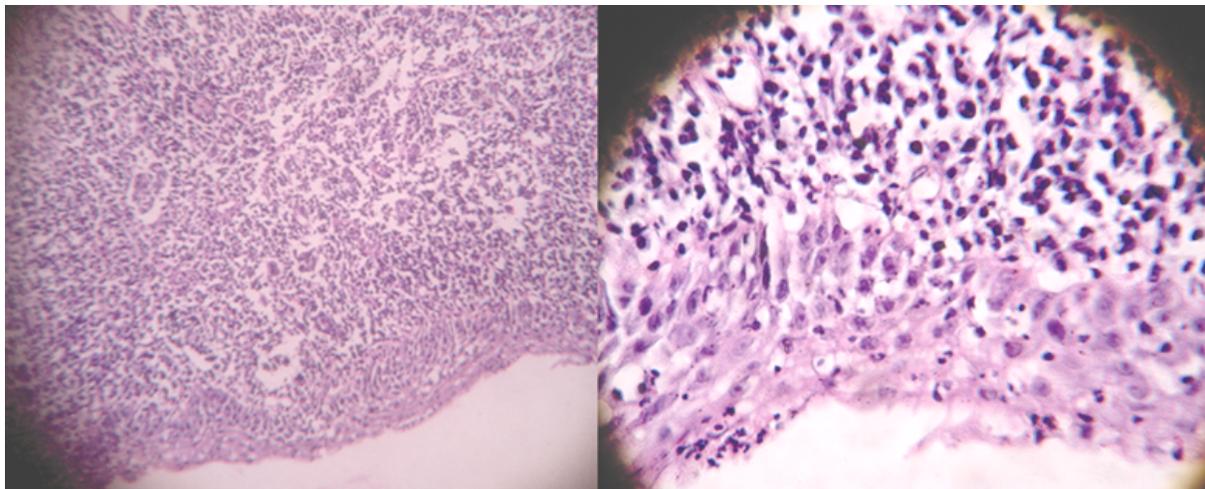


Figure5. Histopathology was suggestive of nasopharyngeal carcinoma

and caused a delay in the diagnosis. In addition, the involvement of the Eustachian tube was observed that resulted in the middle ear dysfunction and supposition of the diagnosis of nasopharyngeal carcinoma; this involvement can be seen on the endoscopy and confirmed by biopsy.

Conflict of interests

The authors have no conflict of interests in this article.

References

1. Regaud C. Lympho-épithéliome de l'hypopharynx traité par la roentgenthérapie. *Bull Soc Franc Otorhinolaryngol* . 1921; 34: 209-214.

2. Schmincke A. Über lymphoepitheliale Geschwülste. *Beitr Pathol Anat* .1921; 68:161-170.

3. Chang ET, Adami H-O. The Enigmatic Epidemiology of Nasopharyngeal Carcinoma. *Cancer Epidemiol Biomarkers Prev*. 2006; 15(10):1765-77.

4. Brennan B. Nasopharyngeal carcinoma. *Orphanet J Rare Dis*. 2006; 26(1):23.

5. Wei WI, Sham JST, Choy D, Zong Y, Ng MH. The efficacy of fiberoptic endoscopic examination and biopsy in the detection of early nasopharyngeal carcinoma. *Cancer* .1991; 67 (12): 3127-3130.

6. Chan JKC, Pilch BZ, Kuo TT, Wenig BM, Lee AWM. Tumors of the nasopharynx: introduction in *Pathology and Genetics of Head and Neck Tumours (World Health Organization Classification of Tumours)*, L.Barnes, J. W. Eveson, P. Reichart, and D. Sidransky, Eds. IARC press, Lyon, France, pp. 82-84, 2005.

7. Wei WI, Sham JS. Nasopharyngeal carcinoma. *Lancet*. 2005; 365: 2041-54.
8. Jeyakumar A, Brickman TM, Jeyakumar A, Doerr T. Review of nasopharyngeal carcinoma. *Ear Nose Throat J*. 2006; 85(3):168-70, 172-3, 184.
9. Dubrulle F, Souillard R, Hermans R. Extension patterns of nasopharyngeal carcinoma. *Eur Radiol*. 2007; 17(10):2622-30.
10. Yang MS, Chen CC, Cheng YY, Hung HC, Chen WH, Lee MC, Lee CW, Lee SK. Nasopharyngeal carcinoma spreading along the eustachian tube: the imaging appearance. *J Chin Med Assoc*. 2004; 67(4):200-3.
11. Taguchi J, Sato M, Sasaki M, Ozaki M, Hanada M, Kuyama J, Hayakawa T. [A case with nasopharyngeal carcinoma extending into the cavernous sinus][Article in Japanese] *No Shinkei Geka*. 1997; 25(10):939-42.
12. Chong VF, Fan YF, Khoo JB. Nasopharyngeal carcinoma with intracranial spread: CT and MR characteristics. *J Comput Assist Tomogr*. 1996; 20(4): 563-9.
13. Ampil FL, Heldmann M, Ibrahim AM, Balfour EL. Involvement of the cavernous sinus by malignant (extracranial) tumour: palliation in six cases without surgery. *J Craniomaxillofac Surg*. 2000; 28(3):161-4.
14. Ding JH, Hu CS, Peng WJ, Zhou ZR, Tang F, Mao J. [Evaluation of MRI in nasopharyngeal carcinoma with cavernous sinus infiltration][Article in Chinese] *Zhonghua Zhong Liu Za Zhi*. 2006; 28(7):530-2.
15. King AD, Kew J, Tong M, Leung SF, Lam WW, Metreweli C, van Hasselt CA. Magnetic resonance imaging of the eustachian tube in nasopharyngeal carcinoma: correlation of patterns of spread with middle ear effusion. *Am J Otol*. 1999; 20(1):69-73.
16. Leong JL, Fong KW, Low WK. Factors contributing to delayed diagnosis in nasopharyngeal carcinoma. *J Laryngol Otol*. 1999; 113(7):633-6.
17. Tang AZ, Zeng G, Zhou Y, Lan XH, Su DK. [Usefulness of CT scan in secretory otitis media in patient with nasopharyngeal carcinoma][Article in Chinese] *Lin Chuang Er Bi Yan Hou Ke Za Zhi*. 2000; 14(8):359-61.
18. Cooper JS, Lee H, Torrey M, Hochster H. Improved outcome secondary to concurrent chemoradiotherapy for advanced carcinoma of the nasopharynx: Preliminary corroboration of the intergroup experience. *Int J Radiat Oncol Biol Phys*. 2000; 47: 861-6.
19. Kalogera-Fountzila A, Karanikolas D, Katodritis N, Samantas E, Sarafopoulos A, Ikononou I, Zamboglou N, Tselis N, Dimitriadis AS, Fountzilas G; AJCC (American Joint Committee on Cancer). Prognostic factors and significance of the revised 6th edition of the AJCC classification in patients with locally advanced nasopharyngeal carcinoma. *Strahlenther Onkol*. 2006; 182(8):458-66.