

Carcinoma Nasopharynx Presenting As Mass in External Auditory Canal

Dr. Sanjay M. Khaladkar¹, Dr. Ronak N. Savani^{2*}, Dr. Aarushi Gupta³, Dr. Radhika Jaipuria⁴

¹Professor, Department Of Radio-Diagnosis, Dr.D.Y.Patil Medical Collage and Research Center, Dr.D.Y.Patil Vidyapeeth, Pimpri, Pune-411018 India

²⁻⁴Post Graduate Resident, Department Of Radio-Diagnosis, Dr.D.Y.Patil Medical Collage and Research Center, Dr. D.Y.Patil Vidyapeeth, Pimpri, Pune-411018 India

*Corresponding author: Dr. Ronak N. Savani

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Abstract

Case Report

Nasopharyngeal carcinoma is rare. Direct invasion of nasopharyngeal carcinoma to middle ear is very rare. Extension of nasopharyngeal carcinoma into middle ear, external auditory canal through eustachian tube is a rare method of spread. Spread is usually mucosal or submucosal along eustachian tube. Rarely, it can be locally advanced nasopharyngeal carcinoma invading eustachian tube and middle ear through extensive skull bone invasion. Presence of external auditory canal polyp or mass and presence of mastoid effusion on CT and MRI should warrant radiologist to look for presence of nasopharyngeal carcinoma. We report a case of nasopharyngeal carcinoma in an elderly female who first presented with auditory symptoms and presented with mass in external auditory canal with lower motor neuron facial nerve palsy. Both CT and MRI (plain and contrast) confirmed mass in nasopharynx, spread along eustachian tube with extension in middle ear cavity and external ear with mastoid effusion.

Keywords: carcinoma nasopharynx, eustachian tube, mastoid effusion, external auditory canal.

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INTRODUCTION

Nasopharyngeal carcinoma is rare with onset rate of <1:1000 of all cancers [1]. Highest is observed in Hong Kong with incidence of 12.2 percent in 100,000 population [1]. It commonly presents as cervical lymphadenopathy. Clinical suspicion is made if there are nasal symptoms like nasal discharge, nasal obstruction and bleeding or otologic symptom like discharge, pain, tinnitus and deafness. Middle ear effusion is found in 38 % of patients first diagnosed with nasopharyngeal carcinoma while auditory symptoms are main presenting symptoms in 18% of population [1].

Direct invasion of nasopharyngeal carcinoma to middle ear is rare. Only 6 cases of nasopharyngeal carcinoma with middle ear extension are reported in English language literature. Most of these were recurrence after primary treatment with radical chemotherapy/ radio therapy [2,3].

Two cases are reported in Turkish literature [4]. Case series is written in Chinese literature which includes 9 patients of nasopharyngeal carcinoma with extension in external auditory canal of which 3 were found during initial diagnosis while 6 occurred during recurrence [5].

CASE REPORT

A 55- year old female patient presented with blood tinge discharge through left ear since 3 months. It was associated with mild pain. There was history of deviation of mouth to left since 15 days.

On examination soft tissue density lesion seen in left external auditory canal. Biopsy of the mass from external auditory canal was suggestive of squamous cell carcinoma. The section showed necrosis infarcted tissue with bacterial colonies and granulation tissue. One of the bits showed necrosed keratin pearl like area with singly scattered pleomorphic atypical cells with pigment laden macrophages and infiltration with neutrophils. No fungus was identified.

MRI Neck (plain and contrast- figures 1-4) showed soft tissue intensity lesion measuring approx. 29 (transverse) x 17(Antero-posterior) x 19 (cranio-caudal) mm involving left lateral wall and roof of nasopharynx, effacing left fossa of RosenMüller and Eustachian tube opening. It was slightly hyperintense with respect to muscle on T1WI and hyperintense on T2WI and and T2FAT SAT. It showed moderate post contrast heterogeneous enhancement and showed restricted diffusion on DWI. It involved left tensor veli palatini and left levator veli palatini and extended via eustachian tube into left middle ear cavity and external

auditory canal, where it measured 15 (transverse) x 8 (Antero-posterior) mm. Hyperintense fluid collection was noted left mastoid air cells due to mastoid effusion. Right fossa of RosenMüller and Eustachian tube appeared normal.

Subcentimeter sized discrete lymph nodes were noted at level II on left side which turned out metastatic on biopsy. A diagnosis of neoplastic mass arising from nasopharynx (CA nasopharynx) extending along left eustachian tube into the left middle ear and left external auditory canal was given with left mastoid effusion due to eustachian tube dysfunction.

CT plain of base of skull (Figures 5-7) showed mass in nasopharynx on left side effacing fossa of

RosenMüller and eustachian tube opening, soft tissue density lesion in left eustachian tube, left middle ear cavity and left external auditory canal and opacification of left mastoid air cells. Soft tissue density mass was also seen in left middle ear cavity and mastoid air cells with erosion and destruction of mastoid septae and sinus plate and tegmen tympani. Enhancement of soft tissue component in middle ear cavity, mastoid air cells and external auditory canal was also observed.

Biopsy of nasopharyngeal mass and mass in external auditory canal was suggestive of squamous cell carcinoma. In our case mastoid effusion was due to eustachian tube dysfunction along tumor infiltration in eustachian tube.

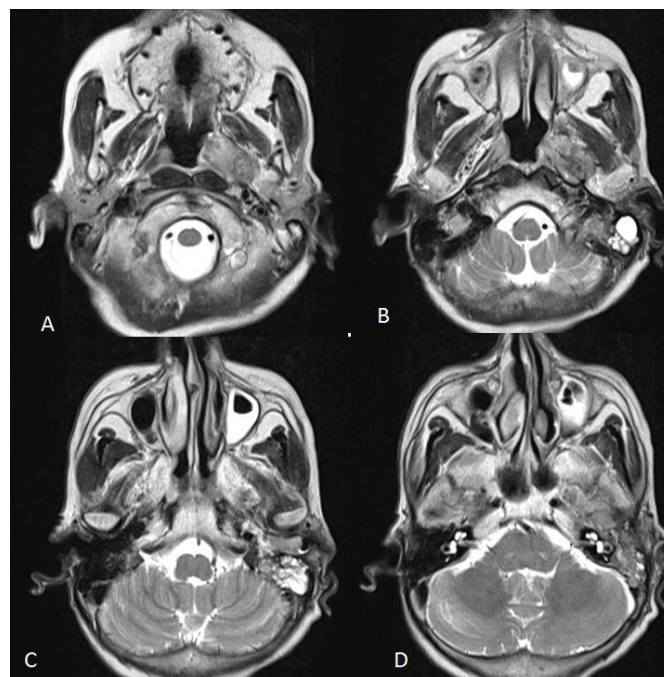


Fig-1: MRI Brain Axial T2WI- showing mass in nasopharynx on left side effacing Eustachian tube opening and fossa of RosenMüller(A,B), extending to left Eustachian tube(C), and left middle ear cavity and mastoid air cells(D) with mastoid effusion

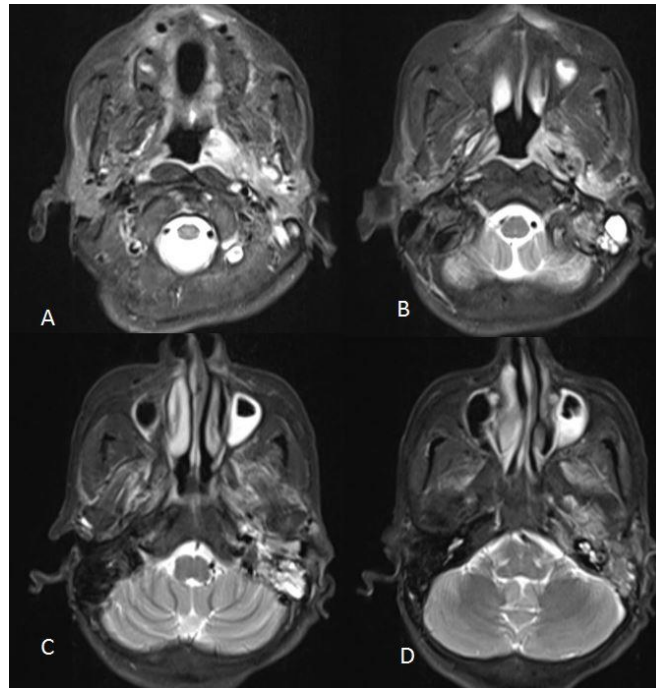


Fig-2: MRI Brain Axial T2FS- showing mass in nasopharynx on left side effacing Eustachian tube opening and fossa of RosenMüller(A,B), extending to left Eustachian tube(C), and left middle ear cavity and mastoid air cells(D) with mastoid effusion

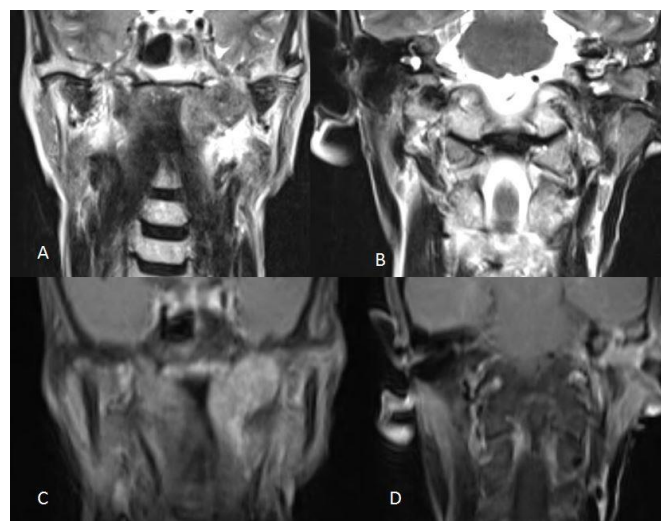


Fig-3: MRI Neck coronal T2 (A, B) and coronal T1(C, D) showing mass in nasopharynx on left side and in left middle ear cavity and external auditory canal

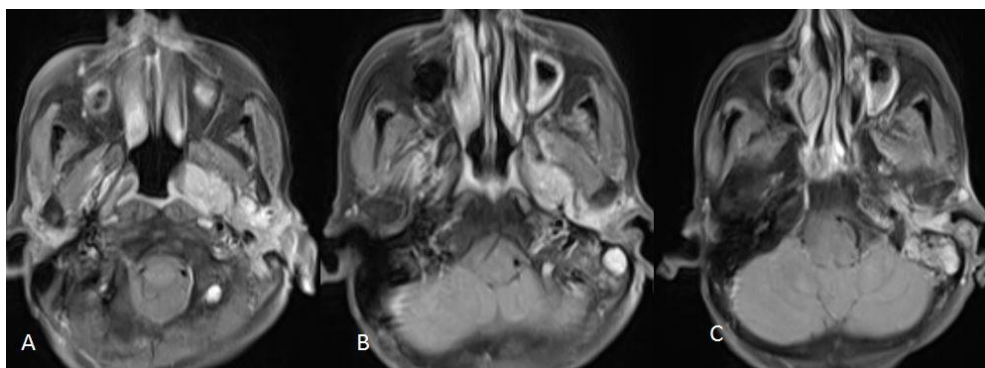


Fig-4: MRI Brain post contrast T1FS- showing enhancing mass in nasopharynx on left side(A), extending along left Eustachian tube into left middle ear cavity, mastoid air cells and external auditory canal(B,C)

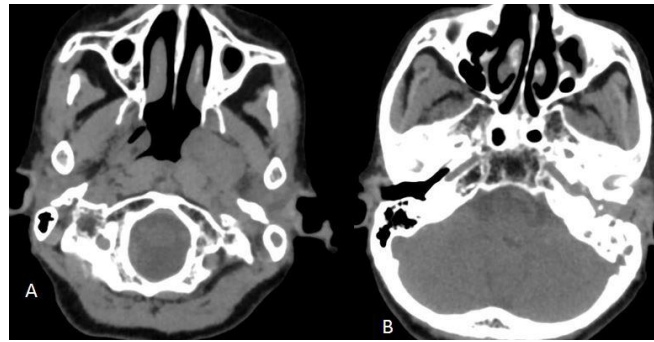


Fig-5: Plain CT Brain axial showing mass in nasopharynx on left side effacing Eustachian tube opening and fossa of RosenMüller(A), extending to left Eustachian tube, left middle ear cavity and mastoid air cells and external auditory canal(B)

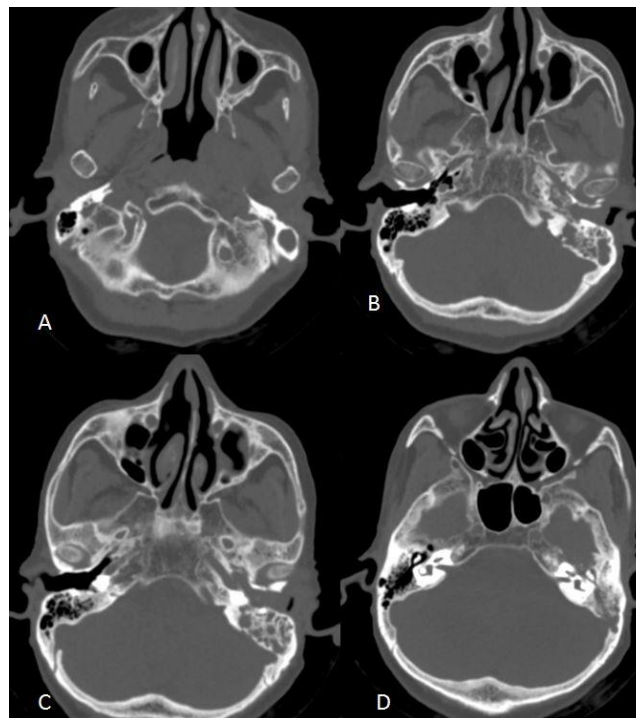


Fig-6: Plain CT scan of base of skull and mastoid-bony windows showing mass in nasopharynx on left side effacing Eustachian tube opening and fossa of RosenMüller(A), extending to left Eustachian tube causing erosions of adjoining walls of Eustachian tube and adjoining base of skull(B,C) and left middle ear cavity and mastoid air cells and external auditory canal with erosion and destruction of mastoid septae and sinus plate(D)

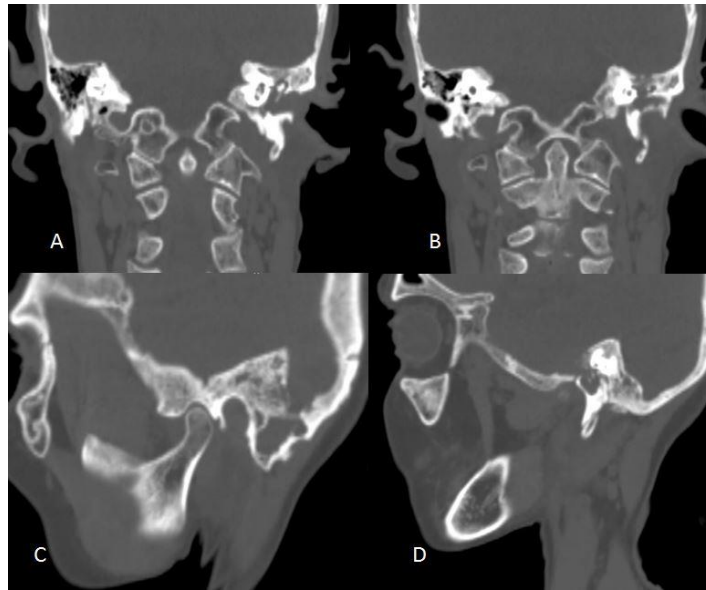


Fig-7: Plain CT scan of base of skull and mastoid-bony windows- showing mass in left middle ear cavity and mastoid air cells(A-coronal), with erosions of tegmen tympani(B-coronal), erosions of sinus plate(C-sagittal), and tegmen tympani(D-sagittal)

DISCUSSION

Nasopharyngeal carcinoma arises from epithelial lining of nasopharynx. Three histologic subtypes of nasopharyngeal carcinoma recognized by World health organization (WHO) - squamous cell carcinoma, non-keratinizing carcinoma and undifferentiated carcinoma [3].

Nasopharyngeal carcinoma spreads via blood and lymphatics commonly. They commonly metastasize to cervical lymph node and present as unilateral neck mass in 50-70 % of patients [3]. Distant metastasis occurs in 5-11 % of cases at time of initial diagnosed. Distant metastasis can occur in thorax, liver, bones and lymph nodes [3].

Yang *et al.* reported appearance of nasopharyngeal carcinoma spreading along eustachian tube on CT and MRI [2]. Nasopharyngeal carcinoma involves eustachian tube orifice, tensor veli palatini, levator veli palatini and parapharyngeal space.

Staging of nasopharyngeal carcinoma is done according to tumour, node, and metastasis (TNM) classification. Nasopharyngeal carcinoma invading middle ear is staged at T4 which is associated with poor prognosis. 5 year survival rate is between 20-35% [3].

Patient usually complains of ear discharge, otalgia, hearing deficit, LMN type of facial nerve palsy and polypoidal growth in external auditory canal. Both CT and MRI can demonstrate soft tissue mass in nasopharynx. Effacement of fossa of RosenMüller and eustachian tube opening is the earliest finding. They can demonstrate soft tissue mass in middle ear cavity and mastoid effusion. Soft tissue density lesion can be detected in eustachian tube canal. Erosions of walls of

external auditory canal with distraction of adjoining base of skull are better detected on CT [1].

Extension of nasopharyngeal carcinoma to mastoid region through eustachian tube is a rare spreading pathway. The definite reason is still unknown and is probably due to relatively anti-neoplastic nature of cartilage. The common routes of spread of nasopharyngeal carcinoma are- A) laterally partial or complete effacement of fat filled parapharyngeal space with further spread into masticator space. Infiltration of medial and lateral pterygoid muscles results in trismus. B) Posteriorly- it can spread to prevertebral muscle – especially longus colli. C) Inferiorly- it can extend into oropharynx. D) Anteriorly- it can spread into nasal fossa. It can cause erosion of nasal and infratemporal wall of maxillary sinus. It may infiltrate pterygopalatine fossa through sphenopalatine foramen. From here, it can infiltrate middle cranial fossa via inferior orbital fissure, optic canal and superior orbital fissure and extend up to cavernous sinus. It can invade anterior cranial fossa through ethmoid sinus and cribriform plate. E) Superiorly- it can cause skull base erosion and destruction in up to one third of patients. It commonly spreads via foramen lacerum and then invades skull base and middle cranial fossa or enters middle cranial fossa through foramen ovale. It can invade posterior cranial fossa via jugular fossa [2].

Route of invasion of middle ear through eustachian tube can be detected by both CT and MRI. Most of the times spread is mucosal or submucosal along eustachian tube. Rarely, it can be locally advanced nasopharyngeal carcinoma invading eustachian tube and middle ear through extensive skull bone invasion when erosion of surrounding temporal bone is found [1].

MRI can identify both cartilaginous and bony eustachian tube. The main body of cartilaginous eustachian tube is below skull base. It continues anteriorly, medially and inferiorly towards nasopharyngeal orifice and expands to form torus tubarius (TT) which lies anterior to fossa of RosenMüller. It can identify fatty tissue adjacent to lateral margin of cartilaginous eustachian tube (CET) and pharyngo-basilar fascia just below level of skull base. Tensor veli palatini (TP) muscle lies superiorly and laterally while levator veli palatini(LP) muscle lies inferiorly and medially from eustachian tube[2].

Mastoid effusion or secretory otitis media in nasopharyngeal carcinoma occurred due to various mechanisms; commonest postulated is paralysis of tensor veli palatini muscle. Tensor veli palatini muscle during swallowing actively dilates eustachian tube. The nerve supplying tensor veli palatine passes through superior part of parapharyngeal space [1]. This nerve can be invaded or compressed by T2 nasopharyngeal carcinoma [6]. Middle ear effusion can also occur due to marked displacement of cartilaginous eustachian tube by tumor [7]. Mastoid effusion is sign of advance disease that has spread out side confines of nasopharyngeal region into parapharyngeal space and tensor veli palatini muscle [2]. In advanced cases, tumor disrupts attachments of eustachian tube to skull base and interferes with supporting tissue (Ostmann's fat tissue) and alters compliances of eustachian tube[2]. The tumor involving fossa of RosenMüller and eustachian tube orifice, cartilaginous eustachian tube, and tensor veli palatini and levator veli palatini muscle can cause mastoid effusion due to eustachian tube dysfunction.

Radiological differential diagnosis are glomous tympanicum paraganglioma. It arises along inferior tympanic nerve and is most common primary tumor of middle ear and arises from neuroectodermal paraganglion cells located near nerves and vasculature [1].

CONCLUSION

Extension of nasopharyngeal carcinoma into middle ear, external auditory canal through eustachian tube is a rare method of spread. Presence of external auditory canal polyp or mass and presence of mastoid effusion on CT and MRI should warrant radiologist to look for presence of nasopharyngeal carcinoma.

Asymmetry in eustachian tube opening and fossa of RosenMüller or their obliteration can be earliest sign of nasopharyngeal carcinoma.

Base of skull including skull base foramen, erosions along walls of bony portion of eustachian tube and enhancing mass along course of eustachian tube are predictors of nasopharyngeal carcinoma.

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