CASE REPORT

A Rare Nasopharyngeal Carcinoma's Metastasis to the Ear

Shea Ann Wee[1], Nour Hanan Daniah MB[3], Ahmad Anwaar MS[3], Azreen Zaira Abu Bakar[2], Shahrul Hitam[1], Noorjehan Omar[4], Nor Azirah Salahuddin[1,3], Siti Asmat Md Arepen[1,3], Zubaidah Hamid[5], Nor Eyzawiah Hassan[1,3]

[1] Department of Otorhinolaryngology, Hospital Ampang, Jalan Mewah Utara, Taman Pandan Mewah, 68000 Ampang, Selangor, Malaysia
[2] Department of Otorhinolaryngology, Hospital Kuala Lumpur, Jalan Pahang, 50586 Wilayah Persekutuan Kuala Lumpur, Malaysia
[3] Surgical-based Department (Otorhinolaryngology), Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia (USIM), Persiaran Ilmu, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia
[4] Department of Pathology, Hospital Sultan Idris Shah, Serdang, Jalan Puchong, 43000 Kajang, Selangor, Malaysia
[5] Department of Surgery, International Medical University, Bandar Bukit Jalil, 57000 Kuala Lumpur, Malaysia

ABSTRACT

Nasopharyngeal carcinoma (NPC) is a malignant tumor of the nasopharynx which is common in South-Eastern Asia. Commonly, route of spreads are hematogenous and via lymphatic systems, spreading to the cervical lymph nodes, bone, lung or liver. External auditory canal (EAC) metastasis in NPC is extremely rare. We report a 69-year-old Malay woman previously treated for NPC (T3N2M0) presented with right otlagia and ear mass. She exhibited symptoms and signs resembling malignant otitis externa, but conventional treatments proved ineffective. Biopsy taken from right ear mass revealed undifferentiated carcinoma. Despite its rarity, metastatic NPC warrants inclusion in the list of potential diagnoses for patients exhibiting EAC lesions or masses in NPC patients.
Malaysian Journal of Medicine and Health Sciences (2025) 21(1):365-368. doi:10.47836/mjmhs.21.1.43

Keywords: Nasopharyngeal neoplasms, Nasopharyngeal carcinoma, Neoplasm metastasis, Ear canal, Ear neoplasms

Corresponding Author:
Nor Eyzawiah Hassan, Doctor of ORL-HNS
Email: eyzawiah@usim.edu.my
Tel:+06-798 5002

INTRODUCTION

Nasopharyngeal carcinoma (NPC) is the commonest epithelial cancer in adults, characterized by the development of squamous cell carcinoma in the nasopharyngeal epithelium. The Malaysian National Cancer Registry ranked NPC as the 5th most common cancer in Malaysia. It occurs more predominantly in males than in females, with higher risk of 1 in 143 and 1 in 417 respectively (1). Commonly, the site of origin for NPC is the fossa of Rosenmьller (FOR), followed by the superior posterior wall of nasopharynx. The tumor may be confined to nasopharynx or spread to adjacent structures. The most common distant metastases are bone, lung, mediastinum and liver. In contrast, external auditory canal (EAC) metastasis in NPC is unusual and rarely seen, with fewer than 30 documented cases reported in the existing literature thus far (2). We report a case of non-contiguous external auditory canal metastasis in NPC, with nearly no residual or recurrence in the nasopharynx. We aim to raise awareness towards the uncommon metastasis of NPC and to highlight the importance of considering recurrent NPC as one of the differential diagnoses in cases following ordinary auditory symptoms such as otalgia, hearing loss, otitis externa or media along with facial paralysis.

CASE REPORT

A 69-year-old lady who was under our follow up for NPC (T3N2M0) and has completed radical radiotherapy. However, she did not complete concurrent chemotherapy owing to her poor tolerance to the side effects, as she developed Grade II desquamation and mucositis. Her initial surveillance follow-up was uneventful, till the sixth month when she complained of right otalgia. Otoscopy examination of the right ear revealed granulation tissue occupying the whole EAC, obscuring the tympanic membrane (Fig.1). Other examinations of the nose, throat, neck and cranial nerves including nasoendoscopy were unremarkable.

The initial biopsy of the right ear mass revealed necrotic tissue, and the culture and sensitivity test identified the presence of *Pseudomonas aeruginosa*. The patient was

treated for otitis externa with several course of both topical and oral antibiotics. Even with the treatment, her symptoms worsened. She was admitted and treated as malignant otitis externa. Broad spectrum intravenous antibiotic and daily ear toileting and packing was performed. Despite on aggressive treatment, her condition further deteriorated. She developed grade II House-Brackmann right facial nerve palsy, along with right profound hearing loss.

The patient underwent contrast enhanced computed tomography (CECT) scan of the brain and high-resolution computed tomography (HRCT) of temporal bone. Magnetic resonance imaging (MRI) was not done due to limited resources and longer appointment date. The imaging revealed an irregular heterogeneous enhancing soft tissue density in the right EAC, middle ear and mastoid air cells causing erosion of posterior EAC wall (Fig. 2A), facial canal (Fig. 2B), the tegmen tympani (Fig. 3), tegmen mastoidea, anterosuperior and posterior wall of the right mastoid bones. The adjacent meninges were also enhanced and thicken. The right Eustachian tube (ET) and right FOR were normal. No evidence of distant metastasis was detected in the contrast-enhanced computed tomography (CECT) scans of the neck, thorax, abdomen, and pelvis.

Subsequently, she underwent an ear examination under anaesthesia. Intraoperatively revealed multilobulated granulation tissue occupying the whole right ear canal, which bleeds easily on touch. A debulking procedure of the granulation was done. The tissues were sent for histopathological study as well as tuberculosis (TB) work up. Another tissue biopsy from the right FOR was also obtained during the procedure. The histopathology report of EAC mass revealed metastatic undifferentiated carcinoma which was consistent with her initial NPC histopathology (Fig.4), while a biopsy from the primary site was not suggestive of recurrent malignancy. TB workup was negative. Oncology team was consulted and she was then planned for palliative radiotherapy. The patient failed to attend ENT appointments following palliative treatment.

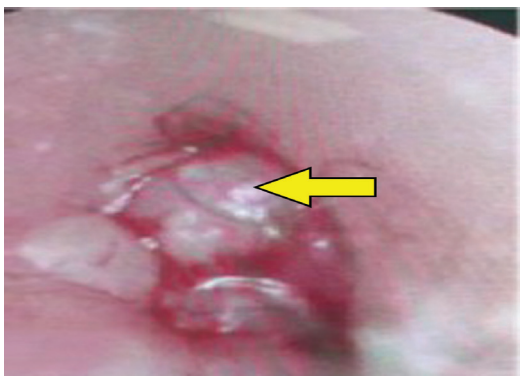

Fig. 1: Granulation tissue occupying the right ear canal obscuring the tympanic membrane.

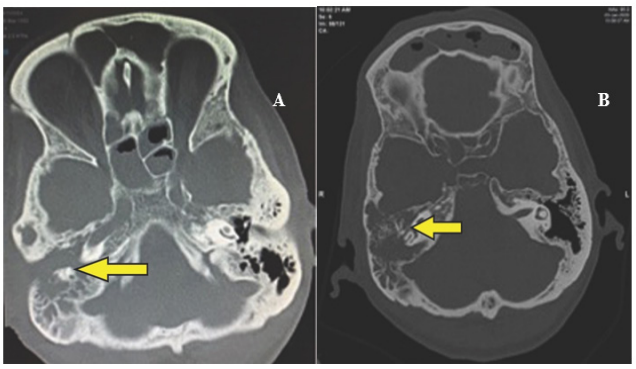

Fig. 2: A) An axial view showing a soft tissue density in the right EAC, middle ear and mastoid with erosion of the anterior and posterosuperior wall of the EAC.B) showing an erosion of the right facial canal.

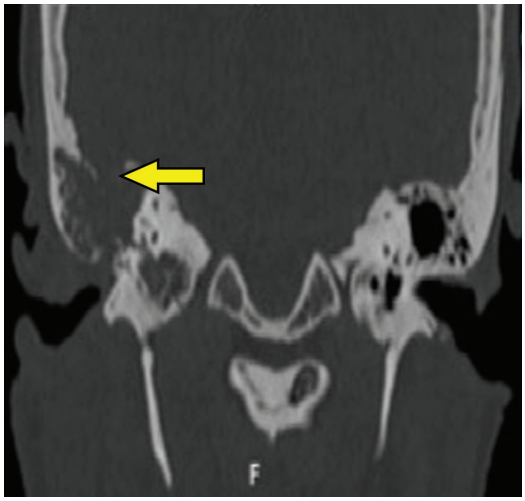

Fig .3: A coronal view showing an erosion of the right tegmen tympani.

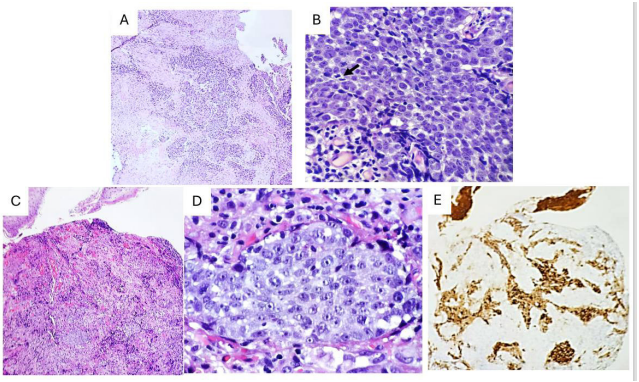

Fig. 4: Histopathological images of previous FOR biopsy (A and B) and EAC mass (C,D and E). A. Fragments of ulcerated respiratory type mucosal tissue infiltrated by malignant cells arranged in syncytial nests. The surrounding stroma shows necrosis, desmoplastic reaction and dense mixed inflammatory infiltrate (H&E, 2x). B. The malignant cells have oval to round vesicular nuclei, prominent nucleoli and scanty cytoplasm. No keratinization or keratin pearls seen. Mitotic figures (marked with arrow) are easily seen (H&E, 60x). C. Fragments of squamous lined mucosal tissue infiltrated by malignant cells arranged in syncytial nest, surrounded by desmoplastic stroma (H&E, 2x). D. The malignant cells have vesicular nuclei with moderate nuclear pleomorphism, prominent nucleoli and moderate amount of cytoplasm (H&E, 60x). E. The tumour cells show positive keratin marker (CKAE1/3, 10x).

DISCUSSION

Spreading pattern of NPC has been well studied which includes direct extension to adjacent organs, lymphatic or hematogenous and perineural spread. Commonly, it spreads hematogenously and via lymphatic systems, spreading to the cervical lymph nodes, bone, lung or liver.

Although EAC is a neighboring structure to the nasopharynx, its involvement has been infrequently reported. In current literature, less than 30 cases has been reported (2). Typically, the NPC extend to EAC via the Eustachian tube and middle ear, which can either be mucosal or submucosally. In this case, submucosal spread is a potential consideration, as histopathological examination and CT scans yielded negative results. However, the absence of magnetic resonance imaging (MRI) due to limited resources and longer appointment dates could have hindered the detection of this spread. Although undifferentiated carcinoma of the ear canal mass, as part of temporal bone carcinoma, is exceptionally rare and typically linked to metastatic disease from elsewhere, it is crucial to explore other potential causes or origins for the ear mass. Besides metastasis from nasopharynx, the common primary sites for temporal bone metastasis in general are breast, lung, prostate, kidney, stomach and bronchus. In addition, there have been reported cases of undifferentiated carcinoma in the middle ear originating from primary undifferentiated car-cinoma of the temporal bone and the spreading of an undifferentiated nasopharyngeal carcinoma (3).

Despite being rare, post-irradiation malignancy of the ear has been known to occur as a result of therapeutic radiotherapy for NPC. It is thus a differential diagnosis for EAC metastasis of NPC. Modified criteria for radiation-induced primary malignancy include history of irradiation, followed by development of a new malignancy in irradiated area diagnosed at least 2 years after radiotherapy and proven to differ histologically from the original malignancy (4). A retrospective examination conducted at a single medical facility revealed that 11 individuals who had undergone radiotherapy for nasopharyngeal carcinoma (NPC) later developed secondary malignancies in the ear. Among these cases, ten tumors were identified as squamous cell carcinoma, while one was diagnosed as chondrosarcoma. The time lapse between the initial radiotherapy and the detection of ear malignancy varied from 3 to 27 years, with a median duration of 17 years. Most of the tumors were located in the external auditory canal (4). In the current case, biopsy from the mass in the EAC was consistent with the initial NPC histopathology and it was less than 2 years gap; 6 months between completion of radiotherapy and EAC mass, thus excluding a radiation induced new primary ear malignancy.

Metastases to the middle ear, mastoid bone, air cells, EAC and temporal bone manifested between 15 months and two years later. In the reported cases, the usual radiological changes of these metastases showed soft tissue mass in the middle ear, often with base of skull and mastoid air cell erosion. Imaging among this cohort of patients showed almost no sign of disease or even subtle change in the nasopharynx as primary site (5).

Clinicians should be vigilant for NPC even when patients present with common auditory sign and symptoms such as otalgia, otorrhea, hearing loss, facial paralysis and mass in the external auditory canal (2). These otological symptoms could also be the first presenting symptom of recurrent NPC. We stress on the importance of the clinical correlation with biopsy specimens when the initial auditory symptoms are unresponsive to conventional antibiotics.

In the present case, the initial completion of NPC treatment and the onset of symptoms and EAC mass was only six months apart. However, there were possibilities of the mass being present within 6 month post-treatment without any symptoms. Given that her chemotherapy was interrupted due to side effects, the likelihood of recurrent disease metastastic to the ear is one of consideration in the diagnosis. The diagnosis was confirmed with repeated biopsies revealed a metastatic undifferentiated carcinoma which was consistent with her initial NPC histopathology.

This case further highlights the importance of examining for ear metastasis in NPC and the need for biopsy performed under general anaesthesia to obtain adequate sample of the mass that may yield a more accurate result. The EAC tissue for histopathologic sample revealed a metastatic undifferentiated carcinoma which was consistent with the initial NPC histology, despite a repeated biopsy at the primary site being negative for malignancy. The mass in EAC has no direct extension to the nasopharynx through ET. This was evidenced by the HRCT temporal, in which the ear enhancement was localized to the ear canal, middle ear and mastoid cavity. The likelihood spreading of tumor in this case are most likely hematogenous or submucosal direct extension. Nevertheless, otorhinolaryngologist must be wary when treating patients known to have NPC who present with otological symptoms and signs.

CONCLUSION

While the occurrence of NPC metastasis to the EAC is uncommon, it warrants attention and should not be disregarded. Symptoms related to the ear may be the sole indicators of metastasis or recurrent NPC, necessitating clinicians to approach such cases with index of suspicion. The diagnosis could only be made histopathologically. Prompt investigation and performing a biopsy for early

diagnosis and treatment is essential to ensure improve prognosis.

ACKNOWLEDGEMENT

The authors express their gratitude to the Director General of Health Malaysia for permission to publish this paper (NMRR ID-22-01662-5WW).

REFERENCES

1. Azizah AM, Hashimah B, Nirmal K, Siti Zubaidah AR, Puteri NA, Nabihah A, et al. Malaysia National cancer registry report (MNCR). moh.gov.my [Internet]. [cited 2023 Dec 3]; Available from: http://www.moh.gov.my/moh/resources/Penerbitan/Laporan/Umum/2012-2016%20(MNCRR)/MNCR_2012-2016_FINAL_(PUBLISHED_2019).pdf
2. Ardhaoui H, Khdim M, Douimi L, Abada R, Rouadi S, Roubal M, et al. Involvement of the external auditory canal by an otherwise discreet nasopharyngeal carcinoma via a spread by the eustachian tube. Global Journal of Otolaryngology. 2019.
3. Rusydi W, Goh BS. Primary undifferentiated carcinoma of the temporal bone: a new entity?. Rawal Medical Journal. 2013;38(1):86-9.
4. Lo WC, Ting LL, Ko JY, Lou PJ, Yang TL, Chang YL, Wang CP. Malignancies of the ear in irradiated patients of nasopharyngeal carcinoma. The Laryngoscope. 2008;118(12):2151-5.
5. Lai JW, Cheng AC, Tong M, Yau CC. Sneaking its way up: external auditory canal involvement by an otherwise inconspicuous nasopharyngeal carcinoma via spread through the eustachian tube. Hong Kong J Radiol. 2015;18:e1-6.