

Case Report

CASE REPORT OF METASTATIC CARCINOMA OF THE TEMPORAL BONE FROM A PRIMARY NASOPHARYNGEAL MALIGNANCY

*Elmart Euster P. Yap, M.D. and Joseph Roy Vincent Umali, M.D., FPSO-HNS

Philippines.

Received 11th November 2022; Accepted 12th December 2022; Published online 22th January 2023

ABSTRACT

Objectives: Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area is a rare case. There is no exact incidence but with the advent of increasing diagnostic modalities, there has been a steady rise (1). A local literature search with search terminologies of Temporal Bone Metastasis and Temporal Bone Metastasis from Nasopharynx yielded no results that pertains with the case. The goal of this paper is to report a case of Temporal Bone Metastasis from a Nasopharyngeal Area. There are no definite protocols in the treatment of Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area. **Materials and Methods:** Case presentation of a male patient with incidental finding of Poorly Differentiated Carcinoma of the External Auditory Canal, AS. Patient was treated with 4 (Four) cycles of Chemotherapy and 35 (Thirty-five) sessions of Radiotherapy. Literature review from international case reports and studies were included. **Results:** A patient presented with External Auditory Canal (EAC) Mass with a biopsy of Poorly Differentiated Carcinoma from a Nasopharyngeal Malignancy. Patient had no surgical intervention but had 4 (Four) cycles of Chemotherapy, 35 (Thirty-five) sessions of Radiotherapy and another 3 (Three) cycles of additional Chemotherapy. The patient tolerated the treatment plan and is now on surveillance. **Conclusions:** Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area is a rare case. There are no definite protocols in the treatment of Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area. The case presented will be the first case presented in the Philippines and is documented.

Keywords: Nasopharyngeal Carcinoma; Temporal Bone Metastasis

INTRODUCTION

Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area is a rare case. There is no exact incidence but with the advent of increasing diagnostic modalities, there has been a steady rise (1). According to Jones *et al.*, (2), from the 255 cases reported, the most common location of primary of a temporal bone metastasis is the breast(19.6%), lungs(16.1%), and prostate(8.6%). There was no mention of a nasopharyngeal carcinoma in origin. In our journal searches, an article by Cundy *et al.*,(3),reported a case of Nasopharyngeal Carcinoma thru the Eustachian Tube to the middle ear cavity and mastoid area as is seen with outpatient; and an article by Sandler *et al.*,(4), where he described an on contiguous metastasis of nasopharyngeal carcinoma to the external auditory canal. Metastases to the Middle Ear and EAC is very rare, with only 20 cases globally.

MATERIALS AND METHODS

I present a case report treated in our institution and proper documentation done. Institutional Review Board approval was not required but a consent from the patient was done. A thorough literature review was done to include local sources to confirm and compare any reports or protocols for treatment that yield no distinct case.

CASE PRESENTATION

This is a case of a 58 year old male with a chief complaint of left external auditory canal mass. Patient is a diagnosed case of Poorly

Differentiated Carcinoma of the cervical lymph node, left probably due to Nasopharyngeal in origin (two nasopharyngeal biopsies were non-diagnostic); Post Chemotherapy 4/4 Cycles (2020) and Radiotherapy 35 Sessions (2020). Five months prior to consult, patient consulted the emergency room (ER) of our institution under the services of Internal Medicine for facial asymmetry, left. Initial impression was Transient Ischemic Attack versus Bell's Palsy, left. Plain cranial computed tomography scan (CT SCAN) neither evidence of infarct nor bleed was revealed. Patient was referred to ENT ER service and a focused ENT examination revealed a House Brackmann Score of 2, left. Also, there was noted a pinkish, non-friable, fun gating, non-tender mass at the external auditory canal, left. No discharge; no ear pain and decrease hearing were noted.

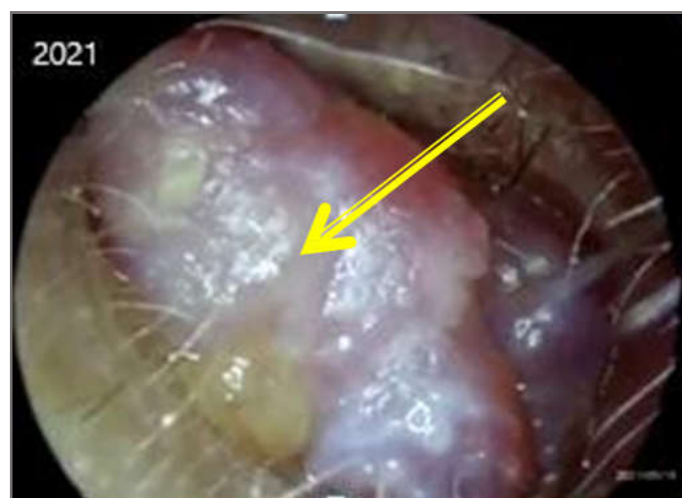


Figure 1. May 15, 2021 (Pre-chemotherapy). AS: Pinkish, Non-tender, Fleshy, Non-friable Mass Occluding the EAC (Yellow Arrow); Tympanic Membrane: Not Seen

*Corresponding Author: Elmart Euster P. Yap, M.D., Resident Physician, Department of Otorhinolaryngology - Head and Neck Surgery Institution, De La Salle University Medical Center, Philippines.



Figure 2. House Brackmann Grade 2: Grossly – slight weakness; At rest – normal symmetry and tone; Motion – almost equal motion of forehead, asymmetry on eye closure, no mouth asymmetry

The patient was discharged uneventful. Four months prior to consult, patient was seen by his primary ENT physician. Nasopharynx free of tumour noted. A punch biopsy was done revealing: Poorly Differentiated Carcinoma, External Auditory Canal. Temporal CT scan was done which noted soft densities in the areas of the middle ear cavity, mastoid, external auditory canal.

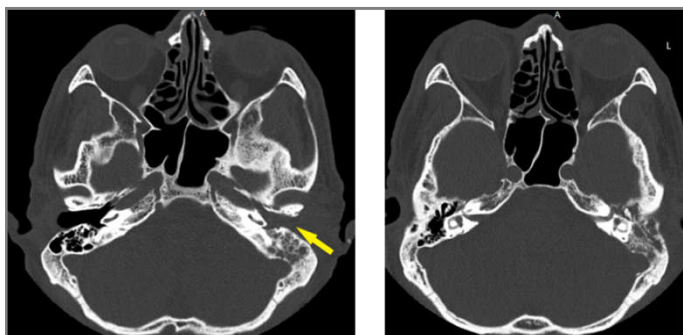


Figure 3. Temporal Bone CT Scan with Contrast in Bone Window (3/24/2021): Axial View – Left Ear shows a soft tissue densities occupying the middle ear, mastoid, external auditory canal (yellow arrow), posterior canal intact, sclerotic mastoid

There was suspicious edema of the left torus tubarius in the said Temporal CT scan. The patient was then referred to the Otolaryngology section of the department and was requested for Magnetic Resonance Imaging (MRI) of the Temporal bone and Internal Auditory canal (IAC) with contrast to evaluate the extent of the tumor and recurrence in the primary site. Two months prior to consult, MRI of the temporal bone and IAC showed hypointense in T1 and hyperintense T2 mass at middle cavity, mastoid, external auditory canal, Eustachian tube and Nasopharynx, left now with extension into the temporal lobe, left. The mass measured 16.9x21.5x16.9 mm.

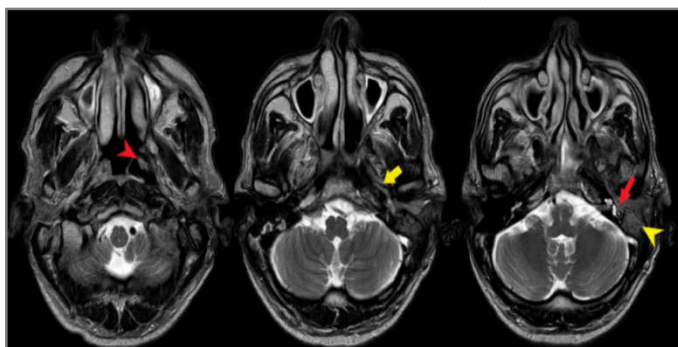


Figure 4. Temporal Bone and Internal Auditory Canal MRI with Contrast (5/15/2021), Axial MRI T2w: On the following cuts, MRI noted a Nasopharyngeal mass (Red Arrowhead), extending into the Eustachian Tube (Yellow Arrow), middle ear and mastoid (Yellow Arrowhead). The facial nerve erosion is at the level of the tympanic segment (Red Arrow).



Figure 5. Temporal Bone and Internal Auditory Canal MRI with Contrast (5/15/2021), Coronal T1w with Fat Suppression: Hyperintense External Auditory Canal and Middle Ear soft tissue mass invading up to the Left Temporal Lobe of the brain

The patient was immediately referred to Medical Oncology for further management and 2nd chemotherapy initiated. A month after initial consult, the external auditory mass decreased in size of about 50% after 2 of 3 cycles of chemotherapy of Cisplatin, Carboplatin and Gemcitabine.

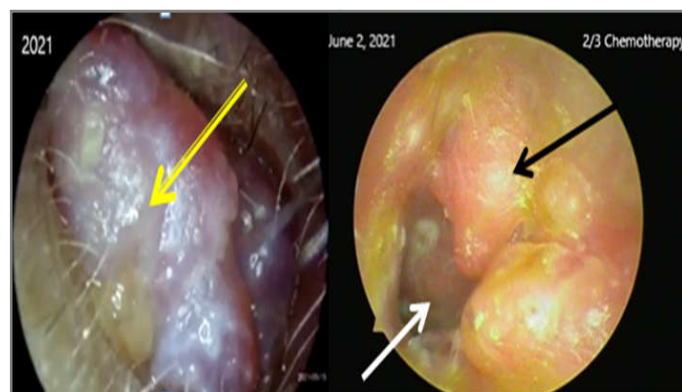


Figure 6. External Auditory Canal Mass, Left. Left Photo: Pretreatment; Right Photo: 2/3 Chemotherapy Given

Past Medical History was non-contributory to the case however, the family has a strong history of Nasopharyngeal Carcinoma. Personal Social history and review of systems were also non-contributory to the case.

DISCUSSION

We are presented here with a case of Temporal Bone metastasis from the nasopharynx are very rare. An international literature search was initially done using Pubmed search engine with key terms of Temporal Bone Metastasis revealed 102 articles from which the initial literature came from. According to Song, *et al.*, (1), the exact incidence of Temporal bone metastasis in general is not yet known to date but due to increasing diagnostic modalities, there has been a steady rise. According to Jones., *et al.*, (2), from the 255 cases reported, the most common location of primary of a temporal bone metastasis thru hematogenous spread are the breast (19.6%), lungs (16.1%), and prostate (8.6%). There was no mention of a nasopharyngeal carcinoma in origin. If there is a spread from the Nasopharynx to the Temporal Bone and External Auditory Canal, it

would be through the Eustachian Tube going more laterally to soft tissues and extend to the Middle Ear and thru the Foramen of Huscke (14). Commonly, the spread of metastasis to the Temporal Bone is from hematologic route and would present bilaterally.

Further narrowing the search parameters to Temporal Bone Metastasis and Nasopharyngeal Carcinoma revealed 9 articles only in the same search engine. The Publication date was not readjusted since no recent study was done pertaining to such case. There are three routes of metastasis from the Nasopharynx – locoregional, nodal thru the lymphatics and distant by hematogenous spread.

Nodal Metastasis, the most common presentation that can be explained thru the posterior extent to the retropharyngeal space and affect the retropharyngeal node 65% of the time or extend immediately to the upper jugular chain that the patient also presented at the early course of the disease. Nasopharyngeal Carcinoma (NPCA) usually spreads submucosally with early palatal muscle infiltration thus a locoregional spread would be the ideal form of spread but presents as a nodal metastasis. A review of the borders of the Nasopharynx could explain this and we know that any mass effect would go through the weakest link within the natural mucosal barriers. If the Carcinoma spreads anteriorly, it will extend to the Nasal Fossa which will then go to the Sphenopalatine foramen to the Pterygopalatine fossa. This can spread to four (4) possible area thru the Maxillary Nerve up to the Foramen Rotundum, Inferior orbital fissure to the Superior Orbital Fissure, Infratemporal fossa by Mandibular Nerve (V3) to the Foramen Ovale and Vidian Canal up to the Petrous Apex, supported by Sandler *et al.*, Posteriorly, this can go to the Retropharyngeal Space and may invade the vertebral body and possibly involve the cerebrospinal fluid or may erode the Clivus and invade the posterior fossa. Superiorly, it can extend intracranially thru the foramen lacerum even if with intact pharyngobasilar fascia. Laterally, the NPCA will go thru the parapharyngeal space and can spread thru the Pharyngobasilar fascia (Directly) and Sinus of Morgagni (Indirectly) that can extend to the Foramen Ovale and Cavernous Sinus. The Sinus of Morgagni was the initial path of spread for this case but did not extend to the foramen ovale. I can postulate that it went laterally, submucosally and entered the middle ear thru the Eustachian tube and thru the Foramen of Huschke, reaching the EAC, sparing the medial structures. The Nasopharyngeal Area and Temporal Bone came from the First Pharyngeal Arch as both are connected by the Eustachian tube. As these are extensions of the pharynx and nasal cavity with its origin, the Neural Crest (15,16, 17).

Due to the rarity of this type of metastatic carcinoma, treatment protocol has not yet been established. In the case of Sandler, *et al.*, (4), surgical resection followed by chemotherapy and radiation were done. Local Literature search in HERDIN, Philippine E-Journals, Philippine Journal of Otolaryngology Head and Neck Surgery, and Philippine Medical Association Journals from 2015 yielded no articles pertaining to Temporal Bone Metastasis and Nasopharyngeal Carcinoma.

CONCLUSION

Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area is a rare case. There are no definite protocols in the treatment of Metastatic Temporal Bone Carcinoma from Nasopharyngeal Area. Prompt evaluation and high suspicion of malignancy unless otherwise proven should be a priority of an Otorhinolaryngologist. The case presented will be the first case presented in the Philippines and is documented to the best of our knowledge.

REFERENCES

1. Song, Kunho, et al. "Clinical Characteristics of Temporal Bone Metastases." *Clinical and Experimental Otorhinolaryngology*, Korean Society of Otorhinolaryngology-Head and Neck Surgery, Feb. 2019, www.ncbi.nlm.nih.gov/pmc/articles/PMC6315217/.
2. Jones AJ;Tucker BJ;Novinger LJ;Galer CE;Nelson RF;. (2020, September 17). Metastatic Disease of the Temporal Bone: A Contemporary Review. Retrieved June 6, 2021, from <https://pubmed.ncbi.nlm.nih.gov/32940937/>
3. WG;, C. R. (n.d.). Middle ear extension of nasopharyngeal carcinoma via eustachian tube. A temporal bone report. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/4723765/>
4. Sandler ML;Sims JR;Xing MH;Khorsand AS;Brandwein-Weber M;Lee NY;Urken ML;. (2020, November 14). Atypical metastasis of nasopharyngeal cancer: Noncontiguous spread to the ipsilateral ear. Retrieved June 6, 2021, from <https://pubmed.ncbi.nlm.nih.gov/33217673/>
5. Bakhos, D., et al. "Two Cases of Temporal Bone Metastases as Presenting Sign of Lung Cancer." *European Annals of Otorhinolaryngology, Head and Neck Diseases*, Elsevier Masson, 21 Nov. 2011, www.sciencedirect.com/science/article/pii/S1879729611000998
6. Shah, A. B. (2021, April 07). Nasopharyngeal Carcinoma. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK554588/>
7. Sarmiento MP, Mejia MB (2013) Preliminary assessment of nasopharyngeal carcinoma incidence in the Philippines: a second look at published data from four centers. *Chin J Cancer*. 2014 Mar;33(3):159-64. doi: 10.5732/cjc.013.10010. Epub 2013 Aug 19 https://www.who.int/selection_medicines/committees/expert/20/applications/NasopharyngealCarcinoma.
8. Nasopharyngeal carcinoma. (n.d.). Retrieved from <https://www.pathologyoutlines.com/topic/nasalnasoaryngealgeneral.html>
9. Iowa Head and Neck Protocols. (n.d.). Retrieved from <https://medicine.uiowa.edu/iowaprotocols/flexible-fiberoptic-laryngoscopy-written-instruction>
10. DHINGRA, P. L. (2017). DISEASES OF EAR, NOSE AND THROAT. Place of publication not identified: ELSEVIER INDIA.
11. Ho, F. C., Tham, I. W., Earnest, A., Lee, K. M., & Lu, J. J. (2012, March 21). Patterns of regional lymph node metastasis of nasopharyngeal carcinoma: A meta-analysis of clinical evidence. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3353248/>
12. Adham, M., Kurniawan, A. N., Muhtadi, A. I., Roezin, A., Hermani, B., Gondhowardjo, S., ... Middeldorp, J. M. (2012). Nasopharyngeal carcinoma in Indonesia: Epidemiology, incidence, signs, and symptoms at presentation. *Chinese Journal of Cancer*, 31(4), 185-196. Available from <https://doi.org/10.5732/cjc.011.10328>
13. Stephanie A Moody Antonio, M. D. (2021, December 23). Malignant tumors of the temporal bone. *Practice Essentials, Etiology, Pathophysiology*. Retrieved May 20, 2022, from <https://emedicine.medscape.com/article/845777-overview#a10>

14. Mankowski, N. L., & Bordoni, B. (2021, August 11). Anatomy, head and neck, nasopharynx - statpearls - NCBI bookshelf. Anatomy, Head and Neck, Nasopharynx. Retrieved May 28, 2022, from <https://www.ncbi.nlm.nih.gov/books/NBK557635/>
15. Langman, J., & Sadler, T. W. (2012). Langman's medical embryology. Wolters Kluwer Health.
16. R;, D. F. S. R. H. (2007, April 3). Extension patterns of nasopharyngeal carcinoma. European radiology. Retrieved June 15, 2022, from <https://pubmed.ncbi.nlm.nih.gov/17404741/>
