Case Report

Multiple Cutaneous Metastases on ^{99m}TC-HYNIC-TOC Scan in a Rare Case of Malignant Laryngeal Paraganglioma

Abstract

Laryngeal paraganglioma is a rare neuroendocrine tumor arising from neural crest cells of larynx, contributing to 0.6% of the laryngeal tumors. Patients usually present with compressive symptoms such as hoarseness of voice. These tumors express somatostatin receptors, which can be imaged with radioligands such as ^{99m}Tc labeled hydrazinonicotinyl-Tyr3-octreotide (HYNIC-TOC). The percentage of malignant transformation in laryngeal paraganglioma is 2%, and they usually metastasize to lymph nodes, bone, and liver. Here, we report a ^{99m}Tc HYNIC-TOC scan of a 55-year-old male patient with recurrent laryngeal paraganglioma, who presented with painful multiple metastatic cutaneous nodules.

Keywords: *^{99m}Tc labeled hydrazinonicotinyl-Tyr3-octreotide, cutaneous metastasis, larynx, paraganglioma, recurrent*

Gowri Sankar, Vishnukumar Rajaraman, Rajesh Nachiappa Ganesh[1], Dhanapathi Halanaik, Nandini Pandit, Madhusudhanan Ponnusamy

Departments of Nuclear Medicine and [1]Pathology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

Introduction

Neuroendocrine tumors of the larynx are very rare primary tumors of the larynx which arise from the neural crest cells. Laryngeal paraganglioma is a type of neuroendocrine tumor that is usually benign in nature. Paraganglioma usually metastasize to lymph nodes, lung, liver, and bone.

Case Report

A 55-year-old male initially presented with hoarseness of voice in 2003. On evaluation, he was found to have a nodule in the false cord region, and he underwent microlaryngeal surgery. Histopathological evaluation of the nodule turned out to be paraganglioma. He presented with hoarseness of voice and underwent microlaryngeal surgeries in 2006 and 2014. Histopathology on both these occasion was consistent with paraganglioma. He complained of with multiple painful cutaneous nodules over scalp, chest, back, abdomen, and gluteal regions in September 2017. Histopathological examination of the excised cutaneous nodule from the back revealed tumor cells arranged in sheets and ill-formed lobules. Nuclei of these tumor cells were exhibiting stippled chromatin. On immunohistochemistry (IHC), they were positive for chromogranin and showed strong diffuse cytoplasmic staining for synaptophysin stain (DAKO antibody USA, Diaminobenzidine chromogen). These findings were consistent with metastatic paraganglioma [Figure 1]. Contrast-enhanced computed tomography of neck, thorax, and abdomen revealed multiple subcutaneous nodules, ill-defined enhancing lesions in bilateral aryepiglottic folds, multiple subcentimetric bilateral lung nodules, and multiple cervical lymph nodes [Figure 2]. FNAC from the cervical lymph node was also positive for metastatic paraganglioma. The patient was then referred for somatostatin receptor (SSTR) scintigraphy.

Twenty millicurie of ^{99m}Tc labeled hydrazinonicotinyl-Tyr3-octreotide (HYNIC-TOC) (BRIT, India) was injected intravenously into the patient and whole body planar and single-photon emission-CT (SPECT-CT) images were acquired after 2 h. Planar images showed multiple foci of abnormally increased tracer uptake in thorax posteriorly, over left iliac region, and right gluteal region. SPECT-CT images revealed tracer avid multiple soft-tissue density nodular lesions in the subcutaneous plane of upper back, abdomen,

How to cite this article: Sankar G, Rajaraman V, Ganesh RN, Halanaik D, Pandit N, Ponnusamy M. Multiple cutaneous metastases on ^{99m}Tc-HYNIC-TOC scan in a rare case of malignant laryngeal paraganglioma. Indian J Nucl Med 2018;33:348-50.

Address for correspondence:
Dr. Madhusudhanan Ponnusamy, Department of Nuclear Medicine, Ground Floor, Super Speciality Block, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry - 605 006, India.
E-mail: freethinker_13@yahoo.co.in

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.IJNM_54_18

Quick Response Code:

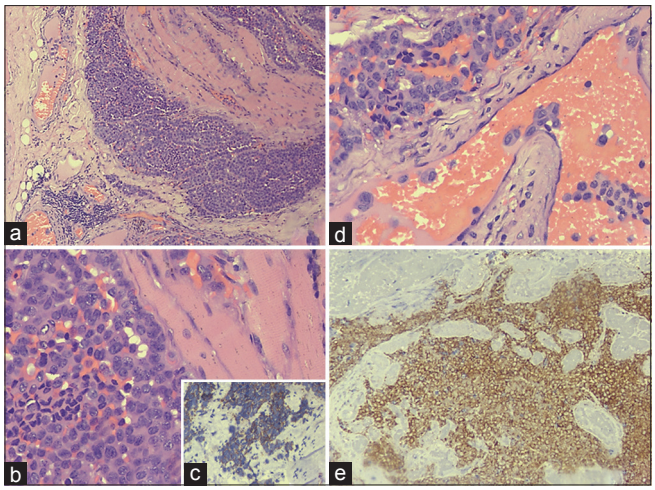

Figure 1: Histopathological evaluation of the excised skin nodule from the back. H and E, ×100 shows tumor cells arranged in sheets and ill-formed lobules infiltrating skeletal muscle bundles (a) and show stippled chromatin (b). Tumor cells highlighted by Chromogranin stain, ×200 (c). Section shows lymphovascular invasion by tumor cells adherent to the endothelium H and E, ×200 (d). They also exhibit strong diffuse cytoplasmic staining for synaptophysin stain, DAKO antibody USA, ×400 (e)

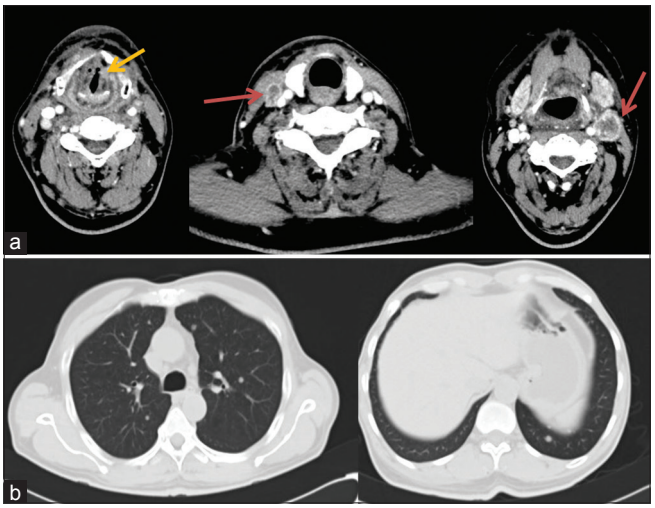

Figure 2: Contrast-enhanced computed tomography of the neck and thorax. Transaxial slices reveal ill-defined enhancing lesion in the area of false vocal cord on the left side (yellow arrow, a). Multiple heterogeneously enhancing bilateral cervical lymph nodes with likely necrotic areas within them are seen (red arrows, a). Multiple lung nodules are also seen in both the lungs (b)

and pelvic regions. In addition, focal increased tracer uptake was seen in segment V and VIII of the liver with corresponding non-contrast CT images showing no specific anatomical abnormality [Figure 3]. However, no abnormal increased tracer uptake was seen in larynx, cervical lymph nodes, and lung nodules.

Discussion

Neuroendocrine neoplasms of the larynx are nonsquamous type tumors of the larynx and account for <1% of all primary laryngeal tumors.[1] They can be of epithelial and nonepithelial in nature. Tumors which are of epithelial in origin include carcinoid, atypical carcinoid, and small and large cell neuroendocrine carcinomas. Paraganglioma of the larynx is a non-epithelial neuroendocrine tumor arising from the neural crest cells present in the larynx.[2] They can be differentiated from carcinoid tumors because of their characteristic pattern of nested "Zellballen" of cells. These nested cells are surrounded by sustentacular cells which show S-100 positivity on IHC. The lesion also shows positivity for synaptophysin and chromogranin just like other neuroendocrine tumors.[2]

Laryngeal paraganglioma is usually nonsecretory in nature and can be divided into two types depending on their clinical presentation. Type 1 is the most common where patients present with hoarseness of voice whereas patients with Type 2 paraganglioma present with wheezing and hemoptysis.[3] They are more common in women with three times more incidence than males and usually present between fourth to sixth decades.[4] The treatment consists of operative removal of the tumor, most commonly through endoscopic excision. The recurrence rate of laryngeal paraganglioma is around 17%, and local recurrence is a sign of malignancy.[5]

Metastases from paraganglioma are usually to lymph nodes, lung, bone, and liver.[6] Cutaneous metastases from paraganglioma are very rare, and to our knowledge, only three case reports have been reported till date.[7-9] In all these case reports, only a single cutaneous lesion was reported in each case, and they were located in the head. In the present case, the patient had multiple cutaneous lesions spread over torso, and many of them showed uptake on ^{99m}Tc-HYNIC-TOC scan. The cutaneous metastasis mentioned in previously published case reports were not from larynx (two were from retroperitoneum and one from sacrum). The time gap from the initial presentation of primary lesion to the presentation of cutaneous metastasis was 14 years in our case and is similar to another case reported recently.[9] In two of the previously reported cases, only cutaneous metastasis was seen.[7,8] In our case, multiple metastatic lesions (in lymph nodes, lungs, and liver) were seen apart from the cutaneous lesions. It is already well known that paraganglioma, like rest of the neuroendocrine tumors, expresses SSTRs, which can be imaged using radiolabeled somatostatin analogs. ^{99m}Tc-HYNIC-TOC is one such gamma emitting analog that targets these receptors and can help in treatment planning.[10,11] If the patient had only cutaneous metastasis, then surgical excision would be considered. In our case, the patient had multiple cutaneous nodules with recurrence in the larynx along with cervical lymph nodes, lung nodules, and suspicious liver lesions, and therefore, surgery is not indicated. Such patients can either be managed with chemotherapy or with radionuclide therapy such as ^{177}Lu labeled SSTR peptide analogs or with ^{131}I-meta-iodobenzylguanidine.[12,13] After our scan findings, this patient was planned for chemotherapy, because the laryngeal lesion, lung nodules, and metastatic cervical lymph nodes were not concentrating ^{99m}Tc-HYNIC-TOC.

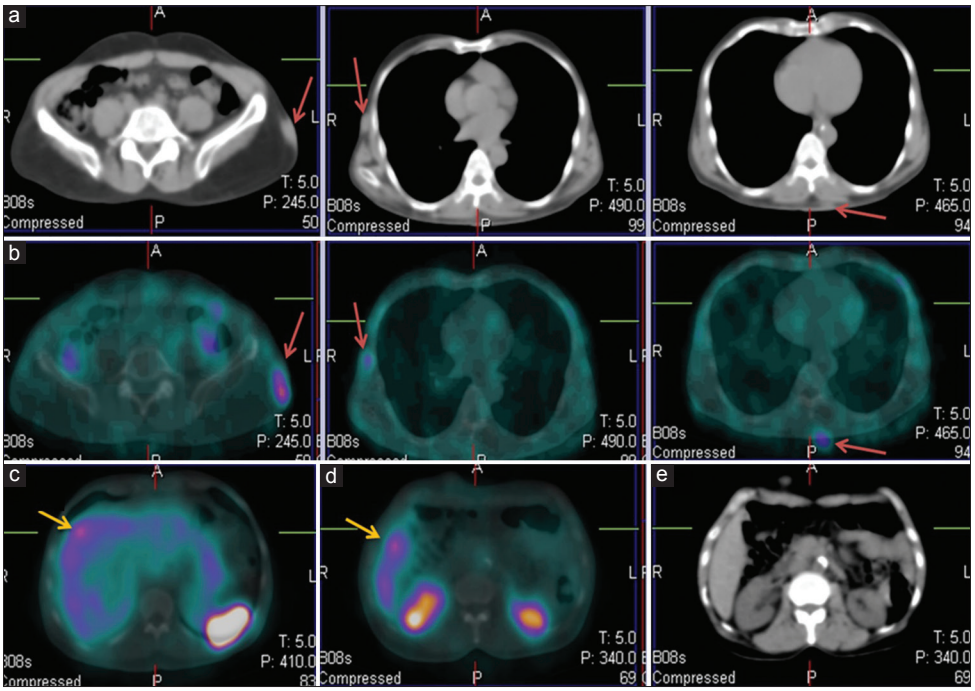

Figure 3: Tc-^{99m} labeled hydrazinonicotinyl-Tyr3-octreotide single-photon emission computed tomography images. (a) Row shows transaxial computed tomography images and (b) row shows the corresponding fused single-photon emission computed tomography images which reveal multiple soft-tissue density cutaneous and subcutaneous lesions at the left iliac region, right lateral aspect of the thorax, and in the posterior thoracic region which shows ^{99m}Tc labeled hydrazinonicotinyl-Tyr3-octreotide uptake (red arrows). Two focal increased uptakes are seen in the right lobe of the liver with no specific changes noted in the corresponding computed tomography images (orange arrows, c-e)

Conclusion

Cutaneous metastasis from neuroendocrine tumor is rare. We presented a case report of metastatic laryngeal paraganglioma with multiple cutaneous metastases that showed ^{99m}Tc-HYNIC-TOC uptake.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Lahoz Zamarro MT, Galve Royo A, Lázaro Maisanava JM. Neuroendocrine carcinoma of the larynx. Acta Otorrinolaringol Esp 1997;48:667-70.
2. Hunt JL, Ferlito A, Hellquist H, Rinaldo A, Skálová A, Slootweg PJ, *et al.* Differential diagnosis in neuroendocrine neoplasms of the larynx. Adv Anat Pathol 2017;24:161-8.
3. Myssiorek D, Rinaldo A, Barnes L, Ferlito A. Laryngeal paraganglioma: An updated critical review. Acta Otolaryngol 2004;124:995-9.
4. Gupta S, Pathak KA, Sanghvi V. Transventricular paraganglioma of the larynx. Eur Arch Otorhinolaryngol 2003;260:358-60.
5. Pellitteri PK, Rinaldo A, Myssiorek D, Gary Jackson C, Bradley PJ, Devaney KO, *et al.* Paragangliomas of the head and neck. Oral Oncol 2004;40:563-75.
6. Somasundar P, Krouse R, Hostetter R, Vaughan R, Covey T. Paragangliomas – A decade of clinical experience. J Surg Oncol 2000;74:286-90.
7. Miller JL, Boyd AS. Metastatic paraganglionoma presenting as a scalp nodule. J Am Acad Dermatol 2001;44:321-3.
8. Cozzolino I, Bianco R, Vigliar E, Vetrani A, Troncone GC, Zeppa P, *et al.* Fine needle aspiration cytology of a cutaneous metastasis from an extraadrenal paraganglioma: A case report. Acta Cytol 2010;54:885-8.
9. de Leon D, Walton K, Sokumbi O. Metastatic cutaneous paraganglioma: A Case report and review of the literature. Am J Dermatopathol 2017;39:700-3.
10. Bombardieri E, Coliva A, Maccauro M, Seregni E, Orunesu E, Chiti A, *et al.* Imaging of neuroendocrine tumours with gamma-emitting radiopharmaceuticals. Q J Nucl Med Mol Imaging 2010;54:3-15.
11. Chen L, Li F, Zhuang H, Jing H, Du Y, Zeng Z, *et al.* 99mTc-HYNIC-TOC scintigraphy is superior to 131I-MIBG imaging in the evaluation of extraadrenal pheochromocytoma. J Nucl Med 2009;50:397-400.
12. Prades CA, Atassi B, Nazeer H. Metastatic malignant paraganglioma: A Case report and review of literature. World J Oncol 2017;8:92-5.
13. Nastos K, Cheung VT, Toumpanakis C, Navalkissoor S, Quigley AM, Caplin M, *et al.* Peptide receptor radionuclide treatment and (131)I-MIBG in the management of patients with metastatic/progressive phaeochromocytomas and paragangliomas. J Surg Oncol 2017;115:425-34.