Iran J Nucl Med. 2023;31(2):196-199 [Serial No. 61]

Homepage: https://irjnm.tums.ac.ir/

CASE REPORT

Jugulodigastric papillary thyroid cancer lymph node metastasis masquerading as carotid body tumor

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ARTICLE INFO

Article History:
Received: 12 October 2022
Revised: 04 January 2023
Accepted: 07 January 2023
Published Online: 19 June 2023

Keyword:
Carotid body tumor
Papillary thyroid cancer
Lymph node metastasis

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ABSTRACT

Thyroid nodule is the most common presentation of thyroid carcinoma. Considering the indolent course of the disease, indeed, the papillary thyroid cancer (PTC) microcarcinoma puts much debate regarding large-scale cohorts on patient follow-up over several decades to detect differences in aggressiveness and outcome. Lymph node metastases might be the salient manifestation of the disease. The nodal metastases usually appear in the central and to a lesser degree in the lateral neck mostly as a solid nodule and rarely in form of a cystic mass. In this study, we describe a case of lymph node metastasis from thyroid papillary carcinoma that clinically and radiologically mimicked a carotid body tumor and despite all pre-surgical evaluations; papillary thyroid carcinoma was detected in the final histopathology report. We intend to describe the initial clinical evaluation, radiological survey and pathology report.

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How to cite this article: Roshanravan V, Soltani E, Aghaee A. Jugulodigastric papillary thyroid cancer lymph node metastasis masquerading as carotid body tumor. 2023;31(2):196-199.

https://doi.org/10.22034/IRJNM.2023.40094

INTRODUCTION

Carotid body tumor (CBT) also known as glomus caroticum, chemodactoma and nonchromaffin paraganglioma originates from chromaffin cells that may develop at various body sites. Ultrasonography (US) and MRI is an integral part of diagnostic workup in many primary and secondary head and neck tumors. Different pattern has been reported in the literature. However, to the best of our knowledge, no report exists on solitary PTC lymph node involvement mimicking a carotid body tumor on US and MRI.

CASE REPORT

We present the case of an asymptomatic 34-year-old woman with a history of right-sided neck swelling. On neck examination there was a right neck swelling measuring 2×3 cm. Proceeded with ultrasonography (US) of the neck, a well-defined heterogeneous hypervascular mass measuring 3.3×1.8 cm in the right submandibular region at the level of carotid bifurcation with no vascular encasement was noted. Furthermore, multiple TIRADS I nodules were found throughout both lobes (the largest measuring 6.5mm). The first differential diagnosis suggested by the radiologist was carotid body tumor. MRI with intravenous contrast was planned and reported an isosignal 22×18 mm mass at the region of right carotid sheath with concomitant compression of the mass on the right internal jugular vein and right common carotid artery (figure 1-2). Arterial blush with lyre sign was also noticed as shown in figure 1. The diagnosis of a carotid body tumor was made upon the MRI findings and clinical presentation. Regarding the impression and low TIRADS score of the thyroid nodules, no fine needle aspiration (FNA) was carried out and the patient underwent surgery. Intraoperatively the mass approved more rigid lobuated than a carotid body tumor. The initial pathology report revealed 4 conglomerated lymph nodes one of them harboring metastatic papillary thyroid carcinoma. Three weeks later, total thyroidectomy with lateral and central lymph node dissection was carried out, in which, pathology depicted multifocal infiltrative microcarcinoma (2 nodules measuring 5mm & 7mm), with no extrathyroidal extension (ETE) and lymphovascular invasion (LVI) in background of adenomatoid thyroid tissue as well as 1 of 17 lymph nodes positive for metastasis. Hence, the patient was then referred to nuclear medicine department for radio-iodine therapy and further treatment planning (Figure 3).

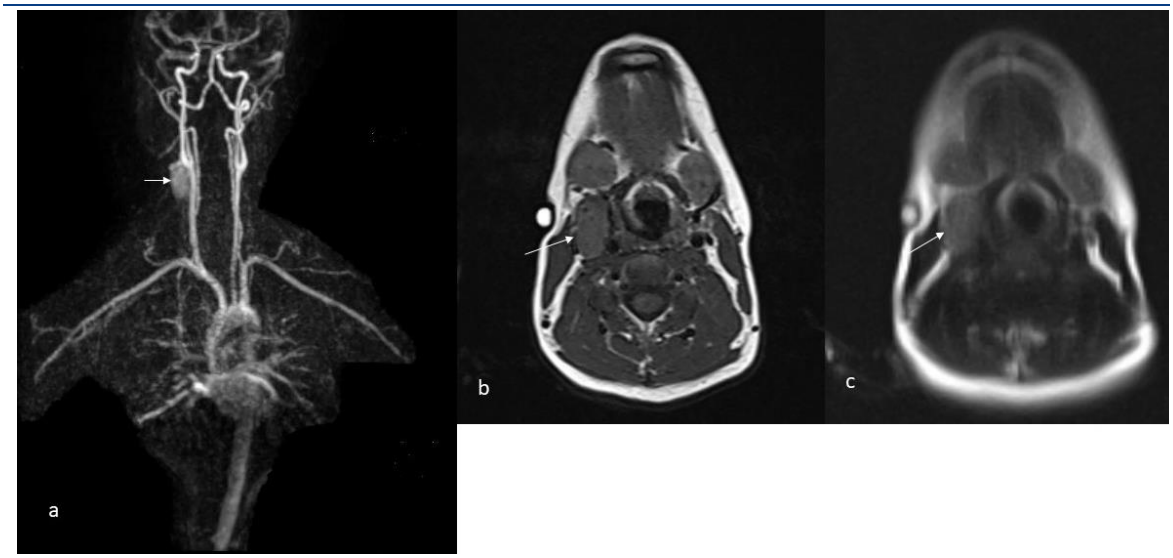

Fig 1. a. Neck MRA, 1.5 tesla magnet with Fl3D technique, TWIST sequence shows there is a mass just below the common carotid bifurcation with arterial blush. b and c axial T1 & T2 TSE images reveal isosignal with small internal foci of signal void (pepper view of feeding vessels within the mass) and mildly hypersignal mass, respectively

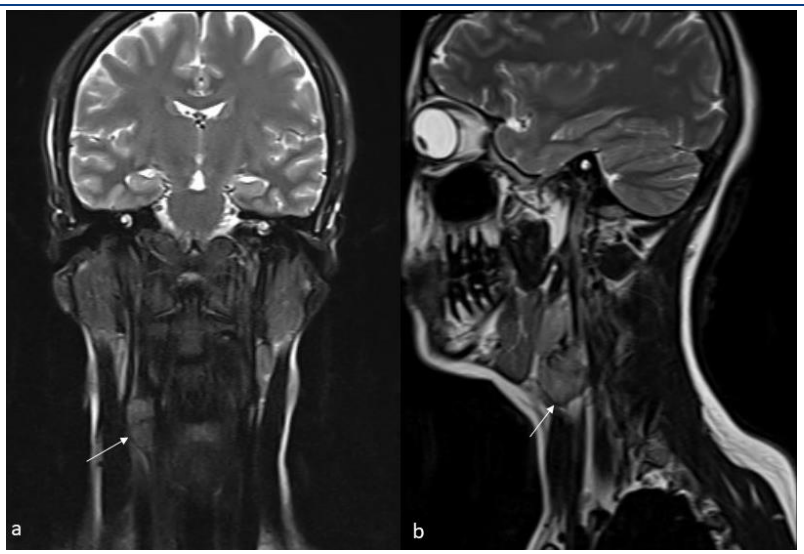

Fig 2. Slightly hypersignal mass in coronal T2TSE with fat saturation and coronal T2TSE sagittal views

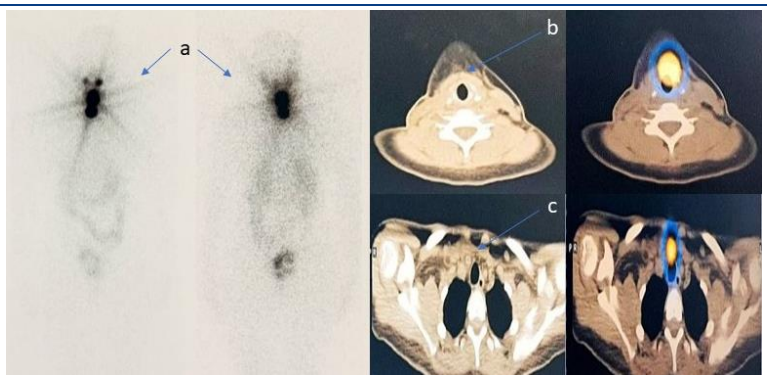

Fig 3. Post-ablation scan after 150 mCi oral administration of I-131. a) represents whole body views with two foci in the neck; b & c) these foci were confined to thyroglossal duct and post-surgical thyroid remnant with no further abnormal tissue nor iodine-avid nodal mets on corresponding CT slices

DISCUSSION

Carotid body tumor (CBT) also known as glomus caroticum, chemodactoma and nonchromaffin paraganglioma originates from chromaffin cells that may develop at various body sites (including the head, neck, thorax and abdomen) [2, 3]. Top differential diagnoses of CBT include carotid space schwannoma or neurofibroma (fusiform without high-velocity flow voids on MRI) [4], carotid artery pseudoaneurysm or ectasia (complex, ovoid mass in carotid space on MRI) [5], glomus vagaleparaganglioma (GVP) and jugulodigastric lymph node. Nevertheless, surgical excision is treatment of choice for all lesions, management of a lymph node can be quite challenging due to sinister causes involving a lymph node. CBT and GVP are hypoechogenous on US and presents with a hyposignal to isosignal (similar to muscle) rounded mass in carotid space, between 2 flow or signal voids: the ICA and ECA and might show a small internal foci of signal void ("pepper") representing vascular flow of feeding vessels on dedicated T1WI MR images. The mass also has intense post-contrast enhancement between the splayed branches of the carotid artery with mildly hyperintensity compared to muscle on T2WI. The internal jugular vein can be compressed at various aspects of the mass [6]. On the other hand, papillary thyroid carcinoma, accounting for 80-90% of all thyroid cancers, is the most common form of well differentiated thyroid carcinoma [7-9]. Papillary thyroid carcinoma is best known by indolent biological behavior, but may have a wide range of cervical lymph node involvement in 20% - 50% of patients by the time of diagnosis [10]. Top differential diagnoses of the nodal disease in this scenario include squamous cell carcinoma, non-Hodgkin lymphoma,

tuberculosis and systemic metastases. Nodal PTC metastases mostly manifests as heterogenicity in signal and size, frequently bright from thyroglobulin or colloid in T1WI and variable, most often hyperintense in T2WI sequences [11]. Nodal systemic metastases most often represents isointense to muscle, slightly hyperintense compared to muscle and minimal enhancement or peripherally when necrotic on T1WI, T2WI and T1W1 C+, respectively. Interestingly, our case revealed a rounded isosignal mass on T1WI with slight hyperintensity on T2WI as well as arterial blush on TWIST sequence.

CONCLUSION

Diagnostic work-up in head and neck cancers carriers a wide range of differential diagnoses, which can mimic the same, patterns in different modalities, especially in MRI and US findings. The present case introduces a rare case of solitary PTC lymph node metastasis at right jugulodigastric region, a common place for detection of paraganglioma, which was falsely interpreted as a carotid body tumor based on subtle imaging clues.

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