

Role of Imaging in Clinically Occult Isolated Intrathyroidal Metastasis from Squamous Cell Carcinoma of Tongue: An Unusual Case Series

Abstract

Metastasis to the thyroid gland is rare; furthermore, intrathyroid metastasis from head and neck squamous cell carcinoma (SCC) is very unusual, with only nine previously documented cases four from intrathyroid metastasis from nasopharyngeal carcinoma, two from oral cavity, one each from oropharynx, larynx, and parotid. The reported case series are unique in nature and illustrates the role of fluorodeoxyglucose positron emission tomography-computed tomography (PET-CT) and ultrasound-guided biopsy in diagnosing clinically occult isolated intrathyroidal metastasis, which helps in the best management for an isolated intrathyroid metastases. This study details the cases of three patients who were diagnosed with intrathyroidal metastasis from SCC of the tongue by PET-CT, followed by USG-guided biopsy, who were treated with either surgery and or chemotherapy. Although intrathyroidal metastasis is an uncommon occurrence and signifies poor prognosis, early detection of an isolated intrathyroidal metastasis on imaging in an appropriately selected patients, radical surgery, and/or chemotherapy improve local control and quality of patient's life.

Keywords: Fluorodeoxyglucose positron emission tomography, histopathology report, intrathyroid metastasis, squamous cell carcinoma, ultrasound

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Introduction

The thyroid gland has an abundant arterial supply, but intrathyroidal metastases from extrathyroid primary tumors are very rare,^[1-3] have been reported in only 1.4%–3% who undergoing thyroid surgery.^[5] This low incidence is possibly due to a fast arterial flow through the thyroid, high oxygen and iodine content of the thyroid gland which may inhibit the settling and growth of metastatic cells.^[5]

Intrathyroid metastasis from an extrathyroid primary head and neck cancer is very rare. Clinical findings may be subtle, detection of an intra-thyroid metastasis from an extrathyroid primary head and neck tumor has improved significantly with current imaging technique 18-fluorodeoxyglucose positron emission tomography-computed tomography (18-FDGPET-CT) scan.^[7-9]

These are the 1st case series that shows isolated intrathyroid metastasis from an extrathyroidal malignancy of squamous cell carcinoma (SCC) of the tongue which was picked on FDGPET imaging and confirmed by ultrasound (USG)-guided biopsy.

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Case Reports

Case 1

A 50-year-old male, operated for carcinoma right tongue in 2012 (pT1N0Mx), presented with ulcerated lesion right lateral margin tongue in December 2016. He underwent surgery for the same in December 2016. HPR – poorly differentiated SCC of the right lateral margin of the tongue (pT1NxMx) and taken radiation for the same in view of the presence of lymphovascular and perineural invasion.

In July 2017, he presented with a small ulcer in upper alveolus with biopsy suggesting of severe dysplasia. Biopsy from upper alveolus ulcer showed severe dysplasia. No malignancy found, considering the past operative tongue history and in the recent history of ulcer, FDGPET-CT was done.

The PET-CT study showed right hemiglossectomy status and no metabolically active recurrent lesion seen at operative bed site. Few high-grade FDG avid irregular hypodense lesions observed in the right lobe of thyroid and isthmus [Figure 1].

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USG showed hypodense and irregularly marginated lesions in the right lobe [Figure 2] and isthmus, and guided biopsy from hypodense lesion from isthmus showed squamous cell carcinoma [Figure 3].

Follow-up contrast CT scan was performed after 15 days revealed few hypodense inhomogeneously enhancing lesions in thyroid gland and new lesions appear in the left lobe of thyroid also.

He underwent total thyroidectomy with central compartment neck dissection which was suggestive of metastatic SCC in both lobes of thyroid with the presence of lymphovascular and perineural invasion.

Case 2

A 42-year-old male presented with a large ulcer on oral tongue, biopsy showed poorly differentiated SCC. Underwent near total glossectomy (pT4aN1Mx) with postoperative radiation in view presence of lymphovascular invasion.

Subsequently, he developed pus discharging sinus in the right neck; follow-up PET-CT scan showed a high grade metabolically active recurrent necrotic lesion at right glossectomy bed site extending in soft tissues in the right submandibular region [Figure 4].

Small metabolically active hypodense lesion observed in the right lobe of thyroid which was suspicious for metastatic thyroid lesion [Figure 5].

Follow-up CT imaging was performed after 15 days as the patient has massive intraoral bleeding.

CT study showed progression in size of a recurrent lesion having fistulous communication with oral cavity. Intrathyroidal hypodense lesions were increased in dimensions and number also.

USG-guided biopsy was performed from intrathyroid lesions. It showed metastasis from SCC [Figures 6 and 7].

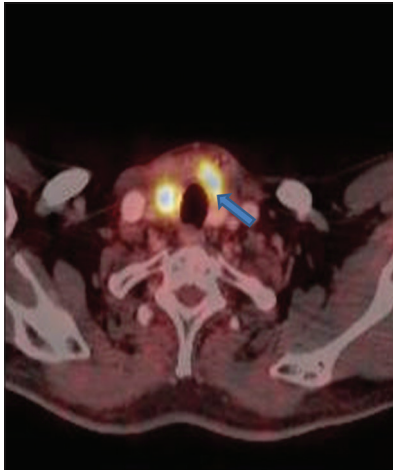


Figure 1: Axial PETCT shows high grade FDG (Fluorodeoxyglucose) avid nodules in right lobe and isthmus of thyroid gland (arrow)

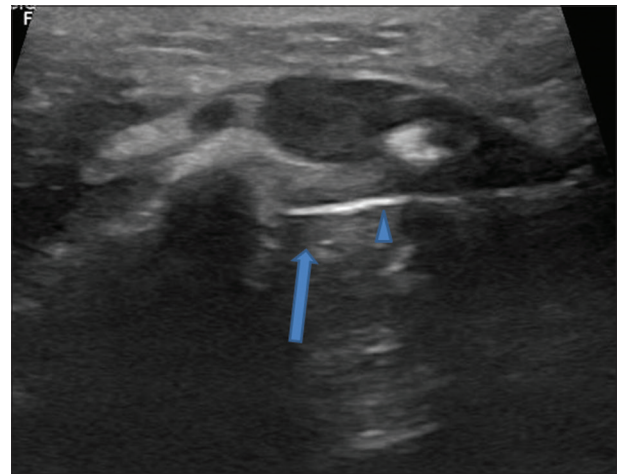


Figure 2: Oblique sagittal image of USG thyroid shows needle tip in thyroid nodule. (Arrowhead for needle and arrow showing thyroid nodule)

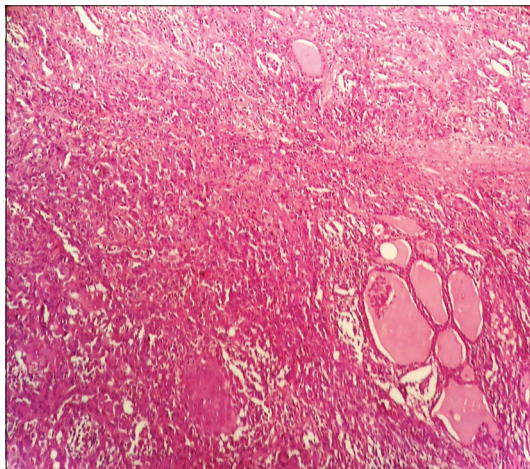


Figure 3: Metastatic poorly differentiated squamous cell carcinoma amidst benign thyroid parenchyma H and E $\times 100$



Figure 4: Axial PETCT scan shows large FDG avid recurrent lesion at operative bed site (Arrow)

In view of large recurrence at the operative bed site with the presence of an intrathyroidal metastasis, surgery (thyroidectomy) was deferred, and he was given palliative chemotherapy.

Case 3

A 52-year-old male who was operated for moderately differentiated SCC of the right buccal mucosa in 2015 (pT4aN2bMx) and moderately differentiated SCC of the left lower alveolus November 2017 (pT4aN0Mx), also taken radiation for the same and in February 2018 he developed SCC of the right lateral margin of the tongue. PET-CT with magnetic resonance imaging fusion was performed.

PET-CT showed a high grade metabolically active lesion in right lateral margin of mid-part of oral tongue, and there were two subcentimetric sized low-grade FDG avid nodules in the right lobe of thyroid with a metabolically active subcentimetric sized right retrothyroid node, and corresponding USG also showed nodules and retrothyroid node [Figures 8 and 9].

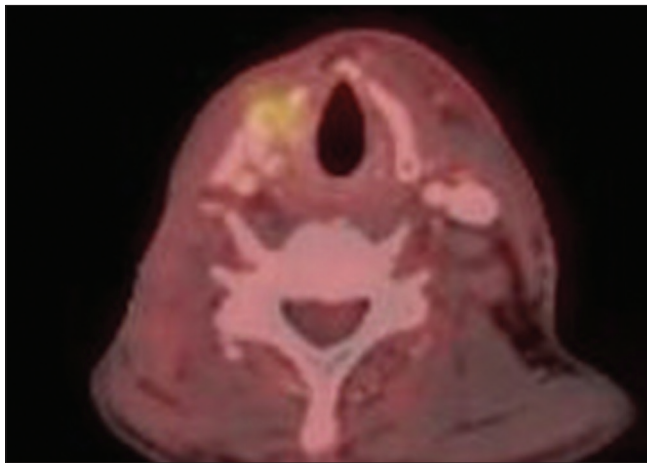


Figure 5: Axial PETCT scan shows small metabolically active nodule in right lobe of thyroid gland. (Arrow)

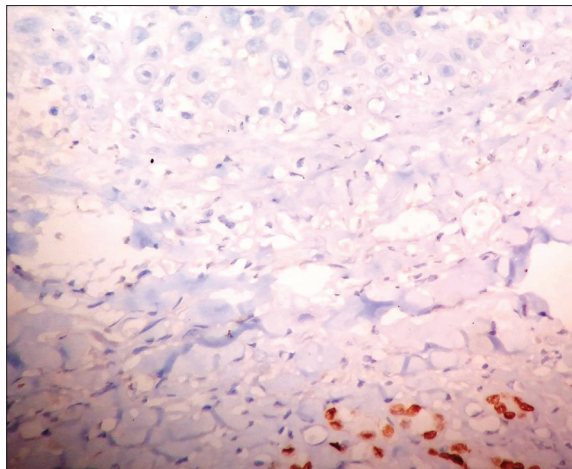


Figure 7: p63 shows positive pattern of reaction in tumor cells (p63, ×400)

Biopsy shows metastatic SCC in thyroid nodule.

Discussion

Head and neck cancers have a significantly high propensity for local recurrence and second primary cancers in view of a large area of mucosa exposed to carcinogens.

Intrathyroidal metastasis is rare, but its detection is early likely due to increased awareness and improved detection with advancing technology. The most common primary sites are kidney, lungs, breast, and colon-rectum with head and neck cancers being a minority (0.02%).^[1,2]

Intrathyroidal metastasis is an uncommon presentation in the clinic though higher incidence rates have been reported in autopsy series (1.25%–24.4%).^[3]

Hematogenous metastasis to the thyroid gland from head and neck squamous cell carcinoma is extremely rare.

There are only nine previously reported cases in the literature: four of nasopharyngeal origin. The other

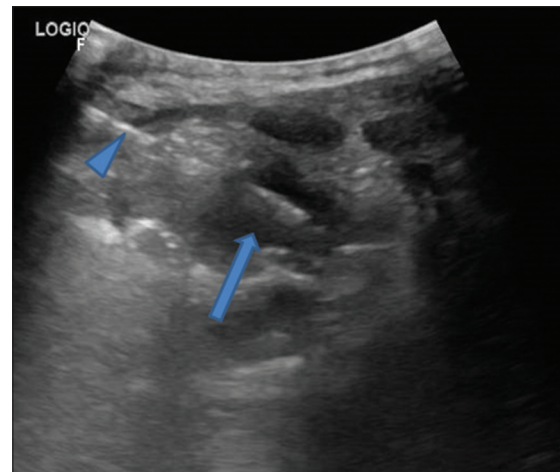


Figure 6: USG guided biopsy was performed from intra-thyroid lesion (Arrowhead for needle and arrow showing intrathyroid nodule)

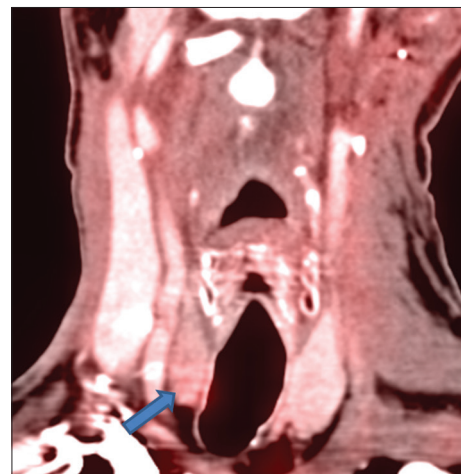


Figure 8: Coronal PETCT shows low grade FDG avid two small ill-defined in right lobe of thyroid

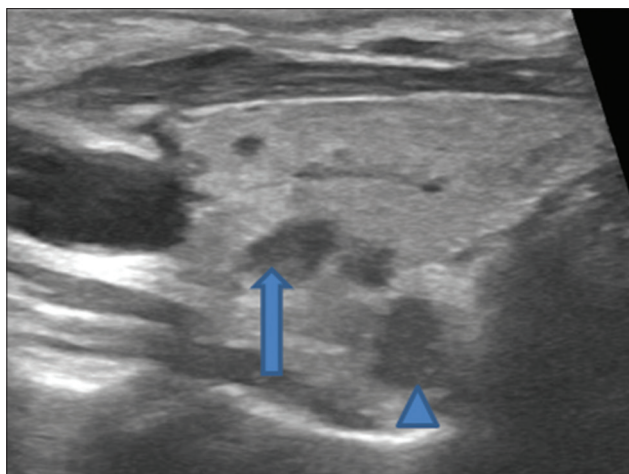


Figure 9: Sagittal USG shows two hypodense nodules right lobe (arrow) and intrathyroid node. (arrowhead)

head and neck sites metastasizing to the thyroid were oral cavity (two), oropharynx (one), larynx (one), and parotid (one).^[4] Intrathyroid metastasis most likely developed by hematogenous route apart from direction extension by adjacent laryngeal or hypopharyngeal tumor.

The thyroid gland is a highly vascular organ in the body being 2nd only to the adrenal gland. Anatomy wise superior thyroid artery is 1st anterior branch and followed by lingual artery from external carotid artery. Rarely superior thyroid artery and lingual artery arising from common trunk known as thyrolingual trunk,^[6] thus lymphovascular invasion can be a factor for intrathyroidal metastasis through hematogenous route can be a probable hypothesis.

All the three cases diagnosed at our center did not show any signs or symptoms due to the SCC metastasis to thyroid gland; all three of them were picked incidentally on PET-CT imaging and followed by USG correlation and guided biopsy from the lesion.

Intrathyroidal metastases present on 18F-PET/CT predominately as high-grade FDG avid solitary nodules, but can also occur as multiple nodules; this is in contradiction to the normal thyroid gland that usually shows low or absent 18F-FDG uptake.^[7-9] Hence, in our case series also, they were picked up incidentally on PET-CT study. The risk of malignancy is as high as 63.6% in thyroid lesions with focal uptake.^[8]

Intrathyroidal metastasis on USG appear as markedly hypoechoic nodules with irregular/ill-defined margins^[10,11] as in our case series also, and under USG guidance biopsy/fine-needle aspiration cytology is easy to perform. USG also helps to differentiate FDG avid nodule on PET to have features of primary well-differentiated thyroid cancers such as papillary or follicular carcinoma, who can also present as synchronous 2nd primary malignancy with tongue cancer.^[12]

Management can be variable depending on the site and stage of the primary tumor, presence of recurrent,

residual or 2nd primary at the time of presentation and the symptoms caused by the thyroid metastases. Patients with good performance status, disease control at the primary site and no evidence of distant metastatic disease, radical treatment should be considered which prolong the survival and prevent further dissemination of the tumor by systemic circulation owing to the rich vascularity of the thyroid.^[13-16]

Conclusion

Metabolically, active thyroid nodule on PET/CT imaging should be considered a potential intrathyroid metastasis in known SCC of tongue and such nodules should always be evaluated by USG for its morphology and under USG guidance should receive tissue diagnosis. Communication among treating surgeons and evaluation of primary tumor index is very essential, and it should be a multidisciplinary team decision by oncosurgeons, medical, and radiation oncologist for the best management of an isolated intrathyroidal metastasis.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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