

Traumatic Bony Lesion Turned Out to be Rare Radial Metastasis of Follicular Thyroid Carcinoma- A Case Report

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ABSTRACT

Follicular thyroid carcinoma (FTC) is the second most prevalent thyroid cancer and usually causes blood borne metastases. However, distant metastases to bone are common in differentiated thyroid cancer, solitary bone metastasis in appendicular skeleton is a rare condition. We report an unusual case of solitary bone metastasis to radius in 52 years, male patient presenting as post-traumatic, non-tender, firm, fixed swelling at left forearm for six months. 99mTc-methylene diphosphonate (99mTc-MDP) bone scintigraphy [planar and single photon emission CT (SPECT)] was the radiological modality of choice for the detection of the solitary bone metastasis in this patient with follicular thyroid carcinoma (FTC). In addition to bone scintigraphy, 99mTc thyroid scan had added the role of nuclear medicine study to detect both primary site and secondary site of metastasis.

Keywords: Differentiated thyroid cancer, Follicular thyroid carcinoma, Radius, Metastasis

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INTRODUCTION

Differentiated thyroid cancers (DTC) are derived from follicular cells and includes papillary thyroid carcinoma (PTC), follicular thyroid carcinoma (FTC), hurthle cell carcinoma etc. FTC comprises approximately 5–10 % of all thyroid cancers. It usually spreads by haematogenous route unlike PTC and may be aggressive to cause distant metastases to bone, brain, lung and other organs (1). FTC has the more tendency to metastasize to bone than PTC as PTC causes metastasis through lymphatic spread. Bone metastases have been reported in 2.3–12.7 % of patients with DTC. Most bone metastases occur in areas of axial skeleton, including the vertebrae, femur, skull and pelvis. Solitary metastasis to bone in appendicular bone is rarer

in DTC. Diagnostic 99mTc-methylene diphosphonate (99mTc-MDP) bone scintigraphy [planar and single photon emission CT (SPECT)] and/or SPECT/CT are very helpful in early diagnosis of such rare sites' bony metastases (2,3). We report a case of multinodular goitre turned out to be an FTC with rare radial metastasis of appendicular bone.

CASE REPORT

A 52 years old male noticed a painless swelling in the neck one year back. He had a history of trauma at distal part of the forearm six month back and according to history, he developed a forearm swelling later. Recently, he complained occasional shortness of breath, difficulty in swallowing due to recent rapid growth of the swelling and visited a physician. The patient was referred to Thyroid and scintigraphy division of Institute of Nuclear Medicine and Allied Sciences, Jashore for further investigations and management.

FTC is common older people with the mean age of being greater than 50 years, or about 10 years older than for typical PTC. Like PTC, it is commoner in women. However, our patient is male, he is in the mean age for FTC. His thyroid hormones (T3, T4, TSH) were within normal limit. However, his serum TG was very high and Anti TG Ab is within normal limit.

Most patients with FTC present with a painless thyroid nodule, with or without background nodularity. FTC has rarely clinically evident lymphadenopathy at presentation (4). On examination, we found a fairly large, globular, firm, non-tender, free from skin, adherent to underlying structure-swelling on left lobe of thyroid gland. No

enlarged lymph node is noted in both side of the neck. This patient is hypertensive and has no history of thyroid disease, drug or radiation exposure history or other risk factors of thyroid malignancy. On High resolution ultrasound of the neck (HRUS), right lobe of the thyroid

gland appeared normal. Left lobe of the thyroid gland was enlarged with multiple solid and iso to mixed echogenic nodules. Largest one was the palpable, firm swelling of the neck which was hypoechoic having irregular margin with both micro and macro-calcifications.



Figure 1:Image of the patient with thyroid swelling (a), Image of the hand swelling of same patient(b).

According to ACR TIRADS criteria, it was a highly suspicious nodule (TR-5) (5). Thyroid scintigraphy with ^{99m}Tc -pertechnetate revealed a large photon deficient area on left side of the thyroid bed representing a cold nodule.

After six months of development of the neck swelling discussed earlier, patient had a trauma at left wrist joint due to fall and gradually a swelling was developed also at traumatic site. It is said that few mechanisms might predispose to metastasis to a distant site after trauma. However, it is very rare and caused by blood borne micro-metastasis (6). On examination, this swelling was fairly large (>5cm), hard, immobile, non-tender, adherent to skin and underlying bone. Xray of left wrist joint both views showed that there was an expansile lytic lesion having few periosteal reactions, causing destruction of cortex and abutting the articular surface at distal end of left

radius. HRUS of the forearm revealed a poorly demarcated, hypoechoic, solid mass lesion in the distal end of left radius having irregularity in the cortical bone and soft tissue involvement.

Planar-two-dimensional skeletal scintigraphy with ^{99m}Tc -methylene diphosphonate (^{99m}Tc -MDP) with SIEMENS Dual Head SPECT CT scanner revealed focal areas of increased radiotracer uptake in distal part of the forearm. SPECT imaging of multiplanar sequences provided precise anatomical localization and characterization (2). SPECT imaging of the left hand with Mediso Dual Head Gamma Camera showed more specific focal increased radio-tracer uptake at the distal end of radius. ^{99m}Tc -MDP bone scintigraphy and SPECT revealed a more detailed extension of a hand metastatic lesion, confirmed by biopsy and histopathological examination in a rare site's bony metastases.

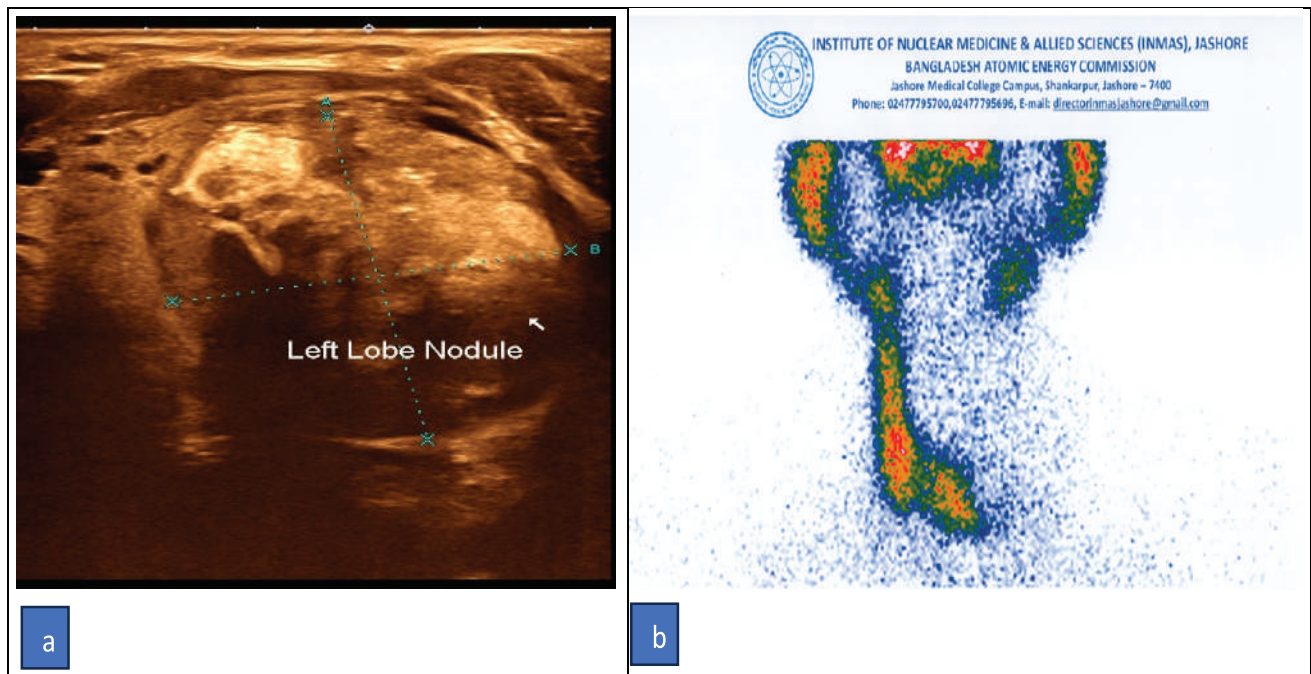


Figure 2: HRUS of neck image showing solid, hypoechoic nodule having irregular margin with both micro and macro-calcifications in left lobe of thyroid gland (a), Thyroid scan showing a large photon deficient area on left side of thyroid bed representing a cold nodule (b).

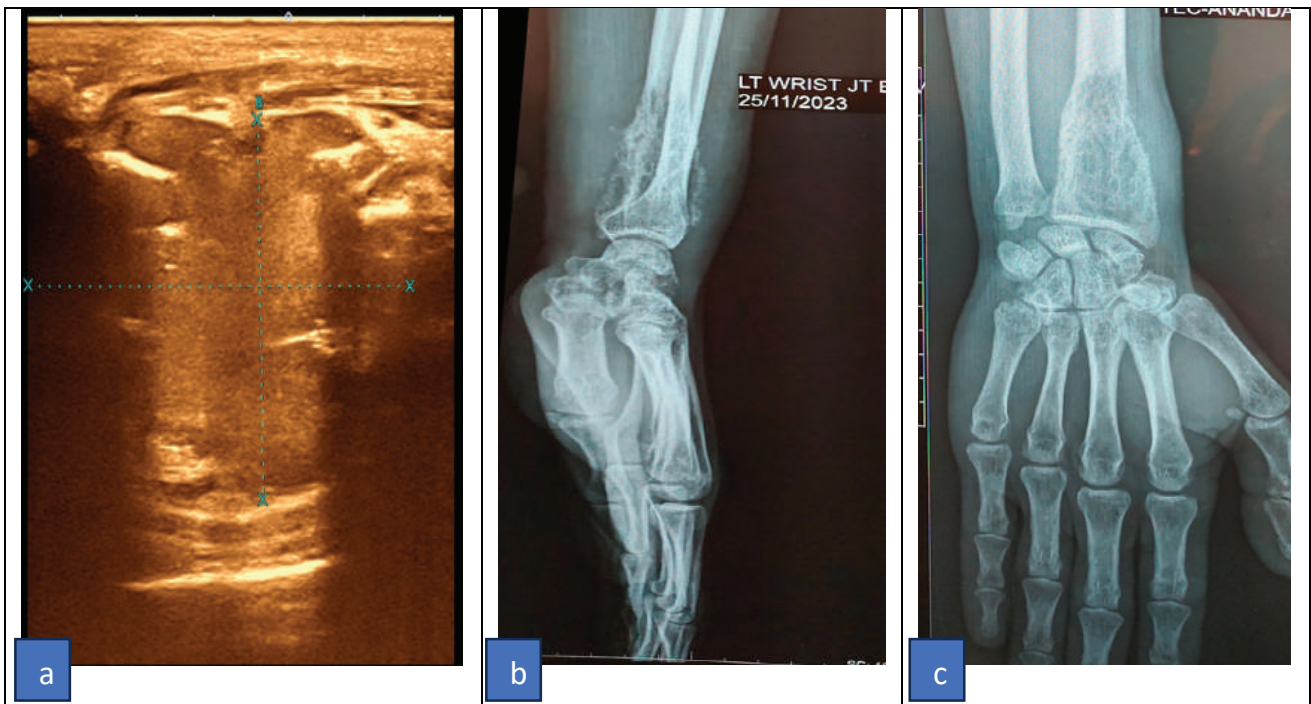


Figure 3:(a) HRUS of hand image showing poorly demarcated, hypoechoic, solid mass lesion in the distal end of left radius (a), Xray of left wrist joint lateral (b) and AP (c) view showing expansile lytic lesion causing destruction of cortex and having few periosteal reactions, abutting the articular surface at distal end of left radius.

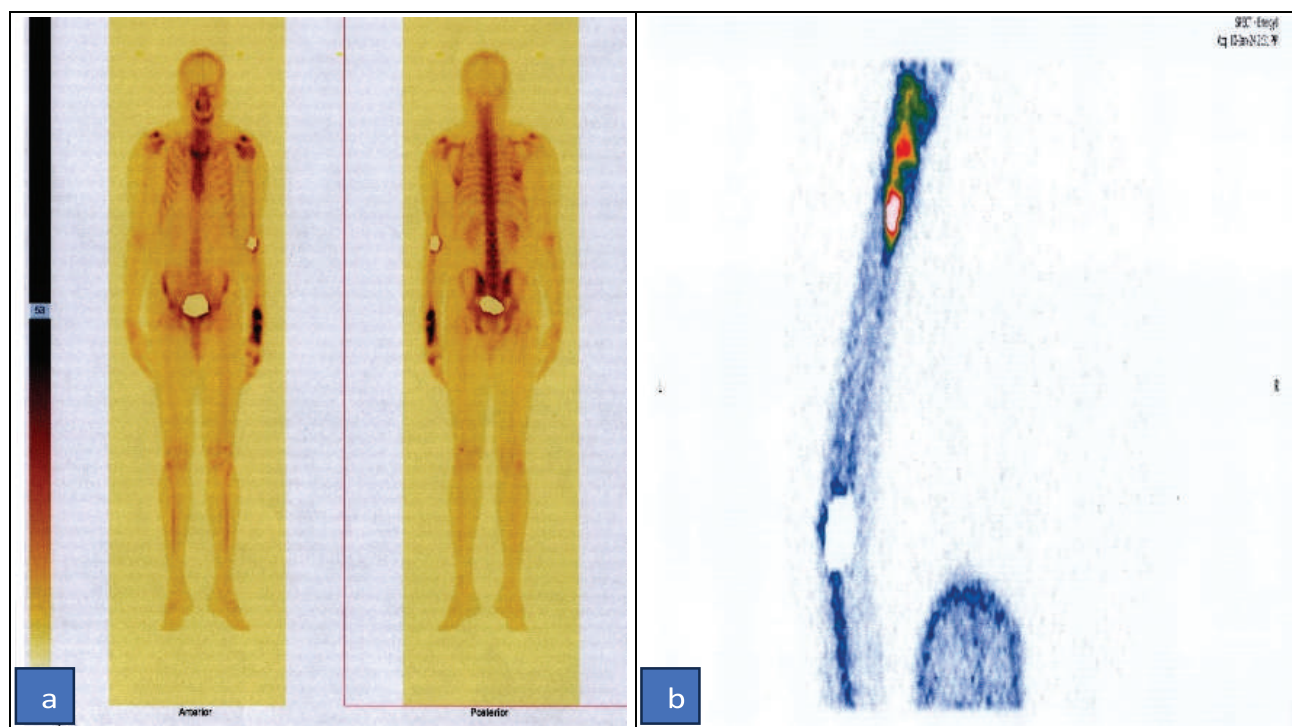


Figure 4: Images showing focal increased radiotracer uptake in distal end of radius at ^{99m}Tc -MDP bone scintigraphy Planar image-(a) and SPECT image-4(b).

DISCUSSION

Solitary metastasis to bone is rarer in DTC. There may be delayed treatment due to unusual presentation or diagnostic pitfall (2). FTC often goes unnoticed due to a lack of obvious clinical symptoms of the patient. It is typically diagnosed during HRUS of the neck when a thyroid goiter is noticed by the patient or when patients exhibit symptoms related to distant metastases at hospital admission. FTC exhibits more aggressiveness compared to PTC, with a higher chance of developing distant metastases and also an increased mortality rate. The occurrence of distant metastasis in follicular thyroid carcinoma (FTC) has been reported to range from 6% to 20% (7). Osorio et al. stated that DTC preferentially metastasizes to the axial skeleton, mostly in the spine and pelvis. The most common sites of metastases, in descending frequency, are the spine (34.6%), pelvis (25.5%), thorax (18.3%), extremities (10.2%), shoulder girdle (5.4%), craniomaxillofacial (5.4%), and sites classified as “other” (0.6%). He also stated that bone metastases were more common in FTC (7% to 28%) than in papillary thyroid carcinoma (1.4% to 7%) (8). In a study of twelve cases of metastatic follicular carcinoma

with initial presentation of metastasis, the primary sites of metastasis were predominantly in the bones, comprising 42% of cases. The rest were lungs at 33%, brain at 17%, and lymph nodes at 8%. Among patients with thyroid cancer, the skeletal metastasis commonly occurs in vertebral bodies, followed by the pelvis, femur, skull, and ribs (7). So, radial metastasis is a really rare phenomenon. However, it may be caused by blood-borne micro-metastasis after trauma (6).

In this case, trauma might mislead the diagnosis, or trauma might cause the metastasis. However, nuclear imaging and histopathological study aided the diagnosis of the rare solitary bone metastasis of FTC to the radius. Nilojan et al. stated that radioiodine therapy in initial bone metastasis in DTC showed the chance of success. Another study shows radioiodine therapy is effective and has a better prognosis in patients having a single metastatic lesion, bone metastasis, or having surgery before radioiodine ablation therapy (7). We have referred the patient for neck surgery as well as consultation with an oncologist. The mainstay of the treatment of DTCs is surgery with radioactive iodine therapy. The patient was referred to us after neck surgery, and the

histopathological report was consistent with FTC. The patient was examined for radioiodine therapy thoroughly, and 5550 MBq (150 mCi) of oral iodine-131 was given according to protocol for metastatic disease. The patient is now on follow-up and advised to treat metastatic bone disease under an oncologist. According to guidelines, complete surgical resection of isolated bony metastasis is recommended. Prognosis can be improved if radioiodine therapy is given at an early stage (9). External beam radiation (EBRT) may help local control (1,9).

CONCLUSION

The diagnosis of a rare radial metastasis of FTC, a post-traumatic lesion, was challenging due to its post-traumatic nature, but nuclear medicine studies and supportive investigations significantly aided the patient's treatment.

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