Unusual Presentation of Primary Hyperparathyroidism with Coexisted Thyroid Carcinoma

Yalcin Basaran[1], Semra Ince[2], Engin Alagoz[2], Coskun Meric[1], Abdullah Taslipinar[1]

[1]Department of Endocrinology and Metabolism, Gulhane School of Medicine, Ankara, Turkey
[2]Department of Nuclear Medicine, Gulhane School of Medicine, Ankara, Turkey

Introduction

Brown tumor is a rare benign bone lesion with incidence ranging from 1.5% in primary hyperparathyroidism to 13% in secondary hyperparathyroidism. Common sites of involvement are pelvis, femur and ribs, but may appear in any bone. Since the incidence of thyroid disease is higher among patients with hyperparathyroidism than the general population, these lesions must be distinguished from metastases from thyroid carcinoma.
We present a patient with a complex clinical picture of primary hyperparathyroidism with multiple destructive skeletal lesions suspicious of bone metastases and concomitant multifocal papillary thyroid carcinoma with a metastatic central lymph node.

Case report

A 38-year old male presented with progressively worsening right hip pain and restricted motion. MRI revealed multiple lytic bone lesions suggestive of brown tumors, but also suspicious for metastases (**Fig1**). Biochemical tests were consistent with primary hyperparathyroidism. Neck ultrasound and parathyroid scintigraphy revealed a single parathyroid adenoma and a thyroid nodule, preoperative cytology of which confirmed papillary thyroid carcinoma, as did the final surgical specimen (**Fig 2**). Biochemical results, regarding hyperparathyroidism, declined to normal levels and his complaints gradually decreased after surgery. Postoperative whole body bone scintigraphy showed increased tracer uptakes at multiple sites (**Fig 3**). However, post-RAI whole body scan and FDG PET/CT did not exhibit an abnormal uptake throughout the skeletal system, which proved these osteolytic lesions to be metabolically inactive (**Fig 4**).

Conclusion

Although the guidelines do not consider primary hyperthyroidism a risk factor for thyroid carcinoma, several data suggest that this risk may be increased when compared to the general population. As the concomitant thyroid carcinoma is not uncommon among primary hyperparathyroidism patients, all patients who present with a thyroid nodule should undergo FNAB, even if sonographic features are not suspicious for malignancy.

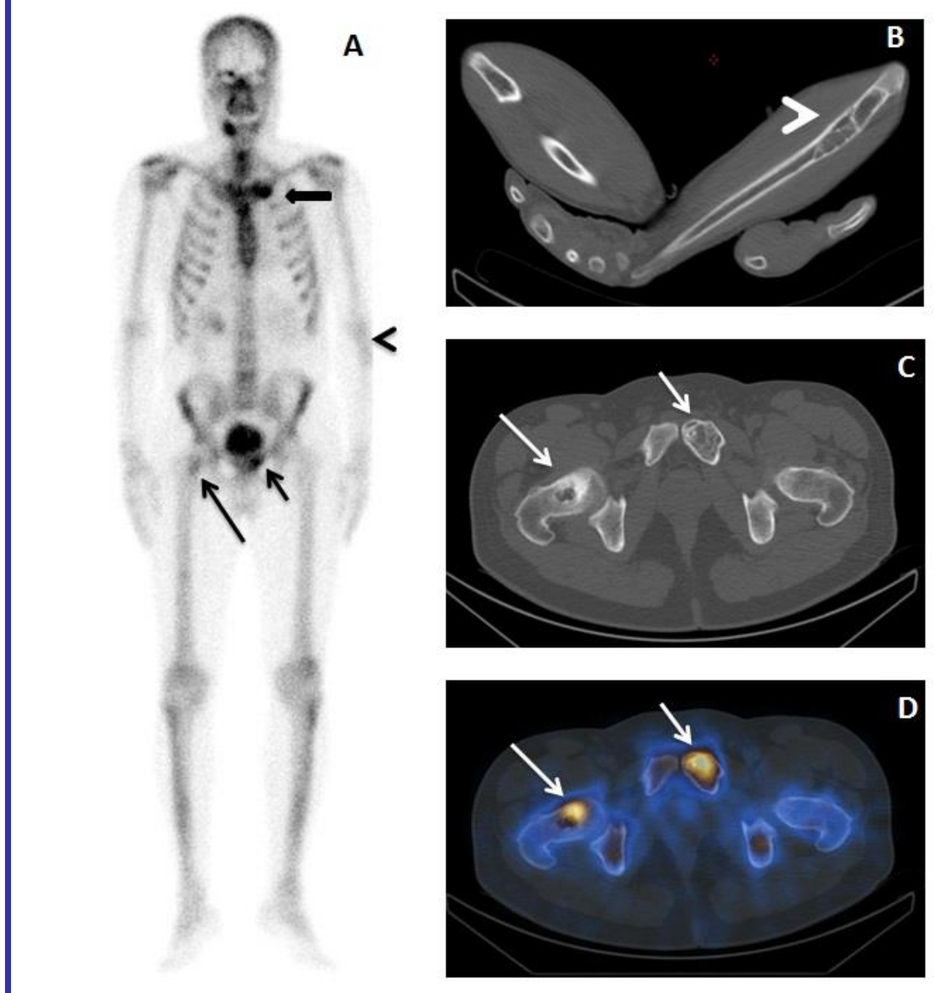
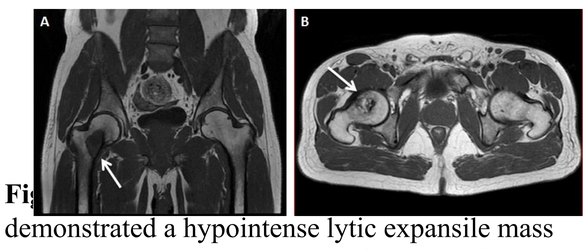
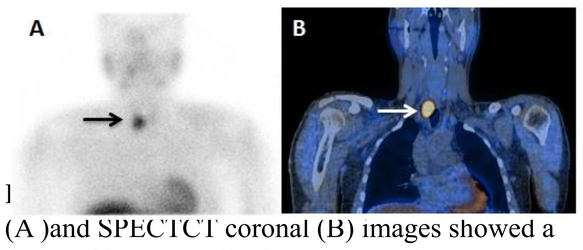


Fig
ased tracer uptakes in left sternoclavicular joint (thick arrow), left proximal forearm (arrowhead), left pubic ramus (short arrow) and right femoral neck (long arrow). CT image of left ulna (B) revealed expansile lytic lesions with lamellar style septas, a finding suggestive of brown tumor (arrowhead). Axial CT (C) and SPECT/CT (D) images of pelvis demonstrated increased tracer uptakes with peripheral sclerosis at the right femoral neck (long arrow) and left pubic ramus (short arrow), all consistent with brown tumors.



Fi
demonstrated a hypointense lytic expansile mass lesion at the trochanter minor of the right femoral neck (arrow). Significant contrast enhancement in the mass lesion and some degree of soft tissues expansion was noted.



]
(A)and SPECTCT coronal (B) images showed a focus of intense radiopharmaceutical uptake (arrow) just below lower pole of the right thyroid lobe.

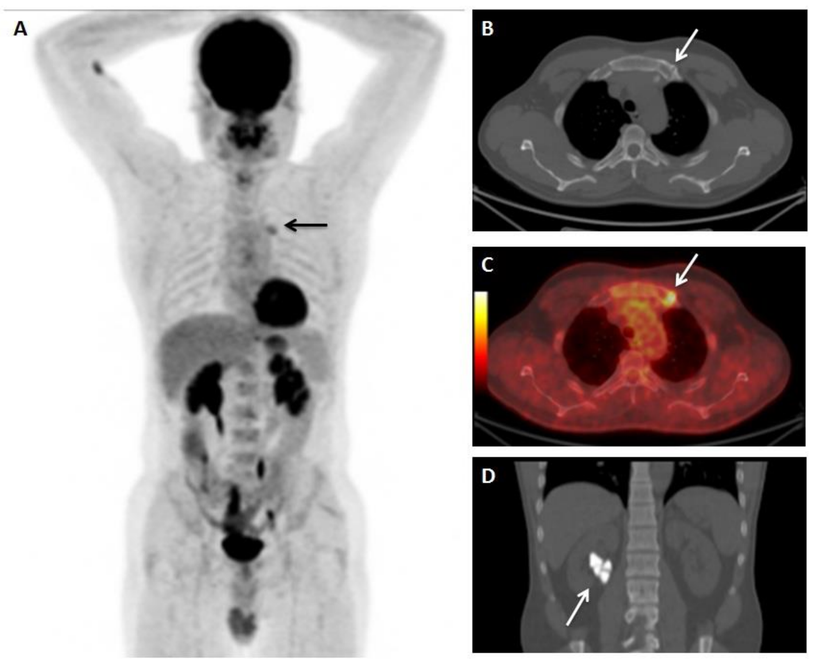


Fig4: Maximum intensity projection (MIP) image of ^{18}F-FDG PET/CT after parathyroidectomy (A) showed increased ^{18}F-FDG uptake in the left sternoclavicular joint region (arrow), but no ^{18}F-FDG uptake was noted in the other bone lesions. Axial CT (B) and axial fusion (C) images revealed increased ^{18}F-FDG uptake in the left sternoclavicular joint suggestive of degeneration (arrow). The lytic lesion on the left side of sternum, which was previously thought as a brown tumor had no ^{18}F-FDG uptake. All these lesions were confirmed to be metabolically inactive. Coronal CT (D) image demonstrated calculi in the right renal calyx probably caused by hyperparathyroidism (arrow).

References

1. Knowles NG, Smith DL, Outwater EK. MRI diagnosis of brown tumor based on magnetic susceptibility. J Magn Reson Imaging. 2008;28:759–61.
2. Irie T, Mawatari T, Ikemura S, Matsui G, Iguchi T, Mitsuyasu H. Brown tumor of the patella caused by primary hyperparathyroidism: a case report. Korean J Radiol. 2015;16:613–6.
3. Cinamon U, Levy D, Marom T. Is primary hyperparathyroidism a risk factor for papillary thyroid cancer. An exemplar study and literature review. Int Arch Otorhinolaryngol. 2015;19:42–5.
4. Jackson W, Sethi A, Carp J, Talpos G, Vaidya R. Unusual spinal manifestation in secondary hyperparathyroidism: a case report. Spine (Phila Pa 1976). 2007;32:E557–60.
5. Hoshi M, Takami M, Kajikawa M, Teramura K, Okamoto T, Yanagida I, et al. A case of multiple skeletal lesions of brown tumors, mimicking carcinoma metastases. Arch Orthop Trauma Surg. 2008;128:149–54.
6. Fineman I, Johnson JP, Di-Patre PL, Sandhu H. Chronic renal failure causing brown tumors and myelopathy. Case report and review of pathophysiology and treatment. J Neurosurg. 1999;90:242–6.
7. Mateo L, Massuet A, Sola M, Perez Andres R, Musulen E, Sanchez Torres MC. Brown tumor of the cervical spine: a case report and review of the literature. Clin Rheumatol. 2011;30:419–24.
8. Kaya RA, Cavusoglu H, Tanik C, Kahyaoglu O, Dilbaz S, Tuncer C, et al. Spinal cord compression caused by a brown tumor at the cervicothoracic junction. Spine J. 2007;7:728–32.
9. Leitha T, Staudenherz A. Concomitant hyperparathyroidism and nonmedullary thyroid cancer, with a review of the literature. Clin Nucl Med. 2003;28: 113–7.
10. Uslu L, Caliskan A, Sager S, Teksoz S, Halac, M. Preoperative and postoperative 18FDG PET/CT and bone scinigraphy images in a patient with parathyroid adenoma. Clin Nucl Med. 2013;38:456–8.