



## Uncommon Cause of Fracture in a Postmenopausal Lady

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### Abstract

Bony metastasis presenting as a fracture of long bone as an initial clinical manifestation of differentiated thyroid malignancy is uncommon. We report a case of 54 year old postmenopausal lady presenting with the fracture of distal end of left humerus following trivial trauma. Retrospectively on evaluation, she had a thyroid swelling for 6 months duration with no symptoms of thyrotoxicosis or hypothyroidism and no pressure symptoms. On examination she had a 4X4 cm hard fixed thyroid swelling without any palpable cervical lymph nodes along with fracture of shaft of left humerus. Blood and bone biochemistry were normal. Thyroid function tests were normal. Radiography showed fracture of shaft of left humerus. Fine needle aspiration cytology from thyroid swelling was done which showed features suspicious of papillary thyroid cancer (PTC). Bone scan done showed disseminated osseous metastases. She underwent total thyroidectomy and histopathology specimen was suggestive of follicular variant of PTC. She received whole body I-131 radio-iodine ablation in view of residual thyroid tissue and disseminated bony metastases. She also received palliative radiation therapy (30 Gy in 10 fractions) to left humerus for pain relief.

**Key words:** Thyroid cancer; Fracture; Postmenopause

### Introduction

Thyroid cancer is the most common endocrine cancer accounting for approximately 1.0%–1.5% of all newly diagnosed cancers.(1) Its incidence has continuously increased in the last three decades all over the world, because of increased detection rates of thyroid nodules with various imaging modalities and subsequent fine needle aspiration cytology.(1)(2) Papillary and follicular thyroid cancers are the differentiated thyroid malignancies which

accounts for more than 90% of all thyroid malignancy.(3) Papillary thyroid cancer (PTC) has a high propensity to metastasize to regional cervical lymph nodes and haematogenous distant metastases are extremely uncommon in PTC. (4)(5).

Bony metastases were less commonly seen (around 5%) in patients with differentiated thyroid malignancy, and to be the initial manifestation of the underlying malignancy is extremely uncommon.(6)(7) We report a case of follicular variant of PTC in a postmenopausal lady presenting as a pathological fracture of of shaft of left humerus.

### Case report

54 year old postmenopausal lady presented with the fracture of distal end of left humerus following trivial trauma. A detailed history revealed thyroid swelling which was there for around 6 months. It was insidious in onset and mildly progressive in nature. She did not have any symptoms suggestive of thyrotoxicosis or hypothyroidism. She did not complain of any pressure symptoms like dysphagia, choking sensation or hoarseness of voice. There were no symptoms of suggestive of disseminated malignancy like jaundice, bone pain or dyspnoea. There was no past history of radiation to the neck. She did not have any history of renal stones, bony pains or abdominal pain in the past. Family history was not significant. On examination she had a 4X4 cm hard fixed thyroid swelling without any palpable cervical lymph nodes. There was no retrosternal extension of thyroid swelling. Trachea was central and carotid pulsations were well felt. Clinically she was euthyroid. On examination she had abnormal mobility along with pain in shaft of left humerus.

X ray done showed fracture of shaft of left humerus (Fig 1) and a pathological fracture was suspected with the background of suspicious thyroid malignancy.



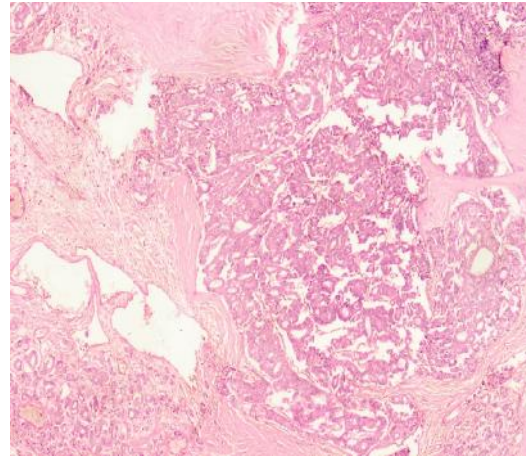
**Figure 1: X ray Left Humerus showing fracture of lower end of humerus**

Blood and bone biochemistry were normal. Thyroid function tests were normal. FNAC from thyroid swelling was done which showed features suspicious of papillary thyroid carcinoma (PTC). Bone scan done showed disseminated osseous metastases (Fig 2).



**Figure 2: Bone scan showing multiple areas of uptake including at the site of fracture (left distal humerus) suggesting disseminated disease**

CT neck showed insignificant cervical lymph nodes with lung metastasis. She underwent total thyroidectomy and biopsy specimen (Fig 3) was suggestive of follicular variant of PTC.



**Figure 3: Histopathology picture of total thyroidectomy specimen suggestive of follicular variant of papillary thyroid carcinoma**

Fracture humerus was managed conservatively. She received palliative radiation therapy (30 Gy in 10 fractions) to left humerus for pain relief. In view of rising serum thyroglobulin (106400 ng/ml) and residual thyroid (assessed by whole body I-131 thyroid scintigraphy) with disseminated osseous metastases, a whole body I-131 radio-iodine ablation was considered. She received a total of five times of whole body I-131 radio-iodine ablation (3700 MBq) over a period of 4 years. The most recent serum thyroglobulin being 157100 ng/ml following she received another session of whole body I-131 radio-iodine ablation (3700 MBq). During the course of the illness she also developed progression of lung metastasis and persistent back pain due to metastasis to D8 vertebra for which she received palliative radiotherapy (30 Gy in 10 fractions) to the lower thoracic and lumbar vertebral region. Currently she is clinically stable with total duration of follow up being around 4.5 years from the time of initial presentation.

## Discussion

PTC is the most common type and has best prognosis among the various types of thyroid malignancy.(3) It usually metastasize to the lymph nodes, however distant hematogenous metastases are uncommon and primarily include lungs and bones.(8) Metastasis to bone usually involves axial skeleton. The commonest sites of bony involvement are spine and pelvis; followed by sternum, ribs, extremities and shoulder girdle. (9)Disseminated papillary thyroid

malignancy presenting as pathological long bone fracture as the initial clinical manifestation is uncommon.(6-10)

Various treatment modalities have been tried in the management of disseminated metastases to bone. I131 radioiodine therapy is the best modality of treatment in case of iodine avid lesions.(2)(11)Management of radioactive iodine refractory differentiated thyroid malignancy is challenging. Focal approaches like surgery, external beam radiation therapy, radiofrequency ablation or cryoablation can be tried in cases of solitary and symptomatic metastatic bony lesions.(2)(12) Bisphosphonates or denosumab therapy can also been considered in symptomatic bone metastases, which are radioiodine refractory in conjunction with other systemic modalities.(13)Tyrosine kinase inhibitors are less effective in controlling bone metastatic disease in patients with thyroid malignancy.(2)

In our case, disseminated PTC presented as fracture of shaft of humerus which lead to the diagnosis of underlying PTC. She received a total of five sessions of I-131 radio-iodine ablation therapy for disseminated malignancy and palliative radiotherapy for symptomatic bony metastasis.

## Conclusion

Disseminated papillary thyroid malignancy presenting as a pathological long bone fracture, as the initial clinical manifestation is uncommon. In our case, disseminated PTC presented as fracture of shaft of humerus which lead to the diagnosis of underlying PTC.

## References

1. Pellegri G, Frasca F, Regalbuto C, Squatrito S, Vigneri R. Worldwide increasing incidence of thyroid cancer: update on epidemiology and risk factors. *J Cancer Epidemiol*. 2013;2013:965212.
2. Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, et al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid Off J Am Thyroid Assoc*. 2016 Jan;26(1):1–133.
3. Sherman SI. Thyroid carcinoma. *Lancet Lond Engl*. 2003 Feb 8;361(9356):501–11.
4. Shoup M, Stojadinovic A, Nissan A, Ghossein RA, Freedman S, Brennan MF, et al. Prognostic indicators of outcomes in patients with distant metastases from differentiated thyroid carcinoma. *J Am Coll Surg*. 2003 Aug;197(2):191–7.
5. Clayman GL, Shellenberger TD, Ginsberg LE, Edeiken BS, El-Naggar AK, Sellin RV, et al. Approach and safety of comprehensive central compartment dissection in patients with recurrent papillary thyroid carcinoma. *Head Neck*. 2009 Sep;31(9):1152–63.
6. Zetting G, Fueger BJ, Passler C, Kaserer K, Pirich C, Dudczak R, et al. Long-term follow-up of patients with bone metastases from differentiated thyroid carcinoma -- surgery or conventional therapy? *Clin Endocrinol (Oxf)*. 2002 Mar;56(3):377–82.
7. Ruegemer JJ, Hay ID, Bergstralh EJ, Ryan JJ, Offord KP, Gorman CA. Distant metastases in differentiated thyroid carcinoma: a multivariate analysis of prognostic variables. *J Clin Endocrinol Metab*. 1988 Sep;67(3):501–8.
8. Lang BH-H, Wong KP, Cheung CY, Wan KY, Lo C -Y. Evaluating the prognostic factors associated with cancer-specific survival of differentiated thyroid carcinoma presenting with distant metastasis. *Ann Surg Oncol*. 2013 Apr;20(4):1329–35.
9. Osorio M, Moubayed SP, Su H, Urken ML. Systematic review of site distribution of bone metastases in differentiated thyroid cancer. *Head Neck*. 2017 Apr;39(4):812–8.
10. Abu-Zaid A, Azzam A, Al-Hindi H, Amin T. Femoral pathological fracture as the first clinical manifestation of papillary thyroid carcinoma in a primigravida. *Case Rep Pathol*. 2013;2013:397361.
11. Farooki A, Leung V, Tala H, Tuttle RM. Skeletal-related events due to bone metastases from differentiated thyroid cancer. *J Clin Endocrinol Metab*. 2012 Jul;97(7):2433–9.
12. Chow S-M, Yau S, Kwan C-K, Poon PCM, Law SCK. Local and regional control in patients with papillary thyroid carcinoma: specific indications of external radiotherapy and radioactive iodine according to T and N categories in AJCC 6th edition. *Endocr Relat Cancer*. 2006 Dec;13(4):1159–72.
13. Orita Y, Sugitani I, Toda K, Manabe J, Fujimoto Y. Zoledronic acid in the treatment of bone metastases from differentiated thyroid carcinoma. *Thyroid Off J Am Thyroid Assoc*. 2011 Jan;21(1):31–5.