CASE REPORT

A Case Report of Skeletal Metastases from Papillary Thyroid Carcinoma

Poongkodi K.,* Kamaludeen M.N.,**
Department of Endocrine Surgery, Madras Medical College, Chennai

ABSTRACT

Thyroid carcinoma, the most common endocrine malignancy comprises only 1% of all cancers. Follicular Thyroid Cancer (FTC) is known to metastasize hematogenously to distant sites such as lungs and bones, however it is rare in Papillary Thyroid Cancer (PTC).

Here, we report a case of 62 year old woman with Follicular Variant of Papillary Thyroid Cancer (FVPTC) and synchronous bone metastasis in left clavicle exhibiting aggressive clinical behaviour. Total thyroidectomy with metastasectomy was carried out with a curative indent. ^{131}I radioactive iodine therapy was administered to facilitate follow up with ^{131}I whole body scan and serum thyroglobulin. However, recurrence of metastasis required re-excision and patient remains asymptomatic till date with TSH suppressive dose of levothyroxine.

Conclusion: The presence of bone metastases alters the prognosis of patients with DTC. Though ^{131}I radioiodine therapy is the first-line treatment for iodine avid metastasis, bone metastases have poor response. Multidisciplinary approach with surgical excision of these metastases with radioiodine therapy facilitates follow up with ^{123}I or ^{131}I WBS and thyroglobulin, and improves quality of life and prognosis.

Introduction

Thyroid carcinoma, the most common endocrine malignancy comprises only 1% of all cancers. Papillary thyroid carcinoma (PTC) is the most common histology constituting 80% of all thyroid malignancies. It occurs in all age groups but is most common in the 3rd to 5th decades[2]. Whilst, lymph node metastases are often present at diagnosis, haematogenous spread is a rare and late event. In contrast, distant metastases (commonly to bone and lung) are more common in follicular thyroid carcinoma, which represents approximately 10–20% of all thyroid cancers[2]. Distant metastases are noted in 1-3% of patients with thyroid cancer at initial diagnosis whereas 7-23% develop distant metastases during the course of the disease process[3]. Thyroid carcinoma usually presents as a neck lump (which may be clinically solitary or multinodular) and initial presentation in the form of bone metastases leading to the diagnoses of papillary thyroid carcinoma is rare.

* Senior Resident, Dept. of Endocrine Surgery, Madras Medical College, Chennai.

** Professor and Head, Dept. of Endocrine Surgery, Madras Medical College, Chennai.

Case Report

A 62 year old woman presented with neck swelling of 3 years duration and rapidly enlarging lesion in the left collar bone of 5 months duration.

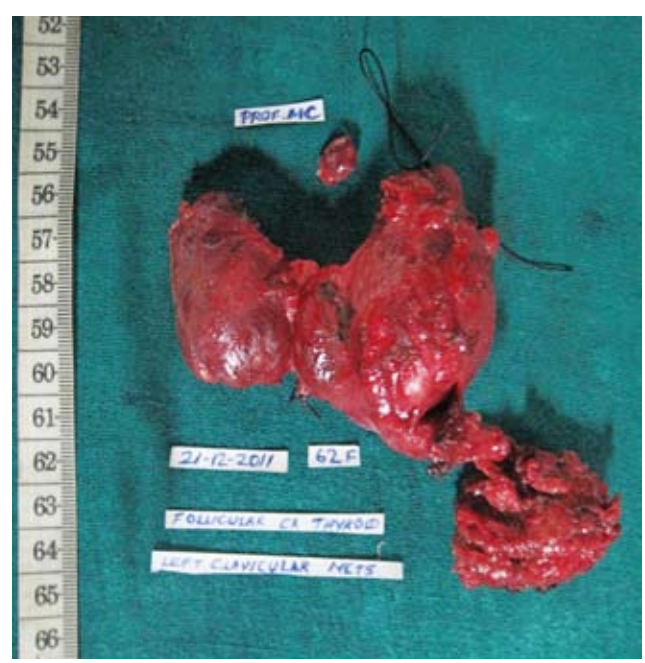

Fig. 1

NoH/o compressive symptoms nor hoarseness of voice. Examination revealed a hard non-tender nodule in the left lobe of thyroid and a well defined non-tender pulsatile bony mass in in the medial end of left clavicle. Computed tomography of neck & chest showed hypodense nodule 3.9×2.9 cm in the left lobe of thyroid with foci of calcification and osteolytic expansile lesion 4.5cm×3cm in the medial end of left clavicle with no evidence of cervical lymph node enlargement. Technetium pertechnetate thyroid scinti-graphy revealed 0.2% thyroid uptake and photopenic areas in the left lobe of thyroid and radiotracer activity in the medial end of left clavicle. Cytology was suggestive of follicular neoplasm of thyroid. In view of lytic clavicular lesion with follicular epithelial cells admixed with cartilaginous cells in the background of colloid, the possibility of follicular carcinoma with metastasis to clavicle was considered. Total thyroidectomy and metastasectomy with the medial third of the left clavicle was proceeded. Histology revealed follicular variant of papillary thyroid carcinoma with multiple foci in both lobes of thyroid with angioinvasion and no evidence of lymph node involvement. Patient was administered 203mCi of ^{131}I Radioiodine and TSH suppressive dose of Levothyroxine. Post-therapy ^{131}I WBS scan revealed radioiodine uptake in thyroid bed, lateral aspect of left clavicle, right lower rib and pelvis which were not evident on X-rays. Patient presented one year later with recurrence of the swelling in the region of left collar bone. Computed tomography of chest showed heterogeneously enhancing lesion 6 cm × 5.5 cm in the region of left clavicle. Cytology showed metastatic papillary carcinomatous deposits. Resection of metastasis with tumor free margins was carried out. Patient remains asymptomatic with negative cervical ultrasound and serum thyroglobulin of 4.12 ng/ml at the end of one year follow up surveillance.

Discussion

The incidence of skeletal metastases from thyroid carcinoma varies from 1% to more than 40% and it constitutes the second commonest metastatic site following lung[1]. The presence of distant metastases (3-4%) at the time of diagnosis of differentiated thyroid carcinoma (DTC) is a rare event[1].

Bone metastases from primary tumours of unknown origin are commonly attributed to prostate, breast or lung and presents with symptoms such as pain, swelling, fracture with or without neurological compromise. However, as reflected in the case report, thyroid carcinoma may present with asymptomatic bone metastases and should be considered amongst the potential differential diagnoses. Usual sites of bone metastases include the vertebrae, skull, pelvis and femur.

PTC has an indolent course and hematogenous spread occurs rarely. However, certain subtypes of papillary thyroid cancer such as tall cell, columnar, insular variant etc., are known to behave aggressively and are associated with poorer prognosis. Follicular Variant of Papillary Thyroid Cancer (FVPTC) are follicular patterned tumors with distinctive nuclear features of papillary thyroid cancer. Majority of these tumors behave similar to classical PTC. Two types of FVPTC have been described namely, "diffuse follicular variant" that diffusely involves the gland and "aggressive follicular variant" with multifocal involvement of both lobes and/or extrathyroidal spread. These tumors are reported to behave clinically as follicular carcinoma with distant hematogenous spread to lungs and bone as reflected in our case report.

Skeletal and whole-body magnetic resonance imaging, ^{123}I or ^{131}I Whole body scan, and fusion 2-deoxy-2-[18F] fluoro-D-glucose whole-body positron emission tomography/computed tomography (PET/CT) are the best anatomic and functional imaging techniques available to identify, localize and assess the extent of bony metastasis. ^{124}I-PET/CT is the newest imaging technique with high sensitivity and specificity.

^{131}I radioiodine is the first line of treatment for iodine-avid bone metastasis. Only one third of these lesions are responsive to radioiodine therapy. Post therapy ^{131}I WBS detects 10-26% of hidden metastases. 18F–FDG PET/CT are useful in non-iodine avid metastasis with rising titres of thyroglobulin.

Reports have shown that surgical removal of upto five bone metastases are associated with improved survival and quality of life[2,3]. Therefore, some groups recommend surgical excision for

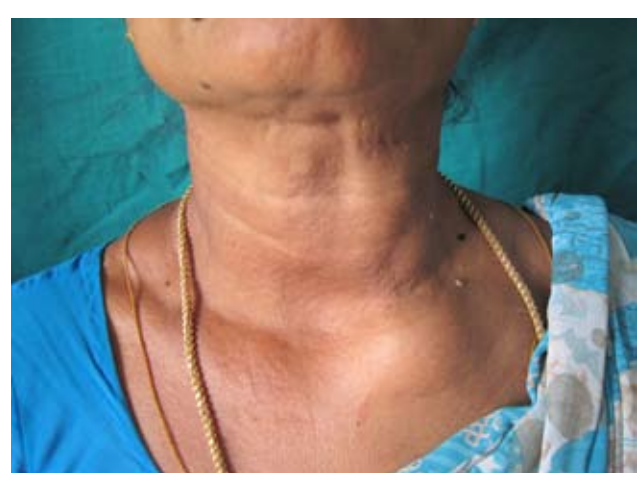

Fig. 2

accessible, solitary, isolated metastases evident on X-ray with pre- and post-operative radioiodine as complementary treatment[5]. Bone metastasis in weight bearing joint and spinal instability with or without neurological compromise requires surgical stabilization undercover of corticosteroids with or without external beam radiotherapy and adjuvant radioiodine therapy. Bisphosphonates and Novel targeted therapy are under trial.

The prognosis of DTC is excellent with 10 year survival rate of 80-95%. However, it decreases by 50% in the presence of distant metastasis and ranges from 13-21% in the presence of skeletal metastasis.

Conclusion

The presence of bone metastases alters the prognosis of patients with DTC. Though ^{131}I radio iodine therapy is the first-line treatment for iodine avid metastasis, bone metastases have poor response. Multidisciplinary approach with surgical excision of these metastases with radioiodine therapy facilitates follow up with ^{123} or ^{131}I WBS and thyroglobulin and improves quality of life and prognosis.

References

1. M.M. Muresan, P. Olivier, J Lecle`re, F Sirveaux, L Brunaud, M Klein, R Zarnegar and G Weryha. Bone metastases from differentiated thyroid cancer Endocrine-Related Cancer (2008) 15:37–49.
2. Bernier MO, Leenhardt L, Hoang C, Aurengo A, Mary JY, Menegaux F, Enkaoua E, Turpin G, Chiras J, Saillant G *et al.* (2001) Survival and therapeutic modalities in patients with bone metastases of differentiated thyroid carcinomas. Journal of Clinical Endocrinology and Metabolism 86:1568–1573.
3. Niederle B, Roka R, Schemper M, Fritsch A, Weissel M & Ramach W (1986) Surgical treatment of distant metastases in differentiated thyroid cancer: indication and results. Surgery 100:1088–1097.
4. Zettinig G, Fueger BJ, Passler C, Kaserer K, Pirich C, Dudczak R & Niederle B (2002) Long-term follow-up of patients with bone metastases from differentiated thyroid carcinoma – surgery or conventional therapy? Clinical Endocrinology 56:377–382.
5. Proye CA, Dromer DH, Carnaille BM, Gontier AJ, Goropoulos A, Carpentier P, Lefebvre J, Decoulx M, Wemeau JL, Fossati P *et al*. (1992) Is it still worthwhile to treat bone metastases from differentiated thyroid carcinoma with radioactive iodine? World Journal of Surgery 16:640–645.
6. Schlumberger M, Tubiana M, De Vathaire F, Hill C, Gardet P, Travagli JP, Fragu P, Lumbroso J, Caillou B & Parmentier C (1986) Long-term results of treatment of 283 patients with lung and bone metastases from differentiated thyroid carcinoma. Journal of Clinical Endocrinology and Metabolism 63:960–967.
7. Hindie E *et al*. Bone metastases of differentiated thyroid cancer: impact of early ^{131}I-based detection on outcome. Endocrine-Related Cancer (2007); 14:799-807.