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BONE FUNCTIONING METASTASES

REVELING A PAPILLARY CARCINOMA OF THE THYROID

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Summary:

Functioning thyroid metastases are a rare cause of hyperthyroidism. Most of them are follicular carcinoma. Here, we report a case of 62 years old man with a past history of right sub total thyroidectomy for a benign adenoma. Recently, he complained of symptoms of hyperthyroidism associated with left arm pain. Biopsy of the humeral lesion was consistent with a papillary carcinoma of the thyroid metastasis. Postoperatively, he received a cumulative dose of 14.8 GBq of 131-I with a good control of hyperthyroidism but without eradication of the bone metastases.

Key words*: thyrotoxicosis, papillary thyroid carcinoma, functioning metastases, SPECT-CT.*

Introduction:

Functioning thyroid metastases are a rare cause of hyperthyroidism. Fewer than 100 cases can be found in the worldwide literature. Most of them are follicular carcinoma with lung or/and bone involvement. Papillary carcinoma has been reported only in twenty cases [1, 2]

Case report:

We report a case of 62 years old man who had an 11-years past history of right sub total thyroidectomy for a benign adenoma. Recently, he complained of symptoms of hyperthyroidism associated with left arm pain. Free thyroxine was elevated (68 pmol/l, normal 11-25 pmol/l), thyroid stimulating hormone (TSH) was suppressed (<0.01 µIU/ml, normal 0.2-3.2 µIU/ml), and TSH-receptor antibody negative. A Tc-99m sodium pertechnetate planar scintigraphy of the neck and the upper side of chest showed (**Figure1)** mild uptake in the left thyroid lobe in contrast with height uptake in the left arm. The planar posterior view and SPECT/CT fusion images (**Figure2)** showed a focal and intense uptake located at the 5th thoracic vertebra, an asymptomatic involvement at the first presentation. Tc-99m-methylendiphosphonate (Tc-99m-MDP) bone scan showed (**Figure3)** an increased focal uptake in the left humeral lesion and a

photopenic area in the right bone of the pelvis. No evidence of other site of bone involvement was detected. As the biopsy of the left humeral lesion was consistent with papillary carcinoma of the thyroid metastasis, a left subtotal thyroidectomy was performed but no malignancy was found in the remaining lobe. The clinical course was marked by rapid installation of medullar compression symptoms. The patient refused to be operated upon after decompressive laminectomy was recommended. Post ablation 131-I whole body scans showed (**Figure4)** the bone metastases despite a persistent low TSH level. Six month after radioiodine therapy (3.7 GBq), myelopathic symptoms improved but free thyroxine and triiodotyronine (T3) remained elevated. At last, he received in the 48 months following the diagnosis a cumulative dose of 14.8 GBq of 131-I with a good control of hyperthyroidism but without eradication of the bone metastases. Anti-thyroid drugs were replaced with life-long TSH suppression.

Discussion:

Three criteria to make functioning metastases diagnosis were present in our patient: failure of thyrotoxicosis to resolve after thyroidectomy, mild iodine uptake in the remnant thyroid lobe and iodine uptake by metastases [2]**.** Furthermore, we see an unusual preoperative accumulation of Tc-99m pertechnetate in bone functioning metastases of a papillary carcinoma with low TSH level caused by thyrotoxicosis. Theses metastases, while readily visible with 131-I, were lost in the normal skeletal uptake when using Tc-99m MDP because of the absence of osteoblastic reaction [3]. One recent publication [4] involving 54 patients suggest that there was 100% agreement between Tc-99m pertechnetate scan and iodine scan in the evaluation of bone metastasis from thyroid cancer. Given that and when such diagnosis is suspected, performing Tc-99m pertechnetate whole body scan as a part of the staging process may be an interesting alternative to avoid the stunning phenomenon. The overall survival of patients with functioning metastatic thyroid cancer and treated by radioiodine seems to be better than that of euthyroid patients [1].

Conclusion:

Our case is pathologically interesting when we consider that a bone metastatic papillary carcinoma could produce hyperthyroidism. Scintigraphic feature and outcome are also

interesting because of the preoperative uptake Tc-99m pertechnetate despite the low TSH level and the improvement of myelopathic symptoms and hyperthyroidism after radioiodine therapy.

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Legend:

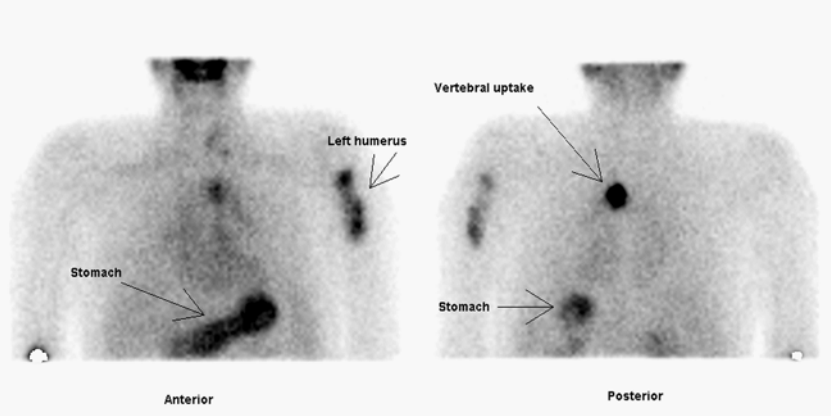

Figure1: Mild uptake in the left thyroid lobe using Tc-99m sodium pertechnetate in contrast with height uptake in the left arm. The posterior view showed a focal and intense uptake in posteromedial region,

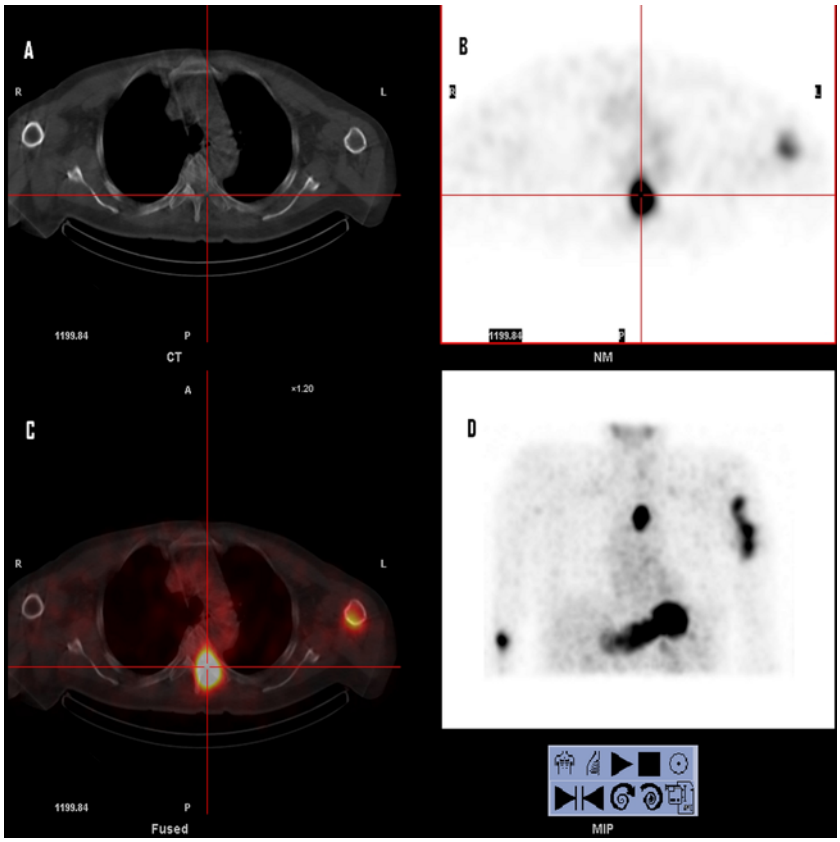

Figure2: SPECT/CT fusion images showing an intense uptake located at a lytic area of the of 5th thoracic vertebra left lamina. (A: transaxial CT image, B: SPECT image, C: fusion image, D: MIP).

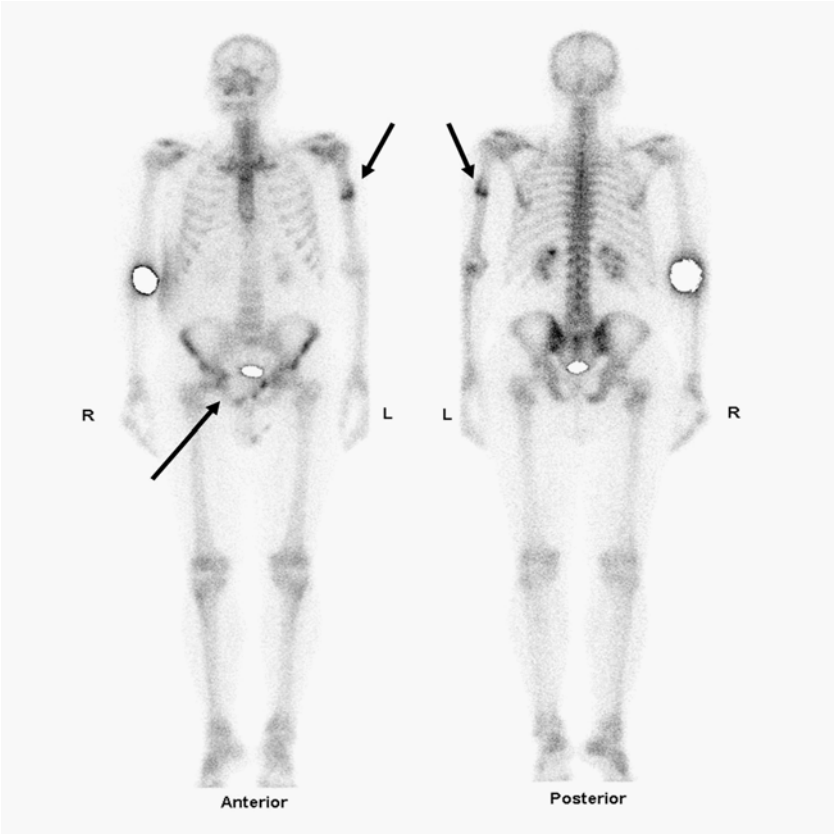

Figure3: Bone scan showing an increased focal uptake in the left humeral lesion (arrow) and a photopenic area (arrow) in the right bone of the pelvis (The injection site and urinary bladder are masked).

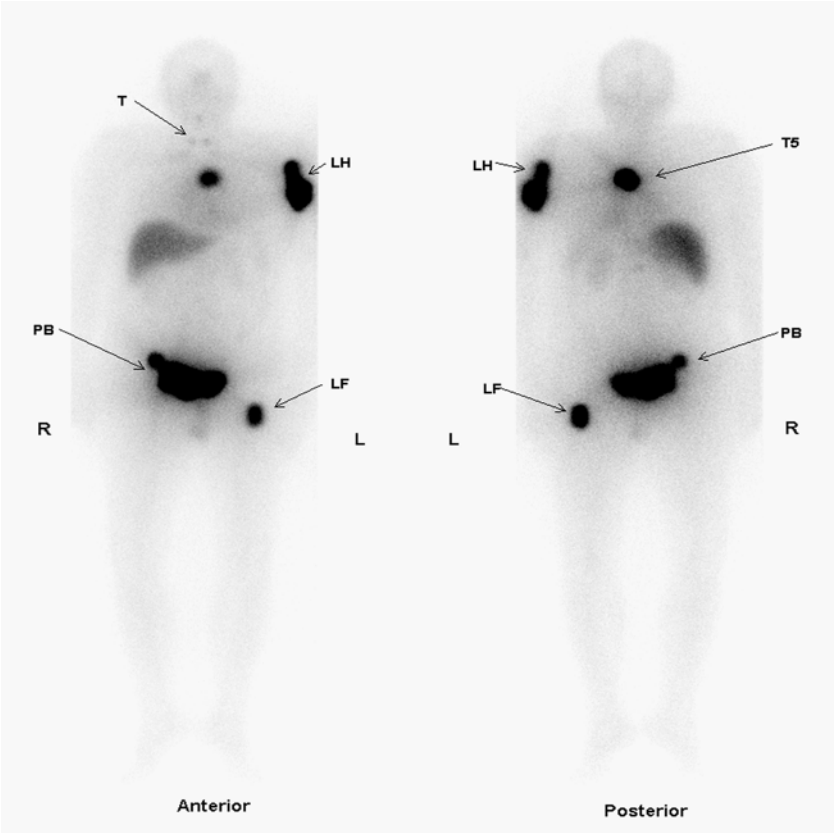

Figure4: Post ablation I-131 whole body scans showing residual uptake in the thyroid bed (T), and striking activity the right humeral (RH), thoracic spine (T5), bilateral pelvic bone (PB) and left femoral (LF) metastases.