Bone metastases and cord compression debut as follicular thyroid carcinoma

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Summary
In thyroid carcinoma, distant metastases are infrequent (10-15% of the follicles). The most common sites are the lungs, bones (appearing in the form of lytic lesions), the brain, the liver, the bladder and the skin. The diagnosis of follicular carcinoma through a metastatic complication is exceptional, but it should be considered in the differential diagnosis of a pathological fracture. We present three cases of exceptional occurrence.

Key words: carcinoma, thyroid, metastasis, surgery.
**Introduction**

Differentiated thyroid carcinoma is the most frequent endocrine neoplasia. It is one of the tumours with the highest potential probability of being cured and with a highly favourable prognosis for metastatic disease characterised by a slow progression and a survival rate at 10 years of 34-40%.

Remote metastases are infrequent (10-15% of the follicles), but in cases where they occur the most common sites are the lung, bone (as lytic lesions), brain, liver, bladder and skin. The diagnosis of a follicular carcinoma through a complication of its metastasis is an exceptional occurrence, but it should be considered in the differential diagnosis of a pathological fracture. In this study, 3 cases are presented of patients with medullary compression due to bone metastasis as a first manifestation of a follicular thyroid carcinoma. We believe that these cases are of general interest due to the unusual nature of the findings and the interdisciplinary management which took place.

**Case 1**

A 68-year-old woman who in April 2010 started to experience refractory dorsal pain and paresthesia with loss of strength in the lower limbs. A simple X-ray identified a collapse of the third dorsal vertebra, and she was admitted to the traumatology service with suspected myeloma vs. metastasis. A magnetic nuclear resonance (MNR) scan showed evidence of an affection of the whole vertebral body and the posterior arch, with an associated mass of soft parts which had entered the neural canal compromising the spinal medulla. Also affected was the neural foramen of the second, third and fourth dorsal vertebrae (Figure 1). The findings suggested tumourous lesions, probably metastatic, while not discounting the possibility of a primary myeloma-type tumour. In a thoracic-abdominal computerized axial tomography (CAT) there was evidence of multiple small nodular lesions in both lungs suggestive of metastatic disease, and which a positron emission tomography (PET)/CAT scan showed to be hypermetabolic. The rest of the examination provided no evidence of significant findings. During the same admission an embolisation of the tumour was tried, without success, and a medullar decompression was effected, with the fusion of the dorsal vertebrae from D1 to D6. The anatomical pathology indicated that what was being dealt with was a follicular thyroid carcinoma of the Hürthle cell variety. Notable antecedents from the anamnesis were a hemithyroidectomy, plus isthmectomy, carried out in 1999 in another hospital due to the presence of a nodule with the result of “oncocytoma”, without further data or follow up.

An ultrasound of the thyroid was carried out which showed a normal right hemithyroid. A total thyroidectomy was performed, with no evidence of malignancy in the tissue removed, and finally, the patient was treated with an ablative dose of Iodine 131 (I\textsubscript{131}) (200 mCi). The post-dose total body scan (TBS) showed an intense capture in the metastatic areas shown up on the PET/CAT scan. After twelve months of development the patient continued with follow up and treatment by the traumatology and endocrinology services, with the control of symptoms and signs of disease stable.

**Case 2**

A woman of 60 years of age in whom, in a simple X-ray study due to pain in the back and lower limbs over a period of 3-4 months, were found lesions suggestive of metastasis in the left femoral neck, dorsal spine (D1, D2 and D12, with infiltration into the spinal canal), left femoral diaphysis and left greater trochanter. A prophylactic femoral pinning was performed. The histological study showed metastasis of follicular thyroid carcinoma. The patient said that in 1993 a left hemithyroidectomy was carried out in another centre, the reasons for which were not made clear. An ultrasound of the thyroid was carried out without significant findings, and a total thyroidectomy was performed with no evidence of malignancy in the tissue removed. Initial thyroglobulin was 67 ng/ml, with negative antithyroglobulin antibodies. The patient was treated with I\textsubscript{131} at a dose of 200 mCi, with evidence of the disease now being stable.

**Case 3**

A woman of 71 years of age with progressively worsening lumbargia and the appearance of paresthesia in the lower limbs in May 2008. An MNR showed lytic lesions in L4 and medullar compression compatible with metastatic lesion, which required a vertebrectomy with fusion from the second lumbar vertebra to the first sacral vertebra (L2-S1). An anatomopathological study suggested metastasis of a primary thyroid tumour. An ultrasound was described as “multimodal goitre with hypoechogenic nodules in the isthmus and left lobe of the thyroid, and adenopathy of 2.7 cm in the left jugular-carotid space, with puncture-aspiration with a fine needle (PAFN) of oncocytic proliferation” (sic). After a total thyroidectomy the final diagnosis was follicular thyroid carcinoma of the Hürthle cell variety. After the first ablative dose of I\textsubscript{131} (200 mCi) there was a persistent Tg value of 17 ng/ml with negative antithyroglobulin antibodies, for which reason it was decided to administer a second dose of I\textsubscript{131} (150 mCi) eight months later. In the control PET there was evidence of newly appearing captures in L4, and right iliac wing and clavicle (Figure 2), for which reason a third dose of 200 mCi was administered (accumulated dose of 550 mCi) six months after the second dose. The post-dose tracking showed intense capture in the areas evidenced in the imaging tests. After fifteen months from the last treatment the data relating to the disease were stable without complications derived from the treatment with I\textsubscript{131}.

**Discussion**

Differentiated thyroid carcinoma has a good prognosis in general, but the natural development of
the disease in some cases is onwards distant dissemination, which carries with it an ominous prognosis, with mortality rates of 65% and 75% at 5 and 10 years respectively. The bone metastases are of the osteolytic type and are difficult to visualise in simple X-rays. Fortunately, the cases of vertebral metastases as a way of diagnosing the disease are very rare, and proof of this is that published cases are scarce.

Faced with a lytic lesion in the spinal column it is necessary to make a differential diagnosis fundamentally between myeloma and metastasis. Among the latter the most frequent primary tumour will be found in the prostate, breast and lung, and less commonly, in the kidney, colon, skin and thyroid.

When bone metastases are suspected a total body scan or a PET/CAT scan should be carried out to locate them. MNR is particularly useful in patients with spinal affection and to characterise the metastases once they have been diagnosed. Carrying out a CAT is also valid.

A biopsy of the lesion is fundamental to identifying the origin of the metastasis, but does not distinguish the follicular or papillary lineage. For this it is essential to investigate the thyroid with ultrasound and PAFN.

Treatment should be with an ablative dose of I131 of between 100 and 200 mCi, to be determined through dosimetry. The dose may be repeated at 6-10 months depending on the development of the disease.

Many studies support the benefit in patients with lytic bone metastasis (more specifically, those originating in breast cancer) of the use of bisphosphonates, especially intravenous zoledronate, since these drugs inhibit osteoclast activity, which means its use has been extended to the treatment of other forms of lytic metastasis, such as those of differentiated thyroid carcinoma.

Radiotherapy is indicated in patients with intense pain without medullar complications or with neurological deficit at the start and slow and incomplete progression, as long as vertebral osteoarticular instability is discounted, a key point for the indication of surgery. In those cases in which the prognosis is bad in the short term, or in which the general situation is contraindicative for surgery, it is the only option. Embolisation is useful for reducing vascularisation of the metastasis, facilitating later surgery, and reducing the growth of the tumour.

The corticoids are used for their antioedemal effect and are not alone except when the patient’s situation does not allow other treatments.

Palliative surgery is indicated when there is a pain of increasing intensity uncontrollable by other methods, an acute, complete and rapid onset neurological deficit, or when the destruction of the bone provokes a segmental instability in the spinal column. It may also be used with curative intent if there is only a single metastasis, or they are few in number. It consists of the resection of the tumourous tissue, releasing all the compression on the medullar tissue, and the fixing through vertebral osteosynthesis associated with bone grafts using anterior and/or posterior means of approach, with the intention of fusing the affected segment with those immediately above and below.

In conclusion, the diagnosis of a follicular thyroid carcinoma from the discovery of bone metastasis is an exceptional first manifestation, but should be considered within the differential diagnosis of these lesions. Treatment demands interdisciplinary coordination and cooperation for the optimum management of the disease.
Bibliography