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Acute paraparesis as presentation of an occult follicular thyroid carcinoma: A case report

José Miguel Baião^{a,*}, Andreia Guimarães^b, Nídia Moreira^b, João Guardado Correia^a,
Cristina Uriarte Rosenvinge^b, Diana Gonçalves^c, Mercedes Agundez Calvo^c

^a General Surgery Department, Instituto Português de Oncologia de Coimbra Francisco Gentil E.P.E, Av. Bissaya Barreto 98, 3000-075 Coimbra, Portugal

^b General Surgery Department (C), Centro Hospitalar e Universitário de Coimbra (Hospital Geral–Covões), S. Martinho de Bispo, 3041-853 Coimbra, Portugal

^c Internal Medicine Department (BB), Centro Hospitalar e Universitário de Coimbra (Hospital Geral–Covões), S. Martinho de Bispo, 3041-853 Coimbra, Portugal

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ABSTRACT

INTRODUCTION: Follicular thyroid carcinoma is the second most frequent type of well differentiated thyroid tumours. It is usually confined to the thyroid gland, however it can metastasize in a later stage of the disease. Signs and symptoms associated with bone metastasis are rare as first clinical manifestations. **CASE REPORT:** An 84-year-old female complained with acute paraparesis. Magnetic resonance imaging revealed an extensive intraosseous infiltrating lesion compatible with a bone metastasis from an occult tumour. Biopsy samples were compatible with bone metastasis from a follicular thyroid carcinoma. The patient was submitted to total thyroidectomy followed by iodine ablative therapy.

DISCUSSION: Follicular thyroid carcinoma presentation with symptoms related to bone metastasis is rare. Patients with bone lesions, such as pathological fractures or compressive symptoms should be studied since they may have clinically unapparent lesions from an unknown tumour. Patients with FTC should be submitted to total thyroidectomy. Bone lesions may be addressed to improve quality of life however this decision depends on disease extent.

CONCLUSION: Acute paraparesis is a rare form of presentation of thyroid carcinoma. These neoplasms must be taken into account when investigating metastasis to the bone from unknown neoplasms.

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1. Introduction

Malignant thyroid tumours are considered the most common endocrine neoplasms. Follicular thyroid carcinoma (FTC) is the second most frequent type of well differentiated thyroid tumours, after papillary type [1].

These neoplasms are usually confined to the thyroid gland and generally are not aggressive [2], although they can metastasize in advanced forms of the disease. FTC trends to spread hematogenously, with lungs and bones as the preferential locations for metastasis [3,4]. Signs and symptoms arising from bone metastasis as initial presentation are rare [4].

In the present article, we report a case of acute paraplegia as the first clinical manifestation of a metastatic thyroid carcinoma to the bone.

This study has been written according to the SCARE criteria [5].

2. Case presentation

An 84-year-old female was admitted in the emergency department complaining of progressive loss of muscle strength in the lower limbs. With three months of evolution, this case has recently been followed by paraparesis and urinary and faecal incontinence.

The patient was already partially care dependent and institutionalized at the time. Her past medical history was unremarkable, with no relevant drug intake nor known cancer family history.

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On neurological examination, there was bilateral lower limb motor paralysis with muscle function grades of 0/5 and sensitive and tactile perception impairment, establishing a level from D7/D8. No other abnormalities were then found.

A vertebro-medular magnetic resonance imaging (MRI) was performed, uncovering an extensive intraosseous infiltrating lesion. This has been centred on the vertebral body of D7, with spinal canal invasion (Fig. 1), causing spinal cord compression and myelopathy, which raised suspicions of bone metastasis from an occult tumour.

* Corresponding author.

E-mail addresses: josempbaiao@gmail.com (J.M. Baião), andriahguimaraes@gmail.com (A. Guimarães), nidia.moreira.22@gmail.com (N. Moreira), joaocorreia86@hotmail.com (J.G. Correia), rosenvinge75@hotmail.com (C.U. Rosenvinge), dianafslg@gmail.com (D. Gonçalves), merch75@gmail.com (M.A. Calvo).



Fig. 1. Vertebral MRI – notice the bone infiltrating lesion.

CT-guided bone biopsies were performed, and the pathological examination showed neoplastic cells arranged in microfollicular standard, positive for cytokeratins AE1/AE3, and cytokeratin 7 (CK7), thyroid transcription factor-1 (TTF1) and thyroglobulin. This morphologic and immunohistochemical pattern was compatible with bone metastasis from a follicular thyroid carcinoma (Fig. 2).

The patient was then referred to the General Surgery department. On physical examination a left cervical solid nodule was found, which during thyroid palpation corresponded to an asym-



Fig. 3. Left cervical solid nodule.

metric elevation of the left lobe (Fig. 3). Cervical ultrasound showed that the thyroid had asymmetric dimensions. With an enlargement of the left lobe, which was practically replaced by a bulky heterogeneous nodule of 42 mm, it was submitted to a fine needle aspiration (FNA) biopsy. No cervical adenopathies were detected. FNA analysis revealed a papillary carcinoma with follicular pattern – Bethesda VI classification. Thyroid functional tests were within normal range values.

The patient was then subjected to total thyroidectomy. During surgical procedure, it was noticed that the left lobe had an irregular shape and had a multinodular structure. Invasion of perithyroidal soft tissues and a major adherent component, anteriorly to the pre-thyroid muscles and posteriorly to the tracheal rings (Fig. 4), was detected. There were no complications during or after the procedure and the patient was discharged home on the seventh postoperative day. Thyroid pathological examination revealed a widely invasive and angioinvasive follicular carcinoma. According to American Joint Committee on Cancer (AJCC) 8th edition, it was classified as T3 NxM1R1 – stage IVb.

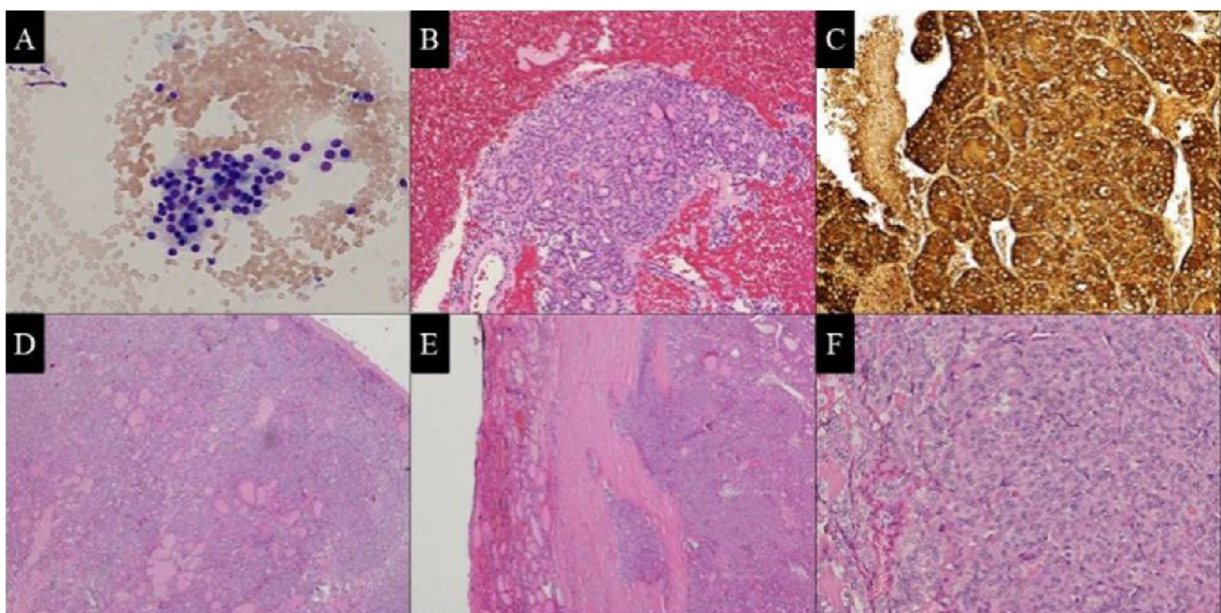


Fig. 2. Anatomopathological analysis.

A Cytology (200×), a group of neoplastic follicular cells with hematic background; B) Bone metastasis (HE 100×); C) Bone metastasis (thyroglobulin 200×); D) Follicular thyroid carcinoma (HE 40×); E) Follicular thyroid carcinoma (HE 40×), tumour capsule invasion; F) Follicular thyroid carcinoma (HE 200×).



Fig. 4. Macroscopic aspect of thyroid after excision – irregular shape and a multinodular structure.

The case was referred to a multidisciplinary meeting. She initiated Free thyroxine 4 (FT4), followed by recombinant Thyroid-Stimulating Hormone (TSH) treatment and was then submitted to Iodine 131 ablative therapy. In the sixth postoperative month, the patient remained clinically stable, though still with paraparesis.

Given the advanced stage of bone infiltration and clinical condition, and the risk/benefit of a neurosurgical procedure it was decided in multidisciplinary meeting not to undertake the patient through this surgical treatment.

3. Discussion

Malignant thyroid tumours are uncommon neoplasms, accounting for about 1.5% of all tumours in adults [6]. FTC type is the second most frequent among well differentiated thyroid neoplasms. According to some series, it represents 10–32% of all differentiated thyroid carcinomas [7]. It is usually known for its indolent behaviour and potential of cure. Lymphatic involvement is rare [7].

Its incidence is higher in endemic areas of iodine deficiency or endemic goitre, in which Portugal is not included [8]. It is currently declining due to the higher accuracy and specificity of histological diagnosis and its greater ability to identify other variants [7].

Among all the variants of thyroid carcinomas, follicular carcinoma is the most likely to present with distant metastasis or metastasize during the course of the disease [9]. It is estimated that metastatic disease develops in 7–23% of FTC cases and its initial presentation occurs in 1–4% [3,10]. When present, it normally leads to a worse prognosis and constitutes the main mortality factor [11]. Bone and lung are the most likely locations for metastatic disease in FTC [12]. As *Durante et al.* [10] demonstrated, in a series of 444 patients with thyroid carcinoma and distant metastasis, 44% of them had bone involvement, and among these, 36% were diagnosed with FTC [10].

According to the literature, over 80% of bone metastasis of all tumours are mainly located in the axial skeleton, namely vertebrae, ribs and basin. Metastasis of thyroid carcinomas is preferentially osteolytic [13], being pain the most common manifestation found at its presentation, followed by pathological fractures [13,14], and rarely, medullary compression symptoms [9], as in this clinical case.

Patients with bone metastasis may have clinically unapparent lesions which may hinder the degree of suspicion, and therefore be not initially diagnosed [15]. Nevertheless, when approaching FTC, metastatic disease should be suspected, as well as when pathological fractures or compressive symptoms of unknown origin occur [14].

Past neoplastic history must be considered as it may unfold later as metastatic disease. Physical examination should be guided according to patient's history and symptoms, but it should also be meticulous in order to look for early signs of metastatic disease. Even so, they are usually nonspecific. Thus high suspicion is the key to complementary imaging studies be undertaken, especially if bone metastases are suspected [15].

Body radiographies are usually the first image study, although they have limited sensitivity for lesions under 1 cm [12]. CT scan is also a good method to diagnose bone lesions, as it has a lower detection threshold when compared to radiographies. MRI is recommended when medullary symptoms are present, since it has higher definition for soft tissue evaluation and can also detect malignant bone lesions up to 2 mm. If imaging studies raise suspicion of bone metastatic lesions of an unknown primary tumour, biopsy is indicated in most cases [4,13,15].

We have presented a case of acute paraplegia secondary to thyroid metastatic disease to the bone. Based on the results of bone lesions biopsy, compatible with follicular tumour origin, we have decided to perform a total thyroidectomy, as recommended [1].

The patient was then submitted to ablative radioactive iodine therapy, which is recommended for primary lesion size >2 cm, when there is gross extrathyroidal extension and when metastatic disease is present [16].

In patients with metastatic bone disease at presentation, the prognosis will depend on the primary tumour location and histology. For FTC, if there is a single bone lesion, the survival might be longer [15], but if multiple bone lesions are already present, a worse prognosis is to be expected [10]. Overall, FTC survival at 10 years is of 80%, dropping to 40% when bone metastasis occur [17].

Age is also pointed out in several studies as a prognostic factor. Diagnosis before the age of 45 is favourable for survival [11]. Recently, the cut-off has been changed to 55 years according to AJCC/UICC [18], meaning that patients between 45 and 55 are classified at a lower stage, when diagnosed with early stage thyroid neoplasms, still able to achieve good results [19,20].

Several studies are consensual in the field of neurosurgical approach to bone metastases in vertebral axis. A study conducted by Zetting et al. [2], points to the increased survival with the excision of metastatic lesions. Similarly, other authors have described the efficiency of surgical treatment for distant metastases as a significant prognostic factor for increasing survival, life quality and pain control [4].

In this case, we have decided not to perform a neurosurgical procedure on bone lesion given its extent and low risk-benefit for the patient.

4. Conclusion

Thyroid neoplasms usually have an indolent behaviour and patients are commonly asymptomatic. Metastatic disease is uncommon as an initial manifestation but, when present, it assumes a later stage of the disease along with a worse prognosis.

Acute paraparesis is a rare form of presentation of thyroid carcinoma and a low suspicion threshold for these neoplasms must be taken into account when investigating metastasis to the bone, since it may lead to an earlier diagnosis and, maybe, to a better outcome.

Conflicts of interest

Authors declare no conflicts of interest.

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Ethical approval

Ethical approval was not needed in this paper. Procedures and practise applied were according to *leges artis*.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

J.M. Baião: Study concept and design; data collection and analysis; writing the paper, review.

A. Guimarães: Data collection and analysis; writing the paper, review.

N. Moreira: Data analysis, review.

J.G. Correia: Data analysis, review.

C.U. Rosenvinge: Review.

D. Gonçalves: Review.

M.A. Calvo: Review.

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Guarantor

J.M. Baião; A. Guimarães; N. Moreira.

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