

# Spinal metastasis as a primary presentation of papillary thyroid carcinoma

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## ABSTRACT

**INTRODUCTION:** Papillary thyroid carcinoma (PTC) is the most common type of well-differentiated thyroid malignancy, which has a good prognosis and low incidence of distant metastasis. Distant metastasis of thyroid carcinoma is rare, and it occurs particularly rarely in spinal regions. We report a rare case of spinal metastasis revealing papillary thyroid carcinoma with a review of the literature on clinical features, radiological aspect, and treatment options.

**CASE REPORT:** A 76 years old female presented with a chronic spinal pain. She had no medical history of spinal or thyroid diseases. Computerized tomography (CT) and the magnetic resonance imagery (MRI) showed an osteolytic mass centered on the last three lumbar vertebrae with an intra-canal extension. A biopsy was performed and histopathological study concluded to a metastasis of papillary thyroid carcinoma. The patient underwent total thyroidectomy and the anatomopathological evaluation was compatible with thyroid papillary carcinoma. Due to intractable pain, the patient was proposed after a multi-disciplinary staff to debulking surgery for the spinal mass.

**CONCLUSION:** Spinal metastases of thyroid cancer are extremely rare, and the initial metastases revealing papillary carcinoma are exceptional. PTC tends to have a good prognosis; however, when it is accompanied by distant metastasis, the prognosis becomes less favorable.

**Keys-words:** Papillary thyroid carcinoma, Spinal metastasis, Thyroid cancer.

## INTRODUCTION

Papillary thyroid carcinoma (PTC) is the most common thyroid cancer, representing approximately 80% to 90% of all newly diagnosed thyroid cancers, which often has a good prognosis [1]. Distant metastases derived from PTC occur in ~4% of the patients [2]. The presence of distant metastasis is an element of poor prognosis associated with a decrease in survival rates [2]. Spinal and bones metastases are rare. They are more prevalent in follicular cancer (7–28%) than in papillary one (1.4-7%)[3]. We present a case of initial spinal metastasis revealing papillary carcinoma of the thyroid.

## CLINICAL CASE

A 76 years old female presented at the emergency room with a chronic spinal pain evolving gradually for 3 months that has not responded to medical treatment. She had no medical history of spinal or thyroid disease, neck irradiation, dysphagia or dyspnea. Physical examination was unremarkable except a pain on lumbar palpation. She was referred to the neurological service where a computerized tomography (CT) of the lumbar spine showed an osteolytic mass centered on the last three lumbar vertebrae with an intra-canal extension. (figure.1)



**Figure 1 :** CT scan showing an osteolytic mass centered on the last three lumbar vertebrae with an intra-canal extension.



The magnetic resonance imagery (MRI) showed the infiltration of paravertebral and epidural spaces, compression of nerve roots in the inter vertebral foramina. (figure.2)

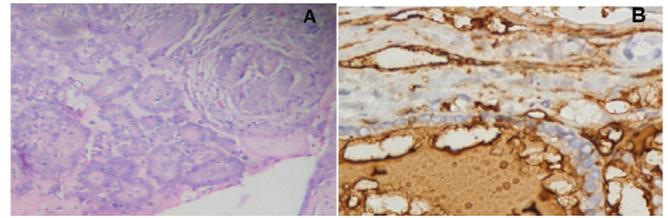


**Figure 2 :** T1-Flair MRI following intravenous gadolinium contrast demonstrates an irregular enhancing mass in the last 3 lumbar spine.

A biopsy was performed and histopathological study concluded to a metastasis of papillary thyroid carcinoma. This diagnosis was based on both the histological findings and the immunohistochemical study which was positive for thyroid transcription factor (TTF1) and thyroglobulin.

A further examination of the thyroid was performed. Non-palpable nodules were found. The cervical ultrasound showed an enlarged thyroid gland with several nodules classified TI-RADS 4B (Thyroid Imaging-Reporting and Database System.) without cervical lymph nodes. No other metastatic lesions were detected in whole body scan. The patient underwent total thyroidectomy with central lymph nodes dissection and the anatomic-pathological evaluation was compatible with thyroid papillary carcinoma without lymph nodes metastasis (Figure 3).

Following the resection of the thyroid gland, thyroid hormone replacement therapy is given.



**Figure 3 :** Histopathologic Study showed spinal Metastasis of Papillary Thyroid Carcinoma as revealed by hematoxylin and eosin staining (A), strong positive immunoperoxidase staining of thyroglobulin (B)

Due to intractable pain, the patient was proposed after a multi-disciplinary staff to debulking surgery for the spinal mass. The surgery would be followed by adjuvant radioiodine therapy (131I ablation).

## DISCUSSION

Well-differentiated thyroid cancers (DTC) account for the vast majority (85-98%) of thyroid malignancies. Bone metastasis incidence in differentiated thyroid cancers (DTC) is 2-13% [2,3]. Papillary thyroid cancers (PTC) accounts for 77% of DTC and has a low incidence of spinal metastasis (SM) of 1-7% whilst follicular thyroid cancer (FTC) which accounts for 15% of all DTC has an incidence of bone metastasis of 7-20%[3].

Spinal metastasis typically affects the thoracic (60-80%), lumbar (15-30%) and cervical spine (<10%) [4]. The preferred route of metastasis to the spine is via the arterial or venous-Batson's venous plexus-vessels resulting in multifocal lesions.

Classical clinical symptoms develop with the progression of spinal metastatic disease and are consequences of infiltration and/or compression of paravertebral, osseous and neural tissues [3]. The chief presenting symptom of SM is pain (83-95%)[4,5]. Radicular pain, described as shooting pain, is a common complaint in SM. It is caused by impingement or irritation of nerve roots in the intervertebral foramina, either by direct tumour compression or via tumour induced pathological fractures[4].

Magnetic resonance imaging (MRI) is the gold-standard imaging modality in SM diagnosis. It renders exquisitely detailed multiplanar imaging, allowing the visualization of metastatic infiltration and/or compression of paravertebral, osseous and neural tissue [4,5].

Computed tomography (CT) imaging is an excellent modality in assessing the osseous spine. It has a high degree of accuracy (90% sensitivity, 100% specificity) in identifying metastatic lesions, vertebral destruction and spinal stability [6].

Bone scintigraphy is used to screen for bone metastasis. Despite its high sensitivity (62-89%), it should be noted that bone scintigraphy measures abnormalities in bone metabolism and does not, therefore, have a high specificity in identifying spinal metastases [5].

The treatment of spinal metastases of thyroid carcinoma can be palliative or curative. The use of radioiodine ablation therapy, selective embolization therapy (SET), bisphosphonates, surgery, and small molecular therapy has been dis-



cussed [7].

Therapeutic interventions should, therefore, target first and foremost the integrity of the spine to prevent neurological complications. In doing so, they may vouch safe symptomatic control, such as pain, paralysis and they impact on activities of daily living [8].

Prognosis of patients with distant thyroid cancer metastases is generally poor, with an average of 40% of patients alive 4 years after the diagnosis of metastasis and an overall 10-year survival rate of 27% for bone metastases of differentiated thyroid carcinoma [9]. Individual prognosis depends up on age at diagnosis of spinal metastasis, tumour burden and number of spinal metastases [10]. Early detection is a prognostic factor in

spinal metastasis of differentiated thyroid carcinoma (DTC). This early detection could help to prevent dissemination to the spine.

## CONCLUSION

Spinal metastases from PTC are rare and their presentation before diagnosis of primary tumor is rarer. Due to absence of firm management guidelines, treatment of spinal metastasis should be done in a multi-disciplinary fashion and take into account tumour response, palliation and neurological function.

**Competing interests:** The authors declare no competing interests.

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