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Metastatic Follicular Thyroid Carcinoma Revealed by Cauda Equina Syndrome: Clinical Case and Literature Review

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Abstract **Case Report**

Follicular thyroid carcinoma (FTC) is a differentiated thyroid cancer characterized by a high propensity for hematogenous metastases, mainly affecting the bones and lungs. Its presentation as cauda equina syndrome (CES) is extremely rare, with few cases reported in the literature. We report the case of a 64-year-old woman admitted for CES secondary to a compressive lumbar metastasis. Histopathological examination revealed a previously undiagnosed FTC. Cervical ultrasonography showed a multinodular goiter with a suspicious EU-TIRADS 5 nodule, and computed tomography (CT) revealed multiple bone and pulmonary metastases, as well as muscular infiltration and left ureterohydronephrosis. The patient died two days after admission due to septic shock secondary to acute pyelonephritis. This case highlights the rarity of a neurological inaugural presentation of FTC and emphasizes the importance of heightened clinical vigilance for early diagnosis.

Keywords: follicular thyroid carcinoma, cauda equina syndrome, bone metastasis, spinal cord compression, thyroid nodule, computed tomography.

INTRODUCTION

Thyroid cancer is the most common endocrine malignancy, with differentiated thyroid carcinomas accounting for more than 90% of cases [1]. Among them, follicular thyroid carcinoma (FTC) represents approximately 10–15% of differentiated thyroid cancers and is characterized by its propensity for vascular invasion and hematogenous dissemination [2]. Unlike papillary thyroid carcinoma, which predominantly spreads through lymphatic pathways, FTC more frequently metastasizes to distant organs, particularly the bones and lungs [2].

Bone metastases from FTC are associated with reduced survival and significant morbidity, including pain, pathological fractures, and neurological complications when the spine is involved [3]. Spinal metastases may lead to spinal cord compression or, more rarely, cauda equina syndrome (CES), a neurosurgical emergency characterized by lower limb weakness, saddle anesthesia, and sphincter dysfunction [4]. Although spinal involvement is well documented in metastatic disease, CES as the initial manifestation of FTC remains exceptionally rare, with only isolated cases described in the literature [5].

The diagnosis of FTC may be challenging, particularly when distant metastases precede identification of the primary thyroid lesion. Imaging modalities such as cervical ultrasonography, especially when classified according to EU-TIRADS criteria, and cross-sectional imaging including computed tomography (CT), play a crucial role in the diagnostic and staging process [6,7]. Early recognition of atypical presentations is essential to ensure timely multidisciplinary management and to improve patient outcomes [8].

The present report aims to highlight the unusual presentation of metastatic FTC revealed by cauda equina syndrome and to review the relevant literature regarding its clinical features, diagnostic challenges, and therapeutic considerations.

CASE REPORT

We report the case of a 64-year-old woman, without significant medical history, admitted for cauda

equina syndrome (CES). She presented with severe lumbar pain, saddle hypoesthesia, and urinary disturbances, necessitating urgent surgical intervention. The patient underwent L2 laminectomy with lumbar osteosynthesis for spinal decompression.

Histopathological examination of the extradural lesion revealed a metastasis from previously undiagnosed follicular thyroid carcinoma (FTC). Similar rare cases of FTC presenting first with CES due to spinal metastasis have been described in the literature. Following this finding, cervical ultrasonography identified a multinodular goiter with a suspicious EU-TIRADS 5 nodule, indicative of thyroid malignancy.

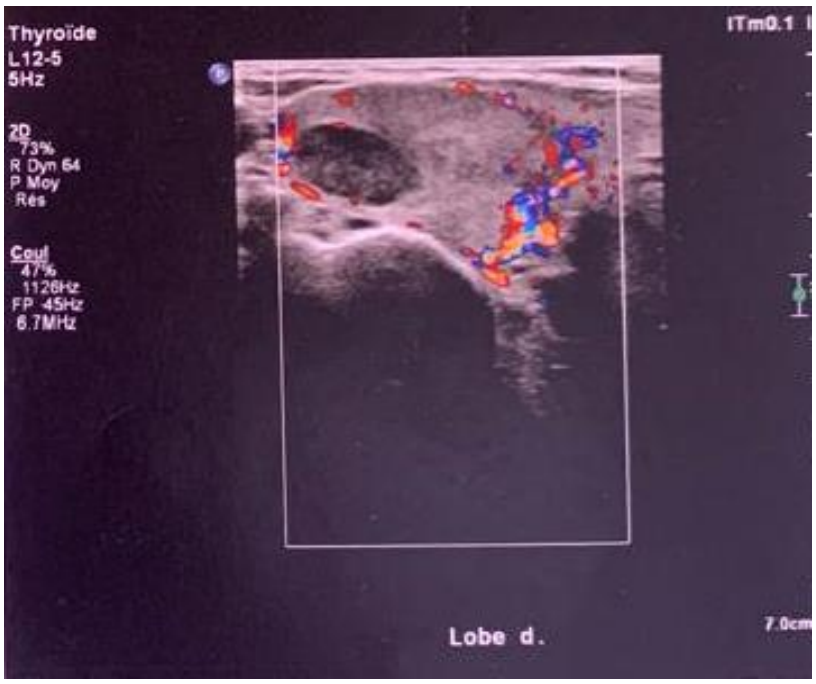

Figure 1: Right thyroid lobe goiter measuring 46 × 30 × 65 mm, classified as EU-TIRADS 5.

Extension work-up with computed tomography (CT) demonstrated a substernal goiter, multiple osseous metastases involving the spine and ribs, as well as suspicious pulmonary lesions. Imaging also revealed psoas muscle infiltration and left ureterohydronephrosis, requiring placement of a JJ stent.

Unfortunately, the patient developed severe acute pyelonephritis complicated by septic shock and died two days after hospitalization, before specific treatment for thyroid carcinoma could be initiated. This case underscores both the severity and the potential rapid progression of metastatic FTC with unusual initial presentation.

DISCUSSION

Follicular thyroid carcinoma (FTC) is a differentiated thyroid cancer less common than papillary carcinoma but is distinguished by a strong tendency for hematogenous spread, particularly to bones and lungs [2]. Bone metastases occur in approximately 6–20% of FTC cases and often indicate advanced disease [3]. The most frequent metastatic locations include vertebral bodies, pelvis, femur, skull, and ribs [9].

Although bone metastases from FTC are uncommon, spinal involvement with compressive symptoms such as CES is extremely rare, with fewer than ten cases reported in the world literature [5]. Chafiki *et al.,* reported an occult FTC revealed by isolated cauda equina syndrome due to spinal metastasis, highlighting the diagnostic challenge of such presentations [10]. Another case described metastatic FTC involving sacral vertebrae mimicking primary spinal tumors [11].

The pathophysiology of CES secondary to FTC metastasis involves osseous invasion and spinal cord compression [4]. FTC bone metastases are often osteolytic and may infiltrate adjacent muscular structures, increasing susceptibility to complications like adjacent infections [12].

Patients with distant metastases often present with pain, pathological fractures, or neurological symptoms depending on the site of spread [9]. FTC may also present as isolated spinal metastases with myelopathy, underlining the need for thorough metastatic work-up in spinal tumors [13].

The standard therapeutic approach for FTC includes total thyroidectomy, followed by radioactive iodine (RAI) therapy and serum thyroglobulin

monitoring [8]. In cases of symptomatic bone metastases with neurologic compromise, surgical decompression and radiotherapy may be considered for palliation and functional preservation [14]. However, prognosis remains poor in the setting of multiple distant metastases [3].

FTC may occasionally metastasize to unusual sites such as the facial skeleton or soft tissues, underscoring the tumor's potential for widespread dissemination [15]. Recognition of unusual clinical presentations, such as CES, is crucial for avoiding diagnostic delays and initiating multidisciplinary management [8].

CONCLUSION

Cauda equina syndrome may exceptionally be the first manifestation of metastatic follicular thyroid carcinoma. This case highlights the rarity of this clinical presentation and the severity of disseminated metastases. It emphasizes the importance of heightened vigilance in patients with unexplained CES and the necessity of a rapid, multidisciplinary approach to optimize care. Early detection of thyroid nodules remains essential to improve survival in differentiated thyroid cancers [8].

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