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Medullary Thyroid Carcinoma - MEN2 Associated with Diabetes: A Case Report

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Abstract | **Case Report**

We report the case of an 84-year-old woman with medullary thyroid carcinoma associated with previously undiagnosed diabetes, presenting as an acute complication. Medullary thyroid carcinoma is a rare neuroendocrine tumor that develops from parafollicular C cells. It is common in elderly women. The patient complained of intermittent respiratory distress and a cervical swelling. Calcitonin levels were very high, and a cervicothoracic CT scan revealed heterogeneous hypertrophy of the right lobe containing multiple micro- and macronodular formations with foci of calcification and necrosis pulmonary metastases were present. Parathyroid hormone levels were elevated, suggesting probable multiple endocrine neoplasia type 2 (MEN2). Blood glucose and urine dipstick tests revealed an initial complication of ketoacidosis. The diagnosis of medullary thyroid carcinoma within probable MEN2 associated with diabetes was made. Due to the patient's age and the presence of pulmonary metastases causing organ failure, which clinically demonstrates the severity of ketoacidosis, in addition to the aggressive nature of medullary carcinoma in elderly patients, the patient was transferred to the intensive care unit.

Keywords: Medullary Carcinoma - Thyroid - MEN2 - Diabetes.

INTRODUCTION

Medullary thyroid carcinoma (MTC) is a rare neuroendocrine tumor that develops from parafollicular C cells. It accounts for 5–10% of thyroid cancers [1]. It is common in elderly women. It presents in two forms: a sporadic form in the majority of cases and a familial form in 30–35% of cases, which is a monogenic hereditary disorder caused by germline mutations in the RET gene and is classified as multiple endocrine neoplasia type 2 [2].The clinical presentation is polymorphic; diagnosis is made by systematic measurement of plasma calcitonin, which is also the parameter used to monitor treatment. Calcitonin levels are generally correlated with tumor volume. Management is surgical. Diabetes can develop through the stress mechanism induced by the manifestations of carcinoma in at-risk individuals predisposed to type 2 diabetes. We report a case of this.

CASE REPORT

This was an 84-year-old female homemaker who presented with intermittent respiratory distress for several months due to a large cervical swelling that had been progressively developing for over 30 years. She also experienced persistent physical fatigue, moderate chest pain exacerbated by exertion and deep inspiration, a dry cough, unquantified weight loss, and recent polyuria.

Clinical Examination: The Lansky/Karnofsky score was 40%, blood pressure was 131/82 mmHg, SpO2 was 88%, and respiratory rate was 30 breaths/min.

Paraclinical Examination: Blood glucose was 3.48 g/L, ketonuria was 42 mg/dL, glucosuria was 300 mg/dL, TSH was 0.36 (IU/mL), FT4 was 20 pmol/L, anti-TG antibody was 70.56 IU/mL, serum calcium was 2.59 pg/mL, and plasma calcitonin was 209 pg/mL. Parathyroid hormone was 106.40 pg/dl. Fine-needle aspiration cytology revealed polyhedral cells with finely granular cytoplasm and nuclei containing cytoplasmic inclusions with amyloid stroma. Cervicothoracic CT scan showed heterogeneous hypertrophy of the right lobe containing multiple micro- and macronodular formations

with foci of calcification and necrosis, along with multiple intraparenchymal and subpleural nodular formations affecting both lung fields in a "balloon-like" pattern. The diagnosis of medullary thyroid carcinoma with pulmonary metastases, integrated within probable multiple endocrine neoplasia type 2, associated with initial diabetic ketoacidosis, was made. The patient was transferred to the intensive care unit, where she died two days after admission.

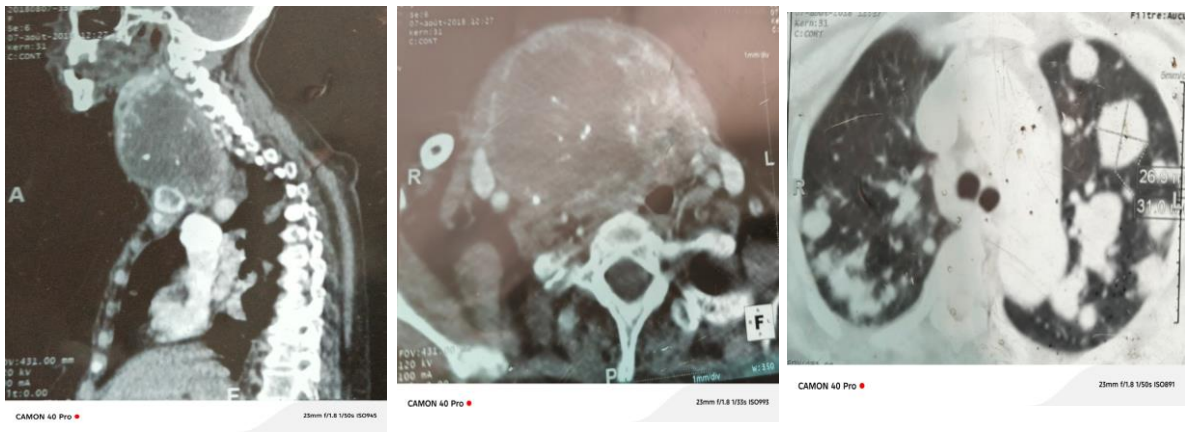

Figure 1. tomodensitometrie cervico-thoracique
La tomodensitométrie cervico-thoracique révèle une Hypertrophie hétérogène du lobe droit renfermant des multiples formations micro et macro nodulaires avec des foyers de calcifications et de nécroses avec présence de multiples formations nodulaires intra parenchymateuses et sous pleurales intéressant les deux champs pulmonaires en lâché de ballon.

DISCUSSION

Due to its widespread rarity in the literature [1, 2], medullary thyroid carcinoma has a diverse clinical presentation with the particularity of being associated with other endocrine pathologies within the framework of multiple endocrine neoplasia type 2 (MEN2), confirmed by the demonstration of the germline mutation of RET in the familial context [1, 2], which was not carried out in this observation.The patient was 84 years old, thus occurring in an elderly person, as reported by Guliana, JM *et al*., [3], and Hélène, L *et al*., [4], who were respectively 75 years old and in an age range between 40 and 60 years old; in females, as reported by a Tunisian study by Doghmi, Y *et al*., [5], and Gabsi, A *et al*., [6], who found a male predominance, while Hélène, L *et al*., [4] found no sex predilection with a sex ratio of 1. The circumstance of discovery was a cervical swelling associated with cough, respiratory distress, and chest pain. However, other authors have reported other symptoms such as: a thyroid nodule (Belhamir, N [7]) and two clinical manifestations, which are thyroid nodules in 16 patients and a multinodular goiter in 2 cases Doghmi. Y *et al*., [5]. In clinical and biological euthyroidism, a French study revealed cases of hyperthyroidism Faivre-Defrance. Fr *et al*., [8], demonstrating a great disparity in its clinical presentation. Cervicothoracic CT scans revealed heterogeneous hypertrophy of the right lobe containing multiple micro and macronodular formations with foci of calcifications and necrosis, and, at the pulmonary level, multiple intraparenchymal and subpleural nodular formations affecting both lung fields in a "balloon-like" pattern, also reported by Niccoli-Sire. P *et al*., [1], who also found pulmonary metastases [9, 10]. A heterogeneous, multinodular goiter predominantly on the right with the presence of pulmonary metastases suggested a late diagnosis of medullary thyroid carcinoma (Guliana, JM [3], but the presence of cervical lymph node metastases has also been reported (Hazard, JB *et al*., [11]). Blood calcitonin levels were measured, with a very high level suggestive of medullary thyroid carcinoma [11, 12], and one non-calcitonin-secreting case was reported by Belhamri, N [7]. The very high parathyroid hormone level confirmed the diagnosis of multiple endocrine neoplasia type 2. Plasma and urinary metanephrine levels were not measured. Fine-needle aspiration cytology revealed polyhedral cells with finely granular cytoplasm and nuclei containing cytoplasmic inclusions with amyloid stroma. The ketoacidosis complication, revealing new-onset diabetes in an elderly patient, was characterized by respiratory distress related to metastases and organ failure. Clinically, the severity of this complication, beyond the measurement of blood pH and bicarbonate levels, is life-threatening. There is no established direct link between medullary thyroid carcinoma and diabetes, except for the oxidative stress caused by its various manifestations, which may be a trigger for diabetes.

CONCLUSION

Medullary thyroid carcinoma, a rare condition, is common in elderly women, in whom it becomes very aggressive. It is classified as a type 2 multiple endocrine neoplasia and requires screening of the entire family for appropriate and early management.

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