Case report

Thyroid metastasis revealing a lung adenocarcinoma: A case report and review of the literature

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ABSTRACT

Introduction: Metastatic lung adenocarcinoma in the thyroid is very rare. The clinical presentation and the radiological findings for metastasis carcinoma are nonspecific and do not allow the distinction between metastatic lung carcinoma and primary thyroid tumor.

Case presentation: We report the case of a pulmonary papillary adenocarcinoma revealed by a thyroid metastasis in a 62-year-old and non-smoker patient with no history of cancer.

Discussion: Thyroid metastasis revealing a primary adenocarcinoma of lung is extremely rare. In the absence of a history of lung cancer, the histological appearance of a papillary adenocarcinoma localized in the thyroid can be misdiagnosed as a primary thyroid cancer given the non-specificity of the clinical, radiological and histological presentations. Immunohistochemical analysis and molecular studies are the gold standards for establishing the diagnosis of the primary site.

Conclusion: In this report we aim to discuss the histological and immunohistochemical features of lung adenocarcinoma metastasizing in thyroid gland through a literature review. We are also targeting to highlight the essential role of immunohistochemistry and molecular study for the confirmation of the primary pulmonary origin and to discuss therapy for patients with lung cancer metastatic in the thyroid [17].

1. Introduction

Thyroid metastases are rare malignancies with poor prognoses. The most common primary neoplasm metastasizing to the thyroid gland are renal cell carcinoma, breast carcinomas and lung carcinomas. Pulmonary adenocarcinoma with metastasis to thyroid represents an extremely rare condition and only a few cases have been reported in the literature.

We report a case of a thyroid metastasis revealing an unknown papillary adenocarcinoma of the lung.

2. Case presentation

A 62-year-old patient presented to the Department of General Surgery for a cervical nodule increasing in size over 3 months with no respiratory symptoms. The patient did not have any medico-surgical or smoking history. Physical examination revealed a palpable thyroid nodule.

Blood investigations including thyroid-stimulating hormone (TSH) and free thyroxine were normal. Neck ultrasonography revealed a solid hypoechic nodule of the left thyroid lobe measuring 16 × 13 × 9 mm and classified as EU-TIRADS 5. The anatomopathological study of the fine-needle aspiration cytology (FNAC) of the thyroid nodule revealed cells showing distinct malignant features, so the lesion was classified as Bethesda category VI (malignant), hence the indication of total thyroidectomy. The specimen was sent to the pathology department.

Seen the suspicious lung images of fortuitous discovery on the chest X-ray performed as part of the preoperative assessment, the patient underwent a Contrast-enhanced Computed Tomography (CT) scan of the thorax after thyroid surgery (and not before it for lack of financial means of the patient and for fear of her loss of sight since she refused any treatment and additional investigation at the beginning). It showed an
82x54x39 mm left mass with ipsilateral and contralateral pleural and pulmonary localizations (Fig. 1). A biopsy of this lung mass was performed.

The histological examination of the 2 samples shows a tumoral proliferation of the same histological aspect, it’s about carcinomatous proliferation composed of papillary structures with fibrovascular cores, and lined by cuboidal to columnar neoplastic cells.

The immunohistochemical stains of neoplastic cells in lung biopsy and thyroid nodule were positive for CK7, TTF-1 and napsin-A but negative for thyroglobulin (Figs. 2 and 3). These anatomopathological results were in favor of pulmonary papillary adenocarcinoma with thyroid metastases.

The patient was referred to Respiratory Medicine and oncology departments for treatment of the metastatic cancer of pulmonary origin.

3. Discussion

The metastatic thyroid gland is extremely rare despite its rich vascular supply. It is found mainly in autopsy cases, and represents less...
than 3% of thyroid cancers among the living [1]. Breast, kidney, lung, and gastrointestinal tract have been reported to be the most common primary sites that metastasize to the thyroid gland [2]. Lung is the second common site [3]. The histological types of the different reported cases of lung cancer metastasizing to the thyroid were small cell carcinoma, squamous cell carcinomas, adenocarcinoma and anaplastic small cell carcinoma [2]. Only a few cases of primary lung adenocarcinoma were reported. Research of English language reports using the keywords “lung adenocarcinoma and thyroid metastasis” revealed only 13 cases of thyroid metastasis from pulmonary adenocarcinoma (Table 1) [4-13].

The interval between the diagnosis of the primary lung carcinoma and the discovery of a thyroid metastasis varies between one month and twenty-six years [7]. In our case report, the thyroid metastasis was the revealing sign of lung adenocarcinoma; This condition has been exceptionally reported in the literature.

Clinically, patients with thyroid metastasis present non-specific symptoms such as thyroid nodule or goiter, cervical discomfort, dyspnea, dysphagia, or dysphonia [14].

Biologically, the balance of thyroid hormones is generally unaffected. However, dysfunction of the thyroid gland has been reported in some cases due to the destruction of thyroid follicles by tumor cells [15].

Medical imaging including ultrasound, a cervical scanner with and without injection CT and PET scan show no specific signs to confirm the thyroid or lung origin of the tumor [7].

Histological examination and especially immunohistochemical studies are crucial for the diagnosis of metastatic lung carcinoma. It can be performed on different types of samples namely fine needle aspiration (FNA), biopsy and thyroidectomy specimens. FNA is a minimally invasive, rapid, and inexpensive technique allowing to make cell blocks used for immunostains. However, it might be non-contributory if insufficient cells are available. Biopsy and surgical specimens are more precise [13]. Several immunohistochemical markers, including CK7, TTF1, thyroglobulin, and Napsin A are essential for diagnosis. CK7 and TTF-1 have been reported to be positive in primary lung adenocarcinoma and thyroid cancers; Positive labeling of tumor cells with anti-thyroglobulin antibody confirms their thyroid origin. However, negative labeling does not eliminate a thyroid origin since some primary thyroid tumors may show negative immunostaining [7]. Napsin A has been proven sensitive and specific immunomarker for identifying a lesion of lung origin, hence its capital interest [16].

Molecular studies are also helpful in the distinction between thyroid papillary carcinoma and lung carcinomas. RET/PTC rearrangements, RAS mutations and BRAF mutations are frequently found in thyroid papillary carcinoma, while EGFR mutations, and ALK rearrangements are usually identified in lung carcinoma [3].

Surgery is indicated in patients with isolated thyroid lesions with no evidence metastasis in other sites and for relieving compressive symptoms in patients with disseminated disease [3]. Systemic treatment with chemotheraphy or targeted therapy is used in the case of polymetastatic cancer. Radiotherapy is used as a palliative treatment for symptoms due to thyroid metastases [7] Radioiodine treatment is not indicated for thyroid metastases [12].

4. Conclusion

Diagnosis of papillary carcinoma in the thyroid gland as a primary or metastatic neoplasm is a significant challenge. In the absence of specific clinical or radiological signs, immunohistochemical and molecular studies remain the gold standard for diagnosis.

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Consent for publication

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Availability of data and materials

Not applicable.

Registration of research studies

Not applicable.

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CRediT authorship contribution statement

IE and OA analyzed and interpreted the patient data and wrote the manuscript. IE and LB made the figs. IE performed the histological examination. KZ and OM proposed the study, supervised IE and revised the manuscript. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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