CASE REPORT

Metastatic renal cell carcinoma to the thyroid gland 24 years after the primary tumour

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SUMMARY

Among the metastases to thyroid gland, metastases from renal cell carcinoma (RCC) are not rare and their frequent macroscopic looks are similar to primary thyroid tumours. We report an unusual case of thyroid metastases from renal carcinoma in a 72-year-old man presented with a 1-year history of choking spells, stridor and dyspnoea. Patient underwent right nephrectomy for RCC, 24 years ago. In the present case, a right hemithyroidectomy was performed for a suspected anaplastic thyroid carcinoma. Histological examination showed a metastases of a clear cell renal carcinoma. Although the RCC showed an indolent biological behaviour, the late thyroid metastases have concurred with a poor prognosis and the patient died 5 months after surgery. The interest of this case lies in the long progression-free survival of the RCC preceded by the diagnosis of the thyroid nodule and the discrepancy between the clinical–radiological and the histological assessment.

BACKGROUND

Unusual presentation of disease with problems of differential diagnosis and therapeutic management.

CASE PRESENTATION

We report the case of a 72-year-old man presented with dysphonia at our endocrinology ambulatory. His medical history includes right radical nephrectomy performed in another hospital, 24 years ago, owing to renal cell carcinoma (RCC) classified as pT2a. Recently, the patient noted a decline of voice, choking spells, stridor and dyspnoea associated with a mass of the neck.

INVESTIGATIONS

Physical examination of the neck region detected a thyroid enlargement; dosage of thyroid hormones, thyroglobulin, anti-TG antibodies and calcitonin levels was in the normal range. Thyroid ultrasonography (USG) showed an enlarged thyroid gland with multiple solid nodules and nodal involvement. Combining USG with Doppler can result in a better malignant potential estimation. In short, the following USG patterns suggested presence of malignancy lesion: irregular shape, ill-defined borders, hypoechogenicity, solidity, heterogeneous internal echoes and the presence of suspicious regional lymph nodes. The patient also performed a flexible laryngoscopy that revealed right vocal-cord palsy. Neck MRI showed an increased thyroid volume, especially at right lobe (maximum transverse diameter 7 cm) and oesophageal compression.

There were no tracheal wall or cricoid and thyroid cartilages involvements. MRI also showed enlarged cervical and submandibular lymph nodes (the largest lymph node measuring 2.3 cm). The patient was submitted to fine needle aspiration biopsy (FNAB) of a thyroid nodule and submandibular lymph node for a preoperative diagnosis. Both the FNABs demonstrated the presence of pleomorphic cells, clear cells and clusters of epithelial cells with eosinophilic cytoplasm in a haemorrhagic background (figure 1A, 1B); a diagnosis of poorly differentiated or anaplastic thyroid carcinoma was made. A right hemithyroidectomy with nodal dissection was performed: the surgical specimen showed a white-grayish, solid and partially encapsulated mass (figure 2). Histologically thyroid tumor (figure 2, inset) was composed of clear cells forming pseudo papille (figure 3A) and glandular spaces containing erythrocytes (figure 3B). Immunohistochemistry showed positivity for CD10 (figure 3C), but not for TTF-1 (figure 3D). A diagnosis of metastases of a clear cell renal carcinoma was made.

DIFFERENTIAL DIAGNOSIS

Primary thyroid tumour or metastases from renal carcinoma.

OUTCOME AND FOLLOW-UP

Although the RCC showed an indolent biological behaviour, the late thyroid metastases have concurred with a poor prognosis and the patient died 5 months after surgery.

DISCUSSION

Metastases to the thyroid gland are not as rare; most cases have been diagnosed in autopsy series and the overall incidence varies from 1.25% to 24%.^{1–2} Tumours that more frequently metastasise to the thyroid gland are pulmonary squamous cell carcinoma (11%), RCC (12%), breast carcinoma (21%), oesophageal squamous cell carcinoma, oropharynx squamous cell carcinoma.^{3–7} Rarely, a thyroid metastasis may be the first sign of a primary carcinoma of other sites, or it can present many years after the primary tumour removal of except that for RCC.^{8–10} In fact, the clear cell variant of RCC show a very unpredictable behaviour. Its metastases are found in atypical sites such as the gums and nasal cavities; they may occasionally be discovered before the primary renal tumour, or arise many years or decades after its surgical removal.^{11–14} RCC spreads both through the lymphatic system, to regional and sometimes to

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Figure 1 (A) Cell cluster formed by atypical epithelial cells with pleomorphic nuclei and prominent nucleoli. The background contains numerous polymorphous nuclear neutrophils and red blood cells (Papanicolaou $\times 10$). (B) A monolayer of cells with clear cytoplasm and well-defined cell borders (Papanicolaou $\times 20$).

retroperitoneal, periaortic and mediastinal lymph nodes, or the lymph-blood system via the thoracic duct, but above all through the blood, via the renal vein and the inferior vena cava, often the site of a neoplastic thrombosis.¹⁰ Furthermore, thyroid metastases from RCC could be considered rare compared with the most common sites of visceral metastases. Thyroid metastases usually are not symptomatic and patients generally complain of a palpable nodule. More rarely, it may present with breathing difficulty, hoarseness, dysphonia, dysphagia and pain.^{2 10} In these cases, diagnosis of primary thyroid tumour should be always excluded, also in patients with a history of RCC. A pre-operative FNAB may be useful in problematic cases. The peculiarity of our case is the long latency between the primary tumour and metastases. Rarely in the literature there have been reported cases with as long an interval time between primary tumour and metastatic disease with an exceptional case described by

Figure 2 Grossly, the right lobe of thyroid showed a white-grayish solid, partially encapsulated mass (inset). Histologically, thyroid tumour showed a prevalent solid pattern: clear cells were evident (H&E $\times 10$).

Bradham *et al*¹⁵ in 1973 that had a 25-year interval between the detection of pulmonary metastases. The evidence of a thyroid nodule many years or decades after the treatment of a primary renal cancer represents always a diagnostic dilemma and causes problems for the therapeutic management of the patient.^{16 17} In fact, the detection of metastases to the thyroid often indicates a poor prognosis also in 'silent' cases or in patients in good general conditions. A diagnosis of metastases from clear cell RCC is easy in patients with a history of nephrectomy or of recent discovery of renal mass. In these cases, a preoperative FNAB may be useful for the diagnosis and correct management of thyroid nodule. Instead, the diagnosis may be very difficult in cases without a history of RCC and in patients with a solitary and well-circumscribed nodule. Moreover, primary thyroid tumours are composed mainly of clear cells that are relatively common and clear cell RCC may have a papillary architecture. In difficult cases, a small immunohistochemical panel with CD10, TTF1, CK7 and thyroglobulin may be necessary for a

Figure 3 (A) A pseudopapillary architecture resembling a primary thyroid tumour was present (H&E $\times 10$). (B) Presence of erythrocytes in the centre of pseudogland simulated renal cell carcinoma (H&E $\times 20$). (C) Tumour cells were positive for CD10 1 (immunoperoxidase $\times 20$). (D) Tumour cells showed no reactivity with TTF-1 (immunoperoxidase $\times 40$).

correct diagnosis. In conclusion, although rare, thyroid metastases may be a diagnostic problem. A thyroid metastasis from an RCC could be considered in any patient presenting with a thyroid nodule and a positive clinical history for RCC. For isolated metastatic cancer to the thyroid, surgical treatment should be considered in order to avoid potential morbidity of tumour recurrence in the neck, even if the prognosis remain poor. Although therapy of metastatic malignancies is often considered to be palliative, aggressive surgical treatment in isolated cases may be curative and of clear survival benefit. In conclusion, we recommend that in all patients with a history of RCC, the appearance of a new thyroid nodule could be investigated.

Learning points

- Thyroid metastases from renal carcinoma may cause problems in differential diagnosis with primary thyroid tumours.
- They may occasionally be discovered before the primary renal tumour, or arise many years or decades after its surgical removal.
- Fine needle aspiration biopsy may be useful for the diagnosis and correct management of thyroid nodule.
- Therapeutic management of thyroid metastases from renal carcinoma represents a challenge for the clinician.

Competing interests None.

Patient consent Obtained.

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