Clinical case

Thyroid metastases from clear cell renal carcinoma 18 years after nephrectomy

Métastases thyroïdiennes d’un carcinome rénal à cellules claires 18 ans après la néphrectomie

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Abstract

Single or multiple thyroid metastases from extra-thyroid primary tumors are reported to be rare. Malignancies that metastasize to the thyroid include cancers originating from lung, breast and kidney. We report our experience with a case of thyroid metastases, which were detected 18 years after curative kidney surgery for renal cell carcinoma. After 18 years, the patients noted the sudden appearance of a lump in the neck. Ultrasonography showed the presence of a multinodular goiter, all nodules being “cold” at scintiscan. Total thyroidectomy was performed; histology of all nodules revealed a metastatic thyroid cancer from renal cell carcinoma. The patient was still alive and in good health 16 months after thyroidectomy. History of patients with thyroid nodules should include inquiring about extra-thyroid malignancies, especially renal cell carcinoma, that may have been diagnosed even many years earlier. As a corollary, follow-up of such patients should include periodic thyroid exploration or at least a physical examination.

Keywords: Thyroid nodules; Thyroid metastases; Renal cell carcinoma

Résumé


Keywords: Nodules thyroïdiens ; Métastases thyroïdiennes ; Carcinome rénal

Mots clés : Nodules thyroïdiens ; Métastases thyroïdiennes ; Carcinome rénal

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1. Introduction

Literature reports intra-thyroid involvement of renal cell carcinoma (RCC) as a rare and late event after kidney cancer diagnosis. As summarised by Nakhjavani et al. [1] in nine autopsy series covering the years 1931–1969, the rate of thyroid metastases from any malignancy ranged from 1.2 to 24.2%. The most frequent primary site was the kidney (33%), followed by lung and breast (16% each). Iesalnieks et al. [2] reported 45 patients who underwent surgery for thyroid metastases at 15 institutions of Germany and Austria between 1980 and 2007. Their study, which was largely focused on analysing the determinants of outcome, found that prolonged survival occurred in patients with solitary thyroid metastases. Here, we report a clinical case of thyroid metastases from RCC that became clinically apparent 18 years after nephrectomy.

2. Case report

In July 2008, a 79-year-old patient was admitted to the Surgery Section of the Human Pathology Department because he had noticed the sudden appearance of a lump in the neck 3 weeks earlier. Past history was relevant only for the fact that he underwent total left nephrectomy for RCC 18 years earlier. The tumor had involved only one kidney and was confined to the renal capsule, with no perirenal fat infiltration or lymph node metastases (Robson stage I). The patient was not given adjuvant chemotherapy.

On physical examination, thyroid palpation elicited no pain; both thyroid lobes were enlarged, with one nodule in the left lobe and another two nodules in the right lobe. A few laterocervical lymph nodes were also palpated. Thyroid function was normal, as TSH was 1.72 mU/L (n.v. 0.27–4.2); FT3 3.56 pg/ml (n.v. 2.0–4.40) and FT4 12.8 pg/ml (n.v. 9.3–17). Serum thyroglobulin and thyroperoxidase autoantibodies were undetectable. Neck ultrasonography (Fig. 1) revealed a few bilateral laterocervical lymph nodes with reactive characteristics and a multinodular goiter with a hypoechoic nodule measuring 44 mm in diameter in the left lobe and two nodules of about 20 mm in diameter in the right lobe. Color-Doppler evaluation showed intra- and perinodular blood flow in all nodules. All nodules were “cold” (no uptake of 99mTc-pertechnetate) at scintiscan; 18F-fluorodeoxyglucose-positron emission tomography and computed tomography (18F-FDG-PET/CT) scan was not performed. The patient declined fine-needle aspiration biopsy (FNAB) and associated cytologic FNAB evaluation of the thyroid nodules. In August 2008, the patient underwent total thyroidectomy.

At macroscopic examination, the isthmus measured 2 cm and the left and right lobes measured 5 cm × 4 cm and 4.5 cm × 4 cm, respectively. The cut surface showed white roundish nodules, apparently well circumscribed and capsulated; the nodule in the left lobe measured 4 cm and the two nodules in the right lobe measured 2 cm each. The consistence of all nodules was hard in comparison to the fleshy and soft adjacent thyroid glandular tissue. The neoplastic nodular tissue was arranged in...
sheets and cords, which were separated by a prominent vascular stroma and sometimes arranged in alveolar structures. These nodules were sharply demarcated from the adjacent thyroid tissue, although the evident fibrous connective capsule was interrupted and infiltrated in some areas. The neoplastic elements had a polygonal or elongated shape with clear, slightly granular and pale eosinophilic cytoplasm and round, occasionally pleomorphic, nuclei; mitoses were rare (Fig. 2 A and 2B). Immunohistochemically, neoplastic elements were unreactive to both thyroglobulin and calcitonin antibodies, thus excluding the thyroid origin of nodules, unlike the adjacent unaffected thyroid tissue (Fig. 2 C). By contrast, the neoplastic cells showed an intense and diffuse cytoplasmic immunoreactivity to low molecular weight cytokeratins, EMA and vimentin antibodies (Fig. 2 D). The growth fraction, analysed by MIB-1 antiserum, was less than 5%. No immunostaining for CEA was apparent. The final histopathologic diagnosis was bilateral thyroid metastases from clear cell renal carcinoma.

The patient was still alive and in good health 16 months after thyroidectomy. At this last follow-up, neck ultrasonography showed no abnormal lesions outside thyroid bed. Contrasted CT-scan revealed no suspicious lesions in the brain, lungs, liver, pancreas, adrenal glands and contralateral kidney.

3. Discussion
Cancers that metastasize to the thyroid gland are uncommon, despite their rich vascular supply. On the other hand, RCC is known for its tendency to give metastases unpredictably. According to Boles and Cerny [3], it is the Batson’s venous plexus between the vertebral and epidural venous systems that facilitates the spread of the metastasizing process. These venous systems are valveless and offer an easy way for metastatic cells to spread with low resistance. Increase in intra-abdominal and thoracic pressure causes retrograde flow in these veins. This plexus allows cancerous RCC to bypass the pulmonary capillary filtration and metastasizes into the head and neck organs. This pathogenetic suggestion has been recently reproposed by Kancherla et al. [4].

Thyroid metastases are observed in elderly individuals in the sixth and seventh decades of life [5]. If clinically apparent, the thyroid metastasis cannot be distinguished from the majority of thyroid nodules, in that it consists of a thyroid nodule that is scintigraphically “cold” and echographically solid. At 18F-FDG-PET/CT scan the factors that are related with an increased risk of a malignancy are focal FDG uptake and a high maximum standardised uptake value. The presence of these risk factors on the 18F-FDG-PET/CT warrants FNAB [6]. The sensitivity of the
$^{18}$F-FDG-PET/CT exam for the detection of thyroid malignancy is extremely high, but the specificity is 39% (ranging from 0 to 66%) [7].

Total thyroidectomy is the procedure of choice for the treatment of thyroid metastases from RCC [8]. Unlike intrathyroidal metastases, which are indicative of less active disease (as in our case), growth of extrathyroidal metastases is an expression of progressive systemic disease. Extrathyroidal growth of thyroid metastases, invasion of the recurrent laryngeal nerve, invasion of the internal jugular vein and cervical lymph node metastases from thyroid metastases are predictors of cause-specific mortality [8]. In these cases, surgery aims at preventing local complications and should be embedded in a systemic treatment concept [8].

4. Conclusion

Although the thyroid is a rare site for tumor metastases, this possibility should be considered in patients with a previous history of RCC. Our case shows that multiple thyroid metastases from RCC in a male patient aged over 70 years are not associated with an unfavorable outcome within one and a half year after total thyroidectomy.

Conflict of interest

The authors declare that there is no conflict of interest.

References