



CASE REPORT

Obstructive nephropathy caused by renal metastasis of papillary thyroid carcinoma: a case report

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Abstract

The aim of this report is to present a rare case of papillary thyroid cancer metastasis to the kidney manifesting with obstructive nephropathy. A 68 year-old man was referred to ultrasound examination because of a multinodular goiter. Ultrasound guided fine needle aspiration biopsy (US-FNAB) suggested follicular adenoma of the right thyroid lobe and a right lobectomy with isthmectomy was performed. Pathohistologic findings confirmed a follicular variant of papillary thyroid carcinoma and the patient underwent a total thyroidectomy followed by radioiodine ablation. A few years later, scintigraphy revealed radioiodine avid metastatic foci in the right kidney as well as an intramuscular lesion in the left thigh. At the same time, non-small cell lung cancer was diagnosed. Papillary thyroid carcinoma is the most common thyroid malignancy, but renal or muscular metastases are extremely rare in this type of cancer and can be found in poorly differentiated cancers, which should be clearly stated in the final pathohistologic report. In order to better the interpretation of these pathohistological findings and allow successful monitoring of these patients, close cooperation with pathologists and immunohistochemical profiling is suggested.

Key words: thyroid cancer; renal metastases, muscle metastasis, obstruction, nephropathy, uropathy

1. Introduction

Papillary thyroid cancer (PTC) is the most common thyroid malignancy, which originates from follicular thyroid cells. Its incidence is growing primarily due to improved diagnostic procedures such as neck ultrasound with targeted fine-needle aspiration biopsy (FNAB). Local metastases are usually confined to the neck lymph nodes, whereas distal metastases are relatively rare and most often occur in the bones and lungs [1]. Distal metastases to other sites are extremely rare, and less than twenty-five cases of metastatic papillary thyroid cancer to the kidney have been reported in the literature [2]. A case of metastatic thyroid cancer to the kidney and muscle is presented, including the coexisting appearance of a second primary malignancy of non-small cell lung cancer.

2. Case Report

A 68-year old man with a multinodular goiter and a suspicious node in the right thyroid lobe was referred to ultrasound. Ultrasound guided FNAB of the node was performed and cytology findings were suspicious for follicular adenoma. A right-sided lobectomy and isthmectomy was performed. Final histopathological findings confirmed the diagnosis of a follicular subtype of papillary thyroid cancer, and the left lobe of the thyroid was also removed. The patient received postoperative radioactive iodine (I-131) with an ablative activity of 3959 MBq (107 mCi), and post-ablative whole-body scans showed intense uptake in the neck region only, which represented thyroid mass remnant. One year later, during regular follow-up, whole-body scans with 185 MBq (5 mCi) of I-131 showed uptake in the right kidney region (Figure 1). Ultrasonography showed an irregular cystic lesion in the lower pole of the right kidney. The patient did not attend his regular follow-up visits and presented again four years later with a suspicious, irregularly shaped, neoplastic lesion in the apical segment of the right upper lobe of the lung, with bilateral small metastases in lung parenchyma, and two enlarged lymph nodes 4.0 × 3.0 cm in the right hilum. Repeated cytological analysis of aspirated fragments by fiber verified the diagnosis of non-small cell lung cancer. The patient received chemotherapy followed by external radiation. Regular MSCT follow-up examination

showed partial regression of the primary lung process and mediastinal lymph nodes, but an extremely well vascularized tumor 2.0 cm in diameter beside the ventral contour of the right kidney. The mass in the right kidney resulted in obstructive uropathy and the patient underwent laparoscopic kidney surgery. Two simple cysts in the lower pole of the right kidney as well as the mass in right kidney were resected. The excised solid formation corresponded histologically and immunohistochemically to metastasis of the previously resected papillary thyroid carcinoma. Almost a year later, PET/CT showed progression of the pulmonary and mediastinal changes, as well as a new intramuscular lesion in the left thigh. Due to the inability to discern the primary origin, and because of previous thyroid cancer metastasis to the kidney, a malignantly altered lymph node 1.3 x 0.7 cm in size was extirpated from the medial muscle groups of the left thigh. The immunohistochemical profile fit into the profile of poorly differentiated metastatic thyroid carcinoma. The patient died six years after the diagnosis of papillary thyroid cancer from the consequences of disseminated lung cancer.

3. Discussion

PTC is the most common type of thyroid malignancy and is characterized by a slow progression and good prognosis, since it usually remains localized to the thyroid gland and tends to spread locally to regional lymph nodes. Distant metastases are seen in a minority of patients, most often in the bones and lungs, and their presence is correlated with a lower survival rate [3, 4]. To the best of our knowledge, this is the first case of obstructive nephropathy caused by renal metastasis of PTC. Clinical detection of kidney metastasis is infrequent, but can develop even decades after removal of the primary thyroid cancer because of the slow course of PTC. Fewer than twenty-five cases have been reported in the literature [5]. I-131 uptake in the abdomen, as was shown in our patient one year after thyroid surgery, should not be assumed as physiological gastrointestinal uptake or a false-positive finding, and renal metastasis should be effectively excluded. On the other hand, renal cysts can sometimes cause false uptake on I-131 scans, and this possibility should be kept on mind [6, 7]. In any case, each ambiguous finding that raises concern should have additional morphological examination. Another

uncommon finding in our patient was the presence of muscular metastasis. A retrospective review of the literature reveals only a few reports of PTC muscle metastasis [5, 8]. Because this extremely rare metastatic presentation did not fit the image of a well-differentiated thyroid cancer, we tried to find the cause of this clinical picture. This finding could be the result of dedifferentiation of a previous well-differentiated thyroid cancer, which has been described in literature. Careful reevaluation of the previous histological thyroid findings was done, and a little focus of solid clusters of insular findings that sometimes represents poorly differentiated (insular) cancer was noted. Poorly differentiated thyroid (insular) carcinoma (PDTC) is a rare and relatively new histological type of thyroid carcinoma (the diagnostic criteria for PDTC was standardized in 2006, just a few months before establishing our patient diagnosis). PDTC is defined as a tumor of follicular origin, but that biologically behaves as a well-differentiated tumor and undifferentiated anaplastic thyroid cancer. This tumor shows a solid, trabecular, or insular growth pattern with the presence of necrosis or mitotic activity. In any case, according to some literature, this description should be included in the final pathohistologic report. Some authors have shown that a minor insular component within a well-differentiated carcinoma does not affect prognosis, while others have shown that even a minor insular component could adversely affect the prognosis with a poorer survival rate [9,10]. This could be identified subsequently in previously resected tumours (e.g. patient has a history of a thyroid carcinoma and the poorly differentiated component is found in a recurrence or metastatic site). Nevertheless, our results suggest that insular growth is an ominous sign, and may raise the possibility of a more biologically aggressive lesion. The attending physician needs to become familiar with the diagnostic criteria as well as the appropriate treatment modalities and follow-up of these patients. Since management strategies vary between different entities, it is important for clinicians to be able to differentiate various forms of malignancy. Metastatic thyroid cancer could present several years after the discovery of the primary tumor. Each unusual ¹³¹I uptake at an unexpected site should be excluded by additional morphological examination, first of all by I-131 single photon emission computed tomography (¹³¹I-SPECT/CT), which can provide both metabolic and anatomic information about a lesion and can better define the doubtful finding [5]. In



Figure 1. Iodine-131 whole-body scan (posteroanterior view) showed area of intense uptake in the right kidney region

addition, changes in tumour features should be noted in histopathology reports and clinicians should be alerted that such tumours (although predominantly well-differentiated) may show more aggressive behavior than conventional forms due to the presence of undifferentiated areas with an image of insular carcinoma.

Author contributions:

All the authors contributed to the acquisition of data, revised the paper and gave final approval.

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