

Solitary Metastasis of Pulmonary Adenocarcinoma Restricted in Thyroid Gland Nodule

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ABSTRACT

Metastatic tumors of thyroid are rare and constitute 1.2% of all thyroid malignancies. Metastasis to thyroid gland from head and neck region occurs usually via direct spread. Hematogenous metastases are mostly seen in kidney, breast, and lung tumors and malignant melanomas. Thyroid gland metastasis is usually seen in widespread diseases. Solitary metastasis in this gland is extremely rare. A 68-year-old male patient was admitted to the general surgery clinic with swelling in the neck. The patient had undergone right lobectomy in another hospital due to lung cancer two years ago. Ultrasonography revealed the presence of nodules in both lobes with maximum diameter of 4.5 cm in the right lobe and 2 cm in the left lobe. Bilateral total thyroidectomy was performed. Nodules with diameter of 4.5 and 3.5 cm were observed in the right lobe. In the histopathologic examination of a small nodule, adenocarcinoma infiltration which was 2 cm in diameter was observed. Tumoral infiltration was not observed in nodule capsule and thyroid capsule. Immunohistochemically, tumor was positive for carcinoembryonic antigen (CEA), weakly positive for thyroid transcription factor-1 (TTF-1), and negative for thyroglobulin, chromogranin A, and calcitonin. Slides of lobectomy material were reexamined and it was observed that the two tumors had the same properties. The case was reported as “pulmonary adenocarcinoma metastasis in thyroid.” No other metastasis was observed in the whole body scan of the patient. In conclusion, in the presence of nodule in thyroid gland, possibility of metastasis should be considered if a history of malignancy exists.

Keywords: Thyroid nodule, metastasis, adenocarcinoma

Introduction

Metastasis in a thyroid nodule is rarely seen. It can be incidentally encountered on histopathological examination during thyroidectomy performed for nodular goiter (1). Hematogenous metastasis to the thyroid gland mostly develops in patients with breast, kidney, and lung cancers; malignant melanoma; and common diseases (1-3). In this study, a case of lung adenocarcinoma metastasis restricted in the nodule, which was incidentally detected during thyroidectomy for multinodular goiter, was presented.

Case presentation

A 68-year-old male patient was admitted to the clinic of general surgery due to swelling in the neck. He had undergone right upper lobectomy due to lung carcinoma at another center 2 years ago. On physical examination, nodules were found in the thyroid gland. His thyroid function test results were within normal intervals: T3, 3.29 pg/mL (2.60-4.80 pg/mL); T4, 0.71 ng/dL (0.7-2.0 ng/dL); and TSH, 2.89 IU/mL (0.27-4.20 IU/mL). Ultrasonography revealed multiple nodules, the largest of which was 4.5 cm in the right thyroid lobe and 2 cm in the left thyroid lobe. Fine needle aspiration biopsy was performed on the 4.5-cm nodule in the right thyroid lobe. Because benign cytological findings consistent with an adenomatous nodule were observed on cytopathological examination, bilateral total thyroidectomy was performed with the prediagnosis of multinodular goiter. Two nodules of 4.5 and 3.5 cm were found in the 11×6.5×5-

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Figure 1. Macroscopic view of the metastatic nodule. Metastatic nodule with dirty yellow-colored sectional surface in the upper part of the picture; adenomatous nodule in the lower part of the picture

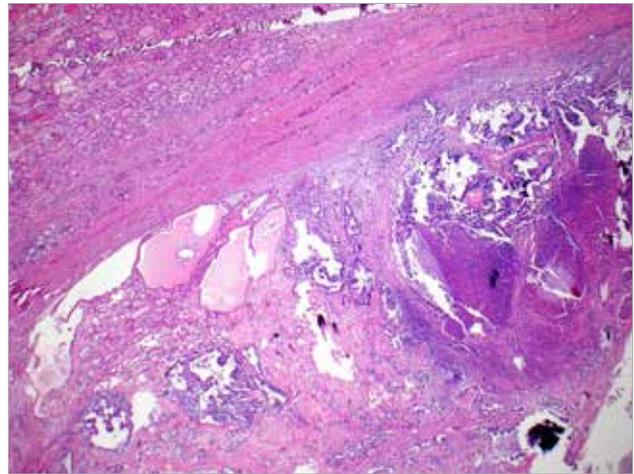


Figure 2. Adenocarcinoma infiltration in the adenomatous nodule separating from the surrounding thyroid tissue with smooth margins (HE, 20×)

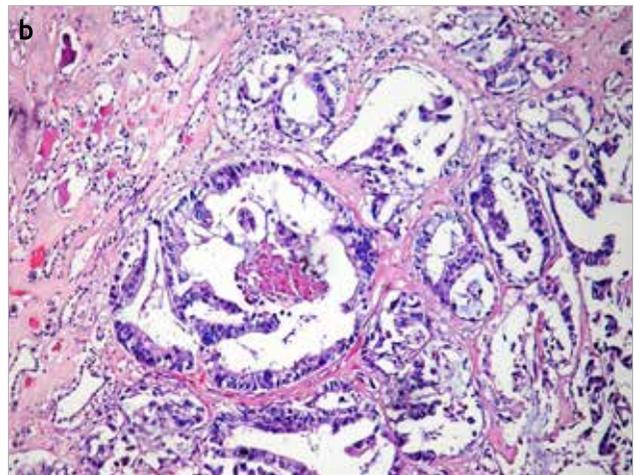
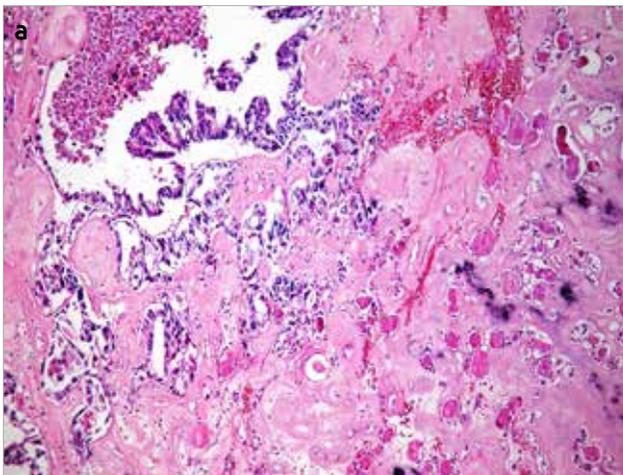


Figure 3. a, b. Adenocarcinoma infiltration forming irregular acinar structures between thyroid follicles (HE, 100× and 200×)

cm sections of the right thyroid lobe. The 3.5-cm nodule was yellow, poor in thae colloid, and partially necrotic (Figure 1). In the 8×3×3-cm left lobe, there were multiple nodules rich in colloid. Histopathological examination revealed approximately 2-cm tumoral infiltration, forming irregular acinar structures and having a hyperchromatic nucleus, partially apparent nucleolus, and nuclear contours with irregular cells in a 3.5-cm nodule (Figure 2-3). In the infiltration, there were wide necrotic areas, and no tumor invasion was observed in the nodule and thyroid capsules. On immunohistochemical examination, CEA (+), TTF 1 poor (+), thyroglobulin (-), chromogranin (-), and calcitonin (-) were detected (Figure 4). Paraffin-embedded blocks from the lobectomy material of the patient were requested. When the sections obtained from the blocks were examined, it was observed that both the tumors had similar characteristics, and the case was reported as lung adenocarcinoma metastasis in the thyroid. The entire body of the patient was examined using positron emission tomography/computed tomography, but no other metastatic

focus was found. Postoperatively evaluated tumor marker levels (CEA, CA 12-5, CA 15-3, and CA 19-9) were normal. The patient was referred to the department of oncology and planned to undergo chemotherapy and radiotherapy; however, he refused the treatment. Recurrence or another organ metastasis was not observed until the postoperative fourth year. This case was presented after receiving informed consent from the patient.

Discussion

The thyroid is an organ in which metastases rarely develop. The rate of metastatic thyroid tumors in all thyroid tumors is reported to be 1.2% (4). In autopsy series, this rate reaches 24% (5, 6). Solitary thyroid metastasis is very seldom, and common diseases are also seen out of the thyroid gland in most cases (1).

It is reported that fast arterial flow in the thyroid gland, high oxygen saturation, and iodine content hinder the growth of

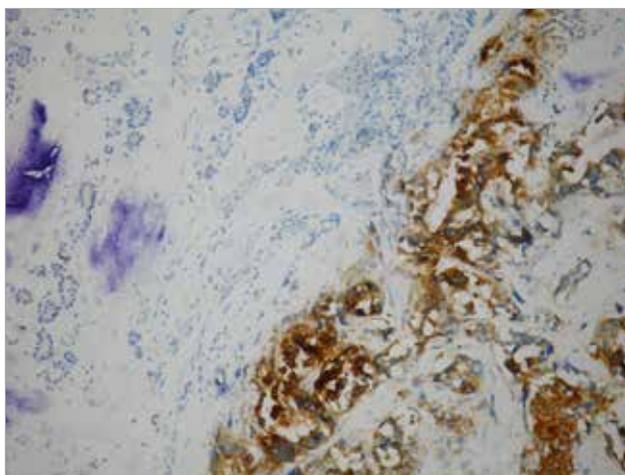


Figure 4. Immunohistochemical CEA positivity in the tumor. No staining in surrounding thyroid follicles

metastatic malignant cells; hence, metastasis to the thyroid gland rarely occurs (5, 7). It is suggested that metastasis to the thyroid is more common in the presence of abnormalities in the thyroid gland, such as goiter, thyroiditis, and benign and malignant primary neoplasms (5, 7). In primary thyroid malignancies, the occurrence of metastasis to the tumor tissue has been explained by the fact that tumor in the thyroid forms a microenvironment in which metastatic tumor cells can easily grow (7).

Metastasis to the thyroid gland occurs as a direct spread in the head and neck region (pharynx, larynx, trachea, and esophagus) tumors and is mostly squamous cell carcinoma (8). On the other hand, hematogenous/lymphatic metastasis to the thyroid gland mostly develops in the kidney, breast, and lung cancers and malignant melanoma (1, 2, 8). Moreover, unexpected metastases such as pleomorphic liposarcoma, colon carcinoma, and pancreatic carcinoma have been reported in the literature (5, 7, 9). Lung carcinoma constitutes 11% of metastatic tumors of the thyroid; it is generally multiple but occasionally solitary or diffuse (8). In most patients, a common disease not located in the thyroid gland is seen. In our case, no other organ metastasis was detected, except the thyroid.

Batson explained solitary metastases in the breast, lung, kidney, and gastrointestinal cancers with a vertebral venous system (10). However, particularly in lung and breast cancers, solitary metastasis directly to the thyroid mostly occurs through the lymphatic route (2).

It can be completely silent in its clinical course or can lead to hypothyroidism and thyroid dysfunction associated with thyroid destruction (2). In clinical practice, in a patient with multinodular goiter, it is difficult to diagnose a metastatic nodule because it displays no specific finding on ultrasonography and computed tomography (2). Therefore, it is very important to know the medical history of the patient and to consider metastasis in the presence of a thyroid nodule in a patient with cancer anamnesis.

The latent period from the diagnosis of primary cancer to the detection of thyroid mass can last up to 24 years (11). This long interval is particularly seen in renal tumors and makes an accurate diagnosis difficult (11). The establishment of diagnosis is possible with fine needle aspiration, but it is important to sample the correct nodule in a patient with multiple nodules. In our case, because the metastatic nodule was not aspirated, resection material was sent to the department of pathology with the clinical prediagnosis of multinodular goiter.

Treatment can include surgical resection, chemotherapy, and radiotherapy, depending on the characteristics of the primary tumor (2). It is reported that surgical resection can be sufficient only when there is metastasis in the thyroid in patients with renal cell carcinoma who had previously undergone nephrectomy (2, 11). Chen et al. reported that 60% of patients with solitary thyroid metastasis were alive until the 5.2-year follow-up post-thyroidectomy (12). In our case, postoperative radiotherapy and chemotherapy were planned but the patient refused the treatment. In the postoperative fourth year, recurrence or other organ metastasis did not develop in the patient.

Conclusion

In patients with a history of malignancy, the possibility of metastasis should be considered in the presence of a nodule in the thyroid.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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