CASE REPORT OLGU SUNUMU

DOI: 10.5336/archlung.2022-93982

A Case of Thyroid Gland Metastasis in a Patient with Squamous Cell Lung Cancer

Akciğer Skuamöz Hücreli Karsinomlu Hastada Tiroid Metastazı Vakası

Kader TOPÇU[a], Yurdanur SÜLLÜ[b], Sultan ÇALIŞKAN[b], Meftun ÜNSAL[a]

[a]Department of Chest Diseases, Ondokuz Mayıs University Faculty of Medicine, Samsun, Türkiye
[b]Department of Pathology, Ondokuz Mayıs University Faculty of Medicine, Samsun, Türkiye

This article is presented as a poster presentation at the 25th Annual Congress of Turkish Thoracic Society, May 24-28, 2022, Antalya, Türkiye

ABSTRACT Isolated metastases to the thyroid gland are rare. It is not common for lung cancer to metastasize to the thyroid gland, and when it metastasizes; the predominant pathology is usually adenocarcinoma. In this article, a rare case of thyroid gland metastasis from squamous cell lung cancer is presented. A forty-four-year-old male patient is diagnosed with Stage III A squamous cell lung cancer in our clinic. After chemotherapy, a nodular lesion in the thyroid gland is detected. Through fine needle aspiration biopsy, diagnosis of metastasis from squamous cell lung cancer has been established. The patient is evaluated for surgical treatment after systemic chemotherapy. Thyroid gland metastases are usually seen in the advanced stages of the primary disease and have a poor prognosis. Patients with a history of cancer and a thyroid nodule should be evaluated for metastatic lesions in the thyroid.

Keywords: Lung neoplasms; thyroid gland; carcinoma, squamous cell; neoplasm metastasis

ÖZET Tiroid bezine herhangi bir yerden izole metastaz nadiren görülür. Akciğer kanserinin tiroid bezi metastazı yapması da çok yaygın değildir ve tiroide metastaz yaptığında genellikle baskın histopatoloji adenokarsinomdur. Bu olgu ile kliniğimizde akciğer skuamöz hücreli kanser tedavisi sırasında tiroid metastazı gelişen ve nadir görülen bir vaka sunuldu. Kırk dört yaşındaki erkek hasta, kliniğimizde akciğer skuamöz hücreli kanser-Evre III A tanısı ile kemoterapi aldıktan sonra takiplerinde tiroid bezinde nodüler lezyon saptandı. Tiroid ince iğne aspirasyon biyopsisi sonucunda akciğer skuamöz hücreli kanser metastazı tanısı konuldu. Sistemik kemoterapi başlanan ve kemoterapi bitiminde cerrahi tedavi açısından değerlendirilmesi planlanan hastanın tedavisi kliniğimizde devam etmektedir. Akciğer kanserlerinin tiroid bezine metastaz yaptığı vakalar nadirdir ve tanı alması zordur. Tiroid bezi metastazları, genellikle primer hastalığın ileri evrelerinde görülür ve prognozu kötüdür. Kanser öyküsü ve tiroid nodülü olan hastalar tiroiddeki olası metastatik lezyonlar açısından değerlendirilmelidir.

Anahtar Kelimeler: Akciğer neoplazileri; tiroid bezi; karsinom, skuamöz hücre, tümör metastazı

Lung cancer is an important reason for mortality in developing and developed countries. It is the most widespread reason of cancer-related mortality in both genders worldwide. The regions where lung cancers frequently metastasize are the nervous, bone, liver, respiratory system, and adrenal glands.[1]

Metastasis to the thyroid gland was first reported in 1871 by Virchow, who described a testicular tumor metastasis.[2]

In the case report, a rare case of thyroid gland metastasis during the treatment of a patient with squamous cell lung cancer in our clinic is presented.

CASE PRESENTATION

A forty-four-year-old male patient with no chronic disease was referred to the Chest Diseases outpatient clinic 2 years ago with complaints of cough, exertional dyspnea, and involuntary weight loss for the

Correspondence: Kader TOPÇU
Department of Chest Diseases, Ondokuz Mayıs University Faculty of Medicine, Samsun, Türkiye
E-mail: kadertopcu@gmail.com

Peer review under responsibility of Turkiye Klinikleri Archives of Lung.

Received: 23 Oct 2022 ***Received in revised form:*** 16 Dec 2022 ***Accepted:*** 21 Dec 2022 ***Available online:*** 23 Dec 2022

2146-8958

past year. He had a 30-pack/year smoking history and had decreased respiratory sounds in the upper right zone on physical examination. In the thorax computed tomography (CT) taken on September 2019, a cystic necrotic mass lesion was observed in the right upper lobe (Figure 1).

Bronchoscopic transbronchial biopsy taken from the endobronchial lesion located at the right upper lobe entrance was reported as squamous cell carcinoma. Positron emission tomography (PET)/CT showed no distant metastases; only subcarinal lymph node metastasis. There was no brain metastasis in brain magnetic resonance imaging. Therefore the diagnosis of Stage III A (T2bN2M0) squamous cell lung carcinoma was established.

After two cycles of neoadjuvant carboplatin+paclitaxel chemotherapy regimen, the patient who did not accept surgical treatment received three more cycles of carboplatin+paclitaxel chemotherapy regimen and 33 fractions of stereotactic radiotherapy. Treatment response was considered a stable disease.

Approximately one and a half years after the diagnosis, thorax CT imaging taken on February 2021 revealed a new focal increase in activity was detected in the former area of the lesion in the right lung and it was considered a recurrent disease (Figure 2).

Upon the diagnosis of recurrence, stereotactic radiotherapy was administered to the lesion in the right lung. On PET/CT taken for response evaluation, a hypodense hypermetabolic nodular lesion was observed in the right lobe of the thyroid gland and a neck ultrasonography (USG) was planned (Figure 3).

In the neck USG imaging, a heterogeneous solid nodule measured 9.5x7x8 mm was observed in the central part of the right lobe of the thyroid. A thyroid fine needle aspiration biopsy was performed. Fine needle aspiration biopsy of the thyroid, performed in September 2021 was reported as squamous cell lung carcinoma infiltration (Figure 4).

The patient with recurrent disease after treatment and had thyroid metastases was consulted to the general surgery clinic for surgical treatment. After the systemic chemotherapy, the patient is planned to be reevaluated in terms of surgical treatment. The patient is still receiving systemic chemotherapy treatment.

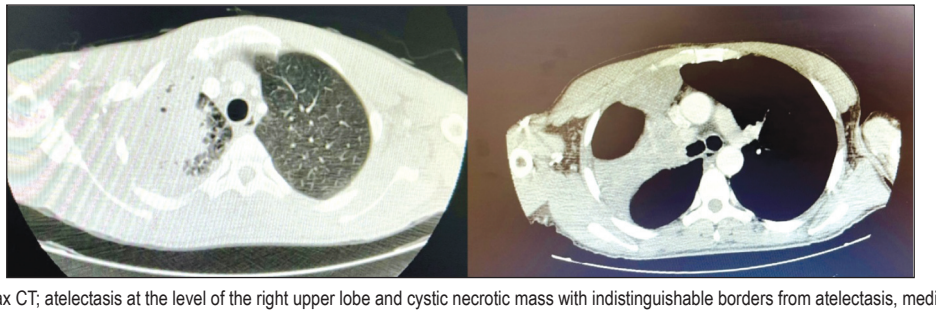

FIGURE 1: Thorax CT; atelectasis at the level of the right upper lobe and cystic necrotic mass with indistinguishable borders from atelectasis, mediastinal section.
CT: Computed tomography.

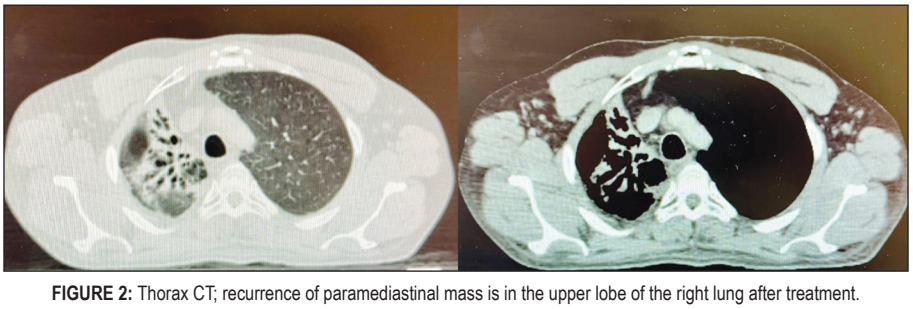

FIGURE 2: Thorax CT; recurrence of paramediastinal mass is in the upper lobe of the right lung after treatment.
CT: Computed tomography.

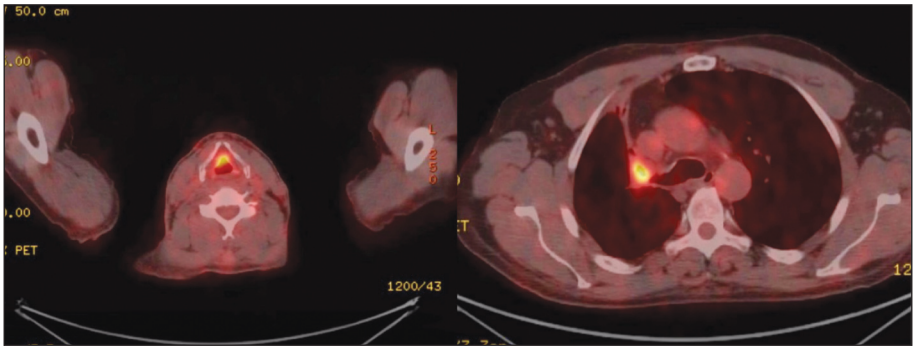

FIGURE 3: PET/CT: Approximately 14x10 mm hypodense hypermetabolic nodular lesion localized anterior to the right lobe of thyroid isthmus, subcentimetric lesion showing FDG increase in the paramediastinal old mass lesion in the superior of the right upper lobe bronchus of the lung.
PET/CT: Positron emission tomography/computed tomography; FDG: Fluoro-2-deoksi-D-glukoz.

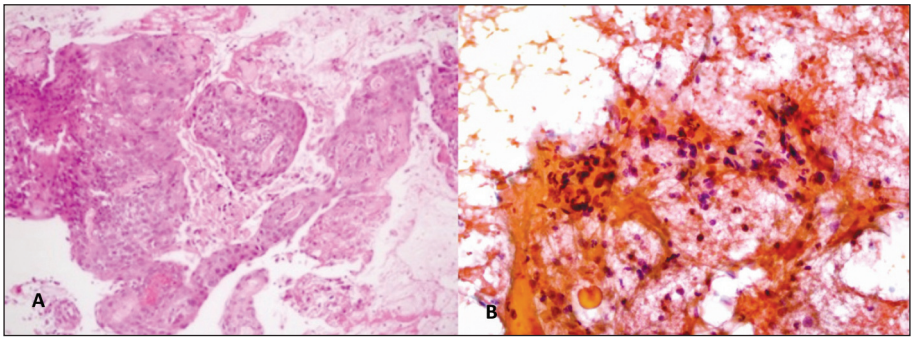

FIGURE 4: Squamous cell lung carcinoma, bronchial mucosa H-EX200 (A), thyroid fine needle aspiration biopsy, PAPx200 (B).

At the beginning of this process, informed consent was obtained from the patient himself.

DISCUSSION

Malignant neoplasms of the thyroid gland are divided into 2 groups, primary neoplasms, and intrathyroidal metastases. Primary tumors are slowly progressive, usually localized, and have a good prognosis. Their histopathological types are follicular carcinomas, medullary carcinomas, papillary carcinomas, anaplastic carcinomas, and lymphoma. The 2nd group consists of intrathyroidal metastases. The prognosis in cases with thyroid metastases, as in other metastatic cancers, depends on the amount and extent of metastases, the nature of the primary tumor, accompanying comorbidities, and the progression of the disease.[3]

Although the rich vascular supply of the thyroid gland, isolated metastases from other cancers to the thyroid gland are unusual. The thyroid gland is relatively protected from metastasis thanks to diverse reasons. These reasons can be listed as; the direct tumoricidal effect of excessive iodine and oxygen content of the gland, a grand majority of the malignant cells being filtered in the circulation primarily by the lungs, and the malignant cells getting through the thyroidal vascular bed being washed off because of high-speed intrathyroidal blood flow.[3,4]

The most common organs to metastasize thyroid are the breast, gastrointestinal cancers, kidney, and lung followed by lymphomas and melanomas.[3] In most of the western series, the most common primary cancer regions in cases of thyroid metastasis are respectively; kidney, breast, and lung, while the most common primary cancer regions reported in most studies conducted in eastern countries are lung, breast, and stomach.[5,6]

Of all the lung cancers reported to metastasize to the thyroid, the most common type is non-small cell lung cancer. The most common metastases to the thyroid gland among lung cancers are respectively adenocarcinoma, squamous, small and large cell lung cancer.[7]

Clinically, non-thyroidal metastases of the thyroid gland are rare, and most are found at autopsy. The proportion of thyroid metastatic lesions reported in vivo is 2-3% of all thyroid neoplasms as against approximately 1-24% reported in postmortem cases.[8]

The role of various immunohistochemical biomarkers of lung origination in metastatic adenocarcinoma has been argued. Some of these are polyclonal and monoclonal napsin A, thyroid transcription factor-1 (TTF-1). Regarding lung-originated thyroid metastasis, TTF-1 may not be clinically significant as it might be positive in both cases regardless of the origin. TTF-1 expression is highly specific for primary thyroid tumors.[9,10]

In a study conducted by Lam et al. on 79 patients, most of the metastatic lesions in the thyroid gland occurred within an average of 9 months after the detection of primary cancers.[11] In a case report by Dao et al. in 2017, thyroid metastasis was reported 5 months after the diagnosis in a patient with lung adenocarcinoma.[3] A retrospective study of patients with thyroid metastases, conducted by Nakhjavani et al, reported that thyroid metastases developed simultaneously or after other distant organ metastases in patients with lung adenocarcinoma.[12] In our case, the time from the lung cancer diagnosis to the development and confirmation of thyroid gland metastasis was approximately 2 years. Our patient did not have any distant metastases other than the thyroid. The surgical requirement for metastatic thyroid neoplasms is not clear still. But with current knowledge; to prolong survival in metastatic and locally recurrent disease, metastasectomy is recommended. The mean survival time after thyroid metastasectomy is roughly 2 years, with almost half of them with 5 years overall survival.[13]

Cases of lung malignancies metastasizing to the thyroid gland are uncommon and difficult to diagnose because clinical findings are nonspecific and can be confused with subacute thyroiditis or primary thyroid tumor. Metastasis to the thyroid gland is generally seen in progressive cases of the primary disease. Since the disease is a detectable finding at autopsy and the prognosis is quite poor, patients with a malignancy history and a thyroid nodule should be evaluated for possible metastatic lesions in the thyroid, even if remission has been achieved for the primary disease.[14]

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Kader Topçu, Meftun Ünsal;* ***Design:*** *Kader Topçu, Meftun Ünsal;* ***Control/Supervision:*** *Meftun Ünsal;* ***Data Collection and/or Processing:*** *Kader Topçu;* ***Analysis and/or Interpretation:*** *Kader Topçu, Meftun Ünsal, Yurdanur Süllü, Sultan Çalışkan;* ***Literature Review:*** *Kader Topçu, Meftun Ünsal;* ***Writing the Article:*** *Kader Topçu, Meftun Ünsal;* ***Critical Review:*** *Kader Topçu, Meftun Ünsal;* ***References and Fundings:*** *Kader Topçu, Meftun Ünsal;* ***Materials:*** *Kader Topçu, Meftun Ünsal, Yurdanur Süllü, Sultan Çalışkan.*

REFERENCES

1. Riihimäki M, Hemminki A, Fallah M, Thomsen H, Sundquist K, Sundquist J, et al. Metastatic sites and survival in lung cancer. Lung Cancer. 2014;86(1):78-84. [Crossref] [PubMed]
2. Nixon IJ, Coca-Pelaz A, Kaleva AI, Triantafyllou A, Angelos P, Owen RP, et al. Metastasis to the thyroid gland: a critical review. Ann Surg Oncol. 2017;24(6):1533-9. [Crossref] [PubMed] [PMC]
3. Dao A, Jabir H, Taleb A, Benchakroun N, Bouchbika Z, Nezha T, et al. Lung adenocarcinoma with thyroid metastasis: a case report. BMC Res Notes. 2017;10(1):130. [Crossref] [PubMed] [PMC]
4. Kim AY, Park SB, Choi HS, Hwang JC. Isolated thyroid metastasis from renal cell carcinoma. J Ultrasound Med. 2007;26(12):1799-802. [Crossref] [PubMed]
5. Turner BM, Cagle PT, Sainz IM, Fukuoka J, Shen SS, Jagirdar J. Napsin A, a new marker for lung adenocarcinoma, is complementary and more sensitive and specific than thyroid transcription factor 1 in the differential diagnosis of primary pulmonary carcinoma: evaluation of 1674 cases by tissue microarray. Arch Pathol Lab Med. 2012;136(2):163-71. [Crossref] [PubMed]
6. Watanabe I, Tsuchiya A. Secondary carcinoma of the thyroid gland. Jpn J Surg. 1980;10(2):130-6. [Crossref] [PubMed]
7. Hulikal N, Naru RR, Gangasani R, Nandyala R, Pai A, Meenakshisundaram M. A case of synchronous isolated thyroid metastasis from a primary lung cancer presenting as thyroid primary: diagnostic challenge! Lung India. 2016;33(3):326-9. [Crossref] [PubMed] [PMC]
8. Namad T, Wang J, Shipley R, Abdel Karim N. Thyroid metastasis from non-small cell lung cancer. Case Rep Oncol Med. 2013;2013:208213. [Crossref] [PubMed] [PMC]
9. Jagirdar J. Application of immunohistochemistry to the diagnosis of primary and metastatic carcinoma to the lung. Arch Pathol Lab Med. 2008;132(3):384-96. [Crossref] [PubMed]
10. Mukhopadhyay S, Katzenstein AL. Comparison of monoclonal napsin A, polyclonal napsin A, and TTF-1 for determining lung origin in metastatic adenocarcinomas. Am J Clin Pathol. 2012;138(5):703-11. [Crossref] [PubMed]
11. Lam KY, Lo CY. Metastatic tumors of the thyroid gland: a study of 79 cases in Chinese patients. Arch Pathol Lab Med. 1998;122(1):37-41. [PubMed]
12. Nakhjavani MK, Gharib H, Goellner JR, van Heerden JA. Metastasis to the thyroid gland. A report of 43 cases. Cancer. 1997;79(3):574-8. [PubMed]
13. Osawa M, Takigawa N, Kiura K, Ichimura K, Matsuoka J, Hotta K, et al. Isolated metastasis of lung cancer to the thyroid gland. Lung Cancer. 2007;58(1):156-8. [Crossref] [PubMed]
14. Sakız D, Sencar ME, Bayram M, Karaçin C. A case report of metastasis to thyroid gland from squamous cell carcinoma of lung. Turk J Endocrinol Metab. 2018;22:59.