Case Report

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# Metastatic squamous cell carcinoma of the lung to the thyroid gland presented as nodular goiter: a rare case report

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**Introduction and importance:** Metastasis of squamous cell lung carcinoma to the thyroid gland is an extremely rare event. It frequently metastasizes to lymph nodes, liver, adrenal glands, bone, brain, and pleura. Among the lung carcinomas metastasizing to the thyroid, adenocarcinomas are the most common followed by squamous cell carcinomas (SCCs).

**Case presentation:** A 58-year-old male patient presented with bilateral neck swelling. Fine needle aspiration is performed and was undetermined. Ultrasonography of the neck demonstrated multiple hypoechoic nodules with thyroid enlargement. The patient was diagnosed with nodular goitre and he underwent a total thyroidectomy. Microscopically, the Hematoxylin and eosin-stained sections revealed thyroid follicles with sheets composed of polygonal cells with pleomorphic nuclei, prominent nucleoli, and a moderate amount of eosinophilic cytoplasm. Keratin pearls were present. Based on histopathological and clinical findings, the final diagnosis was metastatic SCC to the thyroid gland.

**Clinical discussion:** Clinically, patients with thyroid metastasis presented with nonspecific symptoms such as thyroid nodule or goitre, cervical discomfort, dyspnoea, dysphagia, or dysphonia. Chemotherapy is used in the case of a poly metastatic tumour and radiotherapy as a palliative treatment whereas radioiodine treatment is not indicated for thyroid metastases.

**Conclusion:** Diagnosis of SCC in the thyroid gland as a primary or metastatic neoplasm is a significant challenge. In the absence of specific clinical or radiological signs, pathological studies remain the gold standard for diagnosis.

**Keywords:** metastasis, squamous cell, lung, thyroid, carcinoma, goitre

## Introduction

Metastasis of squamous cell carcinoma (SCC) of the lung to the thyroid gland is an extremely rare entity[1,2]. Although the thyroid gland is a rich vascular supply, it is a rare case to see thyroid metastatic carcinoma[1]. The primary carcinomas that metastasize to the thyroid are renal cell (48.1%), colorectal (10.4%), lung (8.3%), and breast (7.8%) carcinomas, melanoma (4%), sarcoma (4%), and other types (17.4%)[2]. Among the lung carcinomas metastasizing to the thyroid, adenocarcinomas are the most common followed by SCCs[2]. Small cell and large cell carcinomas rarely metastasize to the thyroid gland[1]. Here we report a case of squamous cell lung carcinoma metastasis to the thyroid gland.

This case report has been reported in line with the SCARE criteria 2020[3].

### HIGHLIGHTS

- Metastasis of squamous cell lung carcinoma to the thyroid gland is an extremely rare event.
- We described a case of squamous cell carcinoma metastasis to the thyroid gland in a 58-year-old man who presented as nodular goitre.
- Diagnosis of squamous cell carcinoma in the thyroid gland as a primary or metastatic neoplasm is a significant challenge.

## Case presentation

A 58-year-old male patient presented with complaints of bilateral neck swelling which was not associated with any pain, difficulty in swallowing, or hoarseness. Physical examination revealed a 2 × 2 cm firm lump on the lower pole of both lobes of the thyroid gland. No palpable cervical lymphadenopathy was present. The patient was a non-smoker and non-alcoholic. His medical history was unremarkable. Routine blood values were within normal limits. Fine needle aspiration is performed and was undetermined. Ultrasonography of the neck demonstrated multiple

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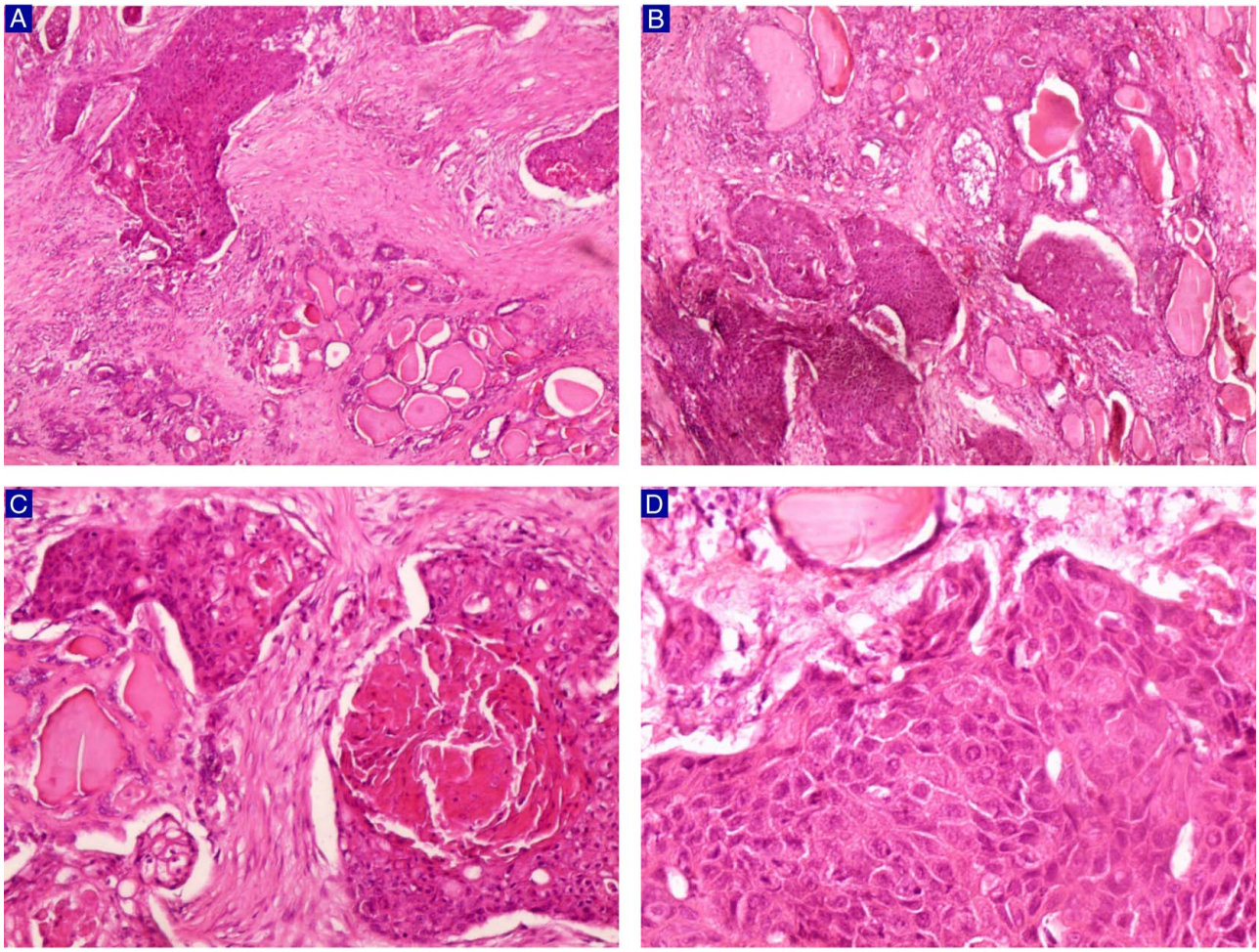


**Figure 1.** Hematoxylin and eosin-stain (A–D). Microscopic images of the nodule. (A, B) The low-power magnification shows thyroid follicles with sheets of tumour cells (×40 and ×100). (C) Necrotic areas are seen (×200). (D) Polygonal cells with pleomorphic nuclei, prominent nucleoli, a moderate amount of eosinophilic cytoplasm, and desmosomes are present (×400).

hypoechoic nodules in located both thyroid lobes associated with thyroid enlargement. The largest nodule measured 31 × 10 mm in the right lobe and 13.5 × 14 mm in the left lobe and 9 × 5 mm in the isthmus. The patient was diagnosed with nodular goitre and he underwent a total thyroidectomy. The specimen was sent to the pathology department. The resected thyroid gland weighed 67.5 g. The right thyroid and left thyroid measured 7.5 × 5 × 3 cm and 7 × 4 × 3 cm, respectively. The cut surface of both thyroid lobes had multiple nodules, the largest one with a size of 1.5 cm. Hematoxylin and eosin-stained sections of the specimen revealed thyroid follicles with sheets composed of polygonal cells with pleomorphic nuclei, prominent nucleoli, and a moderate amount of eosinophilic cytoplasm. Keratin pearls were present [Fig. 1]. Our first diagnosis was SCC in the thyroid gland. A laryngoscopy was done and no abnormal findings were noted. Referring to the medical records, it was found that the patient had a history of SCC in the left lung, 1 year ago [Fig. 2]. The final diagnosis was metastatic SCC to the thyroid gland. The patient was discharged 5 days later and referred to the oncology department for appropriate treatment. After consultation with an oncologist, our patient received three cycles of adjuvant chemotherapy with carboplatin and paclitaxel. Clinical evaluation showed no signs of recurrence or regional metastases after 6 months of follow-up.

## Discussion

To the best of our knowledge, the thyroid gland is an uncommon site of metastatic cancer. This may be attributed to the fast blood flow of the thyroid, abundant oxygen, and iodine[4]. The incidence of thyroid metastases ranges from 1.25 to 24% in autopsy studies and is lower in clinical series[5–7]. It's s more prevalent in women than in men mainly in advanced ages[8]. Chung *et al.*[2] Suggested that nearly half of the metastases to the thyroid took place in abnormal thyroid glands affected by primary thyroid neoplasia, goitre, or thyroiditis, this vulnerability may be justified due to lack of blood supply resulting in reduced oxygen and iodine levels; however, the metastatic disease appears to affect otherwise normal thyroid glands at an equal likelihood. The most frequent tumours metastasizing to the thyroid comprise renal cell, breast, lung, oesophageal and gastric carcinomas as well as melanoma[9]. Among histological types of lung cancer metastasizing to the thyroid, adenocarcinomas have been identified more frequently followed by squamous and large cell carcinomas[8–10]. Isolated

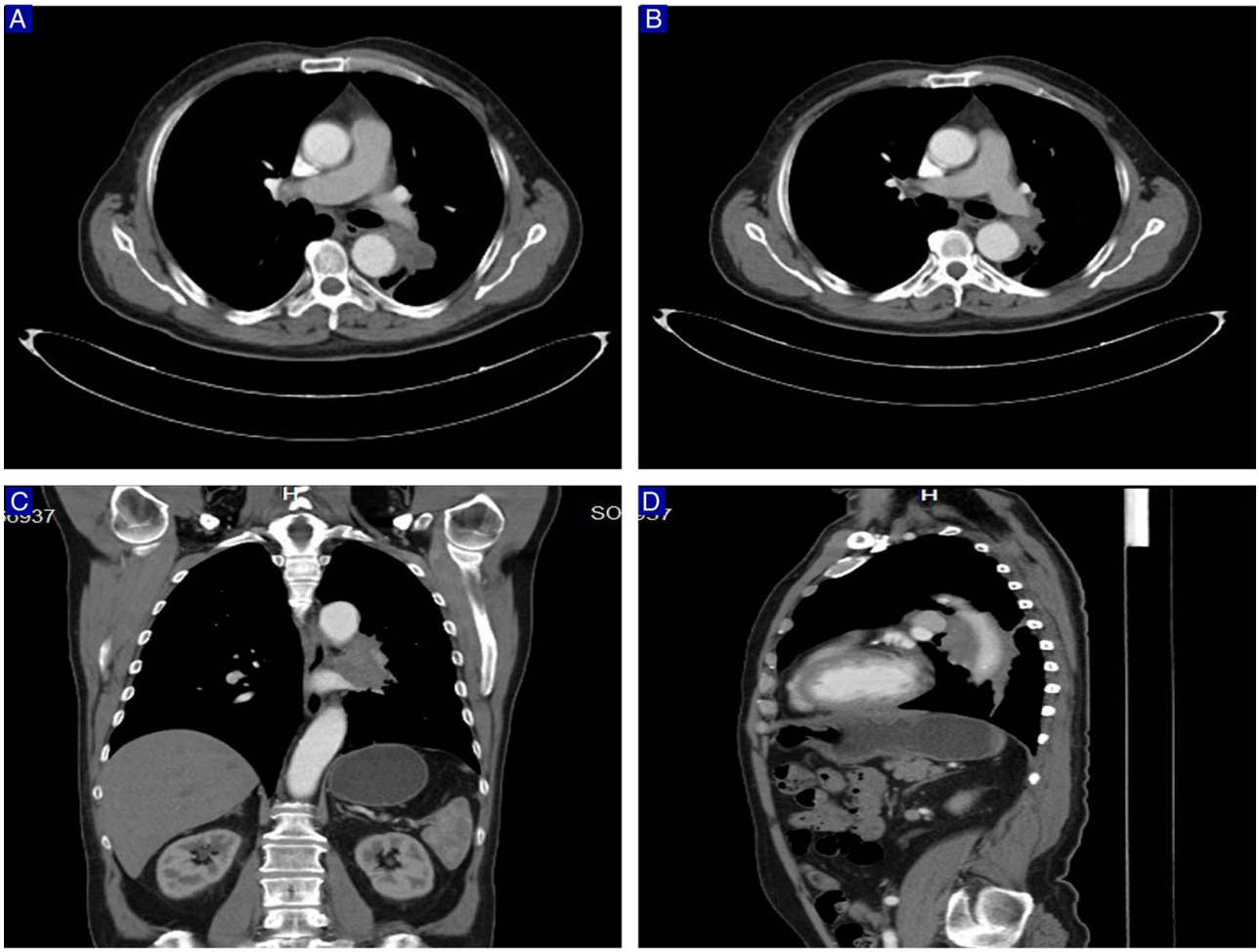


**Figure 2.** Contrast-enhanced computed tomography images of the chest show a mass in the left lung. (A, B) Axial views. (C, D) are coronal and sagittal views, respectively.

cases of small cell, combined small cell, and large cell carcinoma, bronchioloalveolar carcinoma, adenosquamous carcinoma, and pulmonary carcinoid tumour with thyroid metastatic deposits have also been reported[11]. Clinically, patients with thyroid metastasis presented with nonspecific symptoms such as thyroid nodule or goitre, cervical discomfort, dyspnoea, dysphagia, or dysphonia[12,13]. Biologically, the balance of thyroid hormones is generally unaffected[14]. However, dysfunction of the thyroid gland has been reported in some cases due to the destruction of thyroid nodules by tumour cells[12,13]. Our patient was euthyroid. Medical imaging including ultrasound, a cervical scanner with and without injection computed tomography, and a PET scan show no specific signs to confirm the thyroid or lung origin of the tumour[15,16]. Histological examination and especially immunohistochemical studies are crucial for the diagnosis of metastatic lung carcinoma[16]. In our case, the first clinical and radiological diagnosis was goitre while pathological examination revealed SCC. Surgery is indicated in patients with isolated thyroid lesions with no evidence of metastasis in other sites and for relieving compressive symptoms in patients with disseminated disease[17]. The prognosis remains poor in most cases, and the surgery does not contribute to prolonging the life of patients[10,18]. Systemic treatment with chemotherapy or targeted therapy is used in the case of a poly metastatic tumour. Radiotherapy is used as a palliative treatment whereas radioiodine treatment is not indicated for thyroid metastases[19]. In this case, the patient underwent surgical treatment and continued with adjuvant chemotherapy.

## Conclusion

Diagnosis of SCC in the thyroid gland as a primary or metastatic neoplasm is a significant challenge. In the absence of specific clinical or radiological signs, pathological studies remain the gold standard for diagnosis.

## Ethical approval

No ethical approval was needed for this case report.

## Consent for publication

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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## Conflicts of interest disclosure

The authors have no conflicts of interest to declare.

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