

# Synchronous thyroid metastasis from lung adenocarcinoma



Ann. Ital. Chir., 2015 86: 560-562  
pii: S0003469X15024318  
[www.annitalchir.com](http://www.annitalchir.com)

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## Synchronous thyroid metastasis from lung adenocarcinoma

*Metastases from other primary malignancies to the thyroid gland are clinically uncommon, far less frequent than any malignant primary neoplasm, mostly affecting elderly patients. Recent autopsy studies have shown that metastases to the thyroid is relatively common, with a prevalence of of 1,9-24%. We present a case of a man (72 years old) with lung cancer and synchronous metastasis to thyroid gland. Typically the interval between the diagnosis of the primary tumor and the detection of thyroid metastasis is from one month to 26 years. Clinical manifestation of thyroid metastases are rare*

KEY WORDS: Thyroid cancer, Thyroid metastases, Thyroidectomy

## Introduction

Metastases from other primary malignancies to the thyroid gland are uncommon, far less frequent than any malignant primary neoplasm, mostly affecting elderly patients<sup>1,2</sup>. Statistically they represent less than 4% of all thyroid malignancies in clinical studies<sup>3</sup>. It is important for physicians to consider that the thyroid may be a site of metastases in patients with a history of malignancy, although metastases of non-thyroid malignancies to the thyroid gland, as we have already said, are rarely reported due to the rapid arterial flow, high oxygen saturation and iodine content of the thyroid gland<sup>4,5</sup>.

Recent autopsy studies have shown that metastases to the thyroid is relatively common, with a prevalence of of 1,9-24%<sup>1,6</sup>. The peak age for thyroid metastases is in the sixth decade. However, clinically apparent thyroid metastases remain relatively uncommon, with a prevalence of 1.4-3% of all patients who undergo thyroid surgery<sup>4</sup>.

The most common malignancies that have been reported to metastasize to the thyroid are breast, lung and kidney cancers<sup>7,8</sup>. Among pulmonary malignancies metastasizing to the thyroid, adenocarcinomas are the most common type, followed by squamous cell, small cell, and large cell carcinomas respectively<sup>9,10</sup>. In addition to these cancers cholangiocarcinoma and penile cancer has been reported as original cancers inducing diffuse thyroid metastases<sup>11</sup>. Most of the thyroid metastases are detected after the diagnoses or during the follow up after the treatment of the primary tumor<sup>12,13</sup>. Distinction between primary and secondary malignant thyroid tumor can be obtained by clinical examination and radiological imaging; a history of cancer can be helpful in reaching the diagnosis; however, the final confirmation by histopathol-

Pervenuto in Redazione Maggio 2015. Accettato per la pubblicazione Agosto 2015

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ogy is required. Fine needle aspiration (FNA) with ultrasound guidance is a rapid, minimally invasive, and inexpensive technique for the diagnosis of metastatic cancers in thyroid gland<sup>14</sup>. A thyroid nodule detected in a patient with history of recent or old remote cancer should be consider for FNA to rule out metastatic disease in the thyroid. However FNA might be noncontributory and not to guide the etiological diagnostic if insufficient cells are available to make the cell block for immunostains<sup>3,7,14</sup>.

Thyroid hormone levels are usually unaffected by the metastatic thyroid involvement nodules<sup>15</sup>.

### Case Report

A 72 years old man, prior smoker in treatment for hypertension and type 2 diabetes, with no significant family history, was referred to our hospital for persistent right chest pain. The patient had no history of weight loss, anorexia hemoptysis or any respiratory complaints.

The routine investigations were normal, including hematological findings and thyroid function tests.

The CT thoracic scan revealed an irregular mass of the right inferior lobe (77 x 75 mm).

A total body PET was performed, which revealed hypermetabolism in lung lesion. In correspondance of the neck region positron emission tomography enlightened a positive nodule in middle inferior left thyroid pole (Figs. 1, 2).

The patient subsequently underwent an ultrasonogram guided fine needle aspiration cytology (FNAC) which showed, in a 4 cm diameter nodule, overall features suggestive of an adenocarcinoma, overshadowing the hypothesis of a primary thyroid tumor.

Bronchoscopy revealed a stenosis with ab extrinsecal compression of lateral and dorsal ramification of inferior left lobar bronchus while transbrochial needle aspiration and bronchial washing showed immunoreactivity for CK 7 and TTF-1, whereas there was negativity at p63 Pax8. A comparative study of lung and thyroid cytologies supposed the two tumors to be both primitive.

Therefore the patient was diagnosed with lung adenocarcinoma associated with primitive thyroid cancer.

Among his thyroid function tests we observed: calcitonin (<1 pg/ml), TSH reflex (0.897 U/ml) and thyroglobulin (169.55 ng/ml).

The patient underwent an inferior left lung lobectomy without clinical complications. Histopathological findings posed the diagnosis of lung adenocarcinoma.

About two months after the patient underwent a thyroidectomy intervention with nerve integrity monitoring without particular post operative events. The patient was discharged one day after surgery.

The histopathological examination on thyroid nodule confirmed an adenocarcinoma metastasis with epidermodal aspects from pulmonary origin.

A follow up with Pet-scan was performed after 6 months with no significant signs of residual disease.

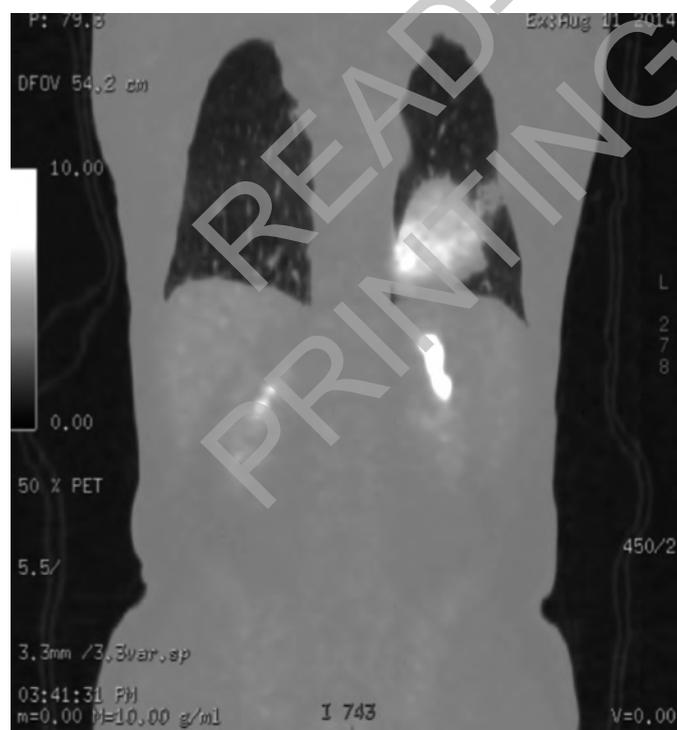


Fig. 1: PET Scan image of primary tumor.



Fig. 2: PET Scan image of hypermetabolic mass in left inferior thyroid pole.

## Discussion

Thyroid gland metastatic involvement, which occurs usually through hematogenous spread, is infrequent even though the gland has a rich vascular supply. The incidence of clinically significant (palpable mass) is much lower than the incidence found at autopsy; in fact autopsical metastasis cases include nonclinical subjects comprising of occult cancer and widespread cancer at the time of death<sup>13,16</sup>.

As the literature confirms, most of the studies have documented conventional renal cell carcinoma to be the commonest primary site of origin, followed by breast and lung<sup>6,7,12,14,16,17</sup>. As happened in our case, the majority of thyroid metastases are found after diagnosis of primary tumor or during the primary tumor management. Typically the interval between the diagnosis of the primary tumor and the detection of thyroid metastasis is from one month to 26 years<sup>3,12</sup>. Clinical manifestation of thyroid metastases are rare as they can only be encountered on imaging studies.

In the reported case primary tumor was a lung adenocarcinoma, and thyroid metastasis was detected by PET scan (hypermetabolic mass in left inferior thyroid pole) and confirmed by histopathological examination.

Metastatic involvement of thyroid gland often indicates advanced disease stage with bad prognosis. There is no specific consensus regarding modality of treatment of thyroid metastasis<sup>12,14</sup>.

The treatment of thyroid metastasis depends on the primary site of malignancy, and the stage of the disease. Surgical resection has to be considered as a possibility versus systemic therapy and/or radiation therapy.

For isolated metastatic cancer to the thyroid gland, surgical resection should be performed in order to avoid the potential morbidity associated with tumor recurrence in the neck.

Surgical approach (isolated thyroidectomy) should be considered, as seen in our experience, in case of solitary metastatic involvement.

Systemic therapy should be used in case of widely metastatic disease.

The actual survival rate of patients with thyroid metastases is variable and depends on the primary cancer stage and site; survival is significantly better if the primary cancer is renal, compared with extrarenal location<sup>10</sup>.

Prolonged survival (more than five years) has been observed in patients who were surgical candidates<sup>3,6,12,14</sup>.

valenza pari a 1,9 – 24%. Presentiamo il caso di un uomo (72 anni) con carcinoma polmonare e metastasi sincrone alla tiroide. Tipicamente l'intervallo tra la diagnosi del tumore primitivo e l'evidenza di metastasi è da un mese a 26 anni. Le manifestazioni cliniche sono rare.

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## Riassunto

Metastasi tiroidee da tumori primitivi di altri organi sono eventi clinicamente rari, meno frequenti che le neoplasie primitive e si presentano soprattutto in età anziana. Recenti studi autoptici hanno dimostrato che le metastasi alla tiroide sono relativamente comuni con una pre-