folia medica

Folia Medica 65(4):671-674
DOI: 10.3897/folmed.65.e85074

Case Report

# A Metachronous Second Primary Lung Cancer after Laryngectomy for Laryngeal Carcinoma

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**Received:** 8 April 2022 ♦ **Accepted:** 10 June 2022 ♦ **Published:** 31 Aug 2023

**Citation:** Yankov G, Alexieva M, Yankova S, Mekov E. A metachronous second primary lung cancer after laryngectomy for laryngeal carcinoma. Folia Med (Plovdiv) 2023;65(4):671-674. doi: 10.3897/folmed.65.e85074.

## Abstract

A combination of laryngeal carcinoma and subsequent primary lung cancer is rare yet important in terms of therapeutic strategy and prognosis.

We present a case of primary squamous cell laryngeal carcinoma treated with laryngectomy and chemoradiation therapy. One year later, the patient developed metachronous squamous cell carcinoma of the lung and underwent left pneumonectomy.

A second primary lung cancer after laryngeal cancer presents a significant challenge for surgeons, oncologists, and radiotherapists. The differentiation between lung metastasis and primary lung cancer is of paramount importance for the correct therapeutic strategy and prognosis.

## Keywords

lung carcinoma, larynx carcinoma, metachronous, multimodal treatment, surgery

## INTRODUCTION

The combination of a laryngeal and subsequent primary lung cancer is a rare entity, yet it has great importance in terms of therapeutic strategy and prognosis. We present a case of a patient with primary squamous cell laryngeal carcinoma treated surgically and with chemoradiotherapy, who developed a metachronous squamous cell lung cancer one year later.

## CASE REPORT

*A 53-year-old man was admitted to the Department of Thoracic Surgery for surgical treatment. Two years before, the patient had undergone laryngectomy and bilateral neck lymph node dissection because of keratinizing spindle-cell laryngeal carcinoma, $T_4N_2M_0$, G1. He received chemotherapy with cisplatin and radiotherapy for two months. A follow-up CT scan one year later showed a new pulmonary nodule of 13 mm in size in the left 6th segment, which was interpreted as a lung metastasis, and stereotactic body radiation therapy was started with DFD 10 Gy for 5 days. A CT scan one month later showed the nodule decreasing in size (9 mm), but after 4 months, we found a 12-mm cavity with inflammatory changes and peribronchial lymphadenopathy. Five months later, imaging of the left 9th and 10th pulmonary segments revealed an enlarged cavity with a diameter of 45 mm.* ***(Fig. 1)****. Fiberoptic bronchoscopy established bronchogenic invasive squamous cell carcinoma. Lab tests showed leukocytosis (WBC, 15.4 cells/$10^9$), anemia (Hgb, 104 g/l), thrombocytosis (platelets, 930 cells/$10^6$), and elevated CRP*

*(235.8 mg/l). The patient was a heavy smoker with 60 pack-years (2 packs per day for 30 years).*

*A left lower lobectomy was planned. Left lateral minithoracotomy revealed partially obliterated pleural cavity, yellowish clear pleural effusion about 300 ml, an atelectatic, destroyed lower lobe with abscess formation. A centrally located tumor formation, adjacent to the inferior pulmonary vein was found. A circular pericardiotomy was performed and 80 ml of clear pericardial exudate was evacuated. An attempt was made for a left lower lobectomy, but during the fissure dissection, a neoplastic infiltration to the upper and interlobar part of the pulmonary artery was revealed. A left intrapericardial pneumonectomy with partial resection and plasty of the left atrium was performed. Thorough lymph dissection was carried out.*

*Pathological diagnosis was squamous cell carcinoma 60×54×56 mm **(Fig. 2)**. One peribronchial lymph node was directly infiltrated by the tumor and another was metastatic.*

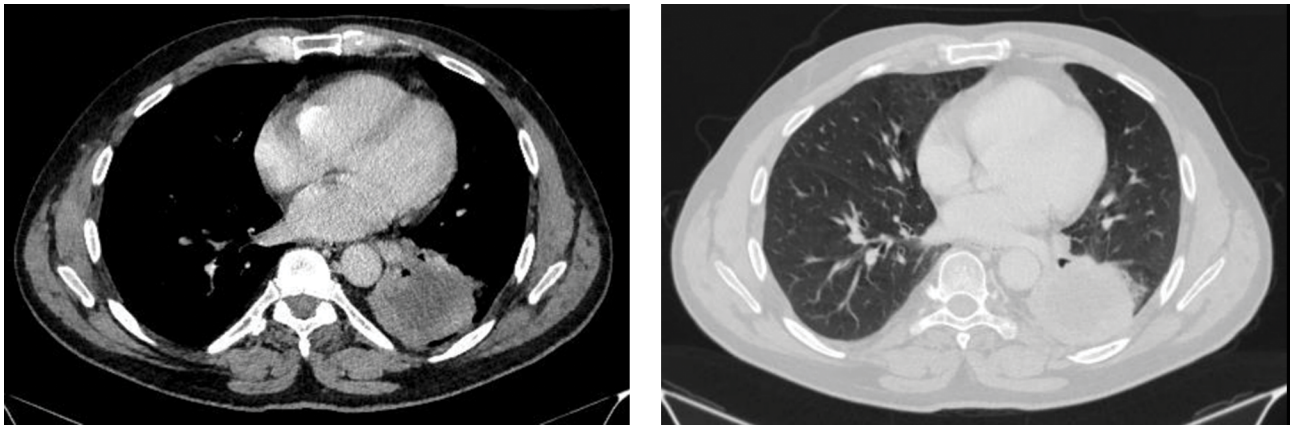

**Figure 1.** CT scan 2 years after laryngectomy.

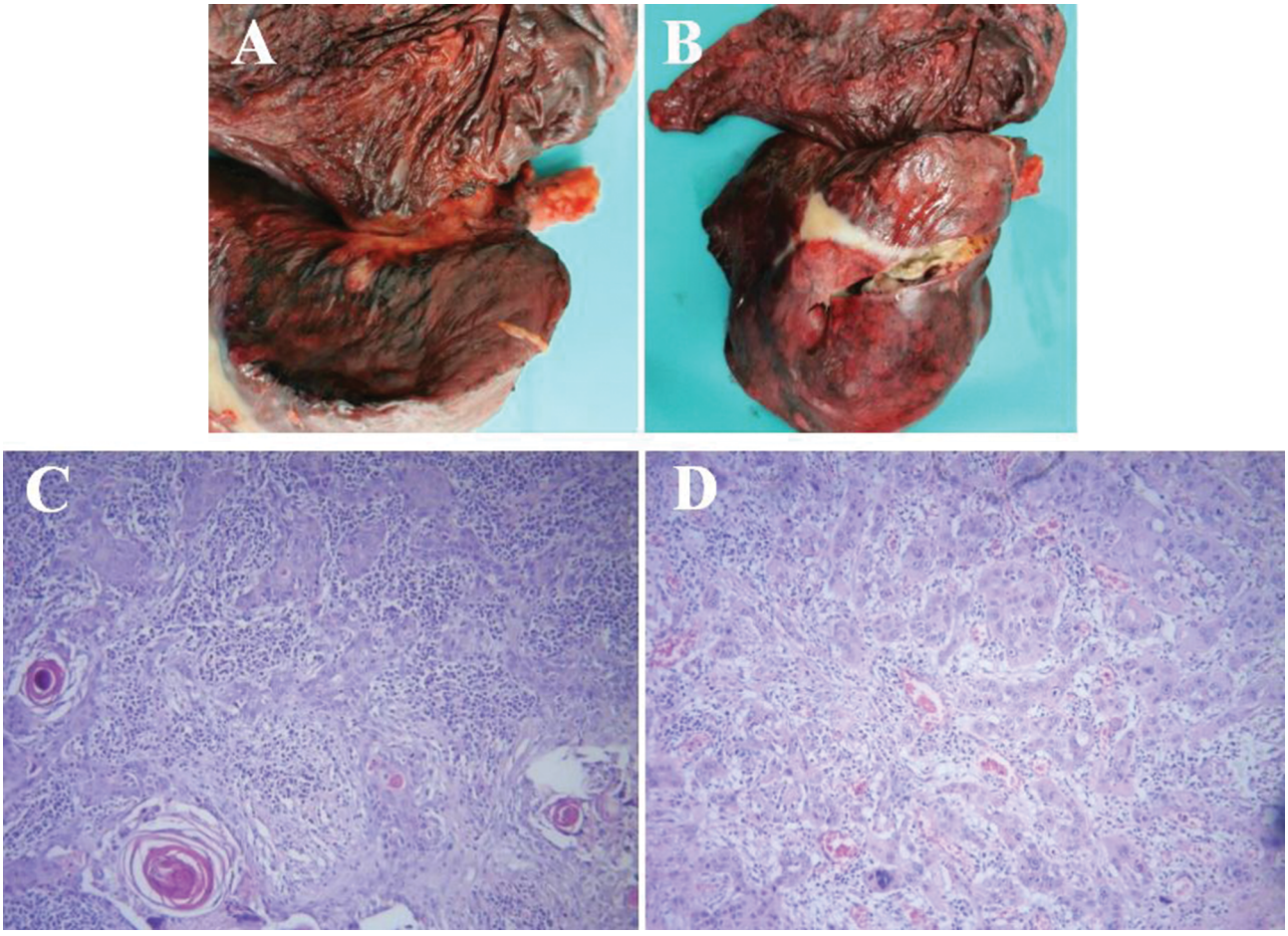


**Figure 2. A, B.** Postoperative specimen showing a left lower lobe tumor, infiltrating through the interlobar fissure to the upper lobe; **C.** microscopic image of the laryngeal squamous cell carcinoma; **D**. microscopic image of the lung squamous cell carcinoma.

*Two carinal lymph nodes were metastatic out of nine excised lymph nodes (aortopulmonary, interlobular, bifurcational, paratracheal). The pleural and pericardial effusions were benign. The tumor was staged as $G_2$, $pT_3pN_2M_0$ (3/11).*

*The patient was discharged uneventfully on the 8th postoperative day.*

*One month after surgery a chest X-ray and CT scan showed normal findings* ***(Fig. 3)****.*

## DISCUSSION

We present a case with primary squamous cell laryngeal carcinoma and a metachronous squamous cell lung cancer.

Multiple primary malignancies are defined as two or more malignancies arising independently of one another in the same or different organs, while excluding metastatic sites of the primary malignancy.[1] Synchronous malignancies are second tumors, that have occurred either simultaneously, or within 6 months after the first malignancy, while metachronous malignancies are secondary tumors that have developed after more than 6 months from the first malignancy.[2]

Smoking is a risk factor for both head and neck and lung cancer.[3] The patient in the presented case was also a heavy smoker. The five-year incidence of second primary lung cancer was 8% (1.6% per year) following a diagnosis of laryngeal cancer.[4] Twenty-eight percent of patients with squamous cell carcinomas of the larynx had second malignancies, lung cancer being the most prevalent.[5] The mean time to development of second primary lung cancer is 44 months with a mean survival time of 23 months and 2- and 5-year overall survival of 41.7% and 8.3%, respectively.[6] Patients affected by supraglottic cancer have the highest risk of developing synchronous or metachronous lung cancer during the first two years of follow-up, which is especially true for multicentric supraglottic tumors.[7] A study reported an exceedingly rare patient with simultaneous triple primary cancers, including laryngeal supraglottic cancer (cT4N0), small cell lung cancer (cT4N2), and squamous cell lung cancer (cT3N0).[8]

The development of second primary lung cancer negatively affects the survival rate of patients with head and neck cancer including laryngeal cancer and they should be routinely screened during follow-up with chest X-ray or CT scan for the early detection of lung cancer.[9] In patients with radical surgery of head and neck squamous cell carcinoma, resection of the secondary pulmonary cancer is associated with favorable outcomes, reaching 30% five-year overall survival.[10]

A lifetime follow-up is suggested for lung neoplasms in larynx cancer patients.[11]

## CONCLUSIONS

A second primary lung cancer after laryngeal cancer presents a considerable challenge for surgeons, oncologists, and radiotherapists. The differentiation between lung metastasis and primary lung cancer is of paramount importance for the correct therapeutic strategy and prognosis.

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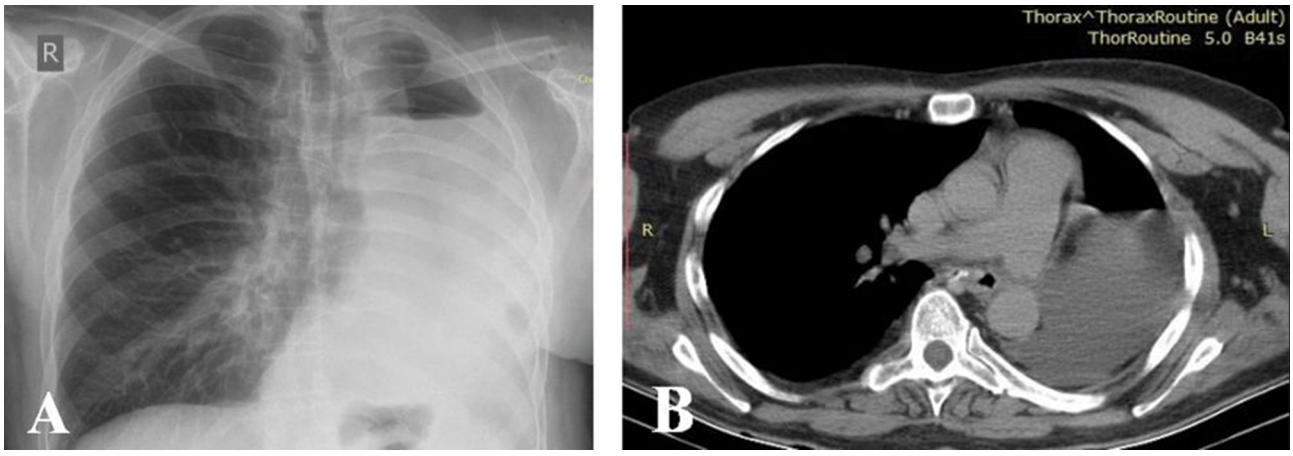


**Figure 3.** **A**. Chest X-ray; **B**. CT one month after left pneumonectomy.



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# Метахронный второй первичный рак лёгкого после ларингэктомии по поводу рака гортани

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**Дата получения:** 8 апреля 2022 ♦ **Дата приемки:** 10 июня 2022 ♦ **Дата публикации:** 31 августа 2023

**Образец цитирования:** Yankov G, Alexieva M, Yankova S, Mekov E. A metachronous second primary lung cancer after laryngectomy for laryngeal carcinoma. Folia Med (Plovdiv) 2023;65(4):671-674. doi: 10.3897/folmed.65.e85074.

## Резюме

Сочетание карциномы гортани и последующего первичного рака лёгкого встречается редко, но важно с точки зрения терапевтической стратегии и прогноза.

Мы представляем случай первичной плоскоклеточной карциномы гортани, леченной ларингэктомией и химиолучевой терапией. Через год у больного развился метахронный плоскоклеточный рак лёгкого, в связи с чем была выполнена левосторонняя пневмонэктомия.

Второй первичный рак лёгкого после рака гортани представляет серьёзную проблему для хирургов, онкологов и радиотерапевтов. Дифференциация между метастазами в лёгкие и первичным раком лёгких имеет первостепенное значение для правильной терапевтической стратегии и прогноза.

## Ключевые слова

рак лёгкого, рак гортани, метахронный, мультимодальное лечение, хирургия