

# Bilateral pulmonary nodules after the successful treatment of a mediastinal seminoma

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## Case Report

### Abstract

Germ cell tumors are unusual, but they represent the most common neoplasm in young men. Since the introduction of cisplatin-based chemotherapy, most cases are expected to be cured today. Intensive monitoring of these patients during follow-up is required to rule out relapses or late complications of therapy. We present the case of a 21-year-old male who developed extensive lung dissemination by Langerhans cell histiocytosis eight months after the successful treatment of a bulky mediastinal seminoma.

**Keywords:** Seminoma; Langerhans Cell Histiocytosis; Lung Nodules

### Introduction

Germ cell tumors represent the most common neoplasm in young men. They constitute the model of a curable neoplasm. The combination of surgery and cisplatin-based chemotherapy allows the cure of most patients, even with advanced disease at diagnosis.<sup>1</sup> Most cases have a primary testicular location but a proportion of them appear in midline extragonadal sites such as pineal gland, mediastinum or retroperitoneum.

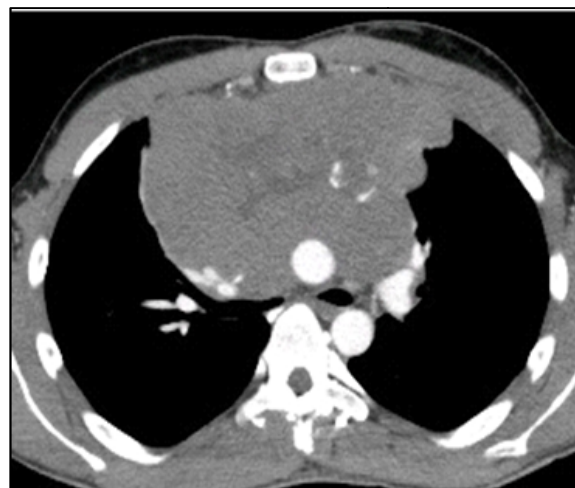
Mediastinal germ cell tumors share a worse prognosis than their testicular counterparts. However, extragonadal seminomas have a better behavior than mediastinal non-seminomas.<sup>2</sup> Lung metastases are common in advanced testicular cancer. The synchronicity of two uncommon diseases such as germ cell tumors and langerhans cell histiocytosis (LCH) is exceptionally unusual, and so a precise differential diagnosis with other pathologies is needed to allow a specific treatment.

### Case report

We report the case of a 21-year-old male, with no relevant medical history but a smoking habit of 2.5 pack/year. He did not suffer from inguinal hernia nor had history of cryptorchidism.

The patient related a severe chest pain and the loss of 4 kg of weight during the six previous months without any apparent cause. Moreover, he showed severe asthenia and uncertain

effort dyspnea. In April 2012, a CT scan of chest, abdomen and pelvis with intravenous contrast was done. The conclusion was: anterior mediastinal mass with infiltration of mediastinum, great vessels, anterior tracheal wall, pericardium and left atrium. No any distant lesions. Differential diagnosis by image was between lymphoma and malignant germ cell tumor (**Figure 1**).



**FIG. 1:** Thoracic CT Diagnosis. Locally advanced mass in the anterior mediastinum

On physical examination, the only finding was a cervical edema and collateral circulation in the front of the chest.

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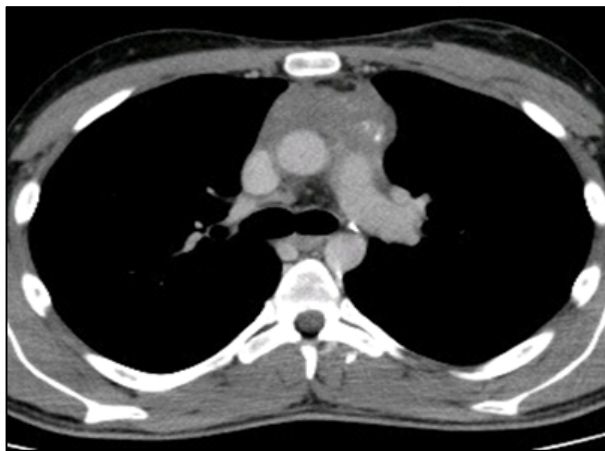
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Normal blood tests results except lactate dehydrogenase (821U/L), beta subunit of the gonadotropic hormone (41.8mU/ml); fibrinogen of 672 mg/dl and erythrocyte sedimentation rate (ESR) of 54 mm/h. The alpha-fetoprotein (AFP) was 1.3 ng/mL.

The definitive diagnosis confirmed by histopathology was pure extragonadal seminoma with cell proliferation index (Ki-67) 70%. Therefore, the treatment chosen was four cycles of BEP chemotherapy (bleomycin, etoposide, cisplatin) with primary prophylaxis of neutropenia support. The intent of treatment was curative. We requested as part of the initial study, viral serology and the preservation of fertility before the treatment was performed.

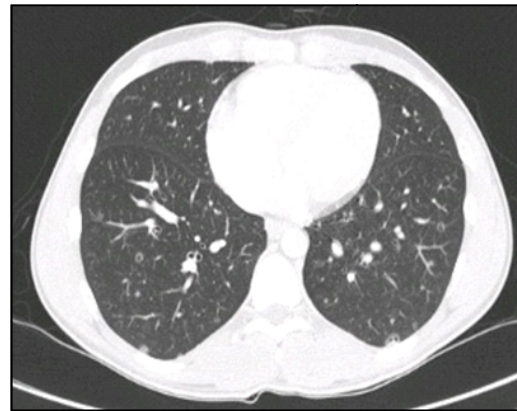
The clinical tolerance of treatment was acceptable, presenting only grade 2-3 emesis, which was controlled with standard antiemetic therapy. No dose reduction or delay was needed. Disease evaluation after four cycles of BEP showed a partial radiological response, with normalization of tumor markers after the first cycle. A positron emission tomography (PET-CT) showed absence of metabolic activity (complete response), so closely follow-up was decided.

The CT evaluation after six months showed further volume regression of the disease with residual mediastinal mass of 25 × 38 mm (Figure 2).



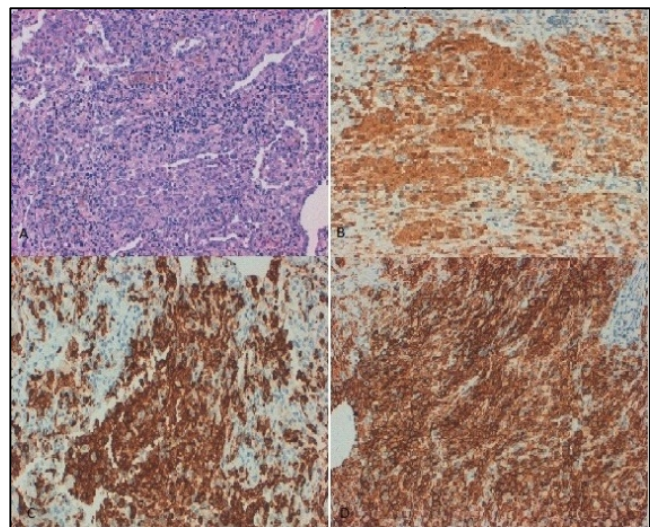
**FIG. 2:** Thoracic CT Evaluation. Residual mediastinal mass with internal calcifications.

During the monitoring, in the CT of March 2013 (eight months after ending the chemotherapy) multiple and bilateral cavitary lung lesions appeared with signs of rapid growth (Figure 3). PET-CT confirmed these findings and informed of an abnormal metabolism in a lymph node of the right hilum, suggesting a metastatic affectation.



**FIG. 3:** Monitoring thoracic CT. Bilateral, multiple cavitary lung lesions.

The patient remained asymptomatic and the rest of the complementary tests were normal including tumor markers. A pathological and microbiological study of the lung lesions was performed in April 2013. The definitive diagnosis was Langerhans cell histiocytosis in cellular stage and respiratory bronchiolitis (Figure 4).



**FIG. 4:** Histopathological and immunohistochemical diagnosis: (A) Dense infiltrates composed mainly of Langerhans cells mixed with occasional eosinophils and lymphocytes (HE, 200x); (B) Intense and diffuse cytoplasmic positive staining with pS-100 (ps-100, 200x); (C) Intense and diffuse positive staining with Langerin (Langerin, 200x); (D) Intense and diffuse positive staining with CD1-a (CD1-a, 200x).

As Langerhans cell histiocytosis was located exclusively in the lung, without any clinical impact, we decided to closely monitor the patient with the strict recommendation of tobacco cessation. At this moment, a year and eight months after ending the chemotherapy, the patient continues with follow-up, he remains asymptomatic, and living in a normal lifestyle.

## Discussion

Germ cell tumors, although considered an unusual tumor, are the most common neoplasm in males aged 15-35 years old (1% of all cancers approximately). The treatment of this disease has experienced considerable advances in the last decades and has demarcated in a more precise way the patients that need treatment, as well as their therapy. This partially explains the significant increase in these patients' survival.<sup>3</sup>

The young age, the high curability of this neoplasm and, as in our case, the chemotherapy treatment employed make extremely important a long term monitoring of these patients. The objectives of this follow-up are the early detection of local or distant recurrences and the early diagnosis of eventual second tumors.<sup>4</sup> During the two first years, the monitoring has to be closer because the probability of a tumor relapse is higher. In the case we present, the lung image alteration (bilateral, cavitory nodules) prompted us to rule out metastatic disease. Other possibilities to keep in mind are the infectious causes and the pulmonary toxicity by bleomycin, in which there is no rising of tumor markers, like in our patient. Contrary to this last possibility was its subpleural localization of a typical shape and its appearance in a short period of time after the chemotherapy administration.<sup>5</sup>

LCH is a disease with unknown incidence and prevalence. Etiological or other risk factors have not been described yet, but it has been noticed that most patients diagnosed with lung involvement (generally young men) smoke, that is why it is believed that smoking has an important role in the development of the disease.<sup>6</sup>

It can affect only one organ, such as the lung, or it can be more severe in the multi-systemic forms. In the exclusively lung form, symptomatic patients can present dyspnea, chest pain (usually secondary to pneumothorax) and other respiratory symptoms. In many patients it is asymptomatic, especially in early stages of the disease. In this stage, like in our case, the secondary lesions of LCH have an increased SUV in PET, and it can suggest other neoplastic disease.<sup>7</sup>

LCH is an eosinophilic granulomatous disease, with a certain similarity to sarcoidosis in its radiological, clinical and histological appearance. The cases described in the literature of association between LCH and seminomas are extraordinary. However, the association between germ tumor and sarcoidosis is slightly more frequent.<sup>8</sup>

Although LCH has an unpredictable course and requires a close monitoring, the chest disease usually has a good evolution and sometimes it has a spontaneous healing. The first treatment step in smoking patients is to stop this habit. If this measure is not enough to attain the complete remission of the

disease, other approaches can be required, such as the administration of corticosteroids.<sup>9</sup>

## Conclusion

Our case is an example of an unusual medical situation because both extragonadal seminoma and LCH diagnosis are exceptional. It illustrates the difficulties to carry out an appropriate differential diagnosis and a correct management of these types of pathologies.

## Conflict of interest

The authors declare that they have no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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