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Radiotherapy

Bulky Primary Mediastinal Seminoma with Complete Radiologic Response to Chemotherapy

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Abstract **Case Report**

Primary mediastinal seminoma is an uncommon extragonadal germ cell tumor that may present with respiratory symptoms related to the size and location of the mass. A 29-year-old man presented with two months of dyspnea and chest pain. Computed tomography showed a 132 × 90 × 89 mm anterior mediastinal mass with areas of necrosis, in close contact with the pericardium and great vessels. Biopsy and immunohistochemistry supported the diagnosis of seminoma, and testicular evaluation identified no primary tumor. The patient received three cycles of bleomycin, etoposide, and cisplatin. One scheduled dose of bleomycin was omitted because of afebrile neutropenia. The symptoms resolved, and the mediastinal mass was no longer detectable on post-treatment computed tomography. The patient entered surveillance. Biopsy and testicular work-up decided the treatment. At the first follow-up, CT showed no mass but AFP was slightly above the reference limit, so imaging and markers had to be read together.

Keywords: Primary mediastinal seminoma, extragonadal germ cell tumor, anterior mediastinal mass, bleomycin–etoposide–cisplatin, case report.

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INTRODUCTION

The anterior mediastinum is a recognized site of extragonadal germ cell tumors [1]. Primary mediastinal seminoma occurs predominantly in young men and may cause dyspnea, chest pain, or other symptoms as the mass enlarges [2]. Imaging shows how far the disease extends, but the diagnosis needs histology and immunohistochemistry, and the testes must be checked to tell a mediastinal primary from metastatic testicular disease. A recently reported patient still had a residual mediastinal mass after BEP [2]. We describe a 29-year-old man whose 13-cm mediastinal seminoma could no longer be seen on computed tomography (CT) after three cycles of bleomycin, etoposide, and cisplatin (BEP).

CASE REPORT

A 29-year-old man who had stopped using cannabis presented with chest pain and dyspnea that had progressed over two months, accompanied by a decline in general condition. No fever was reported. At the oncology assessment, his World Health Organization performance status was 1. Testicular examination was unremarkable, and no peripheral lymphadenopathy was found.

CT on April 3, 2026 showed a lobulated, heterogeneous, partially necrotic mass in the anterosuperior mediastinum measuring 132 × 90 × 89 mm (Figure 1). The mass abutted the pericardium and several great vessels without definite invasion on the radiology report. A small pericardial effusion was present. Staging CT of the brain, chest, abdomen, and pelvis found no suspicious distant lesions.

Histopathology and staging

A biopsy obtained on April 20, 2026 showed a poorly differentiated neoplasm infiltrating fibrous tissue. Tumor cells expressed SALL4, OCT4, and placental alkaline phosphatase (PLAP). Staining for CD20 and CD30 was negative, and the Ki-67 proliferation index was reported as high. These findings supported the diagnosis of seminoma. Scrotal ultrasonography showed bilateral microlithiasis without a focal mass, and testicular magnetic resonance imaging was reported as normal. Baseline serum values were β-human chorionic gonadotropin (β-hCG) 107.65 mIU/mL, alpha-

fetoprotein (AFP) 0.97 IU/mL, and lactate dehydrogenase (LDH) 272 IU/L. The treating team classified the tumor as a primary mediastinal seminoma of good prognosis.

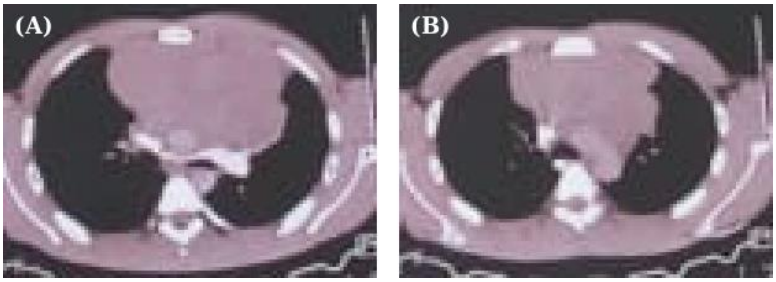


Figure 1: Pretreatment chest CT showing a bulky anterior mediastinal mass. (A–B) Axial images in the mediastinal window at two levels; (B) is the more cranial section

Treatment

The three BEP cycles started on June 15, July 13, and August 6, 2026. Cisplatin and etoposide were administered at 33 mg/day and 169 mg/day, respectively, on days 1–5. Bleomycin was given on days 1, 8, and 15. The day 15 dose of cycle 1 was omitted because of afebrile neutropenia. The last dose was given on August 28, 2026.

Follow-up and outcomes

Chest pain and dyspnea resolved after chemotherapy. CT on September 14, 2026, showed no detectable mediastinal mass, thoracic lymphadenopathy, pleural or pericardial effusion, or distant lesion. The next day, serum LDH was 155 IU/L (reference interval, 135–225), β-hCG was 2 mIU/mL (male reference, <2), and AFP was 4.70 ng/mL (reference, <4.0). After reviewing these results, the treating team judged the marker response complete. Follow-up was planned every three months.

DISCUSSION

Our patient had the typical profile of primary mediastinal seminoma. Zhai *et al.,* treated 27 patients in one center between 2000 and 2018, with a median age of 28 years (range, 13–63), and the most frequent symptoms were chest pain (29.6%), cough (25.9%), and dyspnea (22.2%) [3]. He was 29 and came with chest pain and dyspnea. Seminoma is still the minority histology outside the testis. Of the 635 extragonadal germ cell tumors analysed by Bokemeyer *et al.,*54% were mediastinal and only 16% were seminomas [1].

The differential diagnosis of an anterior mediastinal mass includes lymphoma, thymic tumors, and germ cell tumors. CT shows the extent of the mass and its relation to the great vessels and pericardium, but it cannot reliably separate these tumors, and even a large necrotic mass like this one needs a biopsy [2]. In our patient, negative CD20 argued against B-cell lymphoma. OCT4 helps against thymoma. In the series of Jung *et al.,*it was positive in all 10 mediastinal seminomas and in none of the 22 thymomas, but the one embryonal carcinoma was also positive [4]. So the negative CD30 was useful here, since embryonal carcinoma is usually CD30-positive. With SALL4, OCT4, and PLAP positive and the histologic findings, the picture fit seminoma.

Once seminoma is found in the mediastinum, a testicular primary must be considered. Examination and ultrasonography found no focal testicular lesion, and testicular magnetic resonance imaging was normal, which supported a mediastinal origin. Colon Ramos *et al.,* described testicular microlithiasis in a patient with a large mediastinal seminoma and called it a rare feature of unknown significance [5]. It still matters for follow-up, because 16 patients in the Bokemeyer series developed a metachronous testicular cancer despite platinum-based chemotherapy [1]. The baseline markers fit a pure seminoma. β-hCG can be elevated in seminoma, and his was 107.65 mIU/mL, while AFP was normal at 0.97 IU/mL (about 1.2 ng/mL). A substantial AFP elevation would have suggested a nonseminomatous component [6].

Under the International Germ Cell Cancer Collaborative Group classification, seminoma at any primary site belongs to the good-prognosis group if pretreatment AFP is normal and there are no nonpulmonary visceral metastases. Our patient met both conditions, so he received three cycles of BEP, the standard for good-risk advanced seminoma [6]. The outlook in this group is good. Bokemeyer *et al.,* reported an overall survival of 88% for extragonadal seminoma, with no difference between mediastinal and retroperitoneal sites, while only 45% of patients with mediastinal nonseminoma were alive at 5 years [1]. In the same series, seminoma patients treated with radiotherapy alone had lower progression-free survival than those given chemotherapy [1]. In the series of Zhai *et al.,*5-year overall survival was 100% with or without surgery [3].

The response is also worth comparing with the case of dos Santos Bueno *et al.,* [2]. Their patient's mass measured 9.4 × 12.9 × 10.9 cm, close to ours, and after three BEP cycles it had shrunk to 6.3 × 4.1 cm. PET-CT 8 weeks after chemotherapy still showed a 4.9 × 2.9 cm residual mass (SUV 4.3), and 3.9 cm four months later

[2]. In our patient, the 132 × 90 × 89 mm mass could no longer be seen on CT 17 days after the last dose.

At the first follow-up, AFP was 4.70 ng/mL, marginally above the local limit of 4.0 ng/mL, while β-hCG and LDH were within normal limits. Given the resolution of symptoms and the absence of any residual mass on CT, the team considered this minor elevation not clinically significant and judged the response complete. Borderline marker values are best interpreted together with imaging and serial measurements [6], and AFP will be monitored during the three-month surveillance visits.

CONCLUSION

In this young man with a bulky anterior mediastinal mass, biopsy with immunohistochemistry established the diagnosis of seminoma, and the testicular work-up pointed to a mediastinal primary. After three BEP cycles, the mass was no longer detectable on CT. The slightly raised AFP at the first check needs repeat measurement, and longer follow-up will show whether the radiologic response is durable.

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