Mediastinal Non-Seminomatous Germ Cell Tumor

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Introduction
A young man presenting with cough, fevers, chills, and progressive SOB with hemoptysis was found to have Non-seminomatous germ cell tumor, which is a rare entity, representing less than 0.5% of all thoracic tumors1.

Case Presentation
An 18-year-old Hispanic man with a history of a benign leg tumor presented with two week history of progressive SOB and hemoptysis. Prior to this, he reports being in his usual state of good health. The patient also reported a two week history of cough, subjective fever, and chills. A 40 pound weight loss was noted over previous 2 months prior to admission. The patient migrated from Mexico 6 years previous and has been living in US since. He denied any tobacco, alcohol or illicit drug use, and also denied any sick contacts or recent travel. On physical exam, patient appeared chronically ill. The patient was tachycardic and on lung exam, he had decreased breath sounds over the anterior chest wall, with dullness to percussion and increased vocal fremitus. The patient’s testicular examination was normal and no lymphadenopathy was noted. On his admit chest x-ray, the patient’s cardiomediastinal silhouette was abnormally enlarged which prompted further evaluation with a contrasted CT study.

Images and Pathology
Posteroanterior radiograph of the chest demonstrates massive mediastinal widening.

Case Presentation
Laboratory data showed elevated serum Alpha Feta Protein (AFP) of 31,012 with normal being less than 15 and a serum beta Human Chorionic Gonadotropin (B-HCG) of 7 (normal less than 5). A left anterior thoracotomy was performed for biopsy of the mediastinal mass. Pathologic evaluation of the tissue revealed a yolk sac tumor with necrosis. As mentioned above, the patient had a normal testicular exam and his testicular ultrasound did not reveal any masses or suspicious lesions. The patient was started on a chemotherapy regimen of Bleomycin, Etoposide, and Platinum and he was discharged to home with Hematology and Oncology follow-up.

Discussion
The most common etiologies for anterior mediastinal masses are lymphomas, thymomas, congenital cysts, parathyroid lesions, thyroid masses, and Germ cell tumors. Germ cell tumors account for approximately 12-15% of all anterior mediastinal tumors and of less than 0.5% of all thoracic tumors1. Germ cell tumors commonly occur in young men, mean age of 31 years1. Germ cell tumors can be further categorized as teratomas, seminomas and non-seminomatous germ cell tumors. Non Seminomatous Germ Cell Tumors (NSGCT) are a rare cause of anterior mediastinal tumors. NSGCT can be further divided into embryonic carcinoma, choriocarcinoma, yolk sac tumors, and mixed forms1.

Images and Pathology
The lateral radiograph of the chest reveals the anterior mediastinal location of the mass (arrow).

Discussion Cont’d
Typical presentation of mediastinal NSGCT includes chest pain, shortness of breath, cough, hemoptysis, weight loss, fever, and rarely, SVC syndrome. Gynecomastia can be present in certain patients with tumors which excrete large amounts of HCG. Patients with NSGCT usually present with metastasis at the time of diagnosis due to the aggressive nature of this tumor. Approximately eighty-five percent of patient’s are symptomatic at the time of diagnosis.

Images and Pathology
The lateral radiograph of the chest reveals the anterior mediastinal location of the mass (arrow).

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Posteroanterior radiograph of the chest demonstrates massive mediastinal widening.

Discussion
Initial imaging modality of choice is chest radiograph. Extranodal NSGCT are typically associated with elevations in AFP and HCG. One or both are elevated in 85% of cases. Mediastinal NSGCTs are more likely to result in significant elevations of serum AFP and less likely to result in elevations of HCG when compared to gonadal and retroperitoneal NSGCTs.4 If HCG is ≤ 5000 IU or AFP is ≤ 1000, then no histological proof is necessary to confirm the diagnosis of NSGCT1.

Images and Pathology
The lateral radiograph of the chest reveals the anterior mediastinal location of the mass (arrow).

Discussion
A multimodality approach to treatment is employed to get best response for this poorly prognostic tumor type. These patients are usually started on systemic chemotherapy followed by surgery for any residual mass. Usual chemotherapeutic regimens consist of VIP (Etoposide, Ifosfamide and Cisplatin), or BEP (Cisplatin, Etoposide and Bleomycin). Patients usually undergo four cycles of VIP or four cycles of BEP before being evaluated to see if there is any residual mass present. If any residual masses are present, the patient then undergoes radical resection. Patients who have any viable malignancy present post chemotherapy and surgery may undergo two additional cycles of systemic chemotherapy. In some cases, patients may undergo surgical resection as the initial modality especially when the is HCG ≤ 5000 IU or AFP is ≤ 1000, and the tumor is small1,2.

Images and Pathology
The lateral radiograph of the chest reveals the anterior mediastinal location of the mass (arrow).

Discussion
Mediastinal NSGCT is a rare entity with poor prognosis. AFP and HCG are also helpful in monitoring response to treatment and predicting early recurrence. The five-year overall survival rate using a combined chemotherapeutic and surgical approach is 45% for mediastinal NSGCT. Poor prognostic markers include metastasis at diagnosis, and presence of viable cancer in tumor residue post chemotherapy1.

Images and Pathology
The lateral radiograph of the chest reveals the anterior mediastinal location of the mass (arrow).

Discussion
References