Primary mediastinal seminoma

Clinical History:

A 40-year-old male patient complained of fatigue and worsening exertional dyspnoea followed by face oedema, dizziness and anorexia. Physical examination revealed increased volume of the face and neck, suggesting superior vena cava syndrome, without collateral circulation or palpable lymph nodes. Laboratory tests showed normal values of α-fetoprotein, α-HCG and LDH.

Imaging Findings:

The patient underwent a chest CT examination with intravenous contrast and a solid mass was depicted in the anterior and superior mediastinum. This lesion, measuring 8 x 7 x 9 cm, induced posterior deviation of mediastinal vascular structures and showed slight and heterogeneous enhancement with intravenous contrast. There were no intralesional calcifications. Superior vena cava (SVC) syndrome related to this mass was confirmed as clinically suspected, with SVC thrombosis associated to marked collateral circulation in the shoulder girdle and venous return to the heart conducted through the azygos system. The most probable differential diagnosis was a thymic lymphoma/ Hodgkin's lymphoma of the anterior mediastinum or an invasive thymoma. A surgical biopsy of the lesion was performed and the histologic diagnosis suggested a seminomatous type germ cell tumour – mediastinal seminoma. After this diagnosis, a testicular ultrasound was done to exclude a primary tumour, but no masses were found.

Discussion:

Only about 5-7% of germ cell tumours are located outside the gonads [1]. However, among the possible extra-gonadal locations, the mediastinum is the most common [2]. Although 80% of these tumours are symptomatic, seminomas usually have a large volume at diagnosis. This, coupled with the high degree of malignancy often affects the possibility of surgical resection. The majority of cases occurs in young males (15-35 years old) [3] and is located mostly in the anterior mediastinum. In 30% of cases, these tumours are asymptomatic and are incidental findings on chest radiographs. However, symptoms may occur, usually nonspecific, such as sensation of pressure or local pain, exertional dyspnoea, cough, hoarseness and dysphagia. Systemic symptoms may also be present (e.g. weight loss), and in approximately 10% of cases there is superior vena cava syndrome at presentation [1]. The initial symptom is usually metastatic disease, often located in the chest (lung and regional lymph nodes) and bone [4]. The serum tumour markers, such as α-HCG, AFP and LDH, are essential for the diagnosis of primary mediastinal seminoma, which may be associated with low elevation of HCG (usually below 100 µL/L) levels, high LDH levels and normal AFP[2, 5]. Imaging plays a very important role both in diagnosis and management. A chest radiograph may show widening of the mediastinum, but CT is the modality of choice and contrast enhanced CT helps characterise the lesion and also...
gives information concerning involvement of other structures and organs [2]. A testicular ultrasound should be performed to confirm primary extragonadal seminomatous tumour [6].

Seminomas characteristically are smooth or lobulated masses of homogeneous tissue density [7]. This distinguishes them from other malignant germ cell tumours which typically have a very heterogeneous appearance due to haemorrhage and necrosis but calcifications and fatty material are not seen. Criteria for malignancy are rapid growth, signs of local invasiveness, and the detection of distant metastases in regional lymph nodes, lung, pleura, bone or liver [4]. Although the direct invasion of surrounding structures is rare, obliteration of fat planes is common, and pleural or pericardial effusion may also occur.

Radiographically, seminomas consist of well defined, lobulated masses, located in anterior mediastinum, that may extend to both sides of the midline. Calcifications are typically absent.

On CT, seminomas appear as large and lobulated masses, with homogeneous attenuation and show a slight enhancement after contrast administration.

MRI may be helpful in distinguishing between fibrosis or residual tumour after therapy.

**Differential Diagnosis List:** Primary mediastinal seminoma, Thymoma, Thymic carcinoma, Lymphoma, Mediastinal metastasis of testicular germ cell tumour

**Final Diagnosis:** Primary mediastinal seminoma

**References:**


Description: There is superior mediastinal widening (a), located in the anterior compartment (b).
Origin: IPOLFG, Lisbon, Portugal
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Figure 2

Description: Contrast-enhanced CT axial projection (a) and coronal and sagittal CT reconstructions (b): The lesion induced posterior deviation of mediastinal vascular structures and showed slight and heterogeneous enhancement with intravenous contrast. **Origin:** IPOLFG - Lisbon, Portugal
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Figure 3

Description: Contrast-enhanced CT obtained after four cycles of combination chemotherapy with BEP (Bleomycin, Etoposide and Cisplatin). There was significant decrease in lesion size. Origin: IPOLFG - Lisbon, Portugal
Description: Fibrous stroma containing numerous inflammatory cells. There is proliferation of epithelioid cells with clear cytoplasm, round nucleus and evident nucleolus, which are arranged in clusters. These aspects are in favour of the diagnosis of seminoma. Origin: Hospital da Luz - Lisbon, Portugal