Case 17539

Azygos vein aneurysm - A rare entity
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Section: Cardiovascular
Area of Interest: Cardiovascular system Mediastinum Vascular
Imaging Technique: CT
Imaging Technique: PET-CT
Case Type: Clinical Cases
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Patient: 74 years, female

Clinical History:
An elderly patient referred for a thoracic computed tomography (CT) for staging and treatment planning, after a segmental bowel enterectomy one month earlier in the context of a GIST. She had no thoracic complaints prior, or at the moment of the CT. Her past medical history was unremarkable, in particular, no significant trauma being reported.

Imaging Findings:
Unenhanced CT revealed a large mass in the right posterior mediastinum, displacing laterally the esophagus (Fig.1). In the dynamic CT scan with acquisition in early venous phase, this lesion showed well-defined margins, clearly delimited from surrounding structures, with a contrast enhancement similar to adjacent vascular structures (Fig.2). In multiplanar reconstruction it is visible the structure’s vascular origin, communicating with the superior vena cava.

In the chest radiogram acquired in the emergency department one month earlier, it was already visible a well-defined mass in the upper right mediastinum (Fig.3).

A PET/CT scan with Ga\(^{68}\)-DOTA-NOC done a week prior to the CT, showed no abnormal captation in the mediastinum, supporting its vascular nature (Fig.4).

The final diagnosis was of a large azygos vein dilation/aneurysm, with no further investigation being done.

Discussion:
Azygos vein aneurysm is a rare condition, with less than 50 cases reported to date.

There are three main causes that are thought to contribute to aneurysmal azygos vein: trauma; pressure or volume overload; and idiopathy [1,2]. Some authors postulate that the cause is a congenital failure in the union of the right supra cardinal vein with the proximal portion of the posterior cardinal vein during the gestational period [2].

In the majority of the reported cases, this condition was asymptomatic and usually an incidental finding on chest radiography or CT, often simulating a tumoral lesion [1-4]. On chest radiogram, a well-defined mass is revealed in the right tracheobronchial angle that has a variable size during inspiration or the Valsalva manoeuvre [5]. Dynamic CT scan with acquisition in late venous phase is an excellent method to confirm the vascular structure and identify possible complications like partial thrombosis. One of the potential pitfalls is misinterpreting the azygos aneurysm as a solid mass [1-4]. Three-dimensional CT reconstructions are an important tool, especially in defining its communication with the superior vena cava.
Treatment of this abnormality is still unclear and controversial in asymptomatic patients. Some cases of thrombosis in the aneurysm have been reported, postulating the possibility of pulmonary embolism. No spontaneous ruptured azygos vein aneurysm was ever reported to the best of our knowledge, except for a pseudoaneurysm caused by trauma. Although there are no consensual criteria, some authors of the reported cases suggest that treatment should be offered in patients with (1) enlargement during follow-up; (2) pressure effects on adjacent structure; (3) presence of thrombosis or pulmonary embolism, (4) post-traumatic pseudoaneurysm; (5) special cases of increased risk (i.e. connective tissue disorders) [4,6].

Despite being a rare entity, azygos vein aneurysm should be kept in mind as a differential diagnosis for upper right mediastinal enlargement, particularly in asymptomatic patients. The best course of action in this condition is still unclear, but the majority of authors tend to describe this as a low-risk abnormality, in the absence of alarming features. In the case of our patient, it was decided to maintain clinical and imagiological surveillance.

**Differential Diagnosis List:**  Idiopathic azygos vein aneurysm, Neurogenic tumors, Lymphoma, Castleman disease, Oesophagal neoplasm, Idiopathic azygos vein aneurysm

**Final Diagnosis:**  Idiopathic azygos vein aneurysm

**References:**


Description: Unenhanced axial (a) and coronal (b) thoracic CT showing a large structure in the right posterior mediastinum (white arrows), that displaced laterally the esophagus (arrowhead), measuring 6.1 cm. 

Origin: © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020.
Description: Unenhanced axial (a) and coronal (b) thoracic CT showing a large structure in the right posterior mediastinum (white arrows), that displaced laterally the esophagus (arrowhead), measuring 6.1cm. Origin: © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020.
Description: Sagittal (a) and axial (b) reconstructions of a post-contrast thoracic CT scan with acquisition in early venous phase showing the lesion (star) with contrast enhancement similar to adjacent vascular structures. In sagittal (a) reconstruction, it is visible the structure vascular origin, communicating anteriorly with the superior vena cava (black arrow) and posteriorly with the azygos vein (white arrow) Origin: © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020
Description: Sagittal (a) and axial (b) reconstructions of a post-contrast thoracic CT scan with acquisition in early venous phase showing the lesion (star) with contrast enhancement similar to adjacent vascular structures. In sagittal (a) reconstruction, it is visible the structure vascular origin, communicating anteriorly with the superior vena cava (black arrow) and posteriorly with the azygos vein (white arrow) Origin: © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020
**Description:** Chest radiogram (AP) revealing an enlarged mediastinum with a well-defined mass in the upper right mediastinum in the right tracheobronchial angle (white arrows)

**Origin:** © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020
Figure 4

Description: PET/CT scan with no abnormal captation in the mediastinum, namely the posterior mediastinum lesion. Origin: © Department of Radiology, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal, 2020.