Case Report

Migration of the azygos vein from the azygos fissure to the mediastinum

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ABSTRACT

We report a case of migration of the azygos vein from an azygos fissure into the mediastinum following a large right pleural effusion.
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Introduction

The azygos fissure is an anatomic variant which results from the infolding of the right apical pleura into the right upper lobe to accommodate an aberrant azygos vein. In the present report, we describe the migration of the azygos vein from an azygos fissure to the mediastinum following a large right pleural effusion.

Case presentation

A 69-year-old woman with Turner's syndrome and chronic obstructive pulmonary disease presented with progressive shortness of breath. She was assessed with a computed tomography (CT) pulmonary angiogram to exclude pulmonary embolism and was found to have an acute type A aortic intramural hematoma. The CT also demonstrated an azygos fissure containing the azygos vein (Fig. 1).

The patient underwent a Bentall procedure. A follow-up CT scan on the fifth postoperative day showed large pleural effusions, no evidence of pneumothorax, and extensive atelectasis of the right upper lobe (Fig. 2). The azygos fissure contained fluid, but the azygos vein was not identified. There was also no evidence of pneumothorax on any of the postoperative chest radiographs.

A subsequent CT scan of the chest performed 2 years later showed that the azygos vein had migrated to the mediastinum leaving behind an empty azygos fissure and a persistent azygos lobe (Fig. 3).

The disappearance of the azygos vein from the azygos fissure was also evident in a postoperative chest radiograph obtained at 3 months when compared to a radiograph obtained several years before (Fig. 4).

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Discussion

The azygos lobe is a normal variant with an incidence of about 0.4%-1.2% [1]. It is postulated to result from failure of the right posterior cardinal vein, a precursor of the azygos vein, to migrate over the apex of the lung to its normal mediastinal position at the tracheobronchial angle. Instead, the aberrant vessel penetrates the lung, bringing along the parietal and visceral layers of the pleura. The lung invaginates creating a pseudofissure made up of 4 layers of pleura called the azygos fissure. The azygos vein occupies the bottom of the azygos fissure and drains into the superior vena cava at a variable distance above the tracheobronchial angle.

The azygos vein appears as a tear-drop density at the inferior end of the azygos fissure on chest radiographs and as a curvilinear tubular structure traversing the right upper lobe on CT images. The lung medial to the fissure is referred to as the azygos lobe, although it is not an independent lobe.

As the pleural layers are not fused, the pleural space within the azygos fissure can fill with gas or fluid in cases of pneumothorax or pleural effusion, respectively. This in turn may displace the azygos vein out of the fissure allowing it to migrate to the mediastinum. We believe that the pleural fluid in the fissure was responsible for the displacement of the azygos vein in our patient.

Migration of the azygos vein from the azygos fissure is a rare phenomenon with only a handful of reports in the English-language medical literature [1-6]; the largest series described 6 patients [1]. The majority of the cases were associated with pneumothorax [1,2,5,6], and only a minority were related to pleural effusion [3]. There are also reports of a migrating azygos vein in a patient who developed acute kyphosis from a dorsal vertebral fracture [4] and in patients with...
Fig. 3 – Contrast-enhanced CT chest of the same patient performed 2 years later. Coronal and transverse images show an empty azygos fissure (green arrows) and a high-riding azygos vein in the mediastinum (red arrows). (Color version of figure is available online.)

Fig. 4 – (A) Chest radiograph in the same patient obtained several years before the aortic intramural hematoma developed. Note the characteristic teardrop appearance of the azygos vein (red arrow) at the bottom of the azygos fissure (green arrows). (B) Chest radiograph obtained 3 months following a Bentall procedure shows disappearance of the azygos vein and an empty azygos fissure (green arrows). (Color version of figure is available online.)

prolonged vomiting or coughing, presumably as result of increased intrathoracic pressure [1].

Azygos vein migration is most likely of no clinical significance and should be viewed as an imaging curiosity. When encountered, it raises the suspicion of a previous large pleural effusion or pneumothorax.

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