Original article

Anatomic variation of thorax drainage: absence of accessory hemiazygos vein

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Abstract

Formed by the azygos, hemiazygos and accessory hemiazygos veins, this system is responsible for the venous drainage of the thorax and partially of the abdomen. Abnormalities of this system are not uncommon, and many are referred to in literature. The complete agenesis of the accessory hemyazigos vein is associated with complete regression of the left posterior cardinal vein or atrophy of the left subcardinal vein. The reported case consists of the complete absence of the accessory hemiazygos vein, culminating in the drainage of the 4th, 5th, 6th, 7th and 8th left posterior intercostal veins directly into the azygos vein of a male cadaver. The importance of the theme is due to the necessity of recognizing patterns and frequencies of these variations when facing procedures addressing the mediastinum or the major vessels.

Keywords: azygos system, accessory hemiazygos vein, anatomic variation, thorax drainage, azygos vein.

1 Introduction

The azygos venous system is considered to be a communication between the systems of the superior and inferior venas cava, and has therefore been an object of interest since the beginnings of anatomical research, having been mentioned by Galen, as early as the IIIrd Century and also by Vesalius, in the VIth Century. Eustachio has shown, without further comment, in 1722, the connection between the hemiazygos vein and the left renal vein (BOWSHER, 1954).

Formed by the azygos, hemiazygos and accessory hemiazygos veins, this system is responsible for the venous drainage of the thorax and partially of the abdomen. The azygos vein is formed by the junction of the right subcostal vein with the right ascending lumbar vein and rises in the posterior thoracic wall along the right side of the vertebral column. The esophagic, mediastinal, bronchial and right supreme intercostal veins are tributaries to the azygos vein, as well as the posterior intercostal veins from the 4th to the 11th intercostal spaces and, most importantly, the accessory hemiazygos and hemiazygos veins. The latter corresponds to the azygos vein on the left side of the thorax, possessing, however, as tributaries, the 9th, 10th and 11th left posterior intercostal veins. The accessory hemiazygos vein is formed as a continuation of the 4th left posterior intercostal vein and receives as affluents the veins from the 5th to the 8th left intercostal spaces (DALLEY and MOORE, 2001; GARDNER, GRAY and O'RAHILLY, 1988).

According to Kocabiyik, Kutoğlu, Albay et al. (2006), the anomalies of the azygos system are not uncommon, and many of these are related in literature. The variations of the hemiazygos and accessory hemiazygos veins have been reported by Bergman, Afifi and Miyauchi (2011) in a study consisting of 200 cases, in which the incidence of abnormalities was over 26%. The complete agenesis of the accessory hemyazigos was reported by Ozbek, Daleik and Colak (1999), and its absence is associated with complete regression of the left posterior cardinal vein or atrophy of the left subcardinal vein. (KOCABIYIK, KUTOĞLU, ALBAY et al., 2006).

2 Material and methods

Dissection of male cadaver, according to the dissection technique described by Mizers and Gardner (1963), within

the Anatomy Department of the Faculdade de Ciências Médicas de Minas Gerais. Images have been registered as digital photography. A literature review on the subject followed, mainly through scientific articles, text books and anatomical atlas.

3 Results

During the dissection of the posterior mediastinum of the cadaver, it has been observed that the accessory hemiazygos vein was absent, and that the 4th, 5th, 6th, 7th and 8th posterior intercostal veins on the left side drained directly to the azygos vein (Figure 1). This abnormality is said to occur in 15% of the cases, along with absence of the hemiazygous vein (BERGMAN, AFIFI and MIYAUCHI, 2011). In this reported case, the azygos vein was situated along the medium line of the vertebral spine. The hemiazygos vein was normal, being formed by the junction of the left subcostal and left ascendant lumbar veins and ascending along with the left anterolateral face of the thoracic vertebras. It crossed to the right side posteriorly to the aorta and esophagus, to unite with the azygos vein at the level of 9th, in a common trunk with the 9th left posterior intercostals vein, which was well developed. The left superior intercostal vein drained the upper intercostal spaces. The superior and inferior venas cava were absolutely normal.

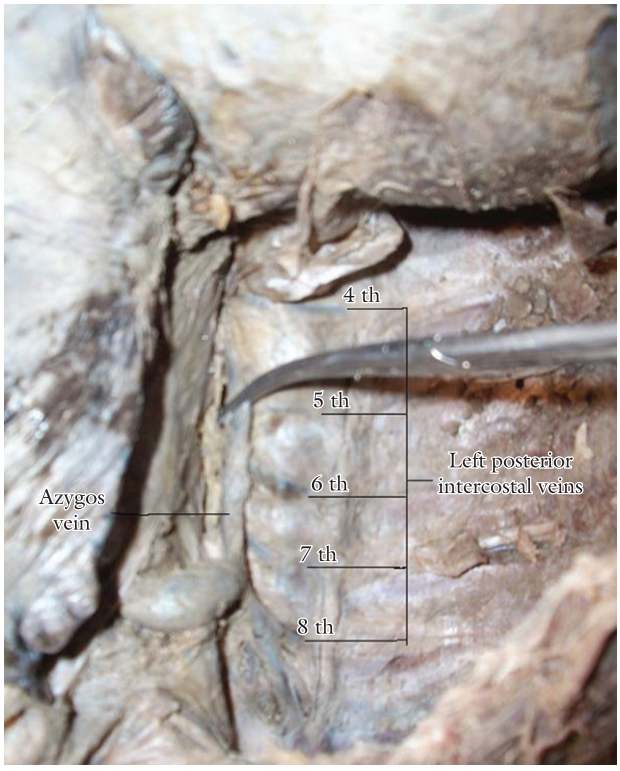

Figure 1. The 4th, 5th, 6th, 7th and 8th left posterior intercostal veins are being drained directly to the azygos vein because of the absence of the hemiazygos vein.

4 Conclusion

The analyzed case presents one of the many possible patterns of absence of the accessory hemiazygos vein, reported in 15% of the cases in literature (along with the absence of the hemiazygos vein), in which the drainage of the posterior intercostal veins of the 4th, 5th, 6th, 7th and 8th left intercostal spaces was directly into the azygos vein. This condition, among others, is generally explained by defective embrionary development (KOCABIYIK, KUTOĞLU, ALBAY et al., 2006). The relative importance of detection of variations of the azygos system, especially through CT scans and MRI of the mediastinum must be remarked. It is important to bear in mind these patterns of variations when facing procedures that address the major vessels (QUADROS, POTU, GURU et al., 2009).

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