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Contribution to Hemiazygos Vein Anomalies

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Abstract

Hemiazygos vein drains venous blood from the left lower intercostal spaces and enters into azygos vein usually at the level of T8 vertebra. Despite the fact that venous variations are more common, in our work we describe a rare variation of the hemiazygos vein caused probably by the persistence of the embryonic connections.

Keywords: Hemiazygos vein; Variability

Introduction

Hemiazygos vein is formed on the left side of the thorax, ascends in front of the vertebral column up to the level of T8 vertebra. On this level the hemiazygos vein crosses the vertebral column behind the aorta, oesophagus and thoracic duct and drains into the azygos vein. Its usual tributaries are the lowest left 3 intercostal veins, whereas its main trunk is formed by the union of the left ascending lumbar vein and the left subcostal vein together with oesophageal rami and mediastinal rami. The lower end of the hemiazygos vein is usually connected with the left renal vein and in described 40% it is also connected with the accessory hemiazygos vein [1-4]. From the embryonic developmental point-of-view the hemiazygos vein is formed from the cranial part of the left subcardinal vein. Usually an anastomosis is developed between the right and left subcardinal veins in the level of T6 to T7. Subsequently the left subcardinal vein is submitted to the complete or partial atrophy cranially from the anastomosis or persists as the accessory hemiazygos vein [5]. The venous variations are much more frequent than the arterial ones. The anatomical (so also the venous) variations are clinically important especially for the surgeons of all fields and also for the radiologists.

Material, Methods and Results (Casuistry)

In 2011 during the routine dissection practicals (thoracic and abdominal cavity) of the 1st year medical students several connections between the azygos and hemiazygos veins were observed in the 65 years old male cadaver after the evisceration of the thoracic cavity: the hemiazygos vein was receiving the last 3 left intercostal veins and was drained itself into the azygos vein, whereas was also connected with the 8th left intercostal vein draining into the azygos vein directly and both were connected with the accessory hemiazygos vein draining the upper 7 left intercostal spaces and drained also to the azygos vein (Figure 1).

We supposed that the described variation represents the persisting embryonic anastomoses between the right and left subcardinal veins, what corresponds also with the level of the found anastomoses (T7 to T8) (Figure 2).

Discussion and Conclusion

The developmental anomalies of the azygos and hemiazygos veins are quite often due to the more complex origin of the venous system. The venous system starts to develop in the early stages of the intrauterine period in the paired and symmetric arrangement to be asymmetric in its final period. The development of the thoracic and abdominal venous system is a complex process including the formation of several anastomoses between the 3 paired embryonic veins: posterior cardinal veins, subcardinal veins and supracardinal veins chronologically developed between the 4th and 8th week of the embryogenesis. The azygos vein system develops from the cranial parts of the right (azygos vein) and left (hemiazygos vein) subcardinal veins [5-6].

The human venous variations are much more frequent, but they have undisputable clinical importance from the point of view performed surgical procedures in the adjacent region and also for the radiologists commenting the results of the various imaging examinations. Our described variation is not so often, as it is evident from the listed reference resources [1,7,8]. We assume,

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Figure 1: The opened thoracic cavity (after evisceration) of the 65 years male cadaver.

Figure 2: The opened thoracic cavity (eviscerated)-left side, a detail: several anastomoses between azygos (the right side) and hemiazygos (left side) veins in the level of T7-T8 vertebras.

that our description should be useful for the thoracic surgeons, spinal orthopedists by their limitation of the possible damage during the performed surgical procedures around the oesophagus, thoracic aortic aneurysms, mediastinoscopy, by the spinal surgical procedures from the ventral approach and also for the radiologists describing the imaging test results of the mentioned region.

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