

PREAORTIC INTERAZYGOS VEIN: A CASE REPORT

Srijit Das and Shipra Paul

Department of Anatomy, Maulana Azad Medical College, New Delhi, 110002, India.

ABSTRACT

This report describes a case of multiple anomalies of the azygos venous system. On the left side, the accessory hemiazygos vein was formed by the 4th - 6th intercostal veins ventral to the aorta. The 7th and 8th intercostal veins united to form a common stem that joined the accessory hemiazygos vein at the level of the 8th thoracic vertebra to create a common trunk. The hemiazygos vein formed by the 9th - 11th intercostal veins joined the common trunk to form a dilated vein termed the interazygos vein. This vein crossed the descending aorta ventrally to open into the azygos vein on the right side. Anomalies of the azygos venous system are common, but the incidence of hemiazygos and accessory hemiazygos veins communicating ventral to the aorta is very low. The development of communications between the left intersegmental veins and the azygos vein ventral to the descending aorta could explain such anomalies. Abnormal communications of these veins anterior to the aorta may mimic aneurysms, tumors and enlarged lymph nodes, and could be misinterpreted by radiologists in computed tomography and magnetic resonance imaging scans. Surgeons operating on the posterior mediastinum must be aware of such anomalies in order to avoid accidental damage to the blood vessels in this region.

Key words: Anomalous, azygos, interazygos, preaortic, vein

INTRODUCTION

The azygos vein is the continuation of the lumbar azygos vein and is formed by union of the ascending lumbar vein and the right subcostal vein at the level of the 12th thoracic vertebra. The azygos vein enters the thorax through the aortic opening in the diaphragm and ascends in the posterior mediastinum to drain into the superior vena cava at the level of the 4th thoracic vertebra. The tributaries of the azygos vein include the right superior intercostal vein formed by the 2nd, 3rd, and the 4th intercostal veins, and all posterior intercostal veins except the first, and the accessory hemiazygos, hemiazygos, esophageal, right bronchial and pericardial veins [9].

Anomalies of the azygos venous system are common [6,7,9]. Very rarely, the communications between the accessory hemiazygos and hemiazygos veins form common channels ventral to the aorta [7]. These common channels, also known as interazygos veins, cross ventral to the aorta and are of considerable clinical significance to surgeons operating on the posterior mediastinum [2]. Accidental manipulation of these vessels may lead to

unnecessary bleeding, and anomalies in these structures may be misinterpreted by radiologists. In this report, we describe the anatomy of an anomalous channel that communicates ventral to the aorta and discuss its clinical implications.

CASE REPORT

During routine dissection in our department, we detected multiple anomalies in the azygos venous system in a 60-year-old male who died of cardiorespiratory arrest. While dissecting the posterior mediastinum, we observed that the accessory azygos vein was formed by the union of the 4th - 6th intercostal veins on the left side. The accessory hemiazygos vein descended obliquely, ventral to the aorta. The 7th and 8th intercostal veins joined to form a common stem that subsequently united with the hemiazygos vein at the level of the 8th thoracic vertebra, ventral to the aorta. The hemiazygos vein that was formed by the 9th - 11th intercostal veins, joined the common channel to form a dilated interazygos vein. This vein crossed ventral to the aorta to open into the azygos vein on the right side. The azygos vein opened into the superior vena cava as usual. No other abnormalities were observed. Figure 1 shows the arrangement of the various vessels involved in these anomalies.

Correspondence to: Dr. Srijit Das
Assistant Professor, Department of Anatomy, Maulana Azad Medical College, Bahadur Shah Zafar Marg, New Delhi-110002, India, Tel: (91) (11) 23239271 Ext 124/128, E-mail: das_srijit23@rediffmail.com

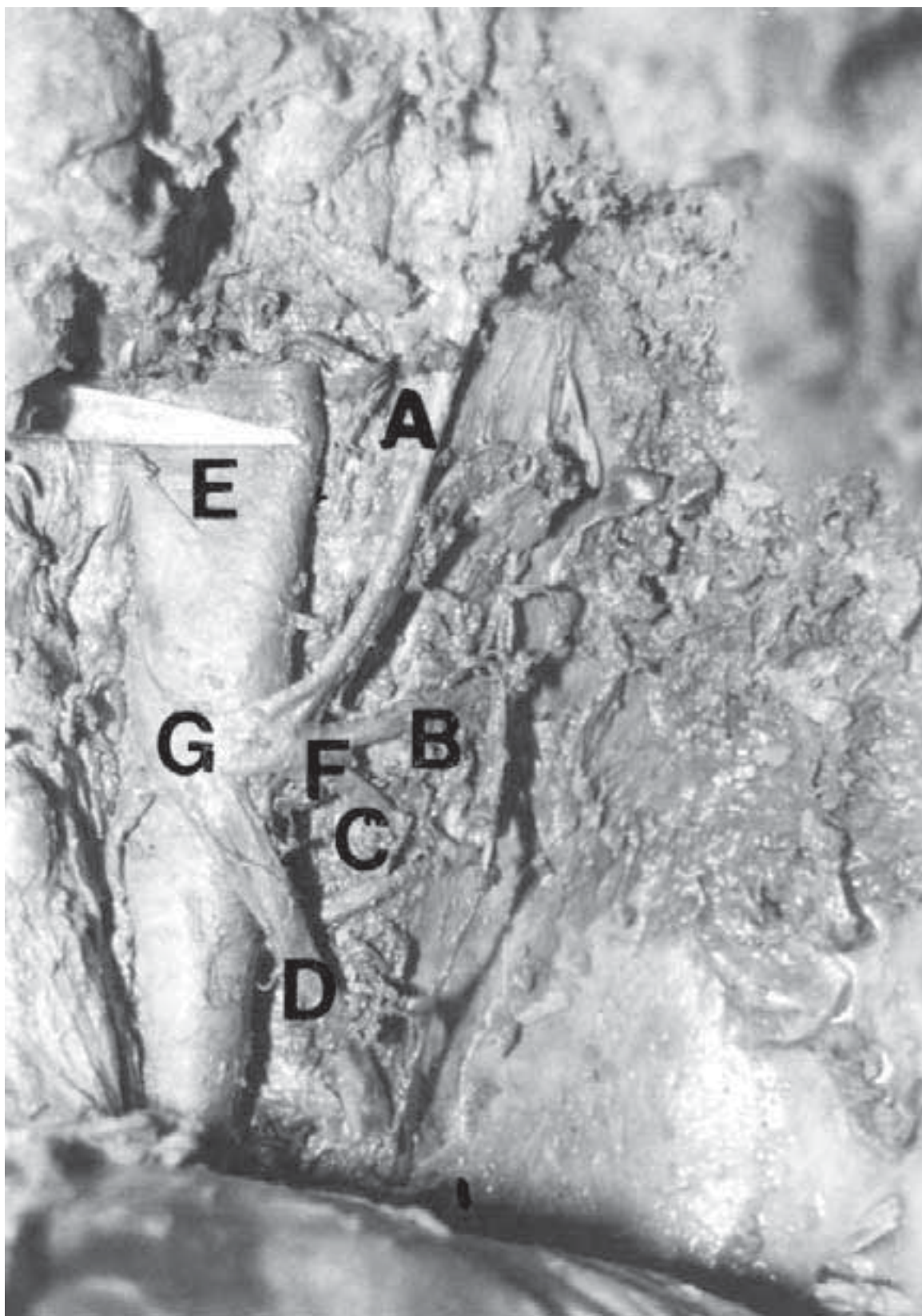


Figure 1. Photograph showing dissection of the posterior mediastinum. **A** - accessory hemiazygos vein, **B** - seventh intercostal vein, **C** - eighth intercostal vein, **D** - hemiazygos vein, **E** - descending aorta, **F** - common stem formed by union of the 7th - 8th intercostal veins and the accessory hemiazygos vein, and **G** - interazygos vein passing anterior to the aorta.

DISCUSSION

The azygos venous system consists of veins on each side of the vertebral column that are responsible for draining the back and the walls of the thorax and abdomen. The hemiazygos vein is more variable in its origin and course than the azygos vein [4]. In the case reported here, the hemiazygos vein was formed by the 9th - 11th intercostal veins, which is considered to be the normal situation.

The accessory hemiazygos vein normally receives the 5th - 8th intercostal veins but, in the present case, this vein received the 4th - 6th intercostal veins. The drainage pattern seen here, in which the 7th and 8th intercostal veins joined the accessory hemiazygos vein to form a common stem that was later joined by the hemiazygos vein to create a common channel, is a rare finding. The drainage pattern in which the accessory hemiazygos vein joins the hemiazygos vein is well documented in standard textbooks of anatomy [9].

The formation of a common channel that crosses the descending aorta ventrally is rarely seen in clinical studies. The incidence of such preaortic communications is reported to be 2.5% [4]. In an earlier study of 195 cadavers, preaortic crossing of the interazygos vein was observed in 3.6% of the cases [7]. Interestingly, the first reported case of preaortic crossing of the interazygos vein seen in computed tomography was detected in a 53-year-old male [8].

The development of a preaortic azygos vein may be explained embryologically. Normally, the subcentral veins develop on the dorsal aspect of the aorta and connect the right and left venous lines [9]. In the present case, there may have been an abnormal communication between the left intersegmental veins and the azygos veins on the ventral aspect of the aorta, without the involvement of subcentral veins. This communication may have persisted and given rise to the anomalies seen here [5].

Anomalies of the venous system are well-known. Venous anomalies are often detected only during surgery. The most troublesome intra-operative hazard is hemorrhage, which is mainly of venous origin [1].

Accidental injury to venous developmental anomalies can lead to excessive hemorrhaging during surgical interventions. Although various surgical approaches have been described to deal with this problem, we believe that the best way to avoid such situations is to have an awareness and knowledge of the expected venous anomalies. A knowledge of such anomalies prior to operative procedures could be useful to surgeons operating on the posterior mediastinum. An anatomical knowledge of these developmental anomalies is also important for radiologists, who may misinterpret these structures as an aneurysm, tumor or enlarged lymph node in computed tomography and magnetic resonance imaging scans [3]. The case reported here clearly emphasizes the need to use various imaging procedures to obtain pre-operative scans of the venous system.

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