

CASE REPORT**ANATOMIC VARIATION OF CELIAC AND TESTICULAR ARTERIES****Osabutey CK**

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ABSTRACT

A case of an anatomic variation in the branching of the celiac trunk in association with a variation in the course of right testicular artery is reported. It was discovered that the celiac trunk emerged from the ventral aspect of abdominal aorta as two roots, which are named hepatogastric and splenomesenteric trunks. The hepatogastric root was located superior to the splenomesenteric root. The branches from each of the roots also varied, the hepatogastric root branched to left gastric, gastroduodenal and hepatic arteries. The splenomesenteric root gave rise to splenic and superior mesenteric arteries. The superior mesenteric branch gave an accessory hepatic artery. In the same cadaver, the right testicular artery also showed variation. The current cases were evaluated in points of embryology, the clinical significance as well as the relevant literature.

Keywords: Celiac trunk, splanchnic arteries, anatomic variations, Testicular artery

INTRODUCTION

Acute obstruction of the CT would therefore lead to the infarction of the structures it supplies (Bannister et al, 1999). The testicular arteries most commonly arise from the anterior lateral aspect of the abdominal aorta at the level of second lumbar vertebra (Pai et al. 2008). Anatomic variations in the testicular arteries have been described by various authors; (Nayaket al. 2007, Pai et al. 2008; Misianiet al. 2012) as these vessels arise from variable origins such as the renal, suprarenal and lumbar arteries. Variation in testicular artery described here has already been reported as individual cases of variations (Bhaskaret al., 2006), but the

occurrence of the variations of the testicular artery and CT in the same person have not been reported in the literature to the best of my knowledge. While vascular anomalies are usually asymptomatic, they may become important in the management of patients prior to surgical procedures as well as in patients undergoing diagnostic angiography for gastrointestinal bleeding, celiac axis compression syndrome, or transcatheter therapy. In this paper, a case of an anatomic variation of the branching of the celiac trunk in association with a variation in the course of right testicular artery is reported in the same person.

CASE

During routine dissection, celiac trunk emerged from the ventral aspect of abdominal aorta as two roots namely hepatogastric (HGR) and splenomesenteric (SMR). The hepatogastric root was located superior to the

splenomesenteric root (Figure 1). The branches from each of the roots also varied the hepatogastric root branched to left gastric artery (LGA) and a hepatic branch (HA). The splenomesenteric root gave rise to splenic artery (SA) and superior mesenteric

artery (SMA). The superior mesenteric artery gave an accessory hepatic artery (AHA).

In the same cadaver, the right testicular artery emerged as two roots (anterior and posterior roots) from the lateral aspect of the

abdominal aorta. The two roots fused together at the right lateral border of the inferior vena cava. The posterior root crosses the inferior vena cava posteriorly, as the anterior root crosses it in front (Figure 2).

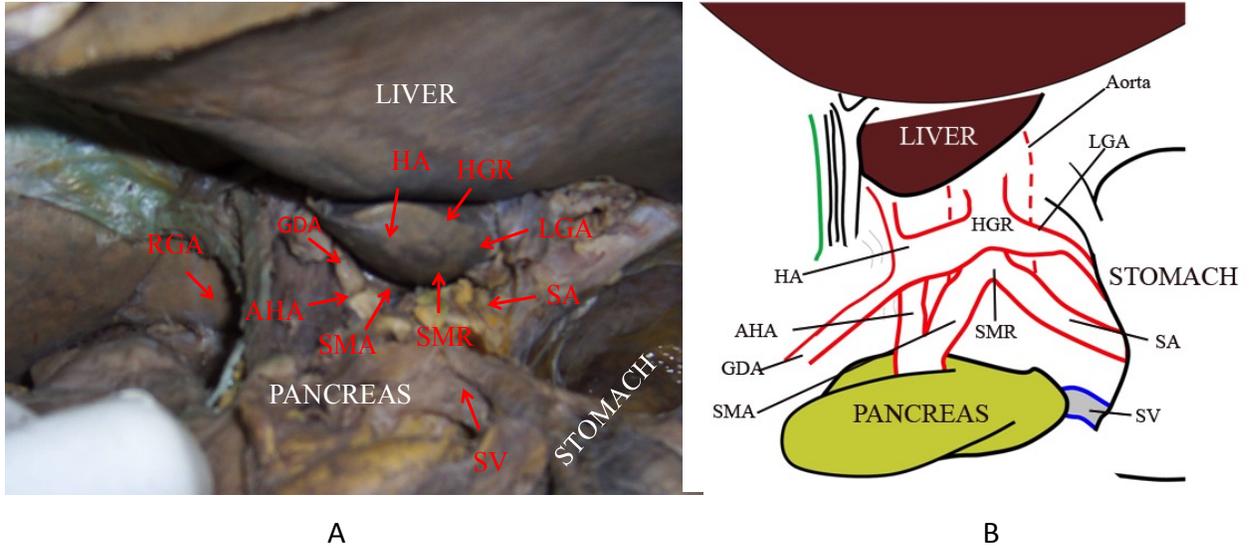


Figure 1: **A.** Photograph of posterior abdominal wall illustrating the TWO roots of the celiac trunk – hepatogastric root (HGR) and splenomesenteric root (SMR) and their branches. Superior mesenteric artery (SMA), splenic artery (SA), left gastric artery (LGA), right gastric artery (RGA), gastroduodenal artery (GDA) and accessory hepatic artery (AHA). **B.** Schematic drawing of the two roots of the celiac trunk and their branches indicated by red lines

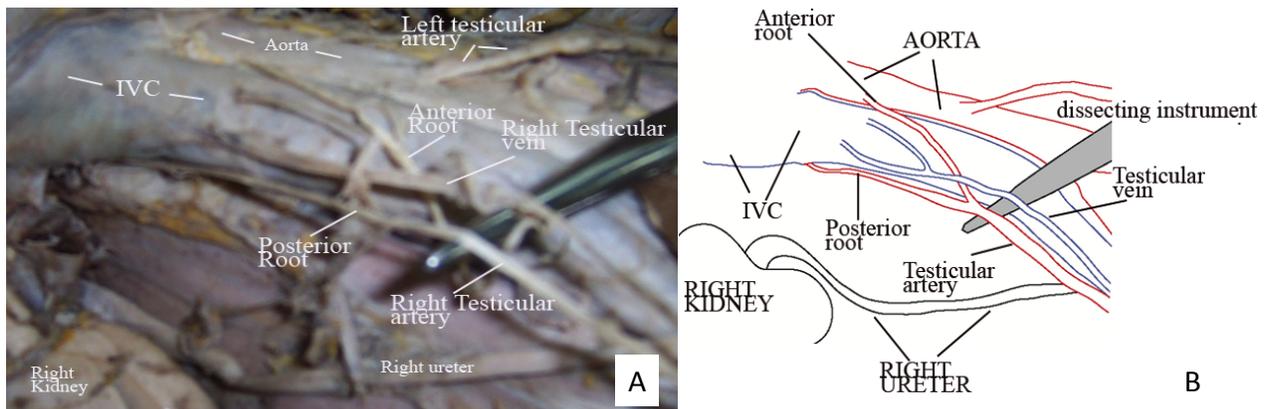


Figure 2: A. Photograph of the posterior abdominal wall illustrating the anterior and posterior roots of the testicular artery. B. Schematic drawing of the two roots of the right testicular artery. Note that the posterior root passes behind the IVC (inferior venacava) as the anterior root crosses it in front. The right testicular vein opens into the IVC at two points (veins marked blue and arteries marked red).

DISCUSSION

In the current study, an abnormality of the celiac trunk branching associated with the right testicular artery lying abnormally posterior to the inferior vena cava is reported for the first time.

Normal celiac trunk exhibits trifurcation into left gastric artery common hepatic artery and splenic artery has been reported with a frequency of 86% (Vandamme and Bonte, 1985; Matoba *et al.* 2003, Ugurelet *et al.*, 2010). Anatomical variation of celiac trunk branches have been described and classified into eight subtypes (Uflacker 1997). Gastrosplenic (gastric arteries and splenic artery have common origin from the aorta) and hepatosplenic trunks (hepatic artery and splenic artery have a common origin) are the most frequent types representing 4 and 3 percent of cases respectively. Celiac trunk bifurcation is present in 8% of cases (Ugurelet *et al.* 2010). Splenomesenteric trunk, as in current case study, is a very rare variant and had not been described by Uflacker (1997). Michels (1966) and Ugurelet *et al.* (2010) in separate studies however, reported an occurrence rate of below 1%. This extensive literature reviews suggest that variations in CT branches are numerous and may display population differences. Surgeons and radiographers should be aware of these vast variations during retroperitoneal operations and in diagnostic procedures.

Normal anatomy of hepatic arteries is found in 52% of cases (Michels, 1966). Michels, (1966) described 10 variant subtypes. In the current study, two hepatic arteries supply the liver, one (hepatic artery proper) originates from the hepatogastric and the other (accessory hepatic artery) from superior mesenteric artery (SMA). Hepatic artery originating entirely from SMA is called aberrant replacing hepatic artery (Bannister *et al.*, 1999). Michels (1966) reported the presence of an aberrant artery replacing the hepatic in 17% of cases.

In the current case, celiac trunk exhibits bifurcation with gross variation in their branches. The anatomical variations of the celiac trunk are due to unusual developmental arterial migration and rearrangement of the ventral splanchnic arteries (VSA). The VSA are initially paired vessels distributed to the capillary plexuses in the wall of the yolk sac. After the fusion of the dorsal aortae, the VSA merged as unpaired trunks supplying arterial blood to the developing digestive tube. At the subdiaphragmatic region, longitudinal anastomotic channels connect each of the VSA forming dorsal and ventral splanchnic anastomoses (Ennablie and Niviero, 1967). These anastomotic vessels obviate the need for so many VSA; thus the VSA are reduced to three: celiac trunk; superior mesenteric and inferior mesenteric arteries. Some of the anastomotic vessels persist as branches of the trunk. Above the diaphragm, however, a variable number of VSA persists (usually 4 or 5) supplying arterial blood to the thoracic part of the oesophagus.

What is interesting is the association between the CT (derived from VSA) variations and the abnormal relation of the right testicular artery (derived from LSA) with inferior vena cava. The renal arteries are also derived from the LSA. Thus the current observation supports the report by Ugurelet *et al.*, (2010) that there are correlation between celiac trunk/or hepatic artery variations and renal artery variations. The implication of this correlation is that abnormality of the vascular structures of organs supply by VSA may be associated with abnormality of the vascular structures of organ supply by LSA.

In the current case, the two roots of the right testicular artery suggests that two right testicular arteries were supplying the developing right testis but fused together as the testis descended from its embryonic

position on the posterior abdominal wall to its adult position in the scrotal sac, through the anterior abdominal wall. Testicular artery is not the sole arterial blood supply to the testis which also receives arterial blood from the cremasteric branch of inferior epigastric artery.

In conclusion, knowledge of these variations and their anatomical relation to the adjacent structures is important in radiological procedure and averting catastrophic haemorrhage during retroperitoneal surgery.

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