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Short communication

Variations of inferior phrenic and coeliac arteries

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ABSTRACT

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The coeliac artery is ventral visceral branch of the abdominal aorta and it supplies supracolic organs. It divides into three branches namely the left gastric, the common hepatic & the splenic arteries. Vascular variations are constantly observed in dissection of adult cadavers. Though they are usually asymptomatic, prior knowledge about the anomalous branching pattern of the celiac trunk is essential to successfully accomplish surgical, oncological, interventional procedures. The present variation was observed during routine dissection of a female cadaver in department of Anatomy, Dr. Vaishampayan Memorial Government Medical College, Solapur. The branches of the coeliac trunk were traced carefully. Unilateral variation in branching pattern of the coeliac trunk (CT) in upper anterior wall of the abdominal aorta of a male cadaver was noted. This coeliac trunk had normal relations with the abdominal viscera. After giving rise to its normal branches that is left gastric (LG), common hepatic (CH), splenic (S) arteries, it also gave origin to left middle suprarenal (LMS) artery. Right and left inferior phrenic arteries were arising as common trunk with right middle suprarenal artery from anterior wall of aorta right to origin of coeliac trunk. Presence of such variation is worth considering in procedures such as intra arterial chemotherapy, radioembolisation, liver transplantation, pancreaticoduodenectomy.

1. Introduction

The coeliac artery is ventral visceral branch of the abdominal aorta and it supplies supracolic organs. It divides into three branches namely the left gastric, the common hepatic & the splenic arteries. This trifurcation was first described by Haller (1756). This "tripus Haller" was and is still being considered to be the normal appearance of coeliac trunk.

The inferior phrenic arteries arise from each side of the abdominal aorta just under the diaphragm. Vascular variations are constantly observed in dissection of adult cadavers (Lipshutz 1917). Reported variations in the branching pattern of coeliac trunk include absence of the trunk (Vandamme and Bante 1985), anomalous branches (Cavdar et al 1997; Nonent et al 2001; Katagiri 2007). Though they are usually asymptomatic, prior knowledge about the anomalous branching pattern of the coeliac trunk is essential to successfully accomplish surgical, oncological, interventional procedures.

2. Materials and methods

The present variation was observed during routine dissection of a female cadaver in department of Anatomy, Dr. Vaishampayan Memorial Government Medical College, Solapur. The branches of the coeliac trunk were traced carefully.

3. Results

Unilateral variation in branching pattern of the coeliac trunk (CT) in upper anterior wall of the abdominal aorta of a male cadaver was noted (Fig. 1). This coeliac trunk had normal relations with the abdominal viscera. After giving rise to its normal branches that was left gastric (LG), common hepatic (CH), splenic (S) arteries, it also gave origin to left middle suprarenal (LMS) artery. Right and left inferior phrenic arteries were arising as common trunk with right middle suprarenal artery from anterior wall of aorta right to origin of coeliac trunk. Left inferior artery had tortuous course. Superior mesenteric artery arose from the front of aorta just below the coeliac trunk.

4. Discussion

Yalein et al reported that the coeliac trunk gave the common hepatic, the splenic and the left middle suprarenal and the common trunk which were constituted by the left gastric artery and the left inferior phrenic artery. Astlik observed unusual origins of the left superior suprarenal, the left middle suprarenal, the gastroduodenal and the right inferior phrenic arteries from the coeliac trunk in addition to its usual branches(1).

Variations in the splanchnic vessels are thought to have an embryological basis. Tandler (1904) suggested that ventral longitudinal anastomoses connected the four roots of the ventral splanchnic vessels and when the central two disappear, first and fourth roots remain connected via these anastomoses(3). The common hepatic, the left gastric and the splenic arteries usually originate from first root and the superior mesenteric from fourth root. Other factors that have been suggested to cause variations are the rotation of the midgut and its physiological herniation during development, leftward migration of the spleen and hemodynamic changes in the abdominal viscera (Reuter and Redman 1977). According to Mburu et al, the celiac trunk was found to be trifurcated in 61.7%, bifurcated in 17.9% and to give collaterals in 20.3% cadavers (3).

The inferior phrenic arteries constitute a pair of important vessels supplying multiple organs like diaphragm, adrenal glands, oesophagus, stomach, liver, retroperitoneum. The vast majority of the inferior phrenic arteries originate as separate vessels with near equal frequency from either the abdominal aorta or the coeliac trunk (8).

5. Conclusion

Presence of such variation is worth considering in procedures such as intra arterial chemotherapy, radioembolisation, vascular ligation and anastomoses, liver transplantation, pancreaticoduodenectomy, penetrating injuries to abdomen (2). In some cases, coeliac trunk will be compressed (Dunbar's syndrome) by overly large median arcuate ligament of the diaphragm (6). The precise localisation of the inferior phrenic artery is significant during attempt to control effectively hepatocellular carcinoma by chemoembolisation.

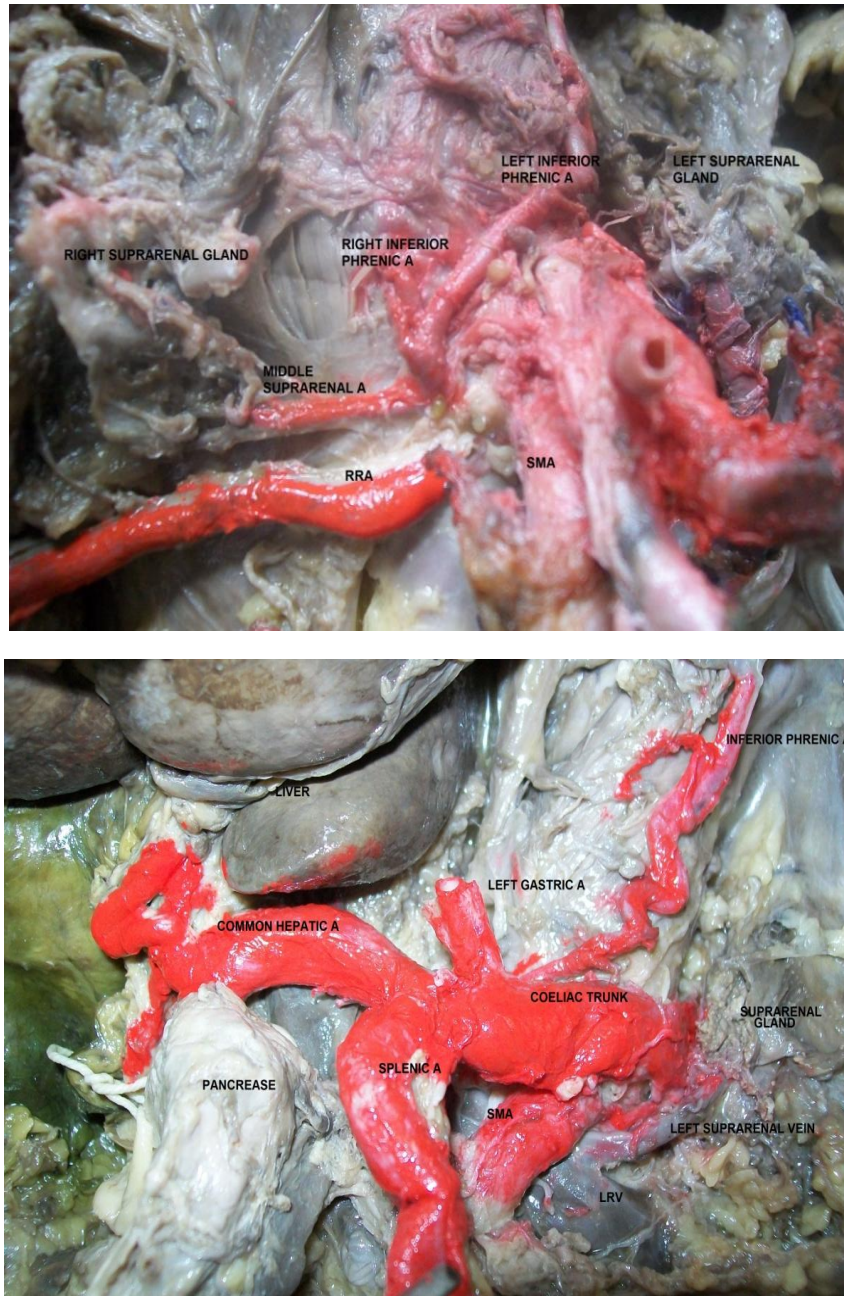


Fig. 1. Unilateral variation in branching pattern of the coeliac trunk (CT) in upper anterior wall of the abdominal aorta of a male cadaver.

Conflict of interest

We hereby state that there is no conflict of interest with the present research. There is also no financial relationship with the organisation where the present research has conducted.

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