Case report

Coeliaco-mesenteric trunk: a rare case report

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Abstract

The "main classic branches" of the coeliac trunk are hepatic, splenic and left gastric arteries. The present variation was observed during the abdomen dissection classes for the medical under graduates, in the Department of Anatomy at Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Gannavaram Mandal, Krishna District (AP), (INDIA), and a 52 year old male cadaver showed the coeliac trunk and superior mesenteric artery arose as common trunk from the ventral surface of the abdominal aorta at the level of the L1 vertebra. The coeliacomesenteric trunk is the rare variation. The incidence of coeliacomesenteric trunk variation was reported to be 2.7% by Parnanen and 1% by both Munger and Eaton. Complications in abdominal surgeries could be avoided with the accurate knowledge of the anatomical variations of coeliac trunk and superior mesenteric artery.

Keywords: coeliacomesenteric trunk, coeliac trunk, superior mesenteric artery.

1 Introduction

The "main classic branches" of the coeliac trunk are hepatic, splenic and left gastric arteries. During the normal development, both dorsal aortas give rise to many ventral segmental (omphalomesenteric) arteries. Both dorsal aortas fuse together in about four weeks. The ventral segmental arteries regress shortly after fusion of dorsal aortas. The dorsal aorta gives off segmental branches to the digestive tube (ventral splanchnic arteries), to the mesonepheric ridge (lateral splanchnic arteries) and intersegmental branches to the body wall (SADLER, 2008). Anatomic variations involving the visceral arteries are common (NAIDICH, NAIDICH and SPRAYREGEN, 1978; GUADAGNI, GOLA and MARSILI, 1995).

The coeliac trunk is an artery of foregut. The superior mesenteric artery is an artery of midgut (SADLER, 2008). The coeliac trunk supplies the liver, stomach, pancreas and superior part of duodenum. The superior mesenteric artery is the second ventral branch of the abdominal aorta. It runs anterior to the third part of duodenum and enters the mesentery of the small intestine. Its normal branches are inferior pancreatico-duodenal, jejunal, ileal, right colic and middle colic arteries. The superior mesenteric artery supplies a large part of the intestine from the descending part of duodenum to the mid-transverse colon (VARMA, PAMIDI, and VOLLALA, 2009; WILLIAMS, 1995) .

The vascular anomalies are usually asymptomatic. But knowledge of these vascular anomalies is important in handling patients undergoing diagnostic angiography for gastrointestinal bleeding, coeliac axis compression syndrome, or prior to an operative procedure or transcatheter therapy (YALCIN, KOCABIYIK, YAZAR et al., 2004). The main aim of this study is to describe the rare occurring coeliacomesenteric trunk variation in detail, which can be a guide and precaution during operative procedures in this region.

2 Case report

The present variation was observed during the abdomen dissection classes for the medical under graduates, in the Department of Anatomy at Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Gannavaram Mandal, Krishna District (AP), (INDIA), and a 52 year old male cadaver showed the following variations. The coeliac trunk and superior mesenteric artery arose as common trunk from the ventral surface of the abdominal aorta at the level of the L1 vertebrae. This trunk travelled for 0.6 cm and then bifurcated into the coeliac trunk and superior mesenteric artery. The coeliac trunk gives of three classical branches hepatic, splenic and left gastric arteries and additional branch right inferior phrenic artery (Figures 1 and 2). Right inferior phrenic artery supply right dome of diaphragm. Branching pattern and distribution of superior mesenteric artery was normal.

The caliber of coeliacomesenteric trunk was 0.9 cm. The caliber of coeliac trunk was 0.7 cm. The caliber of superior mesenteric artery was 0.6 cm. The caliber of splenic artery was 0.5 cm. The caliber of common hepatic artery was 0.5 cm. The caliber of left gastric artery was 0.3 cm. The caliber of right inferior phrenic artery was 0.2 cm. These entire caliber were measured with the help of small spreading caliper and scale.

3 Discussion

The coeliacomesenteric trunk is the rare variation. The incidence of coeliacomesenteric trunk variation was reported to be 2.7% by Parnanen(1945) and 1% by both Munger (1941) and Eaton (1917) (CAVDER, SEHIRII and PEKIN, 1998; MUNGER, 1941).

Cavder, Sehirii and Pekin (1998) found 0.8 cm long coeliacomesenteric trunk which arises from ventral aspect of the aorta at the level of L1. In this case of coeliacomesenteric trunk branching pattern of both coeliac trunk and superior

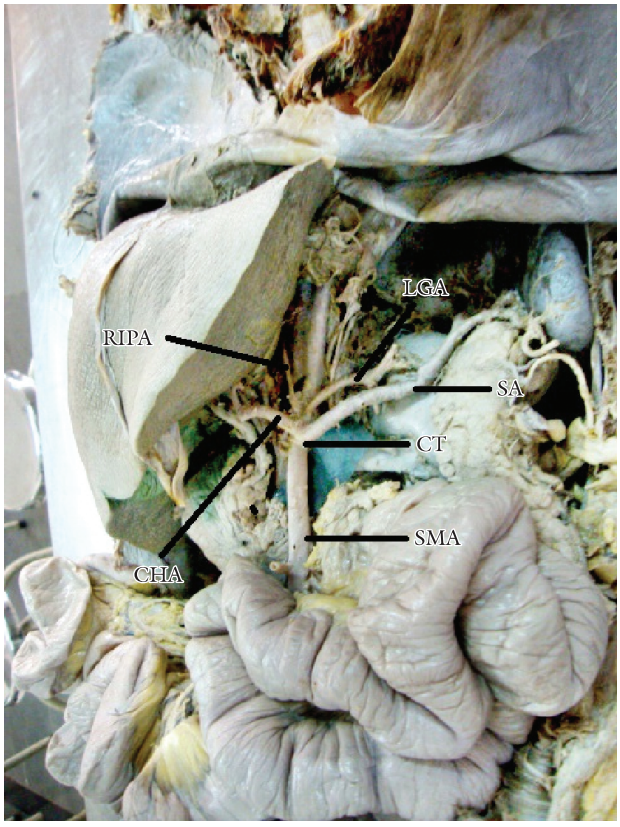

Figure 1. Showing dissection photograph of coeliacomesentric trunk which is get divided into celiac trunk and superior mesenteric artery. CMT – coeliacomesenteric trunk, CT – coeliac trunk, SMA – superior mesenteric artery, AA – abdominal aorta, RIPA – right inferior phrenic artery, CHA – common hepatic artery, SA – splenic artery, LGA – left gastric artery

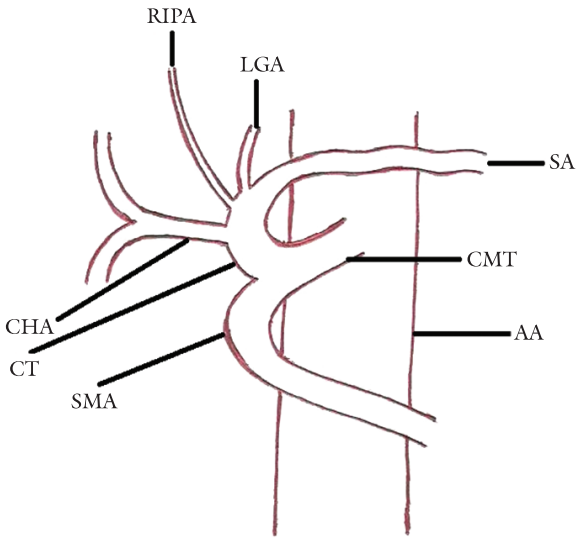

Figure 2. Showing schematic diagram of coeliacomesentric trunk which is get divided into celiac trunk and superior mesenteric artery. CMT – coeliacomesenteric trunk, CT – coeliac trunk, SMA – superior mesenteric artery, AA – abdominal aorta, RIPA – right inferior phrenic artery, CHA – common hepatic artery, SA – splenic artery, LGA – left gastric artery.

mesenteric artery was normal (CAVDER, SEHIRII, and PEKIN, 1998). Varma, Pamidi and Vollala found coeliacomesenteric trunk in 60 year-old male cadaver. This coeliacomesenteric trunk was divided into hepatomesenteric and gastrosplenic trunks. The hepatomesenteric trunk was divided into common hepatic and superior mesenteric artery. The gastrosplenic trunk was divided into left gastric and splenic arteries (VARMA, PAMIDI and VOLLALA, 2009). Cicekcibasi, Uysal, Seker et al. found 0.4 cm long coeliacomesenteric trunk. In this case of coeliacomesenteric trunk branching pattern of superior mesenteric artery was normal but coeliac trunk gave off two additional branches right and left inferior phrenic arteries (CICEKCIBASI, UYSAL, SEKER et al., 2004).

The anatomical variations of the coeliac trunk are due to developmental changes in the ventral segmental (splanchnic) arteries. These ventral segmental arteries supply the yolk sac, allantois and chorion. Three ventral segmental arteries remain as coeliac trunk, superior mesenteric artery and inferior mesenteric artery. During embryological period, there are longitudinal anastomoses between roots of upper four ventral segmental arteries of abdominal region. The two central roots disappear and the longitudinal anastomosis joins first and fourth root. The hepatic, splenic and the left gastric arteries originate at this longitudinal anastomosis. These branches usually become separated from the fourth root (the future superior mesenteric artery) below their last end. If this separation takes place at the higher level, one of the branches is displaced to the superior mesenteric artery. If the first or fourth root disappears, a coeliacomesenteric trunk will be formed (CAVDER, SEHIRII and PEKIN, 1998; MOORE and PERSAUD, 2003). In my case, the variation of the coeliac trunk may be due to developmental changes in the longitudinal anastomosis between above mentioned ventral segmental arteries.

In my opinion; arterial variations should not be ignored during abdominal operative procedures. Complications in abdominal surgeries could be avoided with the accurate knowledge of the anatomical variations of coeliac trunk and superior mesenteric artery. Prior knowledge about variant branching pattern of coeliac trunk and superior mesenteric artery is essential to successfully accomplish surgical, oncologic, or interventional procedures including lymphadenectomy around a hepatosplenomesenteric trunk, aortic replacement with reimplantation of the trunk, or chemoembolization of liver malignancies, all of which can potentially create significant morbidity because of the large visceral territory supplied by a single artery (LOSANOFF, MILLIS and HARLAND, 2007).

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