CASE REPORT

Hepato-spleno-mesenteric trunk: a case report

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Abstract

Hepatic, splenic and left gastric arteries are the "classical branches" of celiac trunk. The authors report a rare variation, hepato-spleno-mesenteric trunk with two classical branches of celiac trunk and superior mesenteric artery having common origin from the abdominal aorta. The third classical branch of the celiac trunk (left gastric artery) was directly arising from the abdominal aorta. Knowledge of variations concerning the celiac trunk and superior mesenteric arteries are of great important for both surgical approaches and angiographic examinations.

Keywords: hepato-spleno-mesenteric trunk, celiac trunk, superior mesenteric artery, left gastric artery, clinical aspects, embryological basis.

Introduction

As the anterior branches of the abdominal aorta (AA), celiac trunk (CT) and superior mesenteric artery (SMA) are most important as they supply most of the gastrointestinal tract. CT arises from the AA at the level of twelfth thoracic vertebra; its branches are left gastric artery (LGA), common hepatic artery (CHA) and splenic artery (SA). The CHA from its origin runs to the right to reach the first part of duodenum, there it divides into hepatic artery proper (HAP) and gastroduodenal artery (GDA). The HAP divides into right and left hepatic arteries at the porta hepatis. CT supplies the liver, stomach, pancreas and superior part of duodenum [1].

SMA arises at the level of L1 from the AA as a ventral branch. It runs down in front of the third part of the duodenum and enters the mesentery of the small intestine. Its branches are inferior pancreatico-duodenal, right colic, middle colic, jejunal and ileal. SMA supplies major part of the intestine, from the middle of the second part of the duodenum to the left one third of the transverse colon. Variations of these arteries and their relationship to surrounding structures are, therefore of particular importance from a surgical perspective [1, 2].

Material and Methods

The study involved abdomen dissection of a 50-year-old male cadaver of south Indian origin in the Department of Anatomy of Melaka Manipal Medical College, Manipal, India. The dissection of the abdomen was carried out according to the instructions by *Cunningham's Manual of Practical Anatomy* [3]. The dissection took place during the year 2007–2008. The body was preserved by the injection of a formalin based preservative (10% formalin) and stored at -4^{0}C.

Results

In the present specimen, CHA, SA and SMA were originated as a common trunk from the AA as hepato-spleno-mesenteric trunk (HSMT). The HSMT originated from the anterior surface of AA at the level of the L1 and exhibited a length of 2 cm (Figure 1).

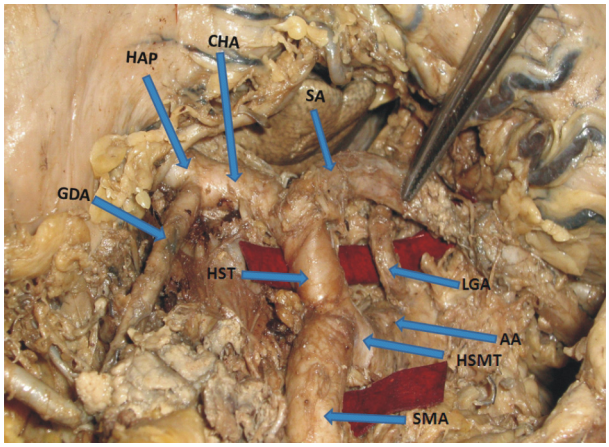

Figure 1 – ***Dissection of the abdomen showing the hepato-spleno-mesenteric trunk (HSMT) and its branches. AA, abdominal aorta; HSMT, hepato-spleno-mesenteric trunk; HST, hepatosplenic trunk; SMA, superior mesenteric artery; CHA, common hepatic artery; GDA, gastroduodenal artery; HAP, hepatic artery proper; LGA, left gastric artery; SA, splenic artery.***

The HSMT was divided into hepato-splenic trunk (HST) and (SMA). The HST was in turn divided into CHA and SA. The course and branching pattern of CHA was found to be normal. The SA was not tortuous in its course, before reaching the spleen it was giving few large gastric arteries to the stomach in the place of short gastric arteries. The SMA was running down, deep to the neck of the pancreas to supply the midgut. LGA (the third classical branch of the CT) was directly arising from the abdominal aorta about 1.5 cm above the HSMT.

Discussion

The fetal digestive tube is supply by four roots of the omphalomesenteric artery. There is a "longitudinal anastomosis between the first and fourth roots [4]. The anastomizing vessel remains with the first root and gives rise to CHA, LGA SA, while separation from the fourth root forms SMA. Separation of the "longitudinal anastomosis" higher than the SMA keeps one or more CT branches with the SMA, disappearance of the first or fourth root causes a common celiacomesenteric trunk [4, 5]. HSMT can be formed by an anomalous separation of the "longitudinal anastomosis" with only the LGA remaining with the first omphalomesenteric root, and the CHA and SA joining with the fourth root, thus forming a common trunk [6].

The incidence of HSMT is 0.5% [7]. The LGA may arise directly from the AA (6.7%) [8]. Studies on arterial variations of the abdomen showed that 86% of the CT exhibited the classical trifurcation out of 756 cases; the branches of CT may arise directly from SMA [7]. An incomplete CT, namely bifurcation accounted for 11.8%, besides these variations CT itself may be absent (0.4%), its branches may arise directly from the AA [9]. The CT may have only two branches, usually the SA and CHA, more rarely the LGA and SA, or it may have more than three branches. One of the usual branches of the CT may be replaced by a stem common to the inferior phrenic, by the right middle suprarenal and the right gastroepiploic, or more rarely by some other branches [10].

Knowledge of variations concerning the CT and SMA are of extreme clinical importance in the areas of the Appleby procedure [11], laparoscopic surgeries and radiological procedures in the upper abdomen. Prior knowledge of vascular variations in the abdomen is essential to successfully accomplish surgical, oncologic, or interventional procedures like lymphadenectomy, aortic replacement with reimplantation of the trunk, or chemoembolization of liver malignancies [6].

Conclusions

Vascular anomalies are usually asymptomatic; they may become important in patients undergoing diagnostic angiography for gastrointestinal bleeding, celiac axis compression syndrome, or prior to an operative procedure or transcatheter therapy. The present case may provide useful information for clinical applications in surgeries of the abdomen.

References

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