Case Report

Hepatomesenteric and gastrosplenic trunks - a case report

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Abstract

During routine dissection for undergraduate medical students, we observed hepatomesenteric and gastrosplenic trunks arising independently from abdominal aorta of 70 years old donated embalmed female cadaver in Department of Anatomy, Grant Govt. Medical College, Byculla, Mumbai, India. Hepatomesenteric trunk divided into common hepatic and superior mesenteric arteries. Both these arteries were found to have their usual course. Gastrosplenic trunk gave rise to left gastric and splenic arteries where right and left inferior phrenic arteries arose from the base of the trunk. Photographs of variations were taken for proper documentation and ready reference. Normally common hepatic artery arises from coeliac trunk which in turn arises from abdominal aorta and superior mesenteric artery arises directly from abdominal aorta. All these mentioned arteries are main supply of supracolic abdominal organs and variations are usually caused by anomalous regression of vitelline arteries. Knowledge of such case report is important for surgeries like liver transplantations and radiological procedures like angiography.

Keywords: Common hepatic artery, superior mesenteric artery, coeliac trunk, hepatomesenteric trunk, gastrosplenic trunk, vitelline arteries, abdominal aorta, angiography

1. Introduction

Common hepatic artery is largest branch of coeliac trunk in fetal and early postnatal life, but in adult it becomes intermediate between left gastric and splenic arteries (¹). It gives rise to right gastric, gastroduodenal, cystic arteries and continues as hepatic artery ‘proper’ to bifurcate into right and left hepatic branches supplying liver parenchyma (⁵). Replaced common hepatic artery arising from superior mesenteric artery is rare (¹). More commonly replaced or accessory right hepatic artery arises from superior mesenteric artery. Occasionally replaced or accessory left hepatic artery arises from left gastric artery. Such replaced arteries are further away from bile duct so they can be lifesaving in bile duct cancer Knowledge of such variations is important for liver transplantation (⁵). Superior mesenteric artery arises from abdominal aorta 1 cm below coeliac trunk. Normally superior mesenteric artery gives off jejunal, ileal, ileocolic, right colic and middle colic branches. It may arise from common coeliacomesenteric trunk and may give off common hepatic, gastroduodenal, accessory right hepatic, accessory pancreatic or splenic arteries (¹). At the end of the 4th week of gestation paired dorsal aortae fuse and vitelline branches supplying abdominal viscera disappear and reduce to about three i.e. coeliac trunk, superior and inferior mesenteric arteries (²). Anomaly of such regression may lead to the variation of these arteries and their branches.

2. Case Report

During routine dissection for undergraduate medical students, we observed hepatomesenteric and gastrosplenic trunks [Fig. 1] arising independently from abdominal aorta of 70 years old donated embalmed female cadaver in Department of Anatomy, Grant Govt. Medical College, Byculla,
Mumbai, India. Hepatomesenteric trunk divided into common hepatic and superior mesenteric arteries. Both these arteries were found to have their usual course. This common trunk arose from the front of abdominal aorta 1 cm below gastrosplenic trunk giving rise to left gastric artery and continuing as splenic artery. Here this trunk also gave rise to bilateral inferior phrenic arteries near its base. Common hepatomesenteric trunk running for short distance to right and downward behind pancreas bifurcated into common hepatic and superior mesenteric arteries. The replaced common hepatic artery first turned upwards and then towards right. Here it gave rise to gastroduodenal and right gastric arteries and completed the further course as hepatic artery 'proper'. Superior mesenteric artery as continuation of the common trunk headed downward behind pancreas and emerging in front of uncinate process of pancreas, it gave rise to inferior pancreaticoduodenal artery. Further in its course through mesentery, superior mesenteric artery gave rise to its all normal branches. Photographs of variations were taken for proper documentation and ready reference. No other vascular variations were found in abdominal region of this cadaver.

3. Discussion
Hepatomesenteric trunk is rare according to literatures. Nicholas A. Michels performed a study on 200 cadavers for arteries supplying supramesocolic organs (liver, gall bladder, stomach, duodenum, pancreas and spleen) over a period of six years. He found five (2.5%) cases with entire hepatic trunk arising from superior mesenteric trunk. In 12.5% the right hepatic artery originated from superior mesenteric and in 11.5% the left hepatic arose from left gastric artery (3). Silveira et al found six cadavers with variations for coeliac trunk out of twenty one cadavers where one cadaver showed two separate trunks – hepatomesenteric and gastrosplenic (4). Chitra observed five types of variations in fifty cadavers out of which two male cadavers showed gastrosplenic trunk (4%) - in one cadaver (2%) common hepatic artery arose from superior mesenteric artery (hepatomesenteric trunk) and other showed right and left hepatic arteries.
originating separately from superior mesenteric artery\(^{(5)}\). In a study on hundred and twenty three (123) bodies comprising of dissection cadavers and autopsy cases, Mburu et al observed 4.9% cases of gastrosplenic and hepatomesenteric trunks \(^{(6)}\). By studying on 89 bodies, Petrella et al observed three (3.37%) cadavers having separate gastrosplenic and hepatomesenteric trunks arising from aorta \(^{(7)}\). Hiatt et al reviewed 1000 cases of liver donors and observed 1.5% cases of hepatomesenteric trunk \(^{(8)}\). Nayak observed a similar case of variation of gastrosplenicophrenic and hepatomesenteric trunks. But in this case, right and left inferior phrenic arteries arose from a common trunk given off from gastrosplenicophrenic trunk, while in present case both phrenic arteries originated separately from the base of gastrosplenic trunk \(^{(9)}\). Varma et al observed in a 60 years old male cadavers during dissection, a common coeliacomesenteric trunk arising from aorta and this common trunk bifurcated into hepatomesenteric and gastrosplenic trunks \(^{(10)}\). Computed tomography angiogram of one hundred and twenty five (125) patients performed by Rawat showed 2% cases of common hepatic artery arising from superior mesenteric artery \(^{(11)}\). In a retrospective study of multidetector CT (MDCT) angiography of 100 patients, Ugurel et al observed 4% cases of gastrosplenic trunk \(^{(12)}\).

4. Conclusion
Variations of hepatic arteries are of utmost clinical importance. Presence of such variations can affect the procedures carried out on supramesocolic abdominal organs and resulting outcomes of such procedures like liver transplantation, resection of pancreatic head carcinoma etc. It is also of very significance in diagnostic radiological procedures like angiography of abdominal vasculature, Magnetic Resonance Angiography. Therefore knowledge of such finding is very helpful for surgeons and radiologists to plan their management on the upper abdominal region.

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5. References


