

Variant Origin of Common Hepatic and Middle Colic Artery- A Case Report

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ABSTRAK

Variasi hepatic biasa atau kolik arteri tengah boleh menyumbang kepada komplikasi yang timbul ketika pembedahan hati dan pembedahan abdomen bahagian atas. Kes corak bercabang ganjil pada cabang ventral aorta abdominal pada mayat lelaki berusia 50 tahun dilaporkan. Batang seliak berasal daripada aspek ventral bagi aorta abdominal dan bercabang kepada gastrik kiri dan arteri limpa. Arteri hepatic umum berasal secara langsung dari abdominal aorta, 0.2 cm di bawah asal batang seliak. Arteri kolik tengah berasal daripada segmen proksimal bagi arteri limpa, bukannya daripada arteri mesenterik unggul. Satu cabang berasingan dari kolik pertengahan mesenterik arteri unggul tidak dilihat. Variasi anatomi dalam corak bercabang batang seliak dan arteri mesenterik unggul tidak kerap, bagaimanapun asal-usul variasi seiring cawangan batang seliak dan arteri kolik pertengahan adalah anomali yang jarang berlaku dan oleh itu, pengetahuan mengenainya akan membantu dalam prosedur pembedahan abdomen dan imej berpandukan intervensi.

Kata kunci: hepatic biasa, kolik tengah, arteri, pembedahan

ABSTRACT

Variation of common hepatic or middle colic artery may account for the complications which arise during liver transplantation and surgeries of upper abdomen. We here report a case of an anomalous branching pattern of ventral branches of abdominal aorta in a 50-year-old male cadaver. The coeliac trunk originated from the ventral aspect of abdominal aorta and bifurcated into left gastric and splenic arteries. The common hepatic artery originated directly from the abdominal aorta, 0.2cm inferior to the origin of coeliac trunk. The middle colic artery originated from the proximal segment of splenic artery instead of its usual origin, the superior mesenteric artery. A separate middle colic branch of superior mesenteric artery was not observed. Anatomical variations in the branching patterns of coeliac trunk and superior mesenteric arteries are not infrequent. However, the concomitant variant

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origins of branches of coeliac trunk and middle colic artery is a rare anomaly and its knowledge would therefore be helpful in operative procedures of abdomen and image guided interventions.

Keywords: common hepatic, middle colic, artery, surgery

INTRODUCTION

The coeliac trunk (CT) is the most cephalic unpaired ventral branch of abdominal aorta. It commonly divides into left gastric, common hepatic (CHA) and splenic arteries. The superior mesenteric artery (SMA) is the second ventral branch of abdominal aorta. The branches of SMA are inferior pancreaticoduodenal, jejunal, ileal, ileocolic, right colic and middle colic arteries. The middle colic artery (MCA) descends in the transverse mesocolon and divides into right & left branches (Standring 2005). These branches form part of marginal artery and supply mostly transverse colon.

Variations in the branching pattern of ventral branches of abdominal aorta are not infrequent. There have been reports of anomalies of coeliac trunk in the past. The common hepatic artery originates from coeliac trunk in 51-80% cases (Adachi 1928; Chen et al. 1998). Several other branches such as inferior phrenic arteries, dorsal pancreatic artery and middle colic artery may also arise from the coeliac trunk (Chitra 2010). Aberrant origin of middle colic artery have been reported earlier (Yildirim et al. 2004). Adachi (1928) observed origin of middle colic artery from the coeliac trunk in 0.5% to 1% cases. Middle colic artery originating from the proximal segment of splenic

artery as observed in the present case is a rare anomaly. A precise knowledge of such arterial variations are important for diagnostic procedures and surgeries of upper abdomen.

CASE REPORT

During routine dissection of abdominal retroperitoneal region for first year medical students, a variant branching pattern of ventral branches of abdominal aorta was detected in a 50-year-old male cadaver. The specimen was photographed after delineating the surrounding structures.

The coeliac trunk originated from the ventral aspect of abdominal aorta and bifurcated into left gastric and splenic arteries. The common hepatic artery arose directly from the abdominal aorta 0.2 cm inferior to the origin of coeliac trunk. Nothing abnormal was observed in the further course and branching pattern of common hepatic artery.

The middle colic artery, normally a branch of superior mesenteric artery originated from the proximal segment of the splenic artery (Figure 1). The artery then passed posterior to the body of pancreas to enter into transverse mesocolon (Figure 2). Two cms proximal to the transverse colon, it divided into right and left branches. These branches anastomosed with the ascending branch of iliocolic and left colic arteries

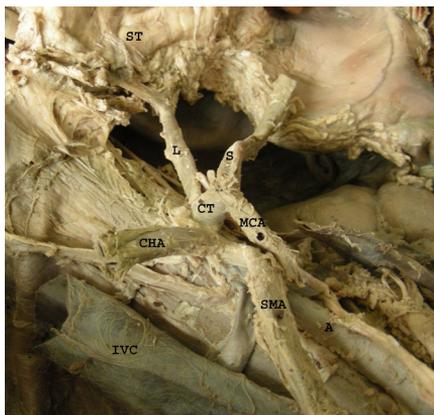


Figure 1: Photograph showing variant origin of common hepatic and middle colic artery.

CT-coeliac trunk , L-left gastric artery, S-splenic artery, CHA-Common hepatic artery, ST-Stomach , MCA-Middle colic artery, A-Aorta, IVC-Inferior vena cava, SMA-Superior mesenteric artery

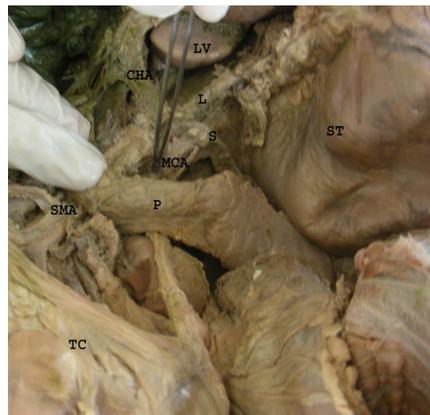


Figure 2: Photograph showing the middle colic artery originating from splenic artery and passing posterior to the body of pancreas to reach transverse colon. S-Splenic artery, MCA-Middle colic artery, P-Pancreas, TC-Transverse colon , ST-Stomach , LV-Liver, L-Left gastric artery, CHA-Common hepatic artery, SMA-Superior mesenteric artery

respectively to form the marginal artery. The length of the middle colic artery was 12 cm and had a diameter of 0.8 cm, near its origin. It gradually narrowed towards its termination. No separate middle colic artery originating from superior mesenteric artery was seen. Other branches of superior mesenteric artery i.e. right colic, ileocolic, ileal and jejunal branches were normal. The distance between the coeliac trunk and the superior mesenteric artery was 1 cm.

DISCUSSION

Variations of hepatic artery are important in liver transplantation. There have been reports of right hepatic artery originating from the middle colic artery, directly from the aorta and a left hepatic artery originating from the common hepatic artery (Ugurel et al. 2010). The origin of hepatic artery are of six types

according to Hiatt's classification. The origin of CHA directly from the aorta belongs to type VI (Hiatt et al. 1994). The present case also observed the type VI origin of CHA.

The superior mesenteric artery or one of its major branches give origin to middle colic artery. It may arise from the (a) coeliac trunk (Standring 2005), (b) abdominal aorta between the origin of superior and inferior mesenteric artery (Benton & Cotter 1963), (c) inferior mesenteric artery (Benton & Cotter 1963; Chen et al. 1998) , (d) common hepatic artery (Cavdar et al. 1998). It may be absent in 3 to 5% of cases (Hiatt et al. 1994). However, the origin of middle colic artery from the proximal segment of splenic artery is a rare anomaly and to the best of our knowledge only one case has been reported in the past (Chou et al. 1997). The unusual origin, variable course and

a smaller lumen of the anomalous middle colic artery increases the risk of vascular damage to ascending and transverse colon.

The variations of the coeliac trunk can be due to abnormal embryological development of the ventral splanchnic arteries. The anomalous middle colic artery originating from splenic artery can be due to the persistence of longitudinal anastomosis between the vitelline arteries in the embryo (Cavdar et al. 1998).

The origin of common hepatic artery directly from abdominal aorta and middle colic artery from the splenic artery is a rare finding and such a possibility should be kept in mind to ensure a safe and successful abdominal surgery.

CONCLUSION

Awareness of anatomical variations in the origin and branching pattern of arteries arising from the coeliac trunk and superior mesenteric trunk are necessary for surgeons and radiologist to avoid vascular complications.

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