

ORIGIN OF LEFT ACCESSORY HEPATIC ARTERY FROM THE LEFT GASTRIC ARTERY IN A SOUTH INDIAN CADAVER: ITS CLINICAL IMPORTANCE.

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SUMMARY

In recent years there has been an increase in number of transplantation surgeries, especially live donor liver transplantation in the western countries. In view of this, anatomical variations of hepatobiliary vessels gained special attention from anatomists, gastroenterological surgeons and interventional radiologists. These variations are of concern in hepatobiliary surgical procedures so as to minimize risk of complications for optimal success rates. We report a case of accessory hepatic artery that arose from the left gastric artery, entered the liver at an independent site from the porta hepatis to supply the left lobe of the liver. Transplantation of such livers with multi vascular pedicles may pose a challenge during anastomosis of these accessory hepatic arteries of the donor liver to the nearby arteries of the recipient.

Keywords: Hepatic artery; Liver transplantation; Hepato biliary surgeries; Multivascular pedicles; Clinical significance.

INTRODUCTION

Common hepatic artery is a branch from the celiac trunk of the abdominal aorta. After the origin, common hepatic artery passes laterally to reach upper surface of the first part of the duodenum, where it divides into gastroduodenal artery and hepatic artery proper. The hepatic artery proper ascends upwards in the right free margin of lesser omentum, anterior to the portal vein but medial to the bile duct. After reaching the porta hepatis the hepatic artery proper divides into right and left hepatic arteries, which supply the physiological right and left lobes of the liver (Standing, 2008). Accessory hepatic arteries present potential bleeding risks during hepatobiliary surgeries and complicate liver transplantation procedures. Therefore, it is important to take note of aberrant arteries to increase the success rates of safe hepatobiliary surgeries.

CASE REPORT

During the regular dissection classes for first year medical students of Rajiv Gandhi institute of

medical sciences, an embalmed female cadaver of 70 years old showed a variation in the hepato biliary vasculature. The dissection was carried out according to the instructions of Cunningham's manual of practical anatomy. Photographs were taken after complete dissection with a high resolution camera. The celiac trunk origin was normal; it gave left gastric artery (LGA), splenic artery (SA) and common hepatic artery (CHA). An accessory branch arose from the LGA and entered the visceral surface of the left lobe of the liver at a site independent from the porta hepatis (Fig 1). The rest of the course and branches of the LGA were found to be normal. The CHA passed laterally to the upper surface of the first part of the duodenum giving rise to the right gastric artery (RGA) and hepatic artery proper (HAP), before dividing further laterally into supraduodenal artery (SDA) and gastroduodenal artery (GDA).

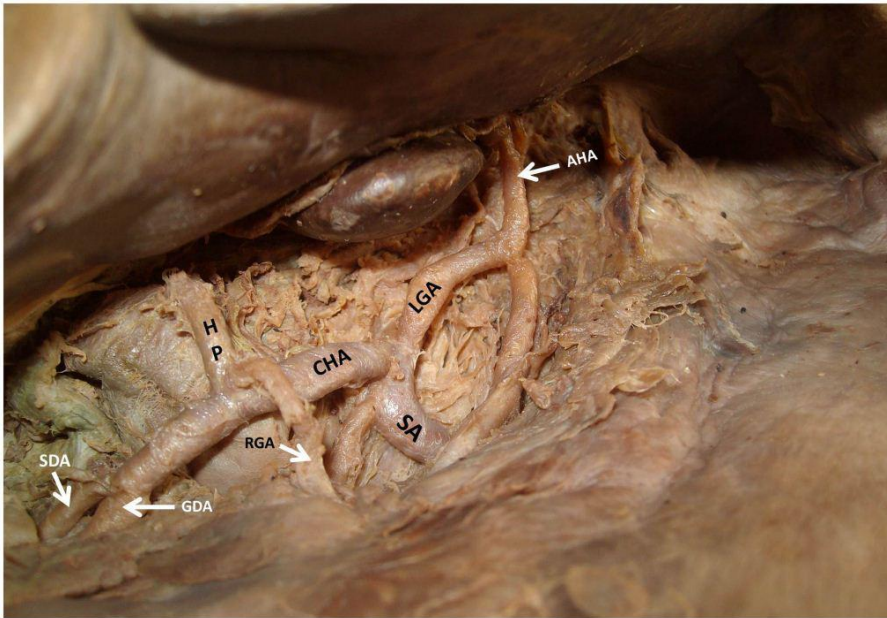


Figure 1 Showing the Accessory left hepatic artery after dissection of lesser omentum. HAP: Hepatic artery Proper; CHA: Common hepatic artery; SDA: Supraduodenal artery; GDA: Gastrooduodenal artery; RGA: Right gastric artery; LGA: Left gastric artery; SA: Splenic artery; AHA: Accessory hepatic artery.

DISCUSSION

Hepatobiliary variations are of concern to gastroenterological surgeons and interventional radiologists. Several types of variations such as AHAs, replaced hepatic arteries and additional branches are the reported anatomic variations of this region. Replaced hepatic artery occurs in absence of HAP, but an accessory artery exists in the presence of HAP (Wang and Frober, 2009). Since the HAP was present, we therefore observed a case of an AHA. In some of the cases, these additional branches replace the right or left hepatic arteries to become the major sources of blood supply to the liver. Gurgacz et al., (2011) stated that AHAs though small, may supply specific areas of the liver. According to the existing literature accessory left hepatic artery ranges from 9.7% - 12% (Yamaoka et al., 1994). There are also reports of the right hepatic artery arising from the left gastric artery (Covey et al., 2002; Panagouli and Venieretos, 2011). The left hepatic artery or accessory left hepatic artery may arise from the LGA and since they lie in the lesser omentum, surgeons must be careful while dividing the lesser omentum to reach gastro oesophageal junction. The left accessory hepatic artery in the present case is at risk of injury during mobilization of stomach, as it lies in the lesser omentum (Standring, 2008). Since the AHA was a direct branch of the LGA, caution is advised while ligating

the LGA to prevent necrosis of liver parenchyma (Pushpalatha et al., 2010). Presence of the accessory hepatic arteries further pose complications in the trans arterial chemoembolization procedure for patients with hepatocellular carcinoma (Prabhasavat et al., 2008) and are a challenge in liver transplantation since multiple vascular anastomoses would have to be performed between the donor and recipient vessels. If the accessory vessels are not anastomosed properly it may lead to several postoperative complications such as necrosis of liver parenchyma, acute liver failure, hepatic arterial insufficiency, hepatic arterial thrombosis and stenosis and other fatal complications which in turn may increase the mortality and morbidity (Xu et al., 2006; Ludmil et al., 2009).

However, AHA may also be advantageous in some instances. Due to proximity of the RHA to the bile duct, bile duct cancer usually spreads to the RHA but the further distance between AHA and bile duct implies that these vessels will be spared in cancers of bile duct (Standring, 2008). Furthermore, accessory hepatic arteries provide collateral circulation in case of thrombosis of the main hepatic artery.

In conclusion, the left gastric artery can provide accessory arteries that may be an important source of blood supply to the left lobe of the liver. These variations present as

potential bleeders during hepatobiliary surgeries and liver transplantation procedures.

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