Accessory left hepatic artery arising from common hepatic artery

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Abstract The knowledge of anatomical variations in hepatic artery are of importance to surgeons and radiologists while performing complicated procedures like liver transplantation and transarterial chemo-embolization for hepatic tumors. The incidence of accessory left hepatic artery is less common than the right accessory hepatic artery. Here we report an anomalous accessory left hepatic artery arising from common hepatic artery in a 55 year old male cadaver.

Keywords Common hepatic artery · Hepatic artery proper · Left hepatic artery · Right hepatic artery · Left accessory hepatic artery

Key message Accessory left hepatic artery is a rare anomaly which usually arises from left gastric, splenic artery or aorta. In this case we report accessory left hepatic artery arising from common hepatic artery, which is a rare incidence.

Introduction

The major supply of oxygenated blood to liver is through the hepatic artery which arises from the common hepatic artery, which in turn is one of the terminal branches of the celiac trunk. As this artery runs to the right along the upper border of the pancreas, it gives rise to its first branch — the gastroduodenal artery. The right gastric artery arises from common hepatic artery usually after and sometimes before the gastroduodenal artery. Once these two branches are given off from common hepatic artery it is called hepatic artery proper which further divides into right and left branches and supplies the right and left lobes of the liver respectively (Fig. 1).

The classic textbook description of arterial anatomy of the liver is found in only 52 to 80% of the cases. Based on the angiographic data the most common types of anomalies are, a left hepatic artery coming from the left gastric artery (accessory or replaced), a right hepatic artery arising from the superior mesenteric artery (accessory or replaced) or both arteries having an accessory or replaced vessel [1, 2]. Accessory left hepatic arteries are reported in 11% of cases, with varying origins, more often from the left gastric artery or the celiac trunk [3]. However the incidence of accessory left hepatic artery arising from common hepatic artery is very rarely reported in the literature [4]. In the present case we report an accessory left hepatic artery arising from common hepatic artery supplying the left lobe of liver in a male cadaver.

Case report

During a routine abdominal dissection of human cadaver for teaching purpose a variation in hepatic artery was noticed.

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Fig. 1 Illustration showing normal course of hepatic artery.

LHA - left hepatic artery; RHA - right hepatic artery; CyA - Cystic artery; HAP - Hepatic artery; CHA - common hepatic artery; RGA - right gastric artery; GDA - gastroduodenal artery

The cadaver was of a 55 years old male. The upper abdomen was carefully dissected while teaching the anatomy of internal organs to the undergraduate medical students. The hepatic artery proper, which was arising from common hepatic artery gave rise to right and left hepatic branches outside the liver. The right hepatic artery had a normal course which crossed the portal vein and the common hepatic duct anteriorly. It gave rise to cystic artery which divided into superficial and deep branches and supplied the gall bladder. An additional branch from the common hepatic artery was observed just opposite to the gastroduodenal artery supplying left lobe of liver (Fig. 2). The artery was of medium size which ran upwards, medial to hepatic artery proper. The intrahepatic branches of this artery supplied only the left lobe of the liver.

Discussion

The presence of an accessory hepatic artery have been reported by earlier studies conducted on cadaver and from angiographic data of patients undergoing hepatobiliary surgery and liver transplantation [4, 5]. The accessory hepatic artery can range from 1 to 4 in number with an incidence

of 21%, 9.3%, 7% and 3.1% respectively [6]. Compared to accessory right hepatic artery the incidence of accessory left hepatic artery is very rare. Jones and Hardy [7] reported that the incidence of aberrant left hepatic artery is 19% in 180 patients undergoing liver transplantation among which in 15% of the cases the accessory artery arose from the left gastric artery and either the splenic, gastroduodenal artery or from aorta in 4% of cases. Similar observations were made by Gruttadauria et al [8] who reported that in 89% of the cases the left hepatic artery branched from hepatic artery proper and in 11% cases it was aberrant. However these studies did not mention the accessory left hepatic artery arising from common hepatic artery. The extensive search in PUBMED indicated that this anomaly is very rarely reported in literature. In an Ethiopian study, Futara et al [4] have observed the accessory left hepatic artery arising from common hepatic artery in 5 cadavers out of 110 (4.5%). We are reporting the presence of an accessory left hepatic artery arising from common hepatic artery which to our knowledge is for the first time in an Indian cadaver. In our Human Anatomy dissection unit this anomaly was observed in only one case out of 72 cadavers (1.38%) dissected between 2000–2005, which is much lower than the incidence reported in the literature (4.5 %).

Fig. 2 Photograph showing accessory left hepatic artery arising from common hepatic artery in a male cadaver.

LHA - left hepatic artery; aLHA - accessory left hepatic artery; RHA - right hepatic artery; CyA- Cystic artery; HAP- Hepatic artery; CHA- common hepatic artery; LGA- left gastric artery; GDA- gastroduodenal artery; CA- coeliac artery; SA- splenic artery

Conclusion

The number of surgical and invasive procedures of abdomen is continuously increasing due to increase in surgical oncology cases and liver transplantation. Therefore the acquisition of profound knowledge of all the anatomic variants of the hepatic artery becomes mandatory to surgeons and vascular radiologists. Although the presence of accessory left hepatic artery is common, its origin from common hepatic artery is very rarely reported. Accessory left hepatic artery is known to create an obstacle during laparoscopic gastric banding operation. The information given in the present report may help the surgeons and radiologists in planning and performing a meticulous and successful procedure and also allows transplant surgeons to preserve all the anomalous vessels, thus avoiding vascular injuries to the harvested donor liver.

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