Case
report

Surgically important accessory hepatic artery – a case report

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Abstract

Variations in the origin and branching pattern of the hepatic artery are common. The knowledge of its variations is of importance to the radiologists and surgeons. We report here, the presence of an accessory hepatic artery. The accessory hepatic artery took its origin from the superior mesenteric artery, passed behind the head of the pancreas, first part of duodenum and reached the porta hepatis through the lesser omentum. In the lesser omentum the artery was posterior to the portal vein. The celiac trunk terminated by dividing into common hepatic, splenic, left gastric and left inferior phrenic arteries. The caudate lobe of the liver was abnormally large.

Keywords: accessory hepatic artery, superior mesenteric artery, coeliac trunk, variation, inferior phrenic artery.

1 Introduction

The liver is supplied by right and left hepatic arteries which are the branches of hepatic artery proper. The hepatic artery proper is one of the terminal branches of the common hepatic artery. The common hepatic artery arises from coeliac trunk along with splenic and left gastric arteries. The hepatic artery proper reaches the porta hepatis through the right free margin of the lesser omentum. In the lesser omentum the artery is anterior to the portal vein and to the left of bile duct. The hepatic artery proper usually gives a right gastric artery and then divides into right and left branches which supply the left and right lobes of the liver respectively. The right hepatic artery gives a cystic branch which supplies the gall bladder. The accessory hepatic artery that is being reported here may have a radiological and surgical importance.

2 Case report

During regular dissections for the undergraduate medical students, we found some variations in the hepatic arteries. These variations were found in an adult female cadaver. The coeliac trunk divided into four terminal branches i.e. splenic artery, left gastric artery, common hepatic artery and left inferior phrenic artery (Figure 1). The common hepatic artery divided into gastroduodenal artery and hepatic artery proper. The hepatic artery proper ascended in the right free margin of the lesser omentum. It did not divide into right and left branches till it entered the liver. It gave a cystic artery which supplied the gall bladder. The proper hepatic artery crossed in front of the bile duct from left to the right before entering the liver. The caudate lobe of the liver was enlarged (Figure 1).

An accessory hepatic artery arose from the proximal part of the superior mesenteric artery (Figures 2 and 3). It then coursed obliquely upward and to the right behind the head of the pancreas and the first part of the duodenum and entered the right free margin of the lesser omentum. In the lesser omentum the artery ascended behind the bile duct (Figures 2 and 3). Due to the presence of this abnormal artery the epiploic foramen was reduced in size. The artery entered the liver through the right end of the porta hepatis.

3 Discussion

Variations in the branches of coeliac trunk are very common. Yuksel and Sargon (1992) have reported a case of inferior phrenic trunk arising from the coeliac trunk. Cavdar, Gurbuz, Zeybek et al. (1998) have reported the presence of a common trunk formed by the left gastric and left inferior phrenic arteries. This common trunk was a branch of the coeliac trunk. A separate origin of splenic, left gastric and common hepatic arteries from the abdominal aorta has been reported by Bordei and Antohe (2002). Presence of a coeliaco-mesenteric trunk (CAVDAR, SEHIRLI and PEKIN, 1997) and a coeliaco-mesenterico-phrenic trunk (NAYAK, 2006) have also been reported.

Variations in the origin of the hepatic artery are also common. Abdullah, Mabrut, Garbit et al. (2006) have found variations in the origin of hepatic arteries in 31.9% of cases. In their study involving 932 patients, the variations were divided into three groups describing 48 common hepatic artery anomalies, 236 left or right hepatic artery anomalies and 13 rare variations including one case of right hepatic artery stemming from the inferior mesenteric artery. Origin of common hepatic artery from the left gastric artery has been reported by Uva, Arvelakis, Rodriguez-Laiz et al. (2007).

Inferior phrenic arteries normally arise from the abdominal aorta just below the aortic opening of the diaphragm. Abnormal origins of these arteries including their origin from the celiac trunk are known. (CAVDAR, GURBUZ, ZEYBEK et al., 1992; YUKSEL and SARGON, 1992; NAKAMURA, MIYAKI, HAYASHI et al., 2003).

The origin of accessory hepatic artery from the superior mesenteric artery is very rare. Its close relationship with the

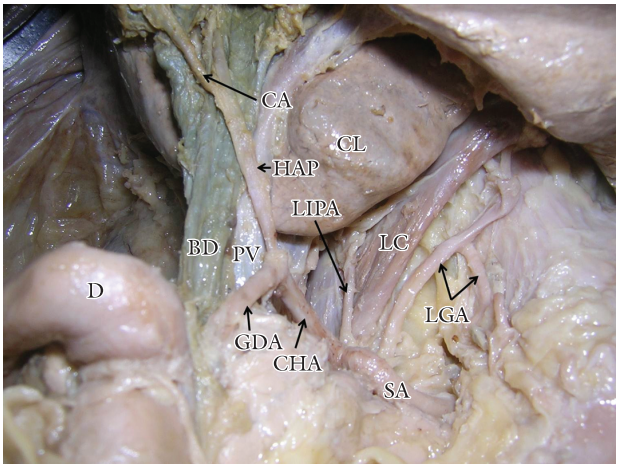

Figure 1. Dissection of the branches of the coeliac trunk. SA – splenic artery; CHA – common hepatic artery; LGA – left gastric artery; LIPA – left inferior phrenic artery; GDA – gastroduodenal artery; HAP – hepatic artery proper; LC – left crus of the diaphragm; BD – bile duct; PV – portal vein; CA – cystic artery; CL – caudate lobe. D – first part of duodenum.

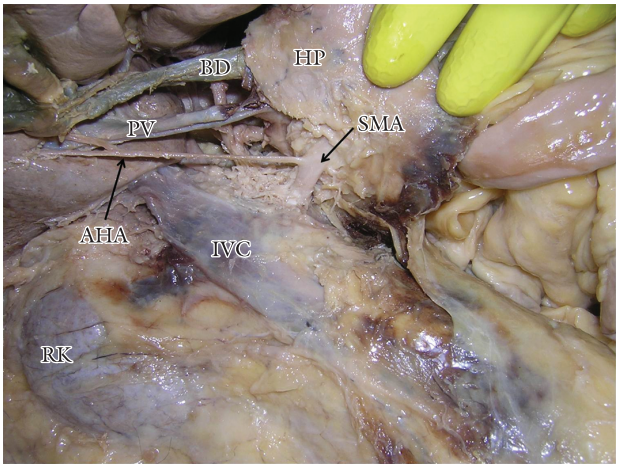

Figure 2. Dissection showing the superior mesenteric artery and the accessory hepatic artery. The duodenum and head of the pancreas have been reflected to show the origin of accessory hepatic artery from the superior mesenteric artery. BD – bile duct; PV – portal vein; HP – head of the pancreas; SMA – superior mesenteric artery; IVC – inferior vena cava; RK – right kidney; AHA – accessory hepatic artery.

head of the pancreas, first part of duodenum and the portal vein makes it vulnerable during surgeries in this area. The knowledge of this kind of vascular variation may be useful for surgeons doing liver transplants, pancreatic mobilizations and gastro-jejunostomies. The knowledge about this artery passing through the lesser omentum behind the bile duct and the portal vein may be important for radiologists and surgeons removing gall stones from the bile duct. The accessory hepatic artery that we are reporting here may also be called right hepatic artery and the proper hepatic artery in this case can be called left hepatic artery since we could not find any branches from the hepatic artery proper other than cystic artery.

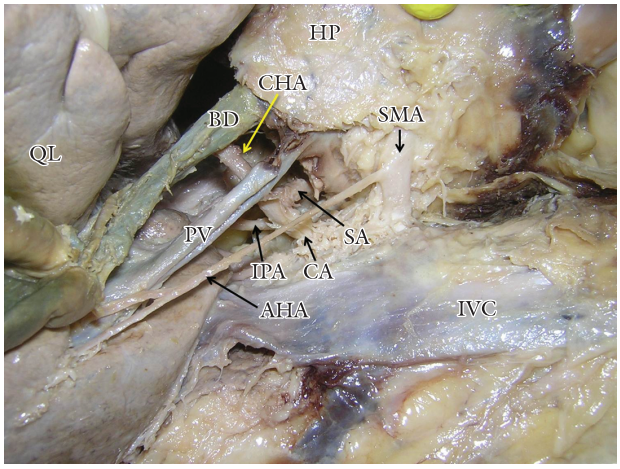

Figure 3. Closer view of the accessory hepatic artery and its relations. The duodenum and head of the pancreas have been reflected to show the origin of accessory hepatic artery from the superior mesenteric artery. CA – Coeliac artery; SA – splenic artery; CHA – common hepatic artery; IPA – left inferior phrenic artery; BD – bile duct; PV – portal vein; QL – quadrate lobe; HP – head of the pancreas; SMA – superior mesenteric artery; IVC – inferior vena cava; AHA – accessory hepatic artery.

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