

An anomalous artery supplying the right lobe of the liver

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An anomalous artery supplying the right lobe of the liver is described in the present report. The proper hepatic artery supplied both the left, and right lobes of the liver and an additional artery arising from the superior mesenteric artery supplied only the right lobe of the liver. The gastro-duodenal artery was a branch of the common hepatic artery, and the cystic artery arose from the additional artery. Knowing the presence of this anomaly is essential for surgical procedures.

The arterial blood supply to the liver has become of increasing interest for several specialists (anatomists, radiologists and surgeons) due to the development of new techniques for vascular investigation, surgery on the stomach and pancreas, but most importantly due to liver transplantation. The common hepatic artery supplies the liver. It arises from the celiac trunk above the body of the pancreas. From its origin, the common hepatic artery courses to the right, transversely along the upper part of the pancreas beneath the parietal peritoneum. In the region of the isthmus of the pancreas, the common hepatic artery bifurcates. The proper hepatic artery is the continuation of the common hepatic artery. The proper hepatic artery enters the hepatoduodenal ligament. In the region of the porta hepatis, the proper hepatic artery bifurcates or trifurcates, giving origin to a large right hepatic artery and to smaller middle and left hepatic arteries.¹

The presented variant was observed in a 65-year-old male cadaver during the investigation of the posterior abdominal wall. The celiac trunk arose from the abdominal aorta at the level of the thoracic 12 vertebra with its usual branches of left gastric, splenic and common hepatic arteries. The proper hepatic artery was located in hepatoduodenal ligament. It was divided into 2 branches, supplying left and right lobes of the liver. The gastroduodenal artery originated from the common hepatic artery. The superior mesenteric artery arose from the abdominal aorta at the level of the lumbar one vertebra. There was an additional artery arising from the superior mesenteric artery that was supplying the right lobe of the liver. This artery was also located in the hepatoduodenal ligament and supplying the right lobe of the liver. The cystic artery arose from the additional artery (Figure 1).

Anatomical studies based on dissections, injection and corrosion casts describe anomalous hepatic arteries arising from the superior mesenteric artery for the right lobe and the left gastric artery for the left lobe or rarely

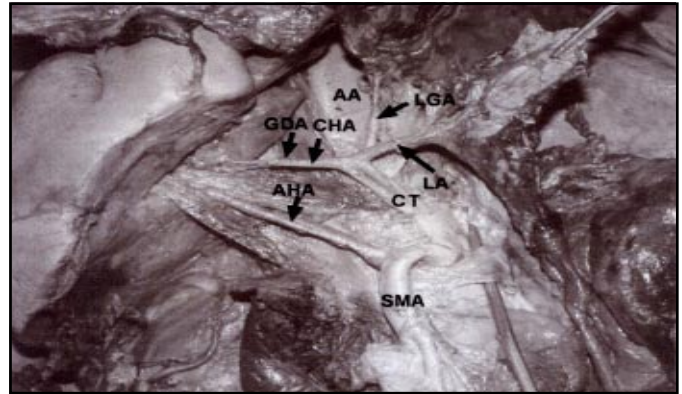


Figure 1 - Photograph of the additional hepatic artery (AA - abdominal aorta, CT - celiac trunk, CHA - common hepatic artery, GDA - gastroduodenal artery, LGA - left gastric artery, LA - lienial artery, SMA - superior mesenteric artery, AHA - additional hepatic artery).

from the aorta or right renal artery.²⁻⁵ It is necessary to distinguish the independent separation of the right and left lobar hepatic arteries from some sources and the presence of additional arteries. The additional arteries are the branches that are formed from any arteries when there is present the hepatic artery proper or substituting it independent right and left branches. According to Bergman et al² some sort of aberrant (variable) hepatic artery, either replacing or accessory, occurs in approximately 42% of individuals.² The additional arteries emanate from the left gastric, superior mesenteric, gastroduodenal arteries, aorta, the right renal artery and other sources.⁵ Matsumura reported 13 cases of an accessory right hepatic artery originating from the superior mesenteric artery within 98 Japanese specimens (13%).⁴ Hiatt et al discovered 106 out of 1000 cases of accessory right hepatic artery originating from the superior mesenteric artery (10.6%).³

The present case fits type 3 of the classification of Hiatt et al. Type 3 of Hiatt's classification consisted of replaced (accessory) right hepatic artery arising from superior mesenteric artery and the gastroduodenal artery was a branch of the accessory hepatic artery. However, in the present case the gastroduodenal artery arose from the common hepatic artery as a distinction. The existence of additional hepatic arteries has important implications for surgery, including laparoscopic cholecystectomy, common bile duct explorations (incisions or excisions), Whipple's operation, radical hepatic surgery, liver transplantation especially split liver transplantation and for endovascular procedures in the liver such as chemoembolization in which surgical ligation or coil occlusion of the gastroduodenal artery is

recommended prior to surgical placement of an infusion pump for continuous direct intrahepatic arterial chemotherapy of liver neoplasms. During minimally invasive or complicated hepatobiliary surgery an understanding of arterial variants in the lesser omentum is necessary if serious problems are to be avoided.

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