

# Accessory Hepatic Artery Originating from the Left Gastric Artery: an Unusual Branching Pattern of the Foregut Artery

Y. Lakshmisha Rao<sup>1</sup>, Shristi Lodha<sup>2</sup>, Vasudha V. Saralaya<sup>1</sup>, Shahin Salim<sup>3</sup>, B.V. Murlimanju<sup>1</sup>

<sup>1</sup>Department of Anatomy, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal, India

<sup>2</sup>Medical Student, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal, India

<sup>3</sup>Department of Physiology, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal, India

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## ABSTRACT

**Introduction:** we report a case of accessory hepatic artery originating from the left gastric artery and supplying the left anatomical lobe of liver. The other branches from the coeliac trunk were found normal in this cadaver. We believe that this anatomical case report is enlightening to the laparoscopic surgeons and prior knowledge about this arterial variation will prevent the catastrophic intraoperative complications like bleeding.

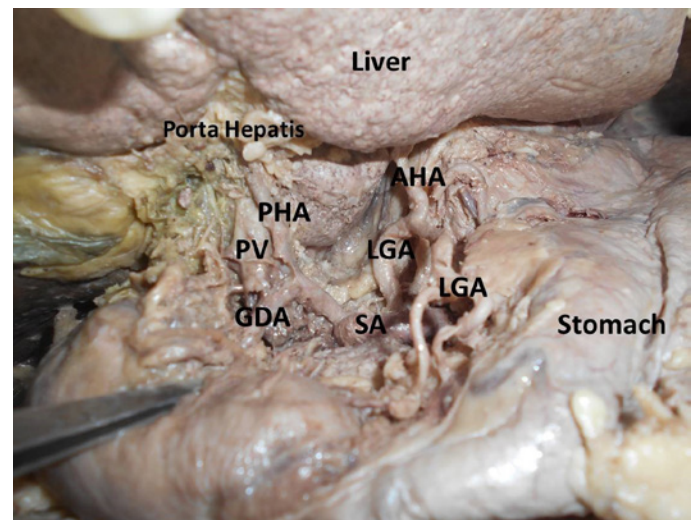
**Keywords:** Hepatic Artery; Laparoscopy; Left Gastric Artery; Liver.

## Introduction

The hepatic artery proper (PHA) divides into left and right branches, which subsequently enters the porta hepatis to supply the respective lobes of the liver<sup>1</sup>. However, it was reported that the hepatic arterial supply is variable from the anatomical norm<sup>2</sup>. In practice, these anatomical variants might be confused with other clinically significant anomalies upon imaging. Nakamura *et al.*<sup>3</sup> opine that, these aberrations may appear as gastric mucosal blush as seen in the hepatocellular carcinoma, or as an abnormal intra-hepatic blood vessel during angiography of the liver, and may hinder proper diagnosis and treatment<sup>3,4</sup>. These variations appear to be caused by persistent embryonic vessels, that fail to regress in the normal developmental time scale. The knowledge of these arteries and their variability stands to be of relevance to the surgeons, radiologists, and oncologists, that deal with the pathologies of this region.

## Case Report

During routine undergraduate teaching, a variation in the arterial supply of liver (Fig. 1) was observed in a 70 years old male cadaver. The common hepatic artery (CHA) was continuing as PHA after giving the gastro-duodenal branch. It divided into right and left branches and entered the porta hepatis. These branches were accompanying the portal vein and bile duct. Another large outlet, which was arising from the left gastric artery (LGA) also supplied the liver by reaching the left lobe of liver (Fig. 1). Thus liver had additional arterial supply by an accessory artery. The accessory hepatic artery (AHA) originated from LGA, before giving the oesophageal branch (Fig. 1). Then the AHA was supplying the left lobe of liver. However, the other branches from the coeliac trunk were found to be normal.



**Figure 1.** Variant arterial supply of the liver (PHA–hepatic artery proper; AHA–accessory hepatic artery; LGA–left gastric artery; PV–portal vein; GDA–gastroduodenal artery; SA–splenic artery)

## Discussion

The vascular pattern of liver is important to the surgeons during the transplant or other surgeries of liver. Variation in the blood supply of liver is often seen with accessory hepatic arteries. The accessory arteries are usually smaller than the hepatic arteries<sup>5,6</sup>. Mu *et al.*<sup>7</sup> reported that, amongst the gastric cancer patients, 26.13% had variation in the coeliac trunk branches. The AHAs from the coeliac trunk branches may show more number of affected lymph nodes in case of gastric cancer<sup>7</sup>. Hence in gastric cancer patients, variant arterial pattern should be evaluated thoroughly. The variation in the hepatic arteries may cause iatrogenic injuries leading to the operative and post-operative complications during surgeries in the hepato-biliary and pancreatic regions. Since radiologists play a key role in pre-operative assessment of vessels, a thorough

study of variation in the hepatic arteries would help them<sup>8</sup>.

During embryonic life, liver contains three lobes—central lobe, right and left lateral lobes. Each lobe gains blood supply individually from these three separate sources. Left lobe receives branch from LGA, right lobe receives blood supply from a branch from the superior mesenteric artery and the central lobe from the common hepatic artery. During the later developmental stage, due to marked decline of size of liver, left and right lobe arteries also regress, leaving PHA, which gives further branches. Hence persisting embryological vessels will give AHAs. So

in our case, AHA which was arising from the LGA, was a persisting embryological artery of left lateral lobe of liver.

### Conclusion

Vascular pattern of liver is important for surgeons during transplant or other surgeries of liver. Variation in the blood supply of liver is often seen with AHAs. The variation in the hepatic arteries may cause iatrogenic injuries leading to operative and post-operative complications during surgeries in hepato-biliary and pancreatic regions. Persisting left lateral lobe artery may remain as AHA.

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Corresponding author

B.V. Murlimanju

E-mail: flutesnowmm@gmail.com