



## ORIGINAL RESEARCH PAPER

## Anatomy

### STUDY OF PREVALENCE OF ACCESSORY HEPATIC ARTERY IN 56 CADAVERS

**KEY WORDS:** left gastric artery, accessory hepatic artery

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#### ABSTRACT

**INTRODUCTION-** In modern surgical and transplantation procedures the recognition of anatomic vascular abnormalities of the hepatic arteries is of greater importance than ever.

**METHOD AND MATERIALS-** This study was done on 56 cadavers in Ahmedabad. Dissection was done on cadavers.

**RESULT-** In one cadaver, an accessory hepatic artery was found to be arising from left gastric artery.

#### INTRODUCTION-

With the advancements in the field of medical science day by day, there has been a significant increase in number of organ transplantations like liver, kidney etc. in the world. So the knowledge about the gross anatomy, the vascular supply and the common variations in it is of utmost importance.

Apart from it, anatomical variations of hepatobiliary vessels has gained special attention from anatomists, gastroenterological surgeons and interventional radiologists so as to minimize risks of complications from hepatobiliary interventions. Normally liver gets arterial blood supply from common hepatic artery which is a branch of coeliac trunk. Different patterns of arterial blood supply to the liver may be seen frequently. Liver may get supply from the superior mesenteric artery, left gastric artery, aorta or other visceral branches. These vessels may be accessory, occurring in addition to the normal arterial supply, or replaced, representing the primary arterial supply to the lobe. 1.

Anatomical variations of the hepatic arteries and coeliac trunk are of considerable importance in liver transplants, laparoscopic surgery, radiological abdominal interventions and penetrating injuries to the abdomen. 2.

The frequency of inadvertent or iatrogenic hepatic vascular injury rises in the event of aberrant anatomy and variations. 3.

#### MATERIAL & METHODS:

During dissection classes of abdomen, we have dissected 56 cadavers in different medical colleges of Ahmedabad.

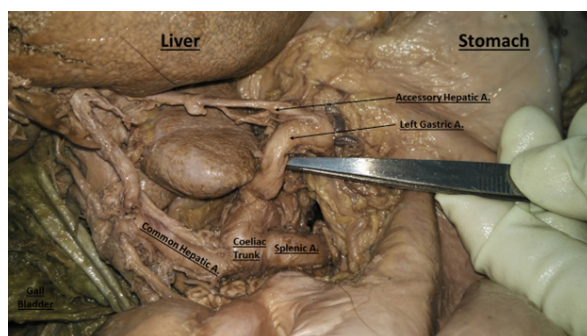
Study was done during years 2014 to 2016. We have dissected out different branches of abdominal aorta specially to look for accessory hepatic artery.

We have also dissected out different branches of coeliac trunk, superior mesenteric artery and inferior mesenteric artery.

Then we have traced all the branches and sub branches of celiac trunk. And observed for accessory hepatic artery for any variation in blood supply of Liver.

#### Result and discussion

We have noted accessory hepatic artery present in one cadaver (Figure-1) out of 56 (1.8%) cadavers. In that cadaver, accessory hepatic artery arose from the left gastric artery, was running towards the left lobe of liver and near the porta hepatis it entered in the left lobe of the liver. In case of transplantation, such livers may be challenging because anastomosis of these accessory hepatic arteries of the donor liver to the nearby arteries of the recipient is little bit challenging. 4.



**Figure-1**

A Koop et al in 2004 studied that an aberrant or accessory left hepatic artery (LHA) arising from the left gastric artery in 3.0% and an aberrant or accessory right hepatic artery (RHA) branching off the superior mesenteric artery in 11.9% of the cases. In 1.4% of the cases there was a combination of anomalies of both the LHA and RHA. 5.

In study of Anne M. Covey et al in 2002, they found 64 cases of accessory hepatic artery out of 600 cases studied. 6.

Alexander S. Lurie observed prevalence of left accessory hepatic artery originating from the left gastric artery is 0.91%. 7.

In the study of M S UGUREL et al (2006) they found accessory hepatic artery in 10% cases. Compare to it in our study we found it in 1.8% of cases, which is comparatively lower in prevalence. 8.

In our study, on further dissection of common hepatic artery, it gave two branches, right and left hepatic arteries independently entering through porta hepatis. So hepatic artery arising from left gastric is accessory artery which may supply left lobe of liver.

Michel's classification of the hepatic arterial system described 10 variant subtypes. 9. The accessory and replaced hepatic arterial systems were described separately within this classification. Under Hiatt's classification, no such distinction was made because it was angiographically difficult to distinguish between accessory and replaced hepatic arterial structures, hence six subtypes were described. We used both classifications in our study.

**Table 1.**

| Hepatic artery variations: Michel's and Hiatt's classifications [9]   |                         |                      |
|---|-------------------------|----------------------|
| Hepatic artery variation  |                         |                      |
|   | Michel's classification | Hiatt classification |
| Normal anatomy  | Type I                  | Type I               |
| Replaced left hepatic artery originating from the left gastric artery | Type II                 | Type II              |

|   |           |          |
|---|-----------|----------|
| Replaced right hepatic artery originating from the superior mesenteric artery   | Type III  | Type III |
| Co-existence of Type II and III   | Type IV   | Type IV  |
| Accessory left hepatic artery originating from the left gastric artery  | Type V    | Type II  |
| Accessory right hepatic artery originating from the superior mesenteric artery  | Type VI   | Type III |
| Accessory left hepatic artery originating from the left gastric artery and accessory right hepatic artery originating from the superior mesenteric artery | Type VII  | Type IV  |
| Accessory left hepatic artery originating from the left gastric artery and replaced right hepatic artery originating from the superior mesenteric artery  | Type VIII | Type IV  |
| Common hepatic artery originating from the superior mesenteric artery   | Type IX   | Type V   |
| Right and left hepatic arteries originating from the left gastric artery  | Type X    | NOD      |
| Common hepatic artery directly originating from the aorta   | NOD       | Type VI  |

7. Revisited: Digital Subtraction Angiography Performed Alexander S. Lurie, The Significance of the Variant Left Accessory Hepatic Artery in Surgery for Proximal Gastric Cancer Arch Surg. 1987;122(6):725-728. doi:10.1001/archsurg.1987.01400180107021.
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NOD, "not otherwise described" in the literature.

With reference to this classification, in our study, Artery belongs to Type V Type II.

Alexander S. Lurie observed that During proximal resection of the stomach and gastrectomy, a large left accessory hepatic artery originating from the left gastric artery is sometimes found. When this occurs together with absent or weak collateral circulation in the corresponding part of the liver, it is necessary to perform resection of the left lobe of the liver (0.91% of all cases). This tactic can save a patient from the development of lethal complications of necrosis of the left lobe.7.

This is also one of the very important aspects of looking for accessory hepatic artery during surgery.

Among variant patterns, the lobes may receive blood supply from the superior mesenteric artery, left gastric artery, aorta, or other visceral branches. These vessels may be accessory, occurring in addition to the normal arterial supply, or replaced, representing the primary arterial supply to the lobe.4.

## CONCLUSION:

In our study we observed that accessory hepatic artery was present in one cadaver out of 56 cadavers. So prevalence is 1.8%. In that cadaver accessory hepatic artery arose from the left gastric artery, runs towards the left lobe of liver and near the porta hepatis it entered in the left lobe of the liver. These data are useful for the planning and conduct of surgical and radiological procedures of the upper abdomen, including laparoscopic operations of the biliary tract. Patterns of arterial blood supply to the liver are variable. That's why knowledge of variant anatomy is must.

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