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Research Article

VARIATIONS OF HEPATIC ARTERY AND ITS BRANCHES

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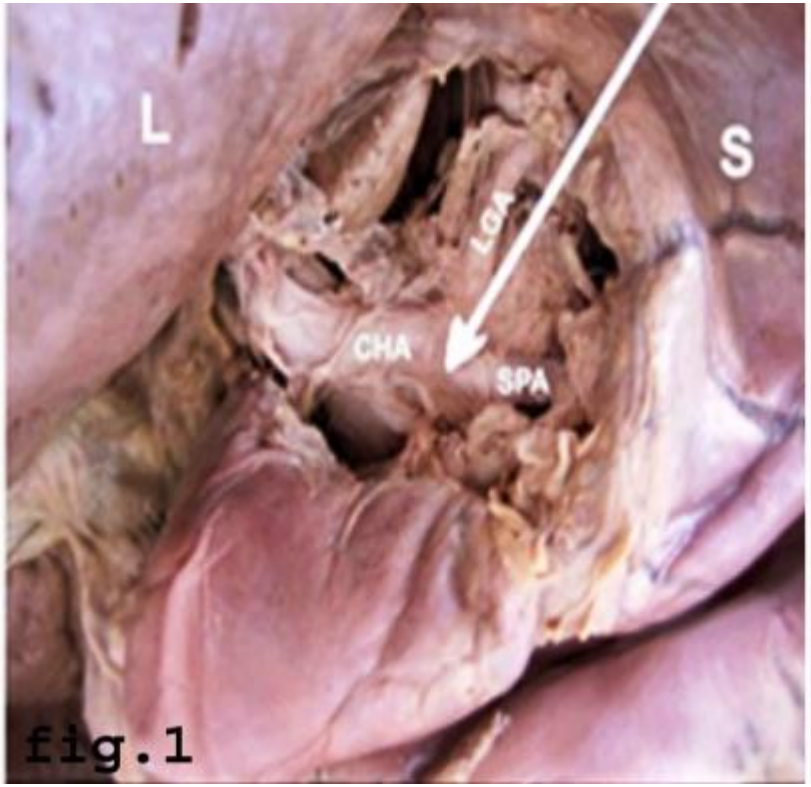
ABSTRACT
The common hepatic artery was the largest branch of the coeliac trunk and the splenic artery was found to be smaller compared with the normal in 5% of cases studied. The right gastric artery is seen arising from the left hepatic artery is in 12.5% of the cases and from the accessory right hepatic artery in 2.5% of the cases. In the present study it is seen that accessory left hepatic artery arising from the left hepatic artery in 7.5% of cases. hepatic artery anatomy is of great importance in increasing the effectiveness and safety of surgical procedures, particularly liver transplants

Key Words: *Coeliac Trunk, Common Hepatic Artery, Left Gastric Artery, Right Gastric, Superior Pancreatico Duodenal*

INTRODUCTION
Variations are extremely common in the coeliac and hepatic arteries. These variations have important implications in surgery and Interventional radiology. Although single isolated variation in a vessel of interest may be easy to recognize, the presence of multiple coexistent variants in the same artery may be confusing. The knowledge of hepatic artery anatomy is of great importance in increasing the effectiveness and safety of surgical procedures, particularly liver transplants, which is the first choice for patients with liver disease in final stage.

MATERIALS AND METHODS
The hepatic artery and its branches dissected in 40 adult cadavers as a routine dissection procedure are randomly selected from the Department of Anatomy G.S.L. medical college during the year 2007-2009 constituted the material for the present study. The hepatic artery is studied in detail and is observed for its Site of origin, Course, Branches and Variations.

RESULTS AND DISCUSSION
Common hepatic artery which is a branch of coelic trunk is the normal pattern which is observed in 8 out of 40 cadavers i.e., 20% of the present study(Figure 1) .It is also seen as the largest branch of coeliac trunk (Figure 2) . In two cases there was an early division of right and left hepatic arteries at the level of gastro-duodenal artery and there was no segment of proper hepatic artery (Figure 3).
In one case two accessory left hepatic arteries were found to be arising from the proper hepatic artery. The right gastric artery and accessory left gastric artery have taken origin from the accessory left hepatic artery (Figure 4).
Right gastric artery: In five cases the right gastric artery was found to be arising from the left hepatic artery (Figure 5). Table 1 is showing percentage of variations in right gastric artery
Left Hepatic Artery: In three cases, accessory left hepatic artery was found arising from the left hepatic artery (Figure 6).Table 2 is showing percentage of variations in left hepatic artery.
Right Hepatic Artery: In one case, the supraduodenal artery has taken its origin from right hepatic artery (Figure 7): In one case right hepatic artery gave origin to accessory right hepatic and right gastric arteries (Figure 8). Table 3 is showing percentage of variations in right hepatic artery.



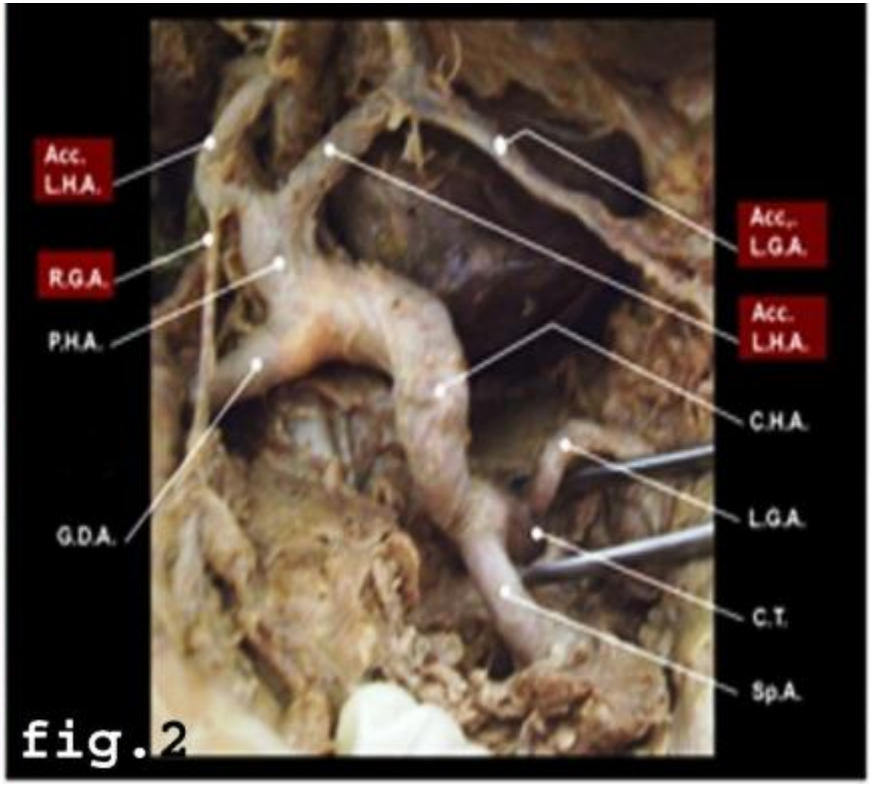
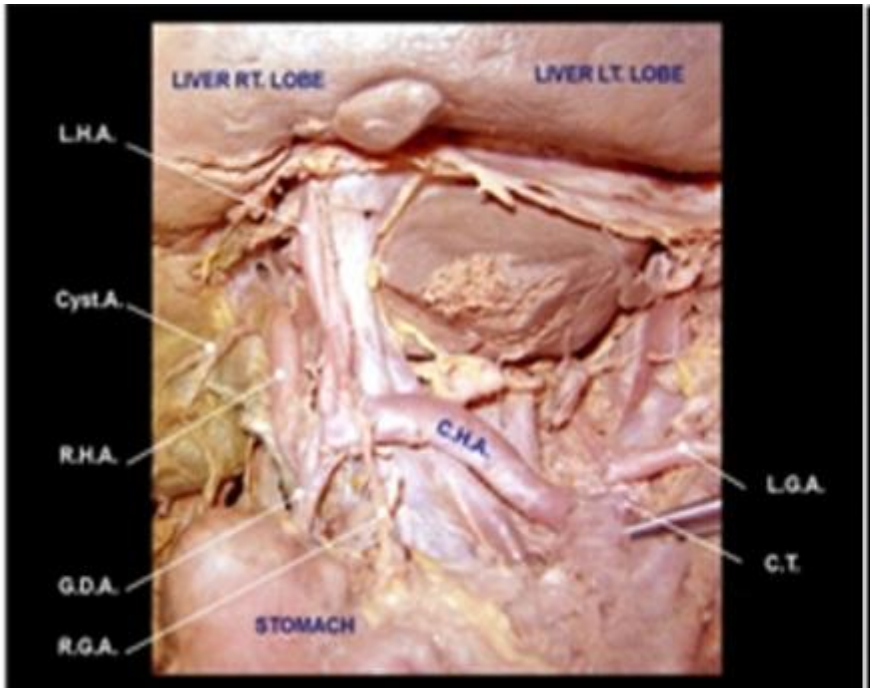


Figure 1: Branches of Coeliac trunk-LGA, SA and CHA; Figure 2: CHA formed as largest branch of coeliac trunk. Acc. LGA arising from Acc.LHA. RGA arising from Acc.LHA.



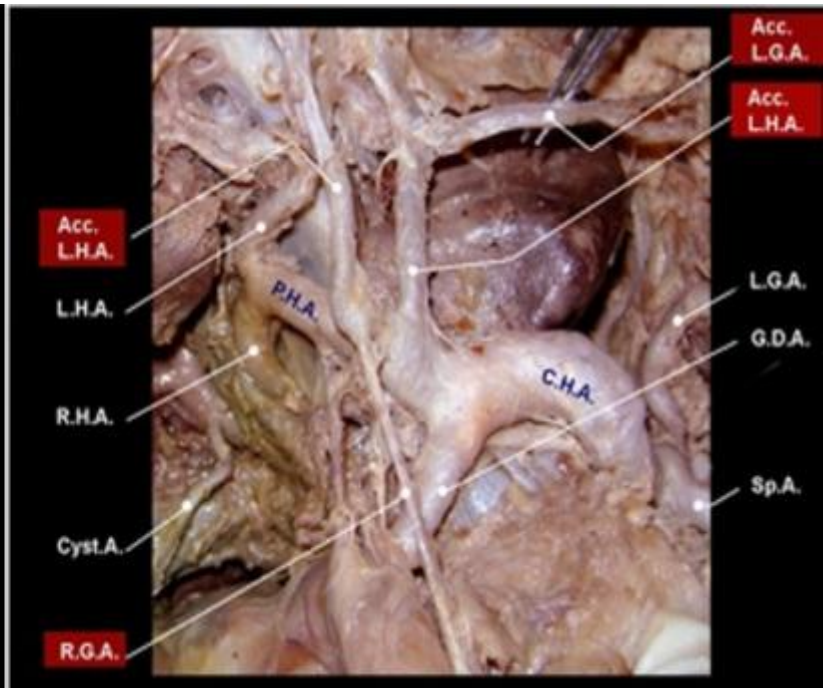
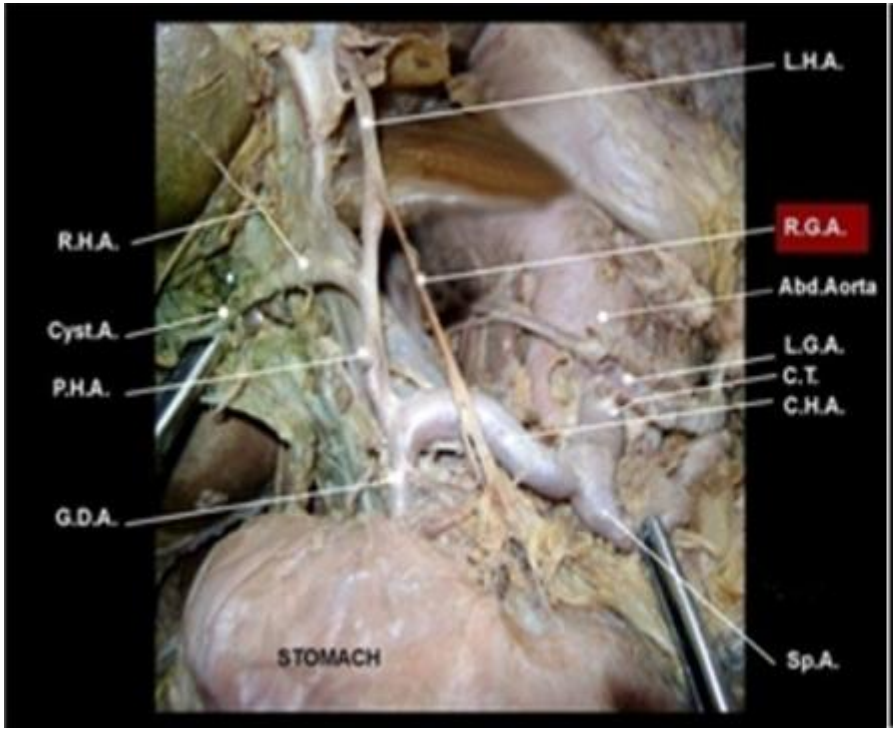


Figure 3: Early division of left and right hepatic artery at the level of gastroduodenal artery; Figure 4: Two accessory left hepatic arteries arising from proper hepatic artery. Right gastric arising from accessory left gastric artery.



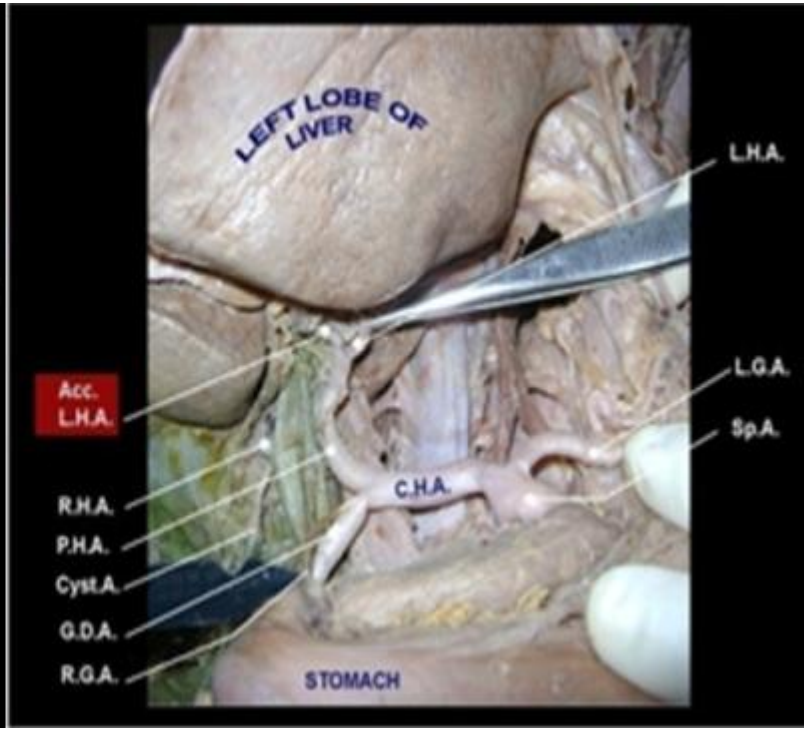
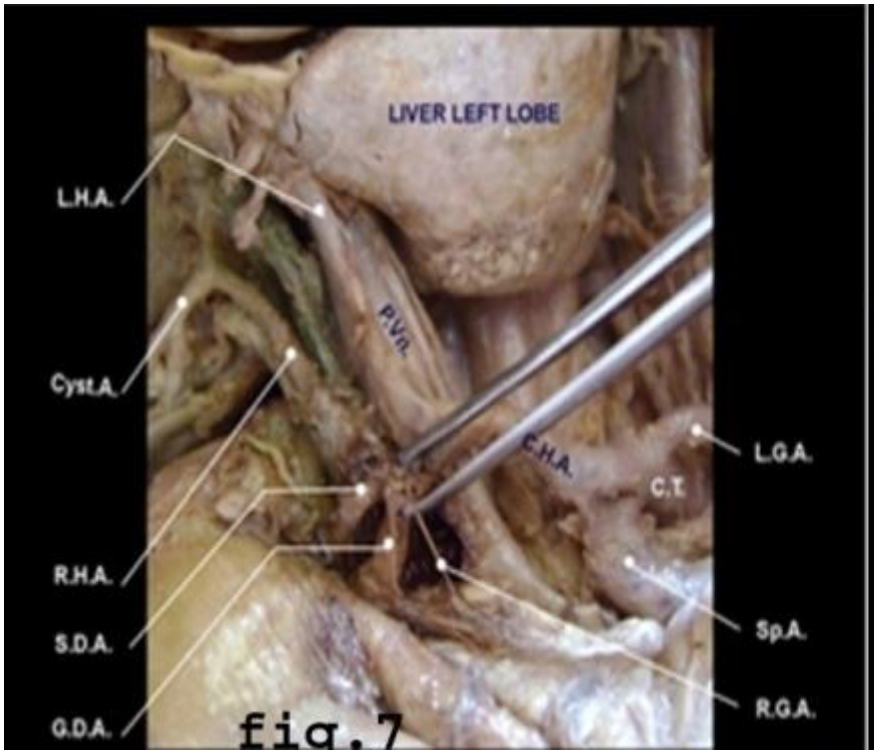


Figure 5: Right gastric artery arising from left hepatic artery; Figure 6: Accessory left hepatic artery arising from left hepatic artery



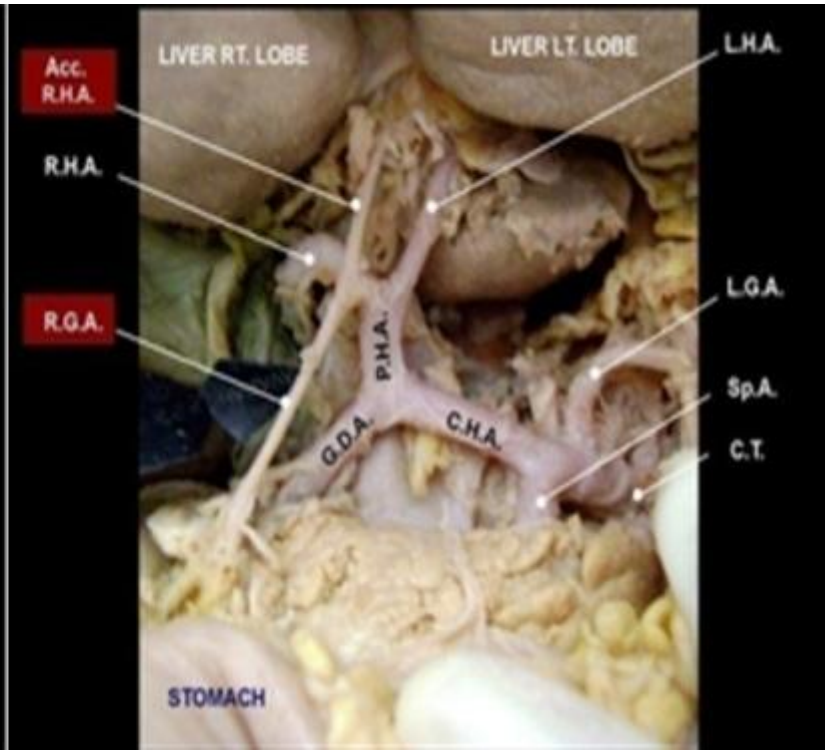


Figure 7: Supraduodenal arising from rt. hepatic artery; Figure 8: Accessory rt. hepatic artery arising from rt. hepatic artery along with RGA;

Figure 9: PSPA arising from CHA. Two acc.HA arising from RHA.

Superior pancreatico duodenal artery: In one case it was observed that posterior superior pancreatico-duodenal artery arising from the common hepatic artery(Figure 9). Table 4 is showing percentage of variations in superior pancreaticoduodenal artery.

Table 1: Percentage wise occurrence of variations of right gastric artery

Vascular pattern	No. of cases	percentage
1.standard pattern	26	70
2a.right gastric from the left hepatic artery	5	12.5
2b.small size and caliber of the right gastric artery	2	5
2c.right gastric artery from the accessory left hepatic artery	1	2.5
2d.right gastric artery from the right hepatic artery	1	2.5

Table 2: Percentage wise occurrence of variations of left hepatic artery

Vascular pattern	No. of cases	Percentage
1.standard pattern	22	55
2.a.acessory left gastric from left hepatic artery	2	5
2b. right gastric artery from the left hepatic artery	5	12.5
2c..acessory left hepatic artery from left hepatic artery	3	7.5
2d.early division of left hepatic artery at the level of gastroduodenal artery	2	5
2e.two acessory left hepatic arteries from proper hepatic artery. Acessory left gastric artery and right gastric from acessory left hepatic artery	1	2.5
2f.acessory left hepatic artery from left gastric artery	5	12.5

Table 3: Percentage wise occurrence of variations of right hepatic artery

vascular pattern	No. of cases	Percentage
1. standard pattern	34	85
2a. supraduodenal from right hepatic artery	1	2.5
2b.early division of right hepatic artery at the level of gastroduodenal artery	2	5
2c.two accessory hepatic arteries from the right hepatic artery	1	2.5
2d.right hepatic artery gave orgin to accessory right hepatic and right gastric artery	1	2.5

Table 4: Percentage wise occurrence of variations of superior pancreatico duodenal artery

Vascular patter	No. of cases	Percentage
1.standard pattern	39	97.5
2.posteruoe superior pancreatico-duodenal artery arising from the common hepatic artery	1	2.5

DISCUSSION

The hepatic artery normally arises from the coeliac artery, which arises from the aorta between the crura of the diaphragm and posterior wall of the omental bursa.

Common hepatic artery divides into proper hepatic artery and gastro-duodenal artery. The proper hepatic artery gives right gastric artery, right and left hepatic arteries. Right hepatic artery gives a cystic branch to

the gall bladder. Gastro-duodenal artery gives right gastro-epiploic artery and superior pancreatico-duodenal artery. Hollinshead (1971), Woodburne and Olsen (1951) has reported that constant origin of posterior superior pancreatico-duodenal artery is from the common hepatic artery. In the present study , the above pattern is observed in 2.5% of the cadavers. In the present study the common hepatic artery was the largest branch of the coeliac trunk and the splenic artery was found to be smaller compared with the normal in five percent of cases studied. This observation does not coincide with the previous investigators.In the present study there is no proper hepatic artery segment but at that site there is a commencement of gastroduodenal artery, right and left hepatic arteries in five percent of cases which coincides with the observations of Renan Uflaceker (2007). In Michel's (1955) series of 200 specimens origin of right gastric artery from the accessory left hepatic artery, common hepatic or proper hepatic is most frequent, each occurring in approximately 40%. In the present study the right gastric artery arising from the left hepatic artery is in 12.5% of the cases and from the accessory right hepatic artery in 2.5% of the cases. Thompson (1933) reported the origin of accessory left hepatic artery from the left hepatic artery in 25-33% of cases. In the present study it is seen that accessory left hepatic artery arising from the left hepatic artery in 7.5% of cases.

Conclusion

Liver being a vital organ and a common site for laparoscopic surgery the origin, course and distribution of the hepatic artery has taken a prior importance by the surgeons. High index of clinical suspicion is required with regard to the variations of the hepatic artery and its branches for the operating surgeon for his successful out come.

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