

Original article:

Evaluation of branching pattern of hepatic artery proper and their importance: A cadaveric study

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Abstract:

Introduction: The incidence of normal hepatic arterial anatomy ranges between approximately 50-80% of individuals. Knowing anomalous origin of hepatic arteries is important for successful cholecystectomy, hepatobiliary and liver transplant surgery.

Materials and methods: The present cadaveric study was planned and work was conducted in our department. Routine dissection of 18 cadavers in the department of anatomy, for first year M.B.B.S. students was done .

Observations: The right hepatic artery was found to enter the cysto-hepatic triangle; by passing dorsal to the common hepatic duct in 82% cases . In 4% cases the artery crossed ventral to common hepatic duct and then turned upward, between the cystic and right hepatic ducts to enter the right lobe of liver. However in 10% cases, the right hepatic artery was situated to the right of common hepatic duct.

Conclusion: It was random study conducted to observe the arterial pattern supplying the extra hepatic biliary apparatus. A good knowledge of arterial system of liver and extra hepatic biliary apparatus, distribution and possible anatomical variation is important for surgeons, radiologists and clinicians as it is significant in liver transplantation in order for the vascularity not to be disturbed and necrosis of liver parenchyma postoperatively, nonestablishment of continuity in time of reconstruction is important because of post operative complication such as acute liver failure which can augment morbidity and mortality.

Keywords: hepatic artery , hepatic surgery

Introduction:

Hepatic arterial anomalies are not rare. A large number of studies have been undertaken on variant patterns of aberrant hepatic arteries because of its high surgical relevance. Some studies have shown the incidence of aberrant hepatic arteries to be as high as almost 50 % . ¹All the studies done earlier were on aberrant origin of hepatic artery and we did not find any report on abnormal branching pattern of the artery. ²During routine dissection we had this accidental finding of abnormality in branching pattern of the hepatic artery with altered relations and course of its branches. A comprehensive understanding of common and uncommon variations in hepatic arterial system is very much essential for the surgeons to avoid any potentially disastrous complication .Knowledge on this abnormal anatomy will be helpful to avoid injuring the arteries during surgeries like pancreaticoduodenectomy in patients with ampullary tumor³

Knowledge of hepatic arterial variations is important for the surgeons performing liver transplant and hepato-biliary surgeries. The normal hepatic arterial anatomy is found only in 50 – 80% of cases as described in classic text books¹. There is documented number of variations worldwide as well as in India. With the advancement of laproscopic surgery of gall bladder we wanted to observe the branching pattern of hepatic artery in detail at the Porta hepatis.³ With this background present study was planned to study of variations of branching pattern of hepatic artery proper.

Materials and methods:

The present cadaveric study was planned and work was conducted in our department. Routine dissection of 18 cadavers in the department of anatomy, for first year M.B.B.S. students was done. The keen dissection was carried out with strict supervision of faculties. The arteries branching pattern was carefully cleaned and marked.

Observations:

In present study, in all cases proper hepatic artery divided into its terminal branches extrahepatically, of which 92% the point of division was proximal to the point of union of hepatic duct, whereas in 8% cases the point of division was higher, these findings were well in accordance with the reports of Almenar-Garcia.

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Discussion:

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Variations in the hepatic artery branches are exceedingly common and investigated by a whole series of workers, these include Eisendrath(1918); Flint; Thompson; Anson and Michles among the others. These branches are the segmental branches which arise early from the main trunk.^{4,5}

In the other a large branch, the common hepatic artery was seen arising and divided into four branches. One descended down as the gastro duodenal, another was right gastric, and the third branch (hepatic artery proper)divided into two and entered the liver substance separately at the fissure for ligamentum teres, fourth branch gave cystic branch and entered the Porta hepatis, a branch was seen arising from the cystic artery and entering the liver. In the third, male cadaver the hepatic artery proper ended in a bunch of branches.⁶

Awareness of variations in arteries supplying the duodenum and pancreas can also help in minimizing the blood loss during various surgical procedures in this area. Vascular variations are usually asymptomatic.⁷ They may become important in patients undergoing coeliacography for gastrointestinal bleeding, coeliac axis compression syndrome,

prior to an operative procedure or transcatheter therapy; chemoembolization of pancreatic and liver tumors. Careful identification and dissection of celiac trunk branches is therefore important to avoid iatrogenic injury. Normal variations are important to be demonstrated angiographically before any hepato biliary pancreatic and liver transplantation surgery, because accidental ligation of aberrant hepatic arteries may result in hepatic necrosis, ischemic biliary injury, graft injury or breakdown of biliary enteric anastomosis.⁸

Conclusion:

It was random study conducted to observe the arterial pattern supplying the extra hepatic biliary apparatus. A good knowledge of arterial system of liver and extra hepatic biliary apparatus, distribution and possible anatomical variation is important for surgeons, radiologists and clinicians as it is significant in liver transplantation in order for the vascularity not to be disturbed and necrosis of liver parenchyma postoperatively, nonestablishment of continuity in time of reconstruction is important because of post operative complication such as acute liver failure which can augment morbidity and mortality.

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