MULTIPLE HEPATIC ARTERIAL ANOMALIES: A CASE REPORT

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Introduction: According to anatomy textbooks, the classical hepatic vasculature is described as, common hepatic artery arising from the coeliac artery, which then gives off gastroduodenal artery to become the proper hepatic artery, this further divides into right and left hepatic arteries, cystic artery is derived from the right hepatic artery. This classical vasculature is seen in 25 to 75% of cases[3], and is termed Type-1 by Michels' classification.

RHA arising from superior mesenteric artery, left hepatic artery arising from the common hepatic artery, then diving into middle hepatic and also having a connection to the left gastric artery was noted in the cadaver during dissection and this did not fit into any of the 12 types[2] as described by López-Andújar R et al., and extensive literature review failed to reveal similar case reports.

Case Report: During anatomical dissection of a middle aged Indian male cadaver, multiple anatomical variations in hepatic vasculature were noted, following which, a careful dissection, colouring to easily delineate the arteries and photographic documentation was done.

What was initially thought as common hepatic artery arose from the coeliac trunk, this then divided into gastroduodenal artery and the hepatic artery proper, when the gastro-hepatic ligament was dissected further, it was noted that the common hepatic artery divided into 2 branches with a rather acute angle between them, and a communicating branch was noted between this common hepatic artery and the left gastric artery at the junction where it divided into two terminal branches and made an angle of around 90^0 with the hepatic artery (fig-1).

Of these two terminal branches, one was clearly noted to be entering the left lobe of the liver, and the other, which till now was being thought as the right hepatic artery, when dissected further, turned out to be entering the quadrate lobe of the liver through the fissure for ligamentum teres, as shown in fig-2.

The right hepatic artery was noted to be arising from the superior mesenteric artery at about 3 cm distal to the origin of SMA, behind the portal vein which later came to be situated posterior to CBD and in the free margin of the gastro-hepatic ligament, and the cystic artery.

This variation has not been reported in the literature, of particular importance is the anastomotic channel (fig-2) between the left hepatic artery and left gastric artery, as seen from the photographs, the left hepatic artery is arising from the common hepatic artery, however the communication between the left gastric artery and hepatic artery is not taking part in supplying the liver.

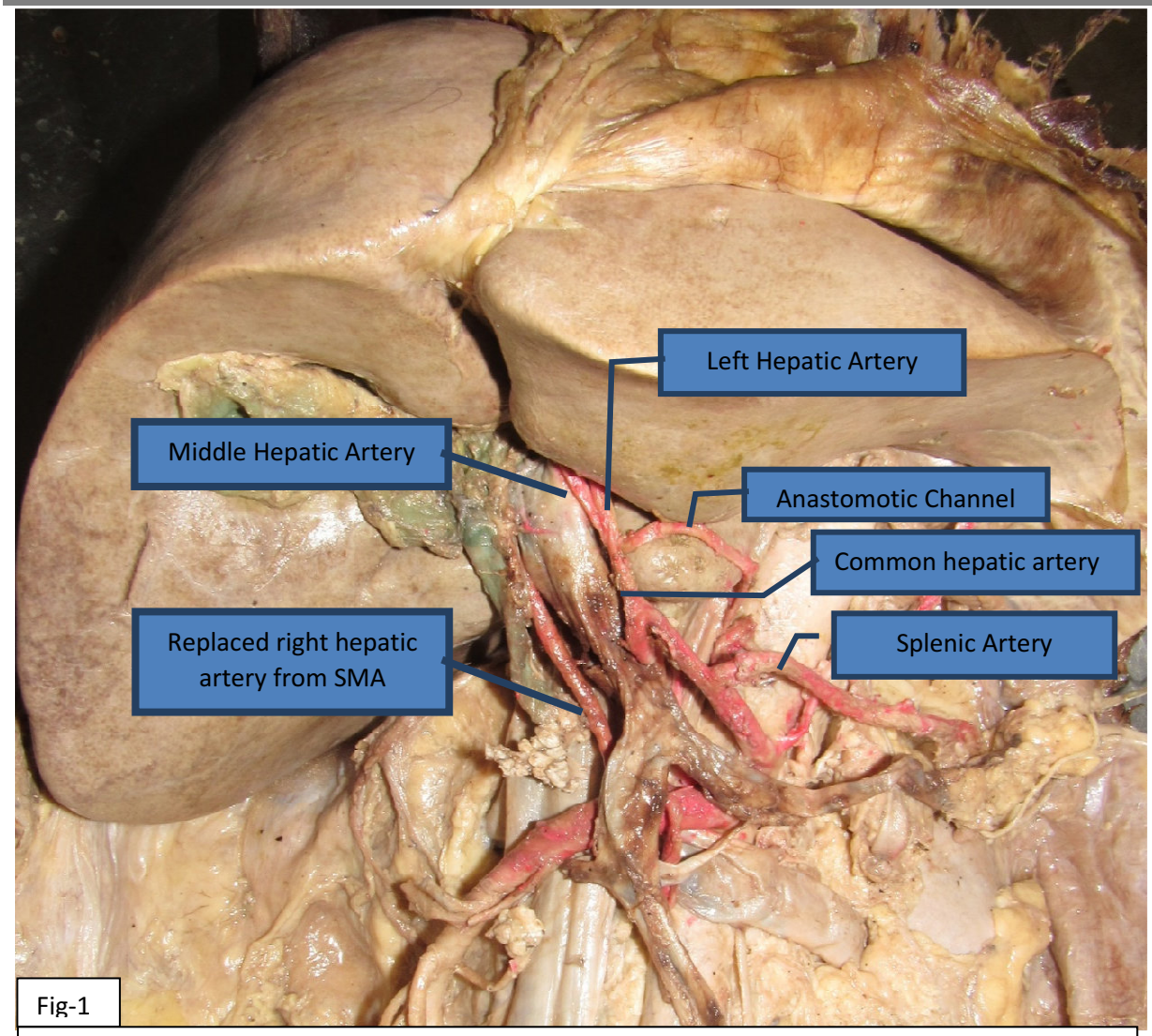

Fig-1

Fig-1. Shows the common hepatic artery arising from rather long coeliac trunk, a communicating branch between left gastric artery and common hepatic artery running in front of the caudate lobe of the liver within the lesser omentum.

Discussion: Anomalies of hepatic vasculature are very frequent, Rafael López-Andújar, et al. conducted an extensive research on 1,081 donor cadaveric livers and have classified the anomalies in hepatic arterial anatomy into 12 types[2], of which the type-1[1] is the most common[3], accounting for 70% all studied livers where the anatomy conforms to the description in the anatomy textbooks, the next common type, Type-2[1] described by them is of a replaced left hepatic artery arising from left gastric artery which accounts for 9.7% of cases.

Type-7[1] (0.6%) includes cases where the accessory left hepatic artery arises from the left gastric artery, and an accessory right hepatic artery from the superior mesenteric artery.

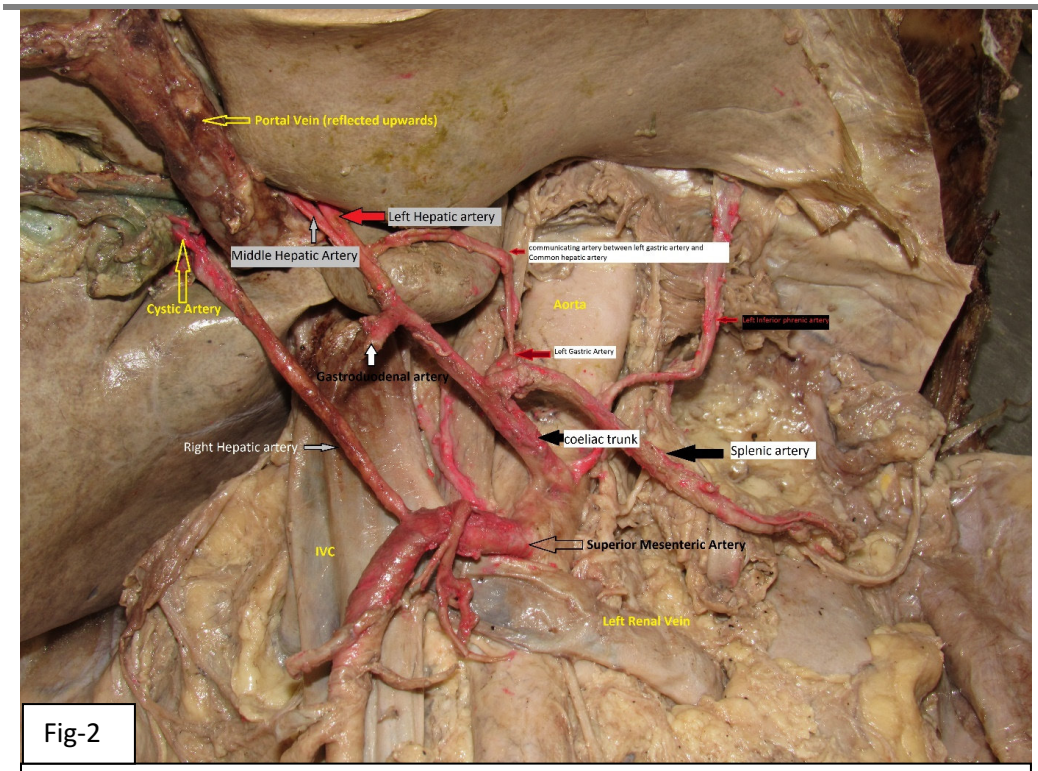

Fig-2

Fig-2. Long coeliac trunk is clearly visible, Left hepatic artery is seen entering the left lobe, between the caudate lobe and left lobe, and middle hepatic artery are seen entering the fissure for falciform ligament. The origin or right hepatic artery from SMA is clearly visible so is the cystic artery arising from the right hepatic artery.

Type-8[1] (0.3%) is when a replaced left hepatic artery originates from the left gastric artery, and an accessory right hepatic artery from the SMA or vice versa. Type-9[1](2.5%) includes the common hepatic artery originating from superior mesenteric artery. Type-10[1], common hepatic artery arises from left gastric artery. Type-11[2] (0.3%0, Common hepatic artery arising from the SMA, and Type-12[2](0.7%) is when the common hepatic artery is originating directly from the aorta.

In this case, we could not classify the anomaly into any of the known types, hence the right hepatic artery is termed a replaced right hepatic artery, left hepatic artery is arising from the common hepatic artery, middle hepatic artery is arising from the common hepatic artery, and the anastomotic channel between the common hepatic artery and left gastric artery is named as communicating artery.

This communicating branch can serve as a replacement artery in cases where the proximal part of the left gastric artery needs to be resected, thus preserving the blood supply to the stomach.

The replaced arteries must be preserved as the hepatic arteries are functionally end arteries[1, 4].

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