Variations in the Ramification of the Aberrant Right Hepatic Artery

By

Tamiji NAKASHIMA

Department of Anatomy and Anthropology, School of Medicine, University of Occupational and Environmental Health, Japan.
Kitakyushu 807, Japan
(Director: Prof. Teruyuki Hojo)

-Received for Publication, July 14, 1986-

Key Words: Aberrant right hepatic artery, Celiac trunk, Japanese anatomical specimen

Summary: The aberrant right hepatic arteries were observed in three of twenty-eight Japanese anatomical specimens. The occurrence of the aberrant right hepatic arteries were fewer in 252 Japanese cadavers studied by Adachi than in 200 American specimens studied by Michels and in 165 American specimens reported by Basmajian. A case of the three aberrant cases had an arterial anastomosis between the aberrant right hepatic artery divided from the superior mesenteric artery and the proper hepatic artery divided from the celiac trunk. The anastomosed case like this has not been reported.

The origin and the ramification of the celiac trunk and its branches are commonly as follows. The celiac trunk has the three branches; the common hepatic, the splenic and the left gastric artery. The common hepatic artery divides into the gastroduodenal and the proper hepatic artery which has the right hepatic, the left hepatic and the cystic artery. Although variations in the ramification of the celiac trunk have attracted many anatomists as well as many surgeons, there have been a few reports on the ramification of the aberrant right hepatic artery (Adachi, 1928; Michels, 1953).

Adachi described and classified the ramification of the aberrant right hepatic artery by using 252 Japanese subjects and also described that the occurrence of the aberrant right hepatic arteries divided from the superior mesenteric artery was 11 of 252 cadavers (Adachi, 1928).

Michels reported the aberrant right hepatic artery of 52 bodies among 200 subjects and the most frequent source (in 32 of 52 bodies) was the superior mesenteric artery (Michels, 1973).

Further, Basmajian described that the percentage frequency of the aberrant right hepatic arteries divided from the superior mesenteric arteries was 12% in 165 specimens (Basmajian, 1980).

In this paper the variations of the ramification of the aberrant right hepatic artery will be described, discussed and corresponded to the types of the Adachi’s classification.

Materials and Methods

The subjects used in this study were three of 28 bodies from the dissection practice in 1985 for the medical students of the University of the Occupational and Environmental Health, Japan. The dissection and
the observation were carefully done and the branches of the aberrant right hepatic artery were observed and classified.

Results and Discussion

Results were as follows:

The first case was a 73-year-old male, died of alimentary bleeding. The results were shown in the Figs. 1 & 2. The celiac trunk divided into three branches: the left gastric, the proper hepatic and the splenic artery. In this case there was no common hepatic artery, and the proper hepatic artery branched the right hepatic artery immediately after dividing from the celiac trunk. This was the aberrant right hepatic artery.

The proper hepatic artery ran a little and divided three branches; the gastroduodenal and the cystic artery, and a branch to the left lobe. The celiac trunk was 6.6 mm in diameter and was 12.1 mm in length. Moreover, an aneurysm, 15.5 mm in diameter, was observed at the origin of the splenic artery.

I observed that the ramification of the celiac trunk of the first case corresponded to none of the types of the classification by Adachi (1928).

The second case was a male, 69 years of age, died of cerebromalacia. The results were shown in the Figs. 3 & 4. The celiac trunk had three branches; the proper hepatic, the left gastric and the splenic artery. The right hepatic artery arose from the superior mesenteric artery. This is the aberrant right hepatic artery, and in this case there was no common hepatic artery. The first branch of the celiac trunk was the left gastric branch which arose 14.0 mm distant from the origin of the celiac trunk.

The splenic and the proper hepatic artery bifurcated 10.9 mm distant from the origin of the left gastric artery. The gastroduodenal and the right gastric artery arose 26.8 mm distant from the origin of the proper hepatic artery. The proper hepatic artery entered the left lobe.

The branching pattern of this case corresponded to the I-8 type of the Adachi's classification (1928). By him this type occurred in 4.4%, very few.

The third case was a male, 81 years of age, died of atrial fibrillation. The results were shown in the Figs. 5 & 6. The celiac trunk divided the left gastric 10.6 mm distant from its origin. After the celiac trunk divided the left gastric artery, it ran 11.0 mm and divided two branches: the gastroduodenal and the splenic artery. The splenic artery ran 7 mm and branched the proper hepatic artery.

On the other hand the superior mesenteric artery ran 25.5 mm from its origin and divided the aberrant right hepatic artery. Furthermore, the proper hepatic artery and the aberrant right hepatic artery Anastomosed and made the loop. Moreover, the right and the left arterial branches to the right and the left lobe of the liver arose from this loop.

I observed that the ramification of the aberrant right hepatic artery of the third case corresponded to none of the types of the Adachi's classification (1928).

Among 28 cadavers dissected in our Department, three cases of the variations in the ramification of the aberrant right hepatic artery were discovered and only one case corresponded to the Adachi's classification.

Furthermore, in this study two of 28 cases showed that the sources of the aberrant right hepatic arteries were the superior mesenteric arteries. But by Adachi the aberrant right hepatic artery divided from the superior mesenteric artery occurred few, in 11 of 252 cadavers, 4.4%. By Michels the most frequent source of the aberrant right hepatic artery was the superior mesenteric artery and these cases occurred in 18.0% of 200 specimens. In Basmajian's study the inci-
The difference between the results of the Adachi's study and those of the Michels and the Basmajian may be considered to be the racial one.

Acknowledgements

The author is deeply grateful to Professor Teruyuki Hojo, the Department of Anatomy and Anthropology, School of Medicine, University of Occupational and Environmental Health, Japan, for his guidance.

References

Explanation of Figures

Plate I

Figs. 1 and 2. The first case. The aberrant right hepatic artery (RH). Aneurysm of the splenic artery is indicated (*).
Abbreviations: L (Left lobe of the liver), CA (Cystic artery), PH (Proper hepatic artery), GD (Gastro-duodenal artery), LG (Left gastric artery), SA (Splenic artery), S (Spleen), SM (Superior mesenteric artery), K (Kidney).
Plate II

Figs. 3 and 4. The second case. The aberrant right hepatic artery (RH) arises from the superior mesenteric artery (SM).

Abbreviations: L (Left lobe of the liver), PV (Portal vein), PH (Proper hepatic artery), GD (Gastro-duodenal artery), RG (Right gastric artery), LG (Left gastric artery), SA (Splenic artery), S (Spleen), RA (Renal artery), K (Kidney), IM (Inferior mesenteric artery).
Variations in the Ramification of the Aberrant Right Hepatic Artery

Plate II
Plate III

Figs. 5 and 6. The third case. The aberrant right hepatic artery (RH) arises from the superior mesenteric artery (SM). The aberrant right hepatic artery and the proper hepatic artery (PH) anastomose and they form the loop. The right and left branches of the liver arise from the loop.

Abbreviations: RL (Round ligament), L (Left lobe of the liver), GD (Gastroduodenal artery), LG (Left gastric artery), IP (Inferior phrenic artery), SA (Splenic artery), S (Spleen), RA (Renal artery), K (Kidney), IM (Inferior mesenteric artery).