

Accessory right hepatic artery originating from proximal and distal right renal artery in two subjects

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ABSTRACT

The hepatic arteries are known for aberrant origins and course. The following two-case report discusses the unique origin of accessory right hepatic artery from proximal and distal right renal arteries, respectively, its clinical significance, and the importance of a preoperative angiogram in renal and liver surgeries involving vascular control.

INTRODUCTION

The liver is supplied by a common hepatic artery which gives off the right and left hepatic arteries to the respective lobes of the liver. The liver is also known to have aberrant arterial supply, most commonly from the celiac artery, superior mesenteric artery and directly from the aorta. We describe two cases with unique origins of the right accessory hepatic arteries from proximal and distal parts of right renal arteries respectively, in two subjects who underwent computerised tomographic angiography as a part of live renal donation evaluation.


CASE REPORT

During a prospective study of 102 consecutive live renal donor subjects from January 2017 to March 2019, at Government Medical College, Calicut, India, the renal vascular anatomy was analyzed using computerized tomographic (CT) angiogram. Accessory right hepatic arteries (A-RHA) were found to originate from the right renal artery (RA) in two subjects among the 102 renal donors studied (1.96%). In the first case, a 46-year-old female, A-RHA originated from the superior aspect of right RA near its origin from the aorta, coursed upward behind inferior vena cava, and

ramified in segment VI of the liver [Figure 1]. Normal right hepatic artery (RHA) was also seen. The right RA distal to the origin of A-RHA was normal. In the second case, a 50-year-old male, A-RHA originated from the distal right RA near the hilum of the kidney, coursed along the right crus of the diaphragm and supplied segment VII of the right lobe of the liver [Figure 2]. Normal RHA was seen. Both subjects underwent left donor nephrectomy and made an uneventful recovery.

DISCUSSION

Developing kidneys receive successive pairs of transient aortic branches during their cranial migration. The sacral pair of renal arteries disappear as the ascending kidneys receive lumbar pairs. The final pair persists to form the proper RAs. Occasionally, an inferior pair of arteries also persists into adulthood as accessory RAs to the lower poles of the kidneys.^[1] The developing liver receives arterial supply variably from the celiacomesenteric arterial system, including aberrant origins with reported variation of 20%–50%.^[2] Aberrant RHAs are categorized as “accessory” or “replaced” (A/R-RHA) in the presence or absence of a normal RHA, respectively.^[3] Careful preservation of A/R-RHA with adequate length is essential in live and cadaver liver donation for reconstruction by anastomosing it to the gastroduodenal

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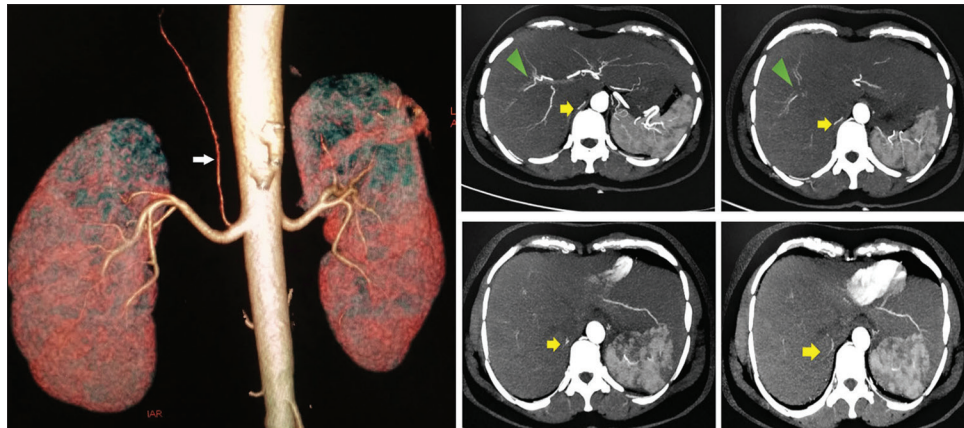


Figure 1: Left panel: CT angiography showing the proximal origin of accessory right hepatic artery from right renal artery (arrow). Right panel: Serial axial sections of the abdomen showing accessory right hepatic artery coursing posterior to inferior vena cava and bifurcating in segment IV of the liver (arrow). Normal right hepatic artery division is also seen (arrowhead)

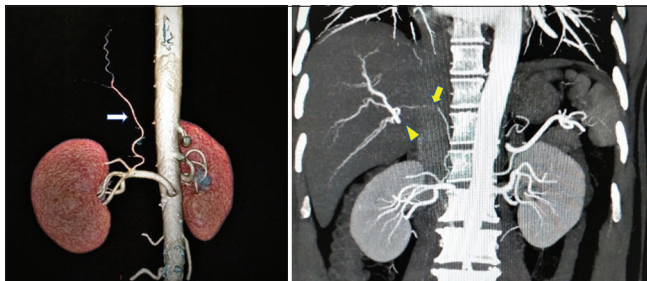


Figure 2: Left panel: CT angiography showing the distal origin of accessory right hepatic artery from right renal artery (arrow). Right panel: Coronal section of the abdomen showing accessory right hepatic artery coursing along the right crus of diaphragm and supplies segment VII of the right lobe of the liver (arrow). Normal right hepatic artery division is also seen (arrowhead)

artery,^[4] especially if it is the dominant or sole arterial supply to the right lobe of liver. An accidental A/R-RHA ligation can result in complications ranging from transient hyperbilirubinemia to potential hepatic lobar necrosis,^[5] depending on their vascular contribution to the liver. A case of R-RHA arising from the proximal right RA has been reported before.^[6] The occurrence of A-RHA originating from right RA is a unique finding of importance in right renal surgeries, liver donation, and in cadaver organ procurement.

CONCLUSION

A branch of right renal artery that courses upward along the inferior vena cava or crus of the diaphragm should be carefully preserved in renal surgeries or procured with adequate length in live and cadaver liver donation since it can represent an accessory or replaced right hepatic artery. A preoperative CT angiogram for elective renal and liver surgeries involving vascular dissection helps in surgical

planning and prevention of inadvertent injury of aberrant vessels.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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