A RARE PRESENTATION OF TRIPLE RIGHT RENAL ARTERIES ARISING FROM ABDOMINAL AORTA - A CASE REPORT
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Abstract: With recent advances in renal surgeries, it becomes imperative to understand the renal vascular anatomy and its variations. This case report highlights about a possible anatomical variation in renal vasculature. During routine dissection of a seventy year old male cadaver there were three right renal arteries. Patients with such variations may be completely asymptomatic. The renal arteries are paired large vessels arising from abdominal aorta. They branch and re-branch as segmental arteries to supply blood to the segments of the kidney. Precise knowledge of renal artery and its branching pattern is useful for surgeons performing nephrectomies and renal transplantations. Very commonly variations occur in number, source, branching and course of renal arteries. A supplemental renal artery is an additional artery within the renal vascular pedicle which perforates the kidney to supply it. An accessory renal artery is a one that is accessory to main artery accompanies the same towards the hilum and enters through the hilum to supply it. An aberrant renal artery supplies the kidney without entering the hilum.


INTRODUCTION: The renal arteries are paired lateral branches arising from abdominal aorta, just below the origin of superior mesenteric artery (at the lower border of first lumbar vertebra). They take about 20 percent of cardiac output to supply the organs which is less than 1/100th of total body weight. The right renal artery is longer and often higher, passing posterior to inferior vena cava, head of pancreas and descending part of duodenum. Near the hilum the renal artery divides into anterior and posterior divisions which further divide into segmental arteries and supply renal vascular segments.

CASE REPORT: Using conventional dissection method, posterior abdominal wall was dissected in a 70 year old male embalmed cadaver. In this case, we found triple renal arteries arising from abdominal aorta on the right side, and the triple renal arteries were photographed. The left renal artery of the same cadaver was normal. In the present case, we observed triple vessels which originated from right lateral side of aorta at lower border of first lumbar vertebra supplying the right kidney. The vessel sandwiched in between the two vessels was considered as main renal artery, as it divided into anterior and posterior branches in front of hilum. There were two supplemental renal arteries which had a parallel course with that of the main renal artery. The supplemental artery lying superior to main renal artery gave the inferior suprarenal artery, a little proximal to renal hilum. Both supplemental renal arteries and main renal artery were postcaval in origin. They entered the kidney through renal hilum as supplemental renal arteries behind the plane of renal vein. The right and left renal veins were single.
DISCUSSION:

Variations in number, source, branching and course of renal arteries are commonly encountered. Bergman R.A, Afifi AK and Miyauchi R (2006) highlight about the incidence of supplemental renal arteries as 20.2% on the right and 19% on the left. Accessory renal arteries are a misnomer because these vessels are not extra but essential, tissue sustaining arteries and cannot be ligated without dire consequences. The occurrence of three hilar arteries is about 1-2%. He also quotes that, there can be variations in number ranging from one to six. There can also be variations in origin of these supplemental arteries, most commonly being abdominal aorta, between eleventh thoracic vertebra to fourth lumbar vertebra. There can also be variations in point of penetration, most commonly the supplemental renal arteries penetrate at superior pole and least commonly at hilum of kidneys. Vessels which penetrate inferior pole may cause obstruction resulting in hydronephrosis. Susan Stranding (2008) states that the accessory renal arteries / aberrant renal arteries are common and account for about 30 percent prevalence. They usually arise from the aorta above or below (most commonly below) the main renal artery and follow it to renal hilum. They are regarded as persistent embryonic lateral splanchnic arteries.

Das.S (2008) states that the anatomical variations of renal arteries may be linked to developmental changes of lateral splanchnic arteries. The incidence of donor kidneys vascular anomalies ranges from 18 percent - 30 percent and such kidneys are usually at increased risk of vascular and urological complications. The patients with variations in renal vasculature, the procedure of laparoscopic donor nephrectomy becomes difficult, with increased risk of intraoperative bleeding and postoperative morbidity. Nayak .S (2008) states that, the accessory renal arteries are additional renal arteries which are frequently seen originating from aorta. They may enter kidney above or below the hilum. They are usually associated with non rotated kidneys with extra renal calices and pelves.

These abnormalities are due to various developmental positions of the kidneys. Jetti . R, Jevoor P.S, Vollala V.R, et al (2008) state that, the accessory renal arteries of kidney frequently occur due to various developmental positions of kidneys. These are end arteries and if damaged the part of kidney supplied by it becomes ischaemic. Rao T.R and Rachna (2011) state that, the accessory renal arteries arise from the aorta above or below the main renal artery and follow it to the renal hilum. These supernumerary arteries vary in size and are generally derived from the aorta in 30 percent of cases and may enter the kidney at any point. These arteries usually arise between eleventh thoracic to fourth lumbar vertebra. They run parallel, enter hilum in sequence and may be prea caval or postcaval. These are considered as persistence of caudal part of mesonephric arteries (persistent embryonic lateral splanchnic arteries) which form the segmental arteries of adult kidney which may show variation at their point of origin. An aberrant artery supplies kidney without entering its hilum. The term has also been applied to an additional artery entering the kidney at either pole, which may be derived from main renal artery / aorta. Aberrant arteries perforate the substance of kidney rather than entering its hilum. CONCLUSION: The triple renal arteries originating from aorta on the right side consisted of a main renal artery in the middle with two supplemental renal arteries (superior and inferior to main renal artery), which were considered as accessory right renal arteries. A comprehensive sound knowledge in possible variations of the renal arterial pattern is a prerequisite for surgical, radiological procedures and postoperative management.

REFERENCES: