Original Research Paper

Radiodiagnosis

ANATOMIC VARIATIONS OF RENAL ATERIES ON CTANGIOGRAPHY

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Introduction:
- Classically,each kidney is supplied by a single renal artery originating from abdominal aorta. However, renal artery variations regarding their origin and number are very common.
- Understanding anatomy of the vascular variations of kidney is essential for the clinician as the invasive interventions such as renal transplantation, interventional radiologic procedures and urologic operations are increased, awareness of the possible variations of the renal arteries is necessary for adequate surgical management more safely and efficiently.

- **Objective:**
- The purpose of the present study is to illustrate the MDCT angiographic appearance of normal anatomy and common variants of renal arteries.
- **Material and methods:** 100 cases were taken for the study. The normal and variant renal arteries were studied by using 16 slice multidetector computed tomography angiography (MDCTA).
- **Results:** The results were single renal artery in 72%(67% in the right and 77% in the left),multiple renal arteries in 28%(33% in the right and 43% in the left), multiple renal arteries on both sides in 4%,hilar(accessory) arteries in 47%(45% in the right and 49% in the left),polar (aberrant)arteries in 53%(50% in the right and 49% in the left),early division in 11%(9% in the right and 13% in the left).
- **Discussion:** Renal artery variations are divided into 2 groups: Early division and Extra Renal Artery.
- Prehilar (early) branching of the renal artery is a normal variant in which any branch diverge within 1.5– 2.0 cm from the aorta in the left kidney or in retrocaval segment in the right kidney. It is essential to identify any prehilar branching that occurs within 2 cm of the origin of the renal artery from the abdominal aorta,since most surgeons require at least a 2-cm length of renal artery before hilar branching to guarantee satisfactory control and anastomosis.
- Extra renal arteries are divided into 2 groups: hilar (accessory) and polar (aberrant) arteries.
- Hilar arteries enter kidney from the hilus with the main renal artery, whereas polar arteries enter kidneys directly from the capsule outside the hilus. The importance of polar arteries is shown in the fact that they supply renal parenchyma, and when damaged during nephrectomy it can cause arterial bleeding or renal infarction.
- A section of an inferior polar artery can cause pyeloureteral necrosis of the graft leading to stenosis or urinary tract leakage. If it is not possible to preserve the artery, a pyeloureteral anastomosis between the graft and the recipient can be considered
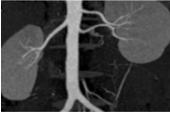
Conclusion:
The knowledge about these variatioans is of utmost importance to the urologist, surgeons dealing with kidney retrieval and transplantation,
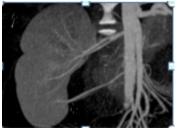
radiologists, persons performing various endourologic procedures and innumerable interventional techniques.In the majority of such situations it is the comprehensive knowledge of the renal arterial variation that remains the key issue in determining the technical feasibility of surgical interventions as well as the postoperative management.

Coronal volume rendering images showing prehilar branching of single right renal artery.

The coronal MIP images showing normal bilateral kidneys with single right renal artery and two renal arteries on the left side.

MIP image illustrating a right inferior polar artery arising from the anterior aspect of the aorta.