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Case Report

UNILATERAL ABERRANT RIGHT RENAL ARTERY A CASE REPORT

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ABSTRACT

Kidney is supplied by renal artery on each side taking origin from abdominal aorta just below the origin of superior mesenteric artery at L2 level. Extra renal arteries are broadly divided into different types. The Aberrant renal arteries are those which supply the kidney (poles) without passing through hilum. During routine dissection of an adult male cadaver in department of Anatomy, M.R. Medical college, Gulbarga, we observed an aberrant right renal artery arising from main right renal artery, supplying upper pole called right superior polar artery. Variations in origin and course of renal arteries are of special interest to urologist, vascular surgeons, nephrologist, anatomist and radiologist.

Keywords: Aberrant renal arteries, Right superior polar artery, Superior mesenteric artery, Abdominal aorta, Right main renal artery.

INTRODUCTION

Renal arteries are two large vessels which branch laterally from the Aorta just below the superior mesenteric artery, the right is longer and often higher than left. One or two accessory renal arteries frequently occur, especially on the left, usually from the aorta above or below the main artery, the former slightly more often. They usually enter above or below the renal hilum; if below, the vessel crosses anterior to the ureter and, on the right, usually also anterior to the inferior vena cava¹. Persistence of lateral splanchnic arteries with branches in the form of accessory renal arteries may be attributed to misexpression of any of these transcription factors and signalling molecules viz., VEGF, TGF β , PDGF, SHH and EphB2². Knowledge of anatomy of renal blood supply is important to every urologic surgeon³.

CASE REPORT

During routine dissection for 1st year MBBS students 2013 - 2014 batch in department of Anatomy, M. R. Medical college, Gulbarga, we observed an aberrant right renal artery arising from main right renal artery supplying right kidney. The trunk of aberrant renal artery supplied the upper pole called right superior polar artery, also gave branch to right supra renal gland. Main right renal artery originated from right side of Aorta and then passed horizontally to reach hilum of right kidney. The left kidney was supplied by single

artery that is left main renal artery which passed into the hilum. No other anomalies were observed in posterior abdominal wall.

DISCUSSION

Bordei P et al. (2004), observed left sided preponderance of the accessory renal artery and reported 28 out of 273 cases, with kidneys having double renal arteries on left side⁴.

Saldarriaga B et al. (2008) reported 97 out of 390 (24.9%) cases, with kidneys having additional arteries; out of these 87 (22.3%) had 1 additional artery and 10 (2.6%) had 2 additional arteries. The frequency of 1 additional artery was 43.5% on right side and 56.3% on left side⁵.

Budhiraja et al., 2008 observed in 10.7% of cases, the superior polar artery originated directly from the abdominal aorta as an additional renal artery⁶.

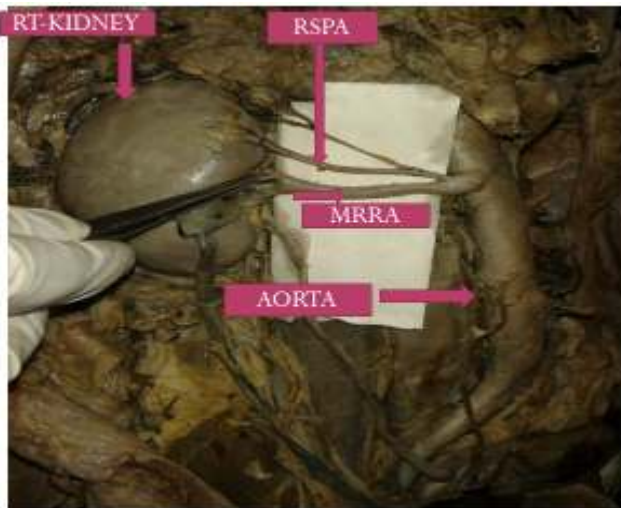
Janschek et al., 2004 reported the incidence of multiple accessory renal arteries to be 20.2% and 19% on right and left sides, respectively⁷.

According to Bergman R.A et al., 1988; Aberrant renal arteries are common in fused kidneys. Aberrant arteries perforate the substance of the kidney rather than entering its hilum to supply it. These arteries could arise as high as inferior phrenic artery or as low as internal iliac arteries. The unusual vessels may originate from the aorta, as well as

gonadal, common iliac, middle sacral, external or internal iliac or superior or inferior mesenteric arteries. Superior renal polar arteries are usually single. They arise as separate branches of the renal artery, inferior suprarenal, inferior phrenic or superior mesenteric artery. Inferior renal polar arteries are usually single and arise from the aorta or renal artery. They have also occasionally been reported arising from a suprarenal, common iliac or superior mesenteric artery. The inferior polar arteries are sometimes doubled, with one arising from the aorta and the other from the renal artery, or the pair from the either source. The inferior polar arteries have been implicated as an etiological factor in a form of hydronephrosis correctable by surgery⁸.

According to Gupta et al., 1982; it is essential for surgeons to bear in mind the possibility of additional superior polar arteries before performing any transplantation surgeries, as kidney transplantation with multiple renal arteries has a chance of rejection, tubular necrosis, or poor graft function⁹.

Ugur Ozkan et al.,2006 observed in 855 patients in an angiographic study that aberrant renal arteries were twice as often as accessory renal arteries. The frequency rate of ERA was same on right and left sides, and in 12% of the general population, ERA is bilateral. It has been reported that ERA are detected less in angiographic studies than in anatomic dissection studies. In several angiographic studies, ERA frequency rate was between 20% and 27%.The reason why ERA are detected with a lesser frequency in angiographic series, is that thin arteries which originate directly from the aorta cannot be observed in angiography¹⁰.



Photograph Showing Aberrant Right Renal Artery (Right Superior Polar Artery)

- MRRA-Main Right Renal Artery
- RSPA-Right Superior Polar Artery
- RT KIDNEY-Right Kidney

CONCLUSION

Variation in the origin and course of the renal arterial blood supply occur frequently. This high incidence of additional renal arteries are significant in the invasive interventions such as renal transplantation, interventional radiologic procedures and urologic operations, renal artery embolization, angioplasty or vascular reconstruction for congenital and acquired lesions.

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