

ACCESSORY RENAL ARTERIES AND ITS CLINICAL SIGNIFICANCE

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ABSTRACT

The relatively common variations in the blood supply to the kidneys reflect the manner in which the blood supply continually changed during embryonic and early fetal life. A single renal artery to each kidney is present in about 75% of the people. About 25% of adult kidneys have two to four renal arteries. The origin of main renal arteries from the aorta is between the upper margin of L1 and lower margin of L2 vertebra in 98% of the patients. Accessory (super numerary) renal arteries usually arise from the aorta superior or inferior to the main renal artery and follow it to the hilum. An accessory renal artery to the inferior pole may cross anterior to the ureter and obstruct it causing Hydronephrosis.

The aim of this study was to determine the location of origins of renal arteries and the variation rates of renal arteries in cadavers. During the routine dissection for a period of two years, on a total of twelve cadavers, accessory renal arteries are found in three cadavers and accessory segmental arteries are found in one cadaver.

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INTRODUCTION

Renal arteries are a pair of lateral branches from the abdominal aorta. Normally, each kidney receives one renal artery. Variations of the renal arteries are usual and the most common variation is the presence of an additional accessory renal artery, occurring in approximately 30% of cases, which has been described by many researchers. Abnormalities of the renal arteries are perhaps more frequently met with than those of any other of the larger arterial trunks. The possible etiology of these variations has been explained by embryological development from the lateral mesonephric branches of the dorsal aorta. Knowledge and awareness of these possible variations and anomalies of the renal arteries are necessary for the correct interpretation of radiological examinations, surgical procedures like renal transplantation, repair of abdominal aorta aneurysm, urological procedures and angiographic interventions.

MATERIALS & METHODS

This study is carried out during the routine dissection for a period of two years, in the department of Anatomy, Shyam Shah Medical College, Rewa, Madhya Pradesh, on a total of twelve cadavers. During the dissection of Posterior abdominal region, kidneys along with blood vessels removed and vascular pattern in each kidney was studied.

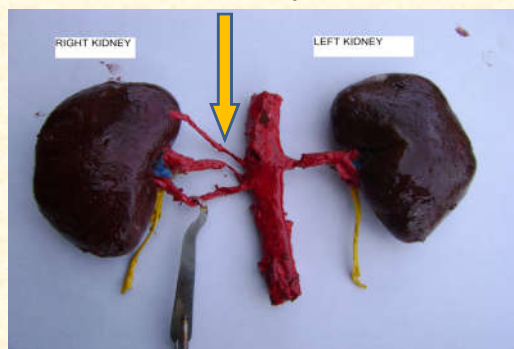
OBSERVATIONS & RESULTS

In the present study accessory renal arteries are found in three cadavers and accessory segmental arteries are found in one cadaver. In one specimen (Fig .1) polar renal artery is observe which is going to the upper pole of right kidney.

Bilateral Accessory renal arteries are found in one specimen (Fig.2) and on the right side inferior accessory artery is passing in front of the ureter which may cause hydronephrosis by obstructing the ureter.

Accessory segmental arteries are found in one specimen (Fig.3) on the right kidney.

Fig: 1 Showing Accessory renal arteries on Right kidney



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Fig:2 Showing Accessory renal arteries on both the kidneys

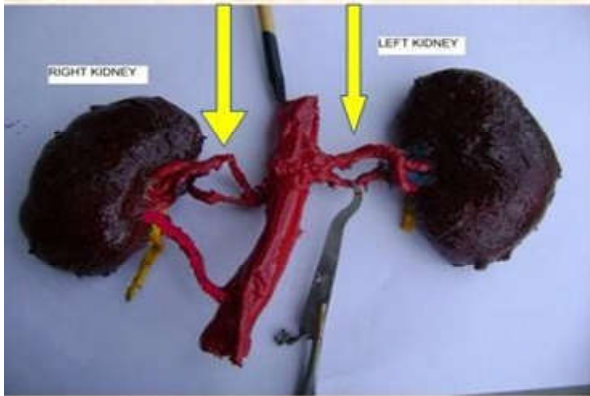
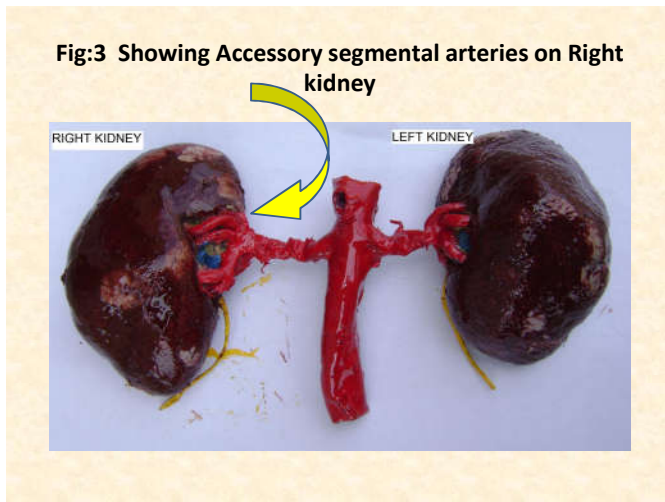


Fig:3 Showing Accessory segmental arteries on Right kidney



DISCUSSION

Accessory renal arteries usually arise from the aorta above or below the main renal artery and follow it to the renal hilum. Development of the kidney is essential in order to understand the possibilities of the multiple anomalies and variations of the renal arteries. In the typical pattern, one right and one left renal artery arise from the antero-lateral aspect of the abdominal aorta and each artery supplies the kidney on that side. Different variations in the origin, courses and branches of renal arteries have been described by many researchers and authors. In about one-third of our general population there are variations in the number, location and branching patterns of the renal arteries, with over 30% of patients having one or more accessory renal arteries.

In recent years great technological advances due to modern diagnostic imaging techniques, particularly in the field of urology, in non-interventionist radiological procedures and in the area of surgery, have emphasized having better morphological references for the renal vascularization pattern. Even though imaging techniques have good resolution, direct anatomical studies lead to recognizing anatomical vascularization patterns in greater detail, offering a reference having great usefulness for interpreting, managing, and surgical approaches and diagnosing functional alterations.

SUMMARY & CONCLUSIONS

Accessory renal arteries are important from the clinical point of view in that they may cause; a) Varicocele (ovarian varicocele in female) secondary to compression of the renal vein by an arched gonadal artery, b) Hydronephrosis due to occlusion or compression of the ureter by an inferior polar artery, c) Nephroptosis and malrotation of the kidney associated with an inferior polar artery, d) Arterial hypertension because of the constriction of renal arteries and subsequent renal ischemia, e) The risk of infarction in a kidney during urologic or oncologic surgical interventions and renal transplantations. It may also be of practical importance for correct interpretation of roentgenographic examinations in angiographic procedures.

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