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Ayurveda

AN ANATOMICAL VARIATION OF RENAL ARTERY - A CASE REPORT

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ABSTRACT Kidneys are pair of excretory organs generally supplied by the Single renal artery on either side, though we found the anatomical variation of blood Supply to the kidney by finding the accessory renal artery on left side. In cadaveric dissection of 65-year male, it was noted that kidney is supplied by the renal artery as well as Accessory renal artery. Accessory renal artery originated about 3cm below the Renal artery. Now a days many renal surgeries such as kidney transplantation, Nephrectomy, pyeloplasty are performed it is must for urologist to understand and identify such anatomical variation for the blood supply to the kidney.

KEYWORDS : Kidney, Accessory renal artery, cadaver etc.

INTRODUCTION

Kidney got arterial supply from the Renal artery which is the lateral Paired branch of Abdominal Aorta [1]. Renal artery arises from the abdominal aorta at the level of L1 – L2 Vertebral bodies immediately below the origin of superior mesenteric artery [2]. After it takes origin from the abdominal aorta it runs laterally behind the left renal vein and splenic vein to reach up to the hilum of kidney and after that it get terminate by distributed in the kidney[3]. Approximately 20% of cardiac output is supplied to the kidney by Renal artery[4].

Around 70 % of individuals have the single renal artery for the arterial supply of kidney, Though the variation found very common within the origin and number of arteries that supply the kidney[5].

PROCEDURE

The abdomen was opened as per Cunnigham's manual of dissection. Anterior abdominal wall was reflected and anterograde viscera were removed. Then, both the kidneys were identified and removed the fascia from the anterior surface of the right and left kidneys [6].

Anatomical variation of blood supply to the left kidney is noted. We Found the Left Accessory renal artery originating direct from the abdominal aorta below the renal artery about 3cm.Accesoory renal artery runs inferior to the renal artery and enters the hilum of the kidney inferior to the renal artery. The specimen is preserved in departmental museum.

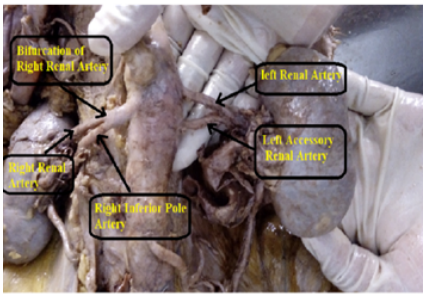

Figure No. 1 – Dissected specimen of Kidney – Anterior View

CASE STUDY

During a gross cadaveric dissection of 65-year-old male in Final year PG practical of Rachana sharir department at Parul institute of Ayurved, Parul university, Vadodara, Gujarat, we observed a variation of blood supply to left kidney. We noted accessory renal artery takes origin from lateral side of abdominal aorta around the 3cm below the renal arteries which supplies the left kidney. Both arteries seem to similar in size and enter the kidney through the hilum of kidney. Accessory renal artery enters in the hilum of kidney immediately inferior to the renal artery. we also noted that right Renal Artery bifurcate immediately after takes origin from Abdominal Aorta which is normally gives division after entering in to the hilum of kidney.

DISCUSSION

With the advent of laparoscopic renal surgeries and donor nephrectomies it becomes more important to understand the vascular variation as it may accidently get damaged during Renal surgery. Anatomical variation of blood supply to kidney is very common. About 70 % of population have a single renal artery and 30% to 35 % population have accessory renal artery[7].

Type of variation

Type 1- Two separate renal arteries arise from the side of the aorta to supply the kidney. The two arteries enter the hilum of the kidney dividing, into two or more branches. This variety may be called the two-artery type [8].

Type 2: A main renal artery arises from the aorta in the normal manner, but a second accessory, artery arises from the aorta a variable distance away, passing directly from the aorta to the upper pole of the kidney. This may be called the superior polar type [9].

Type 3: The main renal artery arises from the side of the aorta and passes to the hilum in the normal manner. An accessory renal artery arising separately from the aorta a variable distance from the main trunk passes to the lower pole of the kidney. This is called the inferior polar type [10].

Type 4: Three renal arteries arise from the side of the aorta and pass separately to the hilum of the kidney. This is called the three-artery type [11].

Type 5: Four renal arteries arise from the aorta and pass separately to the hilum. This is called the four-artery type [12].

Type 6: The accessory artery arises from the common, external or internal iliac, rarely from the hepatic, middle sacral, spermatic and

inferior phrenic, lumbar or even pancreatic or colonic arteries. This may be called the extra-aortic accessory type, and is quite rare as compared to the previously described types [13].

Type 7: Superior or inferior polar arteries arise from a single normal renal artery before it enters the kidney [14].

The present case encountered the type 3 variation where accessory renal artery originating below the left renal artery from abdominal aorta and then it enters into the lower or inferior pole of kidney and Type 7 variation was observed on right renal artery where it get bifurcated before enter into the hilum of the kidney. We nomenclature it as right inferior polar artery.

CONCLUSION

Normal pattern of renal artery is found in 75% of population [15]. Here in the dissection of 65-year-old male cadaver we found the anatomical variation of renal artery i.e. left accessory renal artery that get originate directly from the abdominal aorta shows type 3 variation.Right renal artery has type 7 variation were renal artery gets bifurcate immediately after its origin from the abdominal aorta.

Renal arteries included multiple variation arteries Such as multiple arteries in 24%, bilateral multiple arteries in 5%, and early division in 8% of cases. Additional renal arteries on the right side were found in 16% and on the left side in 13% of cases. Bilateral aberrant renal arteries were found in 13- 16 % of cases [16].

Such anatomical variation is very important and prove to be fatal if get avoided during the operative procedure such as kidney transplantation, Nephrectomy, pyeloplasty. This result should be kept in mind when a non-invasive diagnostic search is performed for renal artery stenosis or when renal surgery related to renal arteries is performed.

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