

# A Case Report of Renal Artery Variation

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## Article info:

Received: 17 Apr. 2014

Accepted: 28 Jul. 2014

## Key Words:

Accessory renal artery,  
Dissection, Renal arteries,  
Anatomic variation

## ABSTRACT

Awareness of the presence of the accessory renal artery in kidney transplant, treatment of renal artery stenosis, clinical assessment of renal vascular hypertension, radiology and angiography interventions is very helpful. In 30% of cases the accessory renal artery is separated from the abdominal aorta and in most cases, this artery along with the main artery entered to the kidney through the hilum. This report is related to the accessory renal artery that was observed during dissection.

## 1. Introduction

**R**enal arteries are mostly derived from abdominal aorta below the origin of superior mesenteric artery at the level of L1-L2 intervertebral disc. These arteries descend to a lower level with aging. The diameter of both right and left renal arteries are equal but the right renal artery is longer [1, 2].

In 70% of the cases the perfusion of the kidney is supplied through entry of the artery in the hilum [3]. Changes in the vascular pattern of renal artery is reported more than other arteries and most changes in this artery is due to the presence of accessory renal artery that can be seen in 30% of cases and deserves more attention clinically [4].

In the evolutionary process, perfusion to the kidneys is proportional to their ascending to the lumbar region.

During the ascending, arteries are not elongated but degenerated and are replaced by new blood in higher levels of the aorta. Remain unstable inferior renal artery leads to the accessory renal artery [5].

Awareness of kidney anatomy knowledge and presence of the accessory renal artery is necessary for management of following processes: processes in the kidney transplant surgery, treatment of abdominal aortic aneurysms, renal artery stenosis treatment, clinical evaluation of renal vascular hypertension as well as radiology and angiography interventions [6-8].

In this study, a change in the pattern of the right renal artery with accessory renal artery is reported.

## 2. Case Report

During the dissection of kidneys in the posterior wall of the abdomen, a variation of the right accessory renal

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**Figure 1.** RRA: right renal artery, RK: right kidney, AA: abdominal aorta, ARA: accessory renal artery.

artery was observed. In this variation, in addition to the main renal artery, an accessory artery originating from the aorta with the same way, the main arteries had entered in the lower pole of the kidney.

### 3. Discussion

Accessory renal artery with 30% prevalence was originated from abdominal aorta. In this field, many angiographic and anatomic studies have been reported so far [9, 10]. But prevalence of the accessory renal artery in angiography has fewer cases than those of the anatomy cases [11].

Attention to the presence of renal artery in clinical view point is very important. Meanwhile, Gesase & et al. in their study reported that problems such as tissue necrosis, thrombosis, rejection of kidney and vascular complications in kidney with accessory renal artery is more common than the kidney with a main artery [12].

Other studies also have indicated an association between accessory renal artery and increased risk of bleeding during surgery, postoperative complications, and renal vascular hypertension [13, 14]. While Gupta & et al. reported that there is no relationship between the presence of accessory renal artery and the risk of high blood pressure [15]. The relationship between increased clinical symptoms after surgery and accessory renal artery may be due to inability and failure to restore primary perfect circulation.

Incidence of the hydronephrosis likely occurs more in the cases that the accessory renal artery enters in lower pole of the kidney. The reason is that the ureter is obstructed by artery [16]. In addition, the presence of accessory renal artery with changes in the geometry and anatomy of the arteries can give rise to some vascular diseases such as atherosclerosis [1].

It is reported that the accessory renal artery on the right side was originated from the aorta in the lower level of the main artery and entered in the lower pole of the kidney. This artery like the main artery does not impose any pressure on the ureter.

With due attention to aforesaid points, the presence of accessory renal artery should be considered important from the clinical and scientific standpoint.

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