



Aberrant right polar renal artery originating from aortic bifurcation

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Abstract

Variations in the renal vessels and knowledge of the possibility of these variations are becoming more important nowadays due to gradual increase in interventional radiological procedures, urological and vascular operations, and renal transplantation. This report describes a case of aberrant right polar renal artery originating from aortic bifurcation in a fifty-year-old woman, that found incidentally while investigating for hypertension before the endovascular treatment of a cerebral aneurysm.

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Key words [aberrant] [polar renal artery] [angiography]

Introduction

Multiple renal arteries are unilateral in approximately 30% of patients and bilateral in approximately 10% [1, 2]. Aberrant arteries usually arise from the aorta or iliac arteries anywhere from the level of T11 to the level of L4. In rare cases, they can arise from the lower thoracic aorta or from lumbar or mesenteric arteries [1]. Aberrant renal artery originating from aortic bifurcation as in our case is an extremely rare variation. It is obligatory to pay attention and keep in mind the possibility of accessory renal vessels during renal transplantations and vascular operations although they may be extremely rare as well as the variation in our case; an aberrant polar renal artery originating from aortic bifurcation.

Renal artery variations are common in general population [3, 4]. Frequency of aberrant renal arteries varies between 9% to 76% in anatomic and cadaver studies [3, 5, 6] and it is becoming more important to detect aberrant renal arteries (ARA) due to gradual increase in interventional radiological procedures, urological and vascular operations, and renal transplantation [5–8]. If ARA is missed before these procedures it may lead to multiple complications ranging from hematoma to death. Herein we report a case of aberrant right polar renal artery incidentally found during the evaluation for resistant hypertension.

Case Report

A fifty-year-old woman suffering from hypertension for 20 years was diagnosed with cerebral aneurysms during the investigation for headaches in 2007. Cerebral aneurysms were treated endovascularly with coil embolization. In 2009 patient was referred to our clinic with relapsing headaches and a new cerebral aneurysm was found but endovascular treatment was postponed due to the malign hypertension reaching levels up to 230/160 mm Hg. Renal artery Doppler ultrasound showed bilateral renal artery stenoses indirectly, according to low resistive index data and the prolongation of acceleration times. Then patient underwent bilateral selective renal arteriography, which showed diffuse extensive atherosclerosis of all arterial vessels, and there was no significant renal artery stenosis. However, there was a single renal artery on the left but double renal arteries on the right. The aberrant renal artery was originating from the terminal aorta at the bifurcation point and supplying the lower pole of the right kidney through the renal capsule (Figure 1a, 1b).

Discussion

The renal arteries are a pair of lateral branches of abdominal aorta. They arise from aorta just below the level of origin of the superior mesenteric artery. The accessory renal arteries are also seen frequently [9, 10]. Such arteries enter the kidney

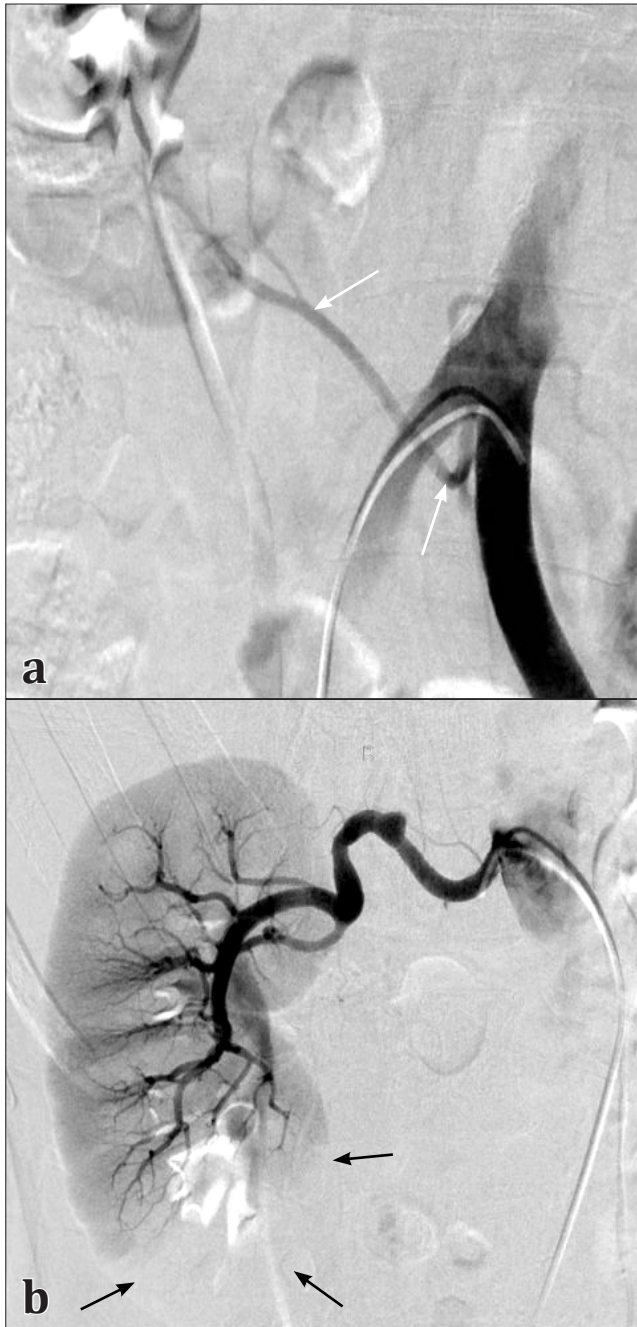


Figure 1. a) Left common iliac arteriogram shows, an *aberrant renal artery* (**white arrows**) originating from aortic bifurcation. b) Selective right renal artery angiogram shows that *lower pole of the right kidney* (**black arrows**) is not supplied by the main renal artery.

either above or below the hilum [11]. Aberrant renal arteries constitute the most common and clinically important renal arterial variations and can be seen in up to one-third of the normal population. Multiple renal arteries are unilateral in

approximately 30% of patients and bilateral in approximately 10%. Aberrant arteries usually arise from the aorta or iliac arteries anywhere from the level of T11 to the level of L4. In rare cases, they can arise from the lower thoracic aorta or from lumbar or mesenteric arteries. Perihilar branching is another common variant and it is the branching of the main renal arteries into segmental branches at a more proximal level than the renal hilum. Most of the variations of the renal arteries are due to the various developmental positions of the kidneys [12].

In conclusion, the aim of this case report was to emphasize the importance of knowledge of renal vessel variations for surgeons practicing kidney transplants, also for radiologists dealing with interventional vascular procedures. In the literature, variations include double renal artery and polar renal arteries but the important point is the origin of accessory renal vessels. Aberrant polar renal artery originating from aortic bifurcation is an extremely rare renal vascular variation. So it is obligatory to pay attention and keep in mind the possibility of accessory renal vessels during these procedures, although they may be extremely rare as in our case.

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