

## Clinical Notes

### A case of a right ovarian artery diverging from a right accessory renal artery

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During the dissection of a 38-year-old female cadaver, an ovarian artery originating from an accessory renal artery is exposed on the right side (Figure 1). The proximal one of the 2 arteries supplying the kidney was emerging from the abdominal aorta at L2 vertebra level and 12.6mm below the celiac trunk. The diameter of this artery was 5.5mm and was passing behind the inferior vena cava. Then, it was giving its 2 branches and both were coursing obliquely downwards to the hilum of kidney. The other artery 2.9mm diameter and 58mm length, was emerging from the abdominal aorta 54mm below the first one. During its course, it was passing anterior to the inferior vena cava and posterior to the right ovarian vein. Then, it was crossing the beginning part of the right ureter posteriorly and was reaching the inferior pole of the right kidney 27.2mm apart from its origin, this accessory renal artery was giving the right ovarian artery. The diameter of the right ovarian artery at its origin was 1.4mm and its further course was normal.

The right kidney was 92.9mm in length and its inferior part was larger than the superior part. The thicknesses and the widths were 23x53.6mm and



**Figure 1** - Photograph showing the accessory renal artery (ARA) and the right ovarian artery (OAr) emerging from this accessory artery. A: aorta, CT: celiac trunk, IMA: inferior mesenteric artery, IVC: inferior vena cava, K: kidney, RVI: left renal vein, RVr: right renal vein, OVr: right ovarian vein. Ur: ureter.

55.3x75.4mm in the upper and lower halves. There was no evidence of hydronephrosis of the renal pelvis and ureter. The left kidney has been removed for forensic investigation. The remaining part of the left renal artery was observed on the left side, 5.5mm below the origin of the right one and was 7.3mm in diameter. The left ovarian artery was normal.

One or more arteries, which directly arise from the aorta supply kidney.<sup>1-3</sup> In 25-30% of population, it has been shown that kidney is supplied by more than one artery.<sup>1,3</sup> Additional renal arteries are encountered more frequently on the left.<sup>4</sup> Bilateral variation is reported in 4.5%.<sup>4</sup> Bergman<sup>1</sup> reports that ARA is more frequent on the left side, while Uflacker<sup>5</sup> suggests no difference in frequency between the sides.

Accessory renal artery (ARA) usually arises from the aorta but in 26-30% of cases it may arise from other arterial sources.<sup>1,2</sup> The gonadal artery, which is expected to diverge from the aorta, may arise from the renal artery or a branch of the renal artery in 15% of cases. Furthermore, it may arise from the suprarenal, inferior phrenic, superior mesenteric, lumbar, common iliac, internal iliac arteries.<sup>1</sup> The existence of the ARA is explained by the developmental pattern of the arteries of the kidney and the posterior abdominal wall. During the third embryonic week, the 2 dorsal aortas unite. The arteries diverging from the periaortic plexus supply the 3 nephrotomes, namely the kidneys, suprarenal glands and gonads.<sup>2</sup> Metanephric renal rudiment arises first at sacral levels and then, as the ureteric outgrowth elongates, it migrates cranially. During this period, the ascending kidney receives its blood supply sequentially from the middle sacral and common iliac arteries.<sup>2</sup> Usually, the inferior vessel degenerate while the superior ones take control of the blood supply. Failure in the degeneration of these vessels results in multiple renal arteries.<sup>5</sup> It has been shown that almost half of the ARAs enters the kidney from its poles, mostly the inferior one.<sup>5</sup> In the present case, the ARA was entering the kidney from the inferior pole. Variations of the gonadal arteries are rare. It has been reported that it may arise from the lower polar branch of the renal artery.<sup>1,3</sup> A case of double gonadal arteries on the same side, in which the upper one was arising from the renal artery and the lower was arising from the ARA, was also reported.<sup>1</sup> Regarding that the ARA supplies the inferior pole, the present case can be considered as the lower polar branch with a different origin, which also gives an ovarian branch. Right renal artery usually passes behind the inferior vena cava. But, if there are multiple arteries, the caudal is usually found in precaval position.<sup>1</sup> Furthermore, ARA mostly passes through the anterior to the ureter and may go with hydronephrosis. But there is no evidence.

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### References

1. Bergman RA Afifi AK, Miyauchi R. Renal arteries. Illustrated encyclopedia of human anatomic variation: Opus II: Cardiovascular system: Arteries: Abdomen. Available from: URL: <http://www.vh.org/Providers/Textbooks/AnatomicVariants/Cardiovascular/Text/Arteries>.
2. Moore KL, Persaud TVN. The developing human. Clinically oriented embryology. 6th Ed. Philadelphia (PA): WB Saunders Company; 1998. p. 305-315.
3. Netter FH. The Netter collection of medical illustrations. Kidneys, ureters, and urinary bladder. Pittsburgh (PA): Novartis; 1997. p. 17.
4. Satyapal KS, Haffejee AA, Singh B, Ramsaroop L, Robbs JV, Kalideen JM. Additional renal arteries: incidence and morphometry. *Surg Radiol Anat* 2001; 23: 33-38.
5. Uflacker R. Atlas of vascular anatomy: An angiographic approach. Baltimore (MD): Lippincott Williams & Wilkins; 1997. p. 414-419, 552-554.