

# Bilateral origin of ovarian arteries from accessory renal arteries

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### ABSTRACT

تنشأ الشرايين المبيضية من الجانب الوحشي الأورطي عند الفقرة القطنية الثانية ويمكنها أن تنشأ من الشرايين الكلوية، أو الكظرية، أو الحجابية الخلفية، أو المساريقية الأمامية والشرايين القطنية. وقد تفرعت الشرايين المبيضية في هذه الحالة النادرة من الشرايين الكلوية الزائدة. ووجدت في أنثى متوسطة البنية تبلغ من العمر 55 عاماً وذلك أثناء معاينة جثتها في قسم التشريح، كلية الطب، جامعة الدمام، المملكة العربية السعودية خلال العام 2009م. إن معرفة منشأ الشرايين المبيضية ومسلكها إلى المبيضين مهمة لدى أخصائي التشريح، والجراحة، والأشعة، وأخصائي النساء والولادة لمعرفة تشريح البطن وتفادي المضاعفات التي ربما تحدث في تشريح هذه المنطقة من الجسم أو أثناء فحصها الأشعاعي.

Ovarian arteries generally arise from the anterolateral (or lateral) aspect of the abdominal aorta caudal to the origin of the renal arteries at the level of L2 vertebra. The ovarian arteries may arise from the renal, suprarenal, inferior phrenic, superior mesenteric, lumbar, common iliac, or internal iliac arteries. This was a unique case, in which both ovarian arteries originated from 2 differently-originating bilateral accessory renal arteries. This unique variation may provide significant information to surgeons and gynecologists dissecting the abdominal cavity. The case was found in a female cadaver aged 55 years during routine dissection in the Anatomy Department, College of Medicine, University of Dammam, Kingdom of Saudi Arabia in 2009. The subject had an average built without any abnormal external features. Both right and left ovarian arteries arose from the bilateral accessory renal arteries. Knowledge of ovarian arteries and their definitive course to the ovaries is of great interest to the anatomists, surgeons, radiologists, urologists, and gynecologists to avoid clinical complications during surgical interference, or radiological examination of this region.

*Saudi Med J 2012; Vol. 33 (10): 1122-1124*

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*Received 24th April 2012. Accepted 31st July 2012.*

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Ovarian arteries generally arise from the anterolateral (or lateral) aspect of the abdominal aorta caudal to the origin of the renal arteries at the level of L2 vertebra.<sup>1</sup> They may arise at higher levels from the aorta, and from the renal, or branch of the renal arteries in 15% of cases.<sup>2</sup> They may also arise from the lower polar branch of the renal arteries.<sup>3-5</sup> Abnormal origin of the ovarian arteries may be from the renal, suprarenal, inferior phrenic, superior mesenteric, lumbar, common iliac, or internal iliac arteries.<sup>6-8</sup> Rare unilateral origins from an accessory renal artery have been reported.<sup>9</sup>

The right ovarian vein drains into the inferior vena cava, while the left vein drains into the left renal vein. Unusual courses followed by the ovarian arteries to their corresponding ovaries have been described.<sup>10</sup> However, a bilateral origin of the ovarian arteries from differently-originating accessory arteries has not been reported. This case is presented to add knowledge or information of such abnormality as it is important, particularly if it represents the only blood supply to the gonads without any other supply from another source. Impairment of such arteries may cause damage of the gonads, and/or impairment of their function.

**Case Report.** During a routine dissection of a 55-year-old female cadaver in the Anatomy Department, College of Medicine, University of Dammam, Kingdom of Saudi Arabia in 2009, the ovarian arteries were found to arise from the bilateral accessory renal arteries (Figure 1). The subject had an average built and height. She had no external injuries, and there were no other anomalies of the internal organs. Two accessory renal arteries arose

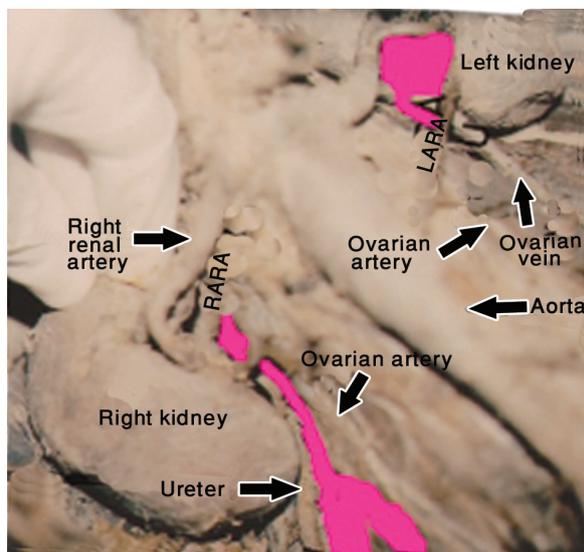
from the aorta below the origin of the renal arteries. The smaller left accessory artery arose 6-7 cm below the left renal artery, and measured 5-6 cm in length. It crossed anteriorly in front of the left ovarian vein and the left ureter and entered into the left kidney below the hilum. During its course, it gave the left ovarian artery, which descended downwards accompanied by its vein to the left ovary. The left ovarian vein was engorged, and was located to the left of the ovarian artery. It terminated into the left renal vein. The larger right accessory renal artery originated 2-5 mm below the right renal artery, and measured 4-5 cm in length. It gave a large branch before reaching the hilum of the right kidney. This branch terminated into the right ovarian artery and a terminal branch, which entered the hilum of the kidney in front of the right ureter together with the main accessory artery. The right ovarian artery accompanied by its vein descended to the right ovary. The right ovarian vein terminated into the inferior vena cava.

**Discussion.** In this case, both ovarian arteries originated bilaterally from the accessory renal arteries. The left ovarian artery originated directly from the left accessory renal artery, while the right ovarian artery arose from the lower branch of the right accessory renal artery. Despite of the relatively different origin of the ovarian arteries from these accessory renal arteries, they showed great symmetry in their size, location of origin, and course followed to their destinations. The

left ovarian vein terminated into the left renal vein. The right ovarian vein ended into the inferior vena cava. Variations in number, source, position, and course of the renal are common. Accessory renal arteries are commonly derived from the renal, abdominal aorta, common iliac, and superior mesenteric arteries. Rarely they originate from the external iliac, lumbar, gonadal, inferior mesenteric, superior suprarenal, inferior phrenic, right colic, subcostal, contralateral renal, splenic, or thoracic aorta.<sup>11,12</sup> The complex development of the kidneys through 3 phases; pronephros, mesonephros, and metanephros, and the variation of its blood supply during its ascent from the pelvis into the lumbar region accounts for the common anomalies of the blood supply of the kidneys.

The accessory renal arteries are usually due to the persistence of embryonic vessels that usually disappear when the definitive blood vessels are formed.<sup>13</sup> In the above-mentioned case, the accessory renal arteries and the lower branch of the right artery crossed in front of the corresponding ureters. They might therefore press on the pelviureteric junction, and cause hydronephrosis, or calculi formation.<sup>14</sup>

Knowledge of the ovarian arteries and their definitive course to the ovaries is of great interest to the anatomists, surgeons, radiologists, urologists, and gynecologists to avoid clinical complications during surgical interference, or radiological examination of this region. Presence of the above-mentioned variation may become a major risk when this type of gonadal artery represents the single blood supply of the gonad, without a second supply from the aorta, or other arterial source. It, thus, becomes imperative to preserve the gonadal artery in order to prevent a vascular impairment of the gonads, the genital artery being its unique source of blood supply. Destruction of the ovarian arteries might lead to infertility, early menopausal symptoms, or sexual dysfunction due to lack of ovarian hormones.



**Figure 1** - Ovarian arteries arising from bilateral accessory renal arteries. RARA - right accessory renal artery; LARA - left accessory renal artery.

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