

# Accessory left testicular artery in association with double renal vessels: a rare anomaly

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*A rare association of accessory testicular artery along with double renal arteries and accessory renal vein was observed unilaterally on the left side. In addition, the left inferior phrenic artery was arising from the left gastric branch of the coeliac trunk. This was observed in the dissection of an adult male cadaver during a routine undergraduate teaching programme.*

*In this case, the accessory left testicular artery originated superior to the normal testicular artery from the descending abdominal aorta immediately below the origin of the normal left renal artery. In addition to this artery, a variant renal artery was noted with three segmental branches before entering the hilum. The accessory renal vein emerged from the lower pole after the receiving testicular vein joined the main renal vein. The left inferior phrenic artery arose from the left gastric branch of the coeliac trunk.*

*An anatomical description of this uncommon variation is presented in this case report, highlighting its clinical implications. (Folia Morphol 2011; 70, 4: 309–311)*

**Key words:** left accessory testicular artery, renal vascular variants, vascular variations, double renal artery, accessory renal vein

## INTRODUCTION

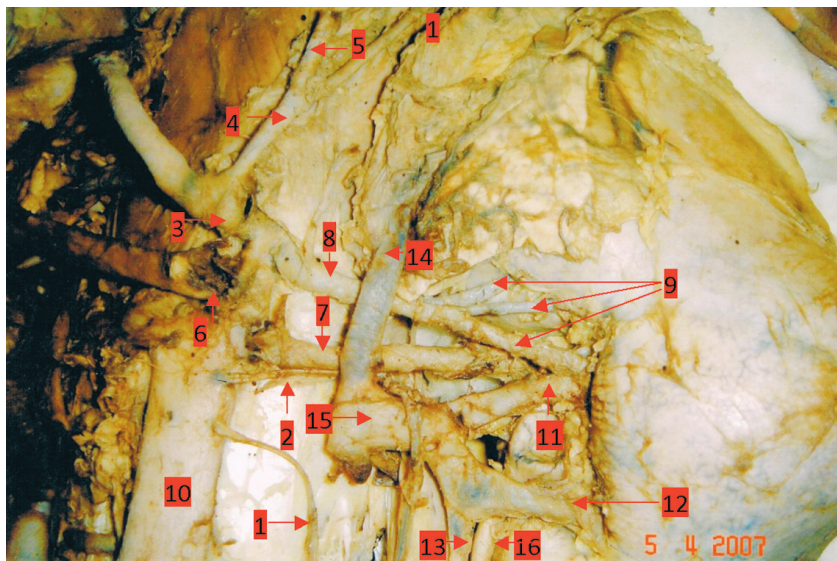
The testicular arteries usually arise from the anterolateral aspect of the abdominal aorta at the level of the 2<sup>nd</sup> lumbar vertebra, 2.5 cm caudal to the renal artery. These arteries pass obliquely inferolaterally on the psoas major muscle. Testicular artery enters the deep inguinal ring, forming the content of the spermatic cord to supply the testis. During its descent into the pelvic cavity it does not normally give off any branches [13].

To the best of our knowledge, reports for accessory testicular arteries are very scarce [11]. Bilateral accessory renal and testicular arteries in mammals were reported by Bremer [3]. Recently, Loukas and Stewart [6] mentioned a case of an accessory testicular artery originating superolaterally from the abdominal aorta above the origin of the left renal artery and vein.

Knowledge of variation in testicular arteries is very important for surgeons during surgical procedures. We are reporting a clinically important variation of the left testicular artery in association with variation of left renal vessels and variation in the origin of the inferior phrenic artery.

## CASE REPORT

During routine dissection of the abdominal region a 50-year-old male cadaver had a left-sided rarest association of variations. Vascular anomalies are quite commonly reported. But to find anomalies of four related vessels on the same side is still uncommon. The vessels involved were accessory testicular artery, double renal artery, accessory renal vein, and anomalous origin of inferior phrenic artery. To the best of our knowledge, a review of literature does not reveal any such previous case report.



**Figure 1.** Photograph taken during dissection shows the accessory testicular artery in association with double renal vessels (the terminal part of left renal vein is folded to show the origin of the accessory testicular artery); 1 — testicular artery; 2 — accessory testicular artery; 3 — coeliac trunk; 4 — left gastric artery; 5 — inferior phrenic artery; 6 — superior mesenteric artery; 7 — left renal artery; 8 — variant renal artery; 9 — segmental branches; 10 — abdominal aorta; 11 — renal vein; 12 — accessory renal vein; 13 — testicular vein; 14 — supra renal vein; 15 — left renal vein; 16 — left ureter.

There were two left testicular arteries. The normal testicular artery arose about 1.5 cm below the origin of the normal left renal artery and had a normal course. The accessory testicular artery arose from the aorta 1.25 cm higher and slightly ventromedial to the normal testicular artery. This variant artery passed farther laterally, ran downwards on the psoas major muscle lateral to the normal testicular artery, and crossed the ureter at a higher level than the normal testicular artery. This variant artery was accompanied by a testicular vein. Both the arteries entered the deep inguinal ring. The further course was found to be normal.

In addition to this, there were two renal arteries, one of which was normal in its origin, and the variant arose at a higher level between the origin of the coeliac trunk and the superior mesenteric artery. These arteries were almost the same size. The variant left the renal artery and gave origin to three segmental branches before entering the hilum. The normal renal artery entered the hilum behind the renal vein. The left renal vein also showed a variation. The accessory renal vein arising from the lower pole of the kidney received the testicular vein and then joined the left renal vein; the left supra renal vein drained normally into the left renal vein. In addition to the above variations the left inferior phrenic artery arose from the left gastric branch of the coeliac trunk (Fig. 1).

The right testicular artery, renal artery, and renal vein had normal size and course. No other anomalies were found in the abdomen.

## DISCUSSION

Variations in the origin of the normal single testicular artery have been commonly reported by various authors. The testicular arteries may vary at the origin, they may be missing, or may originate from the renal artery, middle supra renal artery, one of the lumbar arteries, common or internal iliac artery, or from the superior epigastric artery [1, 4, 6, 8].

Variation and high origin of gonadal arteries from the abdominal aorta in two individuals has also been reported by Ozan et al. [7], in association with accessory renal artery. An anomalous origin of the testicular artery from the inferior polar artery of the kidney and its surgical importance has been reported by Ravery et al. [9]. Entrapment of the left testicular artery between two divisions of the renal vein, a rare variation, was reported by Satheesha [10].

Loukas and Stewart [6] in their case report observed that an accessory left testicular artery originated from the ventrolateral wall of the descending aorta. The origin was located approximately 2 cm inferior to the superior mesenteric artery and 1 cm superior to the left renal vein. The ac-

cessory artery continued laterally from the aorta towards the superior ventral portion of the left kidney and then passed ventral to the kidney inferiorly towards the pelvic region. In their report they found communication between the renal artery and the left accessory testicular artery.

Double testicular artery as observed in the present study is the rarest variation, which may represent as one of the persistent lateral splanchnic arteries, as also suggested by Loukas and Stewart [6].

Double renal arteries with an aortic origin, as observed in the present study, represent a frequent variation and so need no further discussion. Variations of renal arteries are more common than the renal veins [2]. Variations in the left renal vein are less often reported as compared to the right renal vein. Janschek et al. [5] observed such variations in 23% on the right and 6.7% on the left side. However, the variation in the renal vein in our present study was observed on the left side. Verma et al. [12] reported a case of bilateral double renal veins. In their study the lower renal veins were draining into the inferior vena cava indirectly via the upper renal vein, which was similar to our study.

Inferior phrenic artery arising from the left gastric branch seems to be a frequent variation [4].

The anatomy of the gonadal arteries has gained importance because of the technical development of operative surgery within the abdominal cavity; the testicular arteries must be preserved to prevent possible testicular atrophy. During laparoscopic surgery many complications are due to unfamiliar anatomy in the operative field in the abdominal and pelvic cavity. Awareness of variations of the testicular arteries such as that shown in this case report becomes important during such surgical procedures.

Knowledge of variations of vessels in the renal hilar region and retroperitoneal region may greatly contribute to the success of surgical invasive and radiological procedures of this area.

This case with multiple variations has been reported to appraise the surgeon and radiologist of these anomalies.

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