

## **A Rare Presentation of the Left Renal Vein**

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### **ABSTRACT**

The Left Renal vein lies ventral to the left renal artery at the hilum and drains into the inferior vena cava at a right angle, at the level of L2 vertebra. The left renal vein is usually three times the length of the right renal vein. It is a common vessel of drainage for left gonadal vein, left suprarenal vein and left inferior phrenic vein. During routine dissections at Faculty of Medicine, University of Peradeniya, in an elderly female cadaver, variations in the left renal vein anatomy was observed. Abdominal viscera and fascia were methodically removed to reflect the posterior abdominal wall from an anterior aspect of view. Lengths of both veins were measured. As a result, two prominent tributaries draining the left kidney were observed, uniting to form the left renal vein, dorsal to the left renal artery. The left inferior phrenic vein joined the left suprarenal vein to subsequently drain into the left renal vein. The left ovarian vein drained directly in to the left renal vein. Two lumbar veins were also observed to drain through a common vein in to the left renal vein. The left renal vein ran inferomedially in an oblique course to drain into the inferior vena cava at an angle of 60 degrees clockwise at the level of the L4 segment. The length of the left and the right renal veins were respectively 11.8 cm and 3.2 cm, both longer than usual. Understanding the variations in renal vascular anatomy is important for urological surgeons to ensure haemostasis during surgery.

**Key words:** rare, variation, left renal vein

### **INTRODUCTION**

Small veins of renal segments communicate with one another to subsequently form 5 or 6 interlobar veins that unite at the hilum to form a single left renal vein. Usually the vein is in ventral position to the corresponding left renal

artery, at the hilum. It runs behind the pancreas to drain into the inferior vena cava at a right angle, at the level of L2 vertebra. The left renal vein is usually three times the length of the corresponding right renal vein (around 7.5 cm against 2.5 cm) (1). This is due to the fact that the left renal vein runs across the abdominal aorta

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ventral to it, and immediately below the origin of the superior mesenteric artery, in order to drain into the inferior vena cava. The left renal vein is a common vessel of drainage on the left side, typically receiving the left gonadal vein (ovarian or testicular), left suprarenal vein, and often than not, a left inferior phrenic vein. In contrast, the right renal vein drains only the right kidney (1).

As per clinical implications, during surgeries for aortic aneurysms, left renal vein needs to be ligated, provided that it is done to the right of the point of entry of the gonadal and suprarenal veins (1). In addition variations in renal vascular anatomy are important during treatment for renal trauma, renal vascular hypertension, renal transplants, nephrectomy etc. In an era of renal surgeries being frequent in the arena of surgery, a meticulous and accurate knowledge on the renal vasculature is mandatory for successful procedures and to avoid common vascular injury in posterior abdominal approaches.

Regularly reported variations of the left renal vein include, accessory renal vein, retro-aortic or circumaortic position and supernumerary (2). The comparatively complex nature of drainage reported in this case does not seem to be cited in previous literature.

## **MATERIAL AND METHODS**

During routine dissections conducted by undergraduates of the Faculty of Medicine, University of Peradeniya, in an elderly female cadaver, a variation in the left renal vein anatomy was observed. Abdominal viscera and fascia were methodically removed, preserving the vasculature and other landmark structures to reflect the posterior abdominal wall from an anterior aspect of view. The right renal vein and both renal arteries were also observed for variations. Lengths of both veins were measured.

## **RESULTS**

On observation, there were two prominent tributaries dorsal to the left renal artery and outside the hilum of the left kidney uniting to form the left renal vein. The left kidney was not ectopic or malformed. The left inferior phrenic vein joined the left suprarenal vein 2-3 cm below its origin subsequently draining into the left renal vein. The left ovarian vein draining into the left renal vein was also noted. In addition two other veins emerging from the posterior abdominal wall respectively below T12 and L1 vertebral bodies, which were identified as lumbar veins, were observed to join and drain through a common stem into the left renal vein in close proximity to the point of left suprarenal venous drainage. From this

point the left renal vein was observed to run inferomedially in an oblique course to drain into the inferior vena cava as far down as the level of the aortic bifurcation; in this specimen; the upper border of the L4 segment. The vein joined the inferior vena cava approximately at an angle of 60 degrees clockwise. No other variation in the same vein was observed. There were neither variation in the Right renal vein nor in renal arteries. The length of the left and the right renal veins were 11.8 cm and 3.2 cm, respectively. Hence, this combination deviated from the usual presence of a left renal vein three times the length of the right renal vein. Both renal veins were longer than usual.

## DISCUSSION

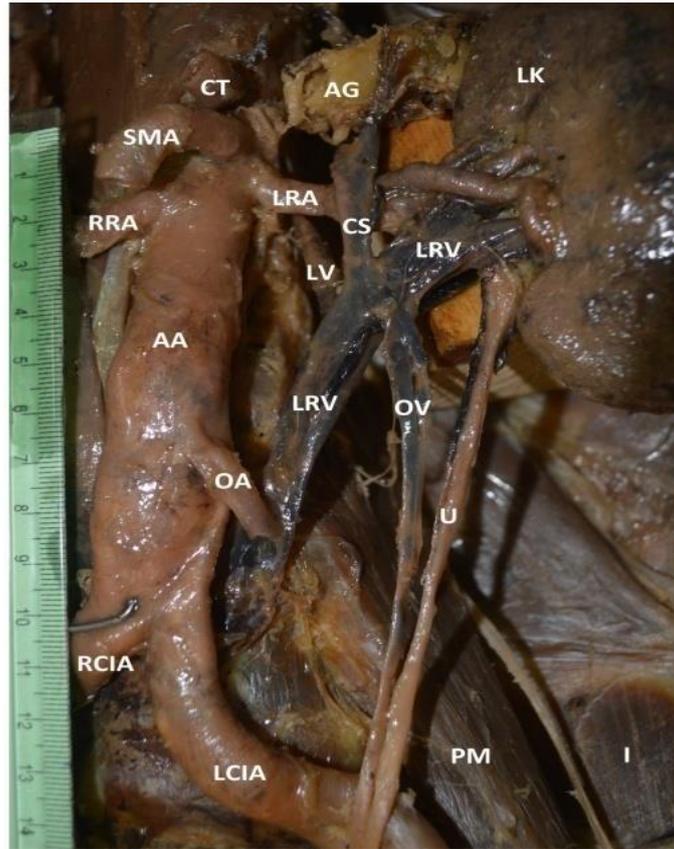
Such a variation may rarely cause complications in terms of physiology, but veins being highly susceptible to trauma, preoperative recognition of such anomalies in the renal vasculature are of great importance to ensure haemostatic control

(2) during posterior abdominal/renal procedures. These venous anomalies result from embryological developmental errors. Renal transplants are a common clinical indication where renal veins are manipulated to a greater extent. Statistics on renal transplants in Sri Lanka are at escalating rates. The success rate of this surgical procedure within the country is only 90% and thus has ample opportunity for refinement.

Knowledge on morphological variations of renal arteries and veins in individual cases is vital for urological surgeons operating on this region as it could prevent surgical complications due to accidental vascular injuries at the time of surgery (2).

## REFERENCES

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**Figure 1:** Left kidney vasculature seen in an anterior dissection of the abdominal wall with the stomach and pancreas removed.

AA-Abdominal Aorta, AG-Adrenal Gland, CS-Common stem of inferior phrenic and suprarenal veins, CT-Coeliac Trunk, I-Iliacus muscle, LK-Left Kidney, LCIA-Left Common Iliac Artery, LRA-Left Renal Artery, LRV-Left Renal Vein, LV -Lumbar Vein, OA-Ovarian Artery, OV-Ovarian Vein, LRV-Left Renal Vein, LV-Lumbar Vein, OA-Ovarian Artery, OV-Ovarian Vein, PM -Psoas Major muscle, RCIA-Right Common Iliac Artery, RRA-Right Renal Artery, SMA-Superior Mesenteric Artery, U-Ureter.

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