

## Abnormal course of left testicular artery in relation to an abnormal left renal vein: A case report

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### Abstract

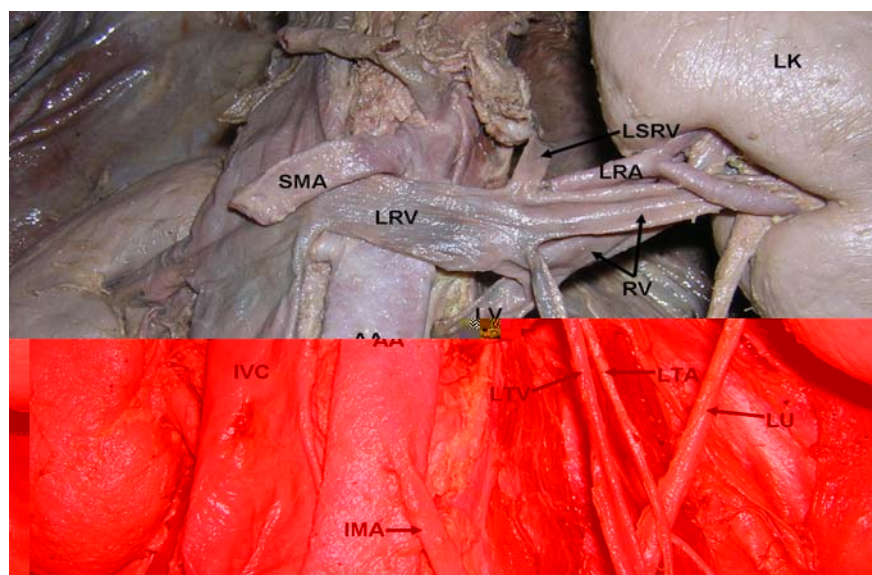
The testis is an important organ upon which the survival of the human species depends. Any compression of testicular artery may lead to loss of gametogenesis and hormone production. We found a left testicular artery entrapped between two divisions of a left renal vein in an approximately 50 year old cadaver. The left renal vein was formed by union of two veins coming from the kidney, left suprarenal vein, left testicular vein and an abnormally enlarged lumbar vein. This case may be of particular importance to surgeons who transplant kidneys, radiologists and orthopaedic surgeons dealing with the spine repairs.

**Key words:** Renal vein, testicular artery, lumbar vein, variation, compression

The testicular arteries originate from the abdominal aorta, just below the level of renal arteries. They run downwards and laterally, close to the posterior abdominal wall with the corresponding veins. They pass through the deep inguinal ring of the corresponding side and then become constituents of the spermatic cord. They reach the testes through the spermatic cord. The left renal vein is a tributary of the inferior vena cava. Normally it receives left suprarenal and gonadal veins before it ends in inferior vena cava. Several variations of the testicular artery and renal veins are known and have been reported. We are reporting a clinically important variation of the left testicular artery and associated abnormalities of left renal and lumbar veins.

### Case Report

The variations were found during the routine dissections for undergraduate medical students and they were unilateral. The left renal vein was formed by the union of two veins coming from the hilum of the left kidney, left suprarenal vein, left testicular vein and a large abnormal lumbar vein (Fig. 1) The left testicular artery took its origin just behind the upper part of the left renal vein and then passed between the two divisions of the left renal vein that came out of the hilum. The rest of the course of the left testicular artery was normal. The right testicular artery and the right renal vein had the normal size and course. No other anomalies were found in the abdomen.



**Fig 1:** Dissection demonstrating the left renal vein and testicular arteries

IVC – inferior vena cava, AA – abdominal aorta, SMA – superior mesenteric artery, IMA – inferior mesenteric artery, LRV – left renal vein, LRA – left renal artery, RV – two divisions of left renal vein, LTA – left testicular artery, LTV – left testicular vein, LV – abnormal lumbar vein, LK – left kidney, LU – left ureter, LSRV – left suprarenal vein.

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## Discussion

Renal veins are the tributaries of inferior vena cava. Right renal vein receives blood only from the right kidney whereas the left renal vein receives blood from left suprarenal gland and left gonad through suprarenal and gonadal veins. Variations of renal veins are rare compared to the renal arteries. Variations of right renal veins are more common than that of the left side. Janschek et al.<sup>1</sup> have reported the cases of multiple renal veins. In their study, variations were more common on the right side (23%) than the left (6.7%). Doubling of the right renal veins has been reported by Malcic-Gurbuz et al.<sup>2</sup>. Senecail B et al.<sup>3</sup> have reported two uncommon anatomical variations of the left renal vein: a circumaortic venous ring and a retro-aortic bifid left renal vein. The first anomaly results from a persistence of the embryonic renal venous collar. The second one would be related to a particular pattern of left inferior vena cava. Malcic-Gurbuz J et al.<sup>4</sup> have seen the branching of the left renal vein. According to their report, the left renal vein divided into 3 branches and the upper among the three drained into the azygos vein, where as the lower two drained into inferior vena cava. In an extensive study on left renal vein variations by Satyapal et al.<sup>5</sup>, renal collars were observed in 0.3%; retro-aortic vein in 0.5%; additional veins in 0.4% and posterior primary tributary in 23.2% of cases.

The variations of the testicular arteries are common and have been reported. The testicular arteries may vary at their origin, they may be missing, or one or both arteries may arise from the renal artery, suprarenal artery or lumbar artery. Also, they may arise from a common trunk or be doubled, tripled or quadrupled<sup>6</sup>. An additional left testicular artery has been reported by Loukas M and Stewart D<sup>7</sup>. In this case, the accessory left testicular artery originated from the anterolateral wall of the descending aorta. High origin of gonadal arteries from abdominal aorta have been reported in two individuals by Ozan H et al.<sup>8</sup> Anomalous origin of the testicular artery from the inferior polar artery of the kidney and its surgical importance has been reported by Ravary V et al.<sup>9</sup> The entrapment of the left testicular artery between the two divisions of renal vein has not been reported yet.

It is not uncommon for a lumbar vein to join the left renal vein. In a study by Baniel J et al.<sup>10</sup> a lumbar vein entering the left renal vein was documented in 43% of the cases.

Our findings have to be kept in mind during surgical procedures in the posterior abdominal wall. The large

abnormal lumbar vein reported here, might cause considerable amount of bleeding while clearing lumbar lymph nodes. It can also be involved in the orthopaedic procedures of the lumbar spine.

The two renal veins, suprarenal vein, testicular vein and the abnormal lumbar vein are joining to form a single renal vein in this individual. This kind of veins may lead to complications of intravenous procedures and confusions during kidney transplants. The testicular artery may get compressed between the renal veins, which may lead to degeneration of the testis.

The 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.

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