

## UNUSUAL TERMINATION OF THE RIGHT TESTICULAR VEIN

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### ABSTRACT

The testicular veins are formed by the veins emerging from the testis and epididymis forming the pampiniform venous plexus. The right testicular vein drains into inferior vena cava and the left testicular vein to the left renal vein. Testicular veins display a great variability with regard to their number, course and sites of termination. Awareness of the possible variations of gonadal vessels is necessary for adequate surgical management.

**Key words:** Testicular vein, Termination, Inferior vena cava, Renal vein.

### INTRODUCTION

The testicular veins are formed by the veins emerging from the testis and epididymis forming the pampiniform venous plexus. The right testicular vein drains into inferior vena cava and the left testicular vein to the left renal vein (Moore et al. 2010; Punita and Surinder 2011; Nayak et al. 2013).

Testicular veins display a great variability with regard to their number, course and sites of termination; the pathological dilated pampiniform plexus veins known as varicocele could be attributed to testicular veins variants (Paraskevas et al. 2012). Varicocele can be main cause of male infertility, and approximately 41% of infertile male patients present varicocele (Luciano et al.2007). The variable morphological and topographical features of the veins are not only significant during the surgical procedures undertaken in the retroperitoneal area, but also during study taking part in cases of male infertility (Paraskevas et al. 2012). As the invasive interventions such as renal transplantation,

interventional radiologic procedures and urologic operations increase, awareness of the possible variations of gonadal vessels is necessary for adequate surgical management in the aforementioned specialties (Punita and Surinder 2011; Bandopadhyay et al 2009). Certain vascular and developmental anomalies of kidneys can be associated with variations in the origin and course of the gonadal vessels. These anomalies are explained by the embryological development of both of these organs from the intermediate mesoderm of the mesonephric crest. Further the vasculature of kidneys and gonads is derived from the lateral mesonephric branches of dorsal aorta (Punita and Surinder 2011).

In the present report, a right testicular vein termination to the junction of left renal artery and inferior vena cava is demonstrated in a male cadaver dissected routine gross anatomy course.

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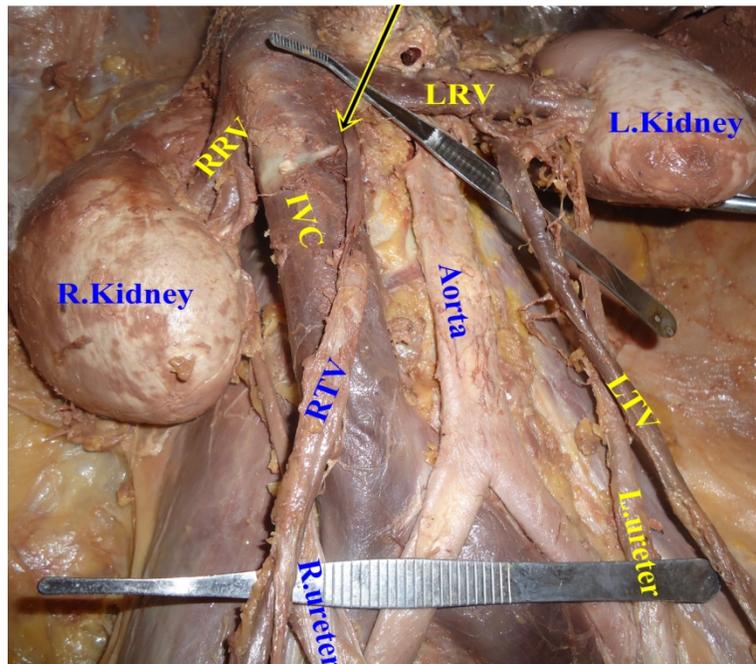
### CASE REPORT

During routine dissection formaldehyde preserved cadaver for undergraduate medical students in the Department of Human Anatomy, GAMBY College of Medical Sciences; an unusual unilateral termination/drainage of the right testicular vein was observed in a 43-year-old male Ethiopian cadaver. It has been reported from the college's hospital that the cause of death was not related to the detected venous anomaly. Past medical history indicated no pathological processes related to the urogenital system, no traumatic injuries of the region and no previous surgical interventions.

The dissection was performed as usual which we use regularly for teaching; (According to the standard procedures of Cunningham's manual of practical anatomy volume II) for 1<sup>st</sup> year preclinical medical students in GAMBY college of medical sciences (Romanes 2010). The anterior abdominal wall was resected and after removal

of peritoneal organs and retro peritoneum, a more clear vision of the organs and vascular structures of the retroperitoneal region was provided. The retroperitoneal dissection of the cadaver was done carefully to delineate the testicular vessels and to study their relationship with renal vessels, abdominal aorta, and inferior vena cava. While doing so we got certain variation, which are rare in literature.

The anatomy of the vein on the left side was as usual; it arises from the pampiniform plexus enters the inguinal canal through superficial inguinal ring and exits through the deep inguinal ring ascends up in front of the iliopsoas muscle crossing the left ureter to the midline and terminates at the left renal vein. The right renal vein follows the same origin as of the left: crosses the right ureter and IVC to the midline and joins the junction between left renal vein and Inferior venacava (Figure 1)



**Fig.1:** Photograph showing unusual termination of right testicular vein. **RRV:** Right renal vein, **LRV:** Left renal vein, **RTV:** Right testicular vein, **LTV:** Left testicular vein, **IVC:** Inferior vena cava.

## DISCUSSION

The testicular vein originates from a plexus of multiple large veins, the so called pampiniform plexus that after coursing across the spermatic cord at the level of the deep inguinal ring consists of two or three veins, united in a single vein. The right testicular vein drains into the inferior vena cava in an oblique angle, while the left testicular vein ascends almost vertically terminating in the left renal vein in a right angle (Paraskevas et al. 2012). Anatomical variations of gonadal venous arrangements are of huge clinical importance. Anatomic variations of the local of drainage of the testicular veins were found mainly at the right side (Luciano et al. 2007). Testicular veins have variations with regards to their number, course and termination. For example the right testicular vein might drain into right renal vein, accessory renal vein or lower part of the inferior vena cava (Nayak et al. 2013). There is no sex related difference in the origin, course and termination of the gonadal vessels indicating that this sort of a variation may be countered in both male and female subjects during surgical and investigative procedures (Luciano et al. 2007).

In the present case we found that the right testicular vein drains (terminates) at the junction of left renal vein and inferior vena cava on the left side after it crosses the inferior vena cava anteriorly. After detailed research of the literature, we were unable to detect such an abnormal termination of the testicular veins. Variations of gonadal veins were more frequent on the left side, as observed in India, in which only 2 cases of right gonadal vein draining into right renal vein out of 150 cadavers dissected [8]. Right testicular vein termination on the ipsilateral renal vein has been reported with an incidence of 1–5% (Paraskevas et al. 2012).

In a study done in Brazil on 100 cases; all left testicular veins (either single or multiple) drained to the renal vein, while the right

testicular vein drained to the inferior vena cava in more than 83% of the cases.

The right testicular vein drained into the right accessory renal vein in a study done in India (Singh et al. 2011). In another report made in India the right testicular vein also drained into right renal vein instead of inferior vena cava (Punita and Surinder 2011).

Another study done in India on 60 cases showed that the left testicular vein was a tributary of left renal vein in all cases and drained into it at a straight angle. It drained as a single tributary in 28 (70%) cases and as double in 12 (30%). Abnormal drainage of left testicular vein was associated with variation of renal veins. The right testicular vein terminated into IVC in 34 (85%) cases, into right renal vein in 4 (10%) cases and into both in 2 (5%) cases in a study done in (Raman and Anupmagupta 2015).

The gonadal veins develop from caudal part of sub-cardinal vein and it drains into the supra-subcardinal anastomosis. In the right side, this supra-subcardinal anastomosis and also a small portion of Sub-cardinal vein are incorporated into the formation of inferior vena cava, so right gonadal vein usually drains into the inferior vena cava. In this present case this failed (Punita and Surinder 2011; Nayak et al. 2013; Sharmistha et al. 2006).

In conclusion knowledge of variations of vessels in the retroperitoneal region may greatly contribute to the success of surgical, invasive and radiological procedures of this area. Variations in the origin course and in the local of termination of the gonadal vessels should not be overlooked because these anatomical findings can help in understanding the origin of varicocele and its recurrence after surgical interventions.

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