

Uncommon drainage of the left testicular vein: a case report

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SUMMARY

An uncommon drainage of the left testicular vein (LTV) was observed during a routine cadaver dissection, where a lateral division of the LTV was found to drain into an abdominal (anterior) tributary of the second lumbar vein. Adequate knowledge of the LTV anatomical variation presents clinical importance in renal transplantation, renal and testicular vein surgeries, testicular color Doppler imaging, testicular venography, and others retroperitoneal therapeutic and diagnostic procedures. Therefore, surgeons, especially those who work in the retroperitoneal space, must be aware of left testicular vein abnormalities, which may be encountered during surgery.

Key words: Vein surgery – Gonadal vein – Collateral circulation – Abdomen – Retroperitoneum

INTRODUCTION

Knowledge of vascular anatomy and its variations are essential for the surgery field to perform safe invasive interventions and avoid complications. Anatomic complications during invasive interventions have been related to incisions in nerve, blood and lymphatic vessels (Mirilas and Skandalakis, 2010).

The testicular vein plays an underlying role in thermo-regulation, essential for testis function. The left testicular vein (LTV) arises from the pampiniform plexus, near the deep inguinal ring and ends in the left renal vein at a straight angle.

This termination angle of the LTV into the renal vein is related to the cause of varicocele, which consists in the dilatation of the pampiniform plexus veins (Hanley and Harrison, 1962; Wishahi, 1991).

The presence of a collateral vein communicating the testicular vein with other veins in the abdominal cavity has been reported during the course of the LTV in the posterior abdominal wall (in the retroperitoneum) (Poynter, 1922; Anson et al., 1948). Adequate knowledge of the LTV communication can aid vascular surgeons, clinical surgeons and radiologists in recognition and diagnosis during invasive interventions, such as laparoscopic surgery and kidney transplantations. This case report presents an uncommon LTV anatomical variation that may contribute to retroperitoneal therapeutic and diagnostic procedures.

CASE REPORT

During the routine dissection of an approximately 83-year-old male cadaver, certain variations of the LTV were observed. The LTV was 22 cm in length, from the deep inguinal ring up to the left renal vein. After emerging in the deep inguinal ring, at the level of the fourth lumbar vertebra, the LTV divided into two trunks, medial and lateral, forming a delta. The medial division terminated at the left renal vein and the lateral division ascended diagonally and laterally, passing next the lateral border of the kidney and draining into an abdominal (anterior) tributary of the second lumbar vein (Fig. 1).

DISCUSSION

Recently, the importance of anatomical variations of the testicular veins has increased significantly due to the development of advanced operative

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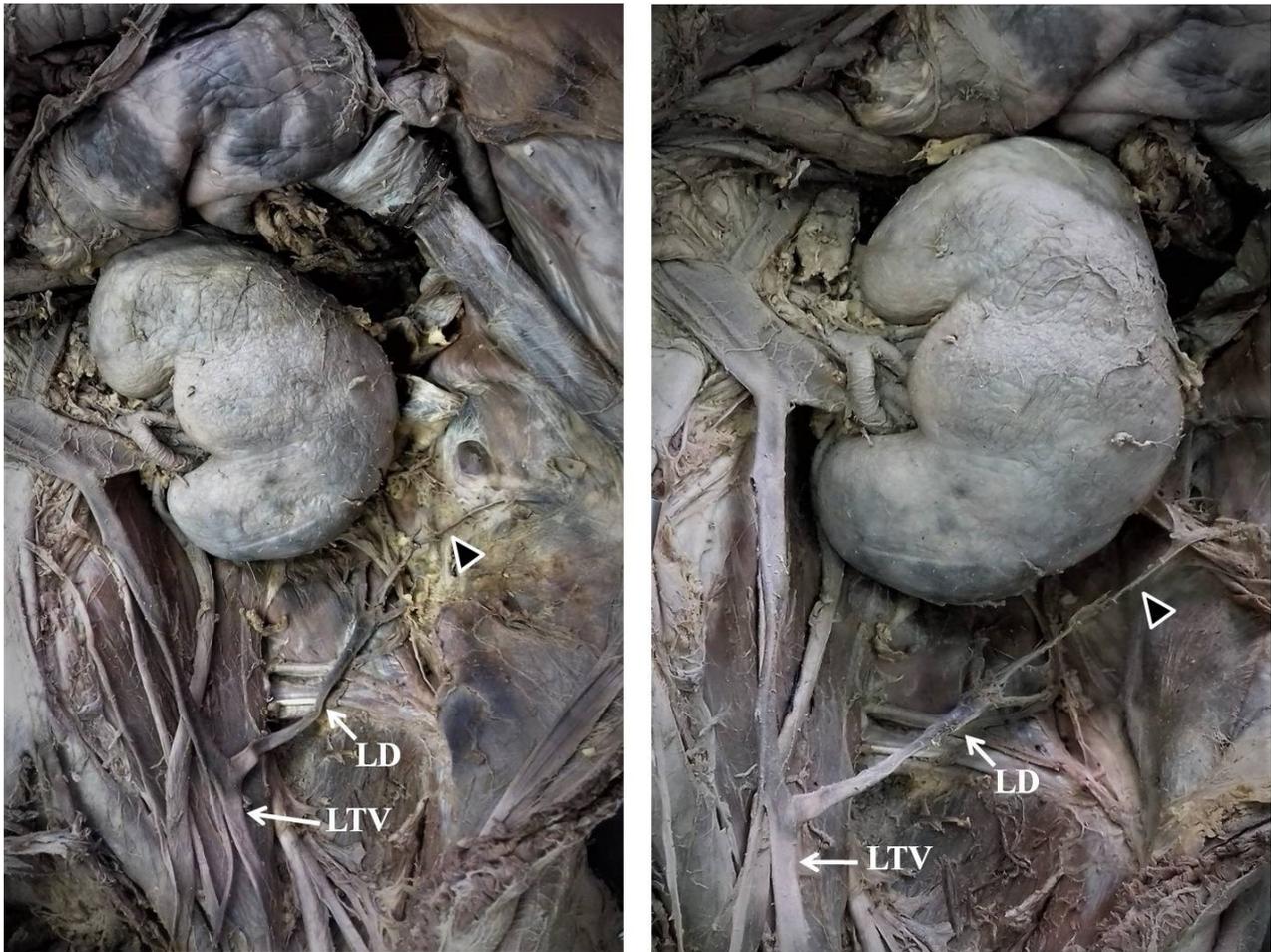


Fig 1. Left testicular vein with its two trunks, lateral and medial. The lateral division ascended diagonally and laterally alongside the lateral border of the kidney and drained into the lumbar vein. LTV = left testicular vein; LD = lateral division; black arrow = drainage into the lumbar vein.

procedures within the abdominal cavity for varicocele and/or undescended testes. LTV division in two trunks has been reported in previous studies (Wishahi, 1991; Favorito et al., 2007; Sofikitis et al., 1993; Tubbs et al., 2005). Wishahi (1991) reported that the lateral division passed toward the lateral border of the kidney, with the emergence of multiple venules, in which an anastomosis was observed with the capsular vein of the kidney (100%) and with the colon in approximately 78% (31 of 40) of the male cadavers evaluated.

Favorito et al. (2007) observed that 31% of the LTV showed communication with the colon, derived from a lateral division. Sofikitis et al. (1993) observed that 39% of the LTV showed communication with the colon, and 49% with the capsular vein of the kidney, both derived from a lateral division. Additionally, Tubbs et al. (2005) reported a case where the lateral division of the LTV drains into the subcostal vein.

It is important to point out that LTV divisions (in lateral and medial trunks) have been considered a constant finding (Wishahi, 1991). However, when evaluating all the LTV dissected in the 189 male cadavers reported in the Wishahi (1991), Favorito et al. (2007) and Sofikitis et al. (1993) studies, a

total of 49% male cadavers (93 of 189) presented the two LTV divisions. This observation is consistent with the findings reported by Sofikitis et al. (1993) that indicated the LTV division in 45% of male cadavers.

Sofikitis et al. (1993) reported anastomotic branches of the testicular veins connecting with the spleen, renal capsule, peritoneum, adrenal and descending colonic veins. The present study demonstrated that lateral division of the LTV drains into an abdominal (anterior) tributary of the second lumbar vein. Anson et al. (1948) reported that the left renal vein receives, caudally, the second lumbar vein through a trunk common to it and the LTV. Li et al. (2011) reported that the posterior lumbar vein may drain into the left gonadal vein.

Although the fact that anastomosis between LTV and lumbar vein may occur has been previously reported (Anson et al., 1948; Li et al., 2011), the present study reported the involvement of the lateral LTV division in this communication. This anastomosis may offer alternative venous drainage to the left kidney in patients with an obstructed left renal vein and/or collateral circulation in subjects with portal hypertension, whereas the great number of veins that converge to the

LTV may also play an underlying role in the occurrence of varicocele due to the greater blood column (Rosalino et al., 2011).

Embryologically, the testicular vein is closely related to the development of the renal vein and inferior vena cava. The posterior cardinal, sub-cardinal and supra-cardinal are three pairs of primitive veins that form complex connections between each other. These veins successively form and regress until the final mature inferior vena cava and renal vein are formed. Bilaterally, anastomosis occurs between the supra-cardinal and the sub-cardinal veins to form the renal segment of the inferior vena cava. The testicular vein develops from the caudal part of the sub-cardinal vein and drains into the supra-sub cardinal anastomosis (McClure and Butler, 1925; Gladstone, 1929). Due to the complicated nature regarding the development of the testicular vein, many opportunities for abnormal development, regression or anastomosis exist, generating anatomical variations (Itoh et al., 2001).

In conclusion, the knowledge of the LTV anatomical variation presents clinical importance in renal transplantation, renal and testicular vein surgeries, testicular color Doppler imaging, testicular venography, and others retroperitoneal therapeutic and diagnostic procedures.

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