

Multiple Vascular Anomalies Involving Testicular, Suprarenal Arteries and Lumbar Veins

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Abstract

Testicular arteries arise from the abdominal aorta and the inferior suprarenal artery from the renal artery. There are reports about variant origin and course of these arteries. Accessory testicular artery is also a common finding but its providing origin to inferior suprarenal artery is an important observation. During a routine dissection of abdomen of approximately 55-year-old male cadaver, unique vascular abnormality was observed. On the left side, a common arterial trunk originating from abdominal aorta immediately branched to give rise to superior testicular and inferior suprarenal arteries, the former after a short course hooked by the left suprarenal vein. In addition, the left suprarenal vein, second left lumbar vein, and left testicular vein joined to form a common trunk which drained into the left renal vein. A sound knowledge of vascular variations in relation to the kidney and suprarenal gland is important to surgeons dissecting the abdominal cavity.

Keywords: Gonadal vessels, Inferior testicular artery, Lumbar veins, Renal vein, Superior testicular artery, Suprarenal artery, Suprarenal vein

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Introduction

The testicular arteries are paired vessels that usually arise from abdominal aorta at the second lumbar vertebral level. Each artery passes retroperitoneally, downward, and laterally on the posterior abdominal wall toward deep inguinal ring.

Normally, testicular artery does not give off any branches in the abdominal cavity. The suprarenal gland is supplied by superior, middle, and inferior suprarenal arteries arising from inferior phrenic, aorta, and renal arteries from above downward. Left suprarenal and left testicular veins open into left renal vein separately and lumbar veins open directly into the inferior vena cava.^[1]

In the present case, we report multiple variations in above-mentioned vessels.

Case Report

During a routine dissection of abdomen of approximately 55-year-old male cadaver, we encountered variations of testicular and suprarenal arteries on the left side of the abdominal aorta. The arteries were arising from the anterolateral aspect of the abdominal aorta. The superior testicular and the inferior suprarenal arteries were originating from a common trunk below the renal artery at the level of the second lumbar vertebra. The superior testicular artery (STA) ran horizontally to the left for a short distance just inferior to the renal artery where it was hooked by the left suprarenal vein. From that point, STA coursed downward along the medial aspect of the normal testicular vein. Inferior suprarenal artery (ISA), during its course, located between the renal vessels (vein anteriorly and the artery posteriorly) and it showed multiple branches before entering into the gland. There was no ISA originating from the renal artery. The inferior testicular artery originated about 3 cm proximal to the inferior mesenteric artery and ran downward medial to STA toward deep inguinal ring [Figures 1 and 2].

In addition to arterial variations, the left suprarenal vein, second left lumbar vein, and left testicular vein joined to

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form a common trunk which drained into the left renal vein [Figures 1 and 2].

Discussion

Variations in the origin of testicular arteries are common and are frequently reported. The arteries may vary at their origin; one or both arteries may arise from renal artery, suprarenal artery or lumbar artery. They may arise from a common trunk, and may be two, three or four on one side.^[2] The gonadal artery variations were more commonly found in male than in female fetuses, and were more on right side than on the left.^[3] A study of testicular artery done by Pai *et al.*, on the South Indian population, one double testicular artery was found on the right side.^[4] According to previous reports, testicular arterial variations are more frequently observed on the right side. In the present case, we observed the variation on the left side and case of two testicular arteries arising directly from abdominal aorta is also unique.

Anatomical knowledge of testicular artery is very essential for performing operative techniques of treating varicocele and undescended testes within abdominal cavity. During varicolectomy, testicular artery must be preserved in order to prevent testicular atrophy. In microvascular autotransplantation of intraabdominal testis, origin and course of testicular artery must be carefully identified. Therefore, awareness of the possible existence of such variations of testicular arteries is of

great importance during surgical procedures in this region.

Variations in the origin of suprarenal arteries have been reported before. Middle suprarenal artery is most variable among the three suprarenal arteries.^[5] Brohi *et al.*, reported a case with high origin of the left testicular artery with a suprarenal branch from it on the left side.^[6] Ondergolou *et al.*, reported a right testicular artery which gave off inferior phrenic and superior suprarenal arteries.^[7] However, when there is a case of double testicular artery, ISA arising in common with STA is being reported for the first time for the best of our knowledge. In the case of spontaneous retroperitoneal hemorrhage from adrenal artery aneurysm, knowledge of such variation might help surgeons during surgery. It is also important during laparoscopic adrenalectomy as such variations may affect the orientation of the surgeon. The thorough knowledge of anomalous arterial anatomy of the suprarenal gland is required for surgical and radiological interventions of retroperitoneal organs of upper abdomen to avoid complications.

Not many reports are available regarding the variations of the veins similar to the present study. Satheesha has reported a case of testicular, suprarenal, and lumbar veins draining into the left renal vein.^[8] In a study by Baniel *et al.*, on lumbar vessels, a lumbar vein entering the left renal vein was documented in 43% of the cases.^[9] Bandopadhyay *et al.* has reported a case of the

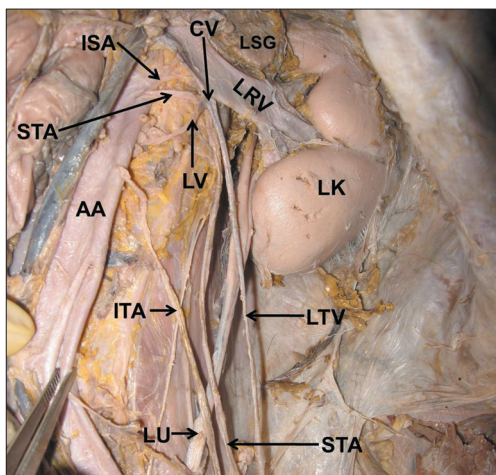


Figure 1: Dissection of the posterior abdominal wall on the left side. Dissection of the left part of the abdominal cavity showing the origin of superior testicular artery (STA) and inferior suprarenal artery (ISA) from a common trunk which is from the abdominal aorta (AA) and origin of the inferior testicular artery (ITA) directly from the abdominal aorta (AA). Unusual termination of the left testicular vein (LTV), left suprarenal vein (not seen in picture), and left second lumbar vein (LV) through a common trunk (CV) into left renal vein (LRV) is also seen. (Left suprarenal gland (LSG), Left kidney (LK), Left ureter (LU))

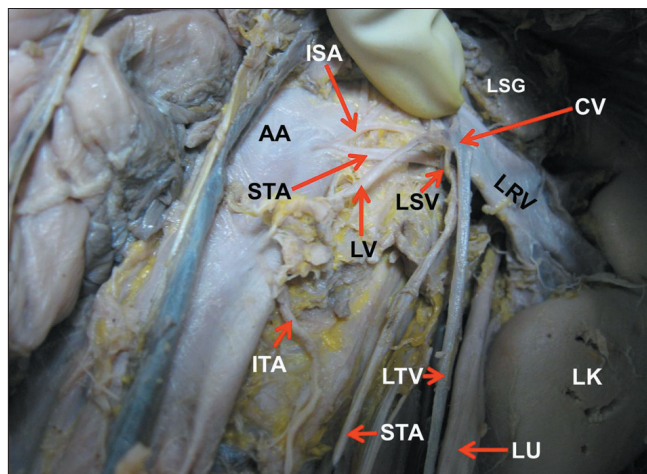


Figure 2: Dissection of the left part of the abdominal cavity. Dissection of the left part of the abdominal cavity showing closer view of the origin of the superior testicular artery (STA) and inferior suprarenal artery (ISA) from a common trunk which is from the abdominal aorta (AA) and origin of inferior testicular artery (ITA) directly from the abdominal aorta (AA). Unusual termination of the left testicular vein (LTV), left suprarenal vein (LSV), and left second lumbar vein (LV) through a common trunk (CV) into the left renal vein (LRV) and abnormal course of superior testicular artery (STA) hooking around the left suprarenal vein (LSV) is also seen (Left suprarenal gland (LSG), Left kidney (LK), Left ureter (LU))

left renal vein receiving an additional tributary coming from the posterior abdominal wall.^[10] This additional tributary was hooking the left testicular artery during its course. During development, the lumbar veins drain into infrarenal part of right supracardinal vein which in adults develops into infrarenal part of the inferior vena cava.^[1] Probably in the present case, the left 2nd lumbar vein was opening into the inter-sub-cardinal anastomosis (future left renal vein) instead of the right supracardinal vein. Our observation of formation of common trunk by the union of left testicular, left suprarenal and left second lumbar veins before terminating into the left renal vein and hooking of left superior testicular artery by left suprarenal vein before its termination into common trunk will add to the list of vascular variations observed in this region. Such variations should be kept in mind during retroperitoneal lymph node dissection surgeries.

Conclusion

Even though the presence of accessory testicular artery is not rare, ISA arising from accessory testicular artery is not common, that too on the left side. Further, variations reported here are of immense importance in view of their unique localization relative to other abdominopelvic organs and structures.

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