

A STUDY OF VARIATIONS OF TESTICULAR VEIN AND ITS CLINICAL SIGNIFICANCE

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ABSTRACT

Background: Testis is drained by the pampiniform plexus of veins which join to form four veins at the superficial inguinal ring, two veins at the deep inguinal ring and one vein at variable levels in the abdomen. The right testicular vein drains into inferior vena cava and left testicular vein drains into the left renal vein. Testicular veins show several variations and they are variations in number; course and termination. The knowledge of anatomic variations of testicular vein will help surgeons and radiologists in recognition of these anomalies and avoid potential complications during surgical procedures.

Materials and Methods: Testicular veins were studied in 25 adult cadavers by dissection method. Two anatomic aspects were considered: Number of testicular veins, and the site of vein termination.

Results and Discussion: In the present study variations in termination and duplication of testicular veins were observed. Right side - One testicular vein occurred in 92% and 2 veins in 4% of the cases. Left side - One testicular vein occurred in 88%, two veins in 8%. Variations of the testicular veins are due to alterations in the embryological origin of the veins.

Conclusion: variations of site of termination and duplication of testicular veins were observed in the present study. These variations are significant surgically and radiological.

KEY WORDS: Testicular veins, Anatomic variations, Embryology, Surgical procedures.

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BACKGROUND

The testicular veins arise posteriorly from the testis, drain the epididymis and unite to form the pampiniform plexus. It ascends anterior to the ductus deference in the spermatic cord. Distal to the superficial inguinal ring the plexus is drained by three or four veins traversing the inguinal canal to the abdomen through the deep inguinal ring; they coalesce into two veins, which ascend anterior to the psoas major and ureter, behind the peritoneum, on each side of testicular artery. These veins join and open into

Inferior vena cava on the right side and left renal vein on the left side [1]. Testicular veins show variation with regard to number, course and site of termination [2]. Variations of testicular veins are a result of error of embryological development in venous shift and alteration of anastomotic channel of post cardinal, supra-cardinal and sub-cardinal veins [3]. The variations of testicular veins are not only important during pre-operative planning of surgical procedures in the retroperitoneal area but also in pathological conditions such as varicocele surgery. Keeping in view of the

applied importance, the present study was undertaken to provide information on the anatomic variations of testicular vein.

MATERIALS AND METHODS

Thirty adult cadavers were dissected and studied. These embalmed cadavers were given for dissection to under graduate medical students in the department of anatomy, J.S.S. medical college. After the students studied the contents of the abdominal cavity and when they approached the posterior abdominal wall, the finer dissection was done. The testicular veins were traced from the testis to their termination into the Inferior vena cava and left renal vein. Variation of the right and left testicular veins were observed and studied.

Fig. 1: Two left testicular veins (T) draining into the left renal vein (R). Lumbar vein (L), Supra renal vein (SR).



RESULTS AND DISCUSSION

The variations of testicular vein are a result of altered anatomy of venous trunks during the developmental phase of the embryonic veins which later develops as congenital vascular malformation. The Embryogenesis of these veins involves the development, regression, anastomosis and replacement of three pairs of venous channels; posterior cardinal, subcardinal, and supra-cardinal. Testicular vein develops from caudal part of sub-cardinal vein and it drains into the supra-sub cardinal anastomosis. On the right side, the supra-sub cardinal anastomosis and a small part of sub-cardinal vein are incorporated into formation of Inferior vena cava,

therefore right testicular vein drains into the inferior vena cava. On the left side, supra- sub cardinal anastomosis forms part of the left renal vein where the left testicular vein drains [4].

In the present study single right testicular veins draining into the inferior vena cava was observed in 92% of cases and single left testicular veins draining into the left renal vein was observed in 88 % of cases. According to a study Single right testicular veins were noted in 82% of cases [5] and in another study single right testicular vein were noted in 88% cases and single left testicular veins in 82% cases[6]. Duplicated right testicular veins were noticed in 4% of specimens. Similar observation was noted by another study [6]. Radiologist should be aware of this variation to avoid diagnostic errors. Knowledge of duplication of testicular veins is of importance to the surgeons as the anomalous vein that ought to be ligated, may go unnoticed during surgery for varicocele and result in recurrence of varicocele which is the cause of male infertility [7].

Anatomical variations of termination of testicular veins were found only on the right side [8]. In one specimen one of the duplicated right testicular veins drained into the inferior vena cava and the other drained into the right renal vein. In the present study right renal vein terminating on the ipsilateral renal vein was observed in 4% of case. The incidence of this variation was reported to be 1-5% [6, 9]. This variation may predispose to varicocele on the right side [10]. The duplicated left testicular veins were observed in 8% cases. Both the vein drained separately into the left renal vein. The left testicular vein was a tributary of left renal vein in all cases. These variations may cause confusion in assessing the radiological findings or during retroperitoneal surgeries [8].

CONCLUSION

Anatomical variations of testicular veins were observed in the present study. Incidence of variations of testicular veins was noted mostly on the left side. These numeric variations and variations in its site of drainage results in pathological conditions such as varicocele leading to infertility. Knowledge of variations of testicular vein is of great importance surgically

and radiologically.

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Conflicts of Interests: None

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