



Case report

Triple right testicular veins and their variant termination and communications

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ABSTRACT

Testicular veins are known to show many variations in their origin, course and termination. Some of their variations can lead to male sterility. We report a unique variation of right testicular vein here. Pampiniform plexus reduced to three testicular veins (medial, middle and lateral) at the deep inguinal ring on the right side. The medial vein terminated into the right renal vein, the middle vein terminated into the inferior vena cava above the level of right renal vein (close to the suprarenal gland) and the lateral vein terminated partly into the veins in the capsules of the kidney and partly into the veins under the diaphragm. The medial and middle testicular veins were connected through an oblique communicating vein. The middle and lateral testicular veins were also connected to each other through another oblique communicating vein. Knowledge of this case could be useful to radiologists, nephrologists and surgeons in general.

1. Introduction

Testicular veins begin as a continuation of pampiniform plexus of veins. The right testicular vein terminates into the inferior vena cava and the left testicular vein drains into the left renal vein. Many variations of the testicular veins have been reported. The reported variations include duplication [1], bifurcation [2, 3], variant termination into the renal vein [4] on the right side and presence of five veins at the deep inguinal ring [5]. Testicular arterio-venous anastomosis is another rarely observed variation of the testicular vein [6]. We report one of the rarest variations of the right testicular vein and discuss about its possible embryonic basis.

2. Case report

During dissection classes for medical undergraduates, a unique variation of right testicular veins was observed in a male cadaver aged approximately 70 years. On the left side there was only one testicular vein. Three testicular veins (medial, middle and lateral) emerged out from the deep inguinal ring on the right side. The medial vein terminated into the RRV, the middle vein terminated into the IVC above the level of RRV (close to the right suprarenal gland) and the lateral vein terminated partly into the veins in the capsules of the kidney and partly into the veins

under the diaphragm (Figures 1 and 2). The capsular veins of the kidney, had an anastomosis with the muscular veins of the posterior abdominal wall and they terminated into the renal vein. The veins under the diaphragm terminated into the inferior phrenic vein. The medial and middle testicular veins were connected through an oblique communicating vein. The middle and lateral testicular veins were also connected to each other through another oblique communicating vein (Figures 1 and 2). No other variations were found in the abdomen.

3. Discussion

Gonadal veins develop from the caudal parts of the subcardinal veins. The right subcardinal vein contributes to the development of the inferior vena cava and the left subcardinal vein contributes to the development of the left renal vein. Hence, the right gonadal vein terminates into the inferior vena cava and the left gonadal vein terminates into the left renal vein [7]. Variations of the gonadal veins are usually caused by dysplasia of the subcardinal veins during the seventh to eighth week of embryonic development [8]. This dysplasia of subcardinal venous system could explain the triplication of the right testicular veins in the current case. Embryological reason for occurrence of the accessory right testicular veins and termination of one of

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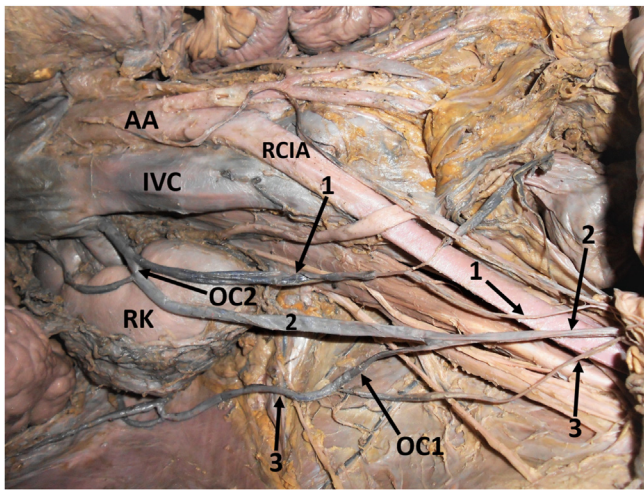


Figure 1. Dissection of the posterior abdominal wall, showing the variant right testicular veins. (AA – abdominal aorta; IVC – inferior vena cava; RCIA – right common iliac artery; RK – right kidney; 1 – medial testicular vein; 2 – middle testicular vein 3 – Lateral testicular vein; OC1 – oblique connection between middle and lateral testicular veins; OC2 – oblique communication between the medial and middle testicular veins.).

them into the right renal vein is not very clear. It is possibly due to the duplication of the infra-renal part of the subcardinal vein. Since the right renal vein represents the original mesonephric vein that drains into the right subcardinal vein, the accessory right testicular vein should open into right renal vein adjacent to the inferior vena cava. The embryological reason for the communication of one of the testicular veins with the veins in the capsules of the kidney and sub-diaphragmatic veins is not known at present. One of the possibilities for that is that the capsular veins of the kidney are also derived from the mesonephric veins and hence there was a communication between the testicular vein and this plexus. Triplication of the right gonadal vein has not been reported yet to the best of our knowledge. The variations of the gonadal veins are more common on the left side as reported by the previous studies [9]. Yang et al., (2008) have reported the triplication of the left testicular vein where, all the three veins

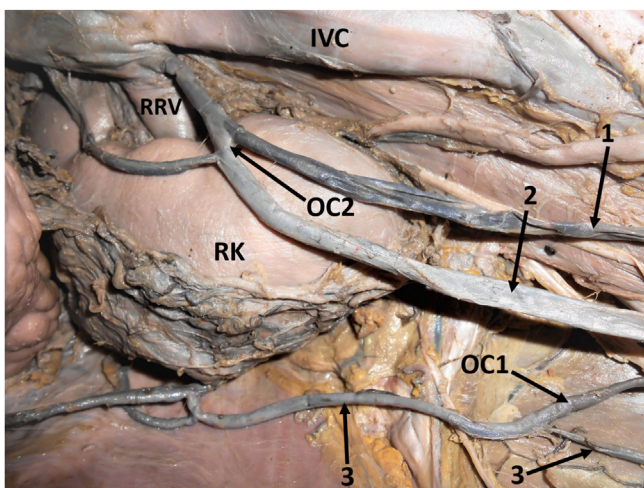


Figure 2. Dissection of the posterior abdominal wall, showing the terminal parts of the testicular veins. (IVC – inferior vena cava; RRV – right renal vein; RK – right kidney; 1 – medial testicular vein; 2 – middle testicular vein 3 – Lateral testicular vein; OC1 – oblique connection between middle and lateral testicular veins; OC2 – oblique communication between the medial and middle testicular veins.).

were opening into the left renal vein. In a report by Mazengenya P (2016), there were four testicular veins on the right side, out of which one drained into the subcostal vein, the other two travelled separately for a longer course and joined shortly before draining into the right main renal vein, and the fourth one drained into the anterior aspect of the inferior vena cava [10]. Our case is unique as there were three testicular veins on the right side and the lateral most among them anastomosed with the veins around the renal capsule and also with subdiaphragmatic veins. There were oblique communications between the three testicular veins. Though this pattern provides more than one choice for the right testicular venous drainage, it might cause problems in renal transplant surgeries, retroperitoneal varicocelectomy and other such procedures as the testicular veins were in close relation to the right kidney.

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Author contribution statement

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