



Variation in the testicular artery: A case presentation

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Abstract:

Variations in the gonadal arteries are due to their embryological origin which is very complex process. Vasculature of kidneys and gonads is derived from the lateral mesonephric branches of dorsal aorta. The gonads descend during development, but the origin of the gonadal arteries becomes fixed at the third or fourth lumbar level. During routine dissection of posterior abdominal viscera, on right side we found that the testicular artery arises from the upper surface of right renal artery. Just on lateral side of right testicular artery, segmental renal artery arises which enters the upper pole of the right kidney and this segmental renal artery gives rise to the inferior suprarenal artery. On left side testicular artery arises as the branch of abdominal aorta near the junction of aorta and left renal artery. Various types of variations are found around the kidney. Multiple vascular variations near the hilum of the kidney can create confusion during renal transplant surgery and also increases the chances of the vascular injuries. So, knowledge of variations of perirenal vessels is important.

Keywords: Testicular artery, Renal artery, Segmental artery, Gonadal artery

Introduction:

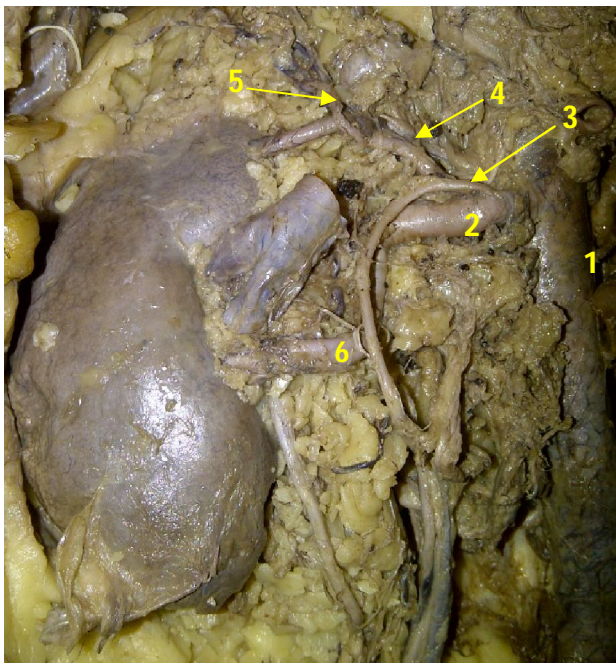
The presumptive gonads become vascularized by gonadal arteries that arise initially at the 10th thoracic level. The gonads descend during development, but the origin of the gonadal arteries becomes fixed at the third or fourth lumbar level. As testes descend further, the testicular arteries elongate. The definitive kidneys, in contrast, arise in the sacral region and migrate upward to a lumbar site just below the suprarenal glands. As they migrate, they are vascularized by a succession of transient aortic branches that arise at progressively higher levels. These arteries do not elongate to follow the ascending kidneys but instead degenerate

and are replaced. The final pair of arteries in this series forms in the upper lumbar region and become the definitive renal arteries.¹ The lateral splanchnic arteries which are branches of the dorsal aorta at embryonic stage persists bilaterally as testicular and three suprarenal arteries. Certain vascular and developmental anomalies of kidneys can be associated with variations in the course of the gonadal arteries. 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 derived from the lateral mesonephric branches of dorsal aorta.² Knowledge of variation in the origin of the testicular artery is

very important. Because in present era of renal transplant chances of vascular injuries increases due to variability in the normal course of the surrounding vessels especially testicular vessels.

Case report:

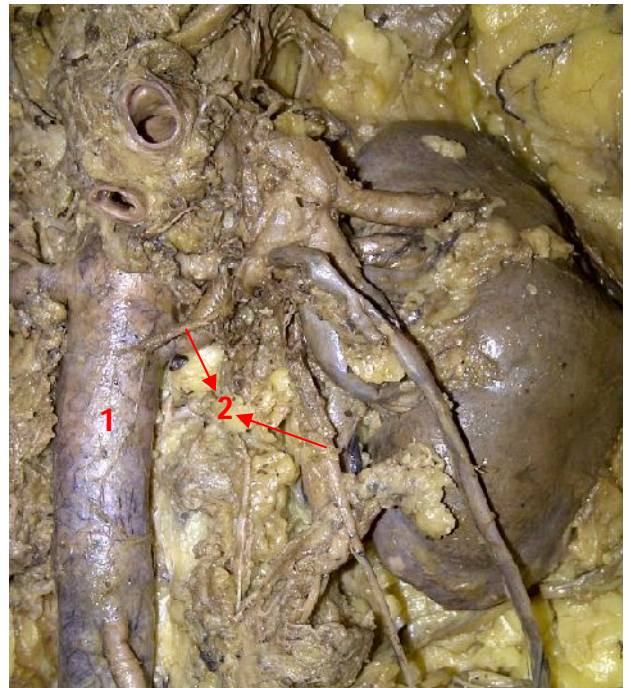
During routine dissection of posterior abdominal viscera for undergraduate students in Anatomy department of Government Medical College, Miraj we come across some abnormal vessels around the renal vessels in 60years old male cadaver. On detailed dissection of the region we found the abnormal origin of the right testicular artery. On right side the testicular artery arises from the upper surface of right renal artery and just on side of it segmental branch of renal artery arises which enters the upper pole of the right kidney and this segmental branch of renal artery gives rise to the inferior suprarenal artery (Photograph 1). On left side testicular artery arises as the branch of abdominal aorta near the junction of aorta and left renal artery (Photograph 2).



Photograph 1: Abnormal origin of right testicular artery from renal artery.

1-Aorta, 2-Righth renal artery, 3-Right testicular artery, 4-Right segmental branch of renal artery, 5-

Right inferior suprarenal artery, 6- Inferior segmental branch of renal artery



Photograph 2: Origin of left testicular artery from abdominal aorta.

1-Aorta, 2-Left testicular artery

Discussion:

Variations in the renal, gonadal and suprarenal arteries are seen frequently. As quoted by Gupta A, Singal R, Singh D³ (2011) the variations in the gonadal arteries are due to their embryological origin. Embryogenesis of these vessels is very complex process. Nine lateral mesonephric arteries are divided into the cranial, middle and caudal group. The gonadal arteries are persistent branches of mesonephric arteries that develop cranially and caudally to the renal pedicle. From those branches generally caudal branch develop as a definite gonadal artery and others undergoes atrophy. The sex gland descends and the kidney ascends. If the artery persisting was situated cranial to renal pedicle then it will appears crossing in front of pedicle with the descend of gland and if kidney ascends still higher carrying its renal vein to a higher level than the origin of the gonadal artery, then the latter will be forced to follow an arched course around the vein.

Notkovich H⁴ (1956) has classified the gonadal arteries into three types based on their anatomical relationship to the renal vein:

Type I – the gonadal arteries arise from the aorta behind or below the renal vein and pass downwards and laterally into the inguinal canal.

Type II – the artery arises from the aorta above the level of renal vein and crosses in front of it.

Type III – the gonadal arteries arise from the aorta behind or below the renal vein and course upwards to arch over the renal vein.

Pai MM et al⁵ (2008) studied 34 male cadavers i.e. 68 testicular arteries. Among them in 85.3% of the cases the testicular artery was normal in origin, number and course. However, in the remaining 14.7% cases various anomalies in the testicular artery were noted. The testicular artery arising as a branch of the inferior polar artery was observed in 7.4% cases, origin from the main renal artery in 1.47% cases, high origin from abdominal aorta in 4.41% cases and double testicular artery in 1.47% cases were noted.

Gupta A, Singal R, Singh D³ (2011) studied the gonadal artery and observed that the gonadal artery was normal in the origin, number and course in 55(91.6%) cases among 30 cadavers studied (20 males and 10 females). In the remaining 5 (8.3%) cases different variations were observed and all were seen in testicular artery and none in the ovarian artery. The variations found in this study include the testicular arteries arching over the renal vein (1.6%), arising from the renal arteries (6.6%) and passing through a hiatus in the renal vein.

Kayalvizhi I, Monisha B, Usha D⁶ (2011) noted the accessory left testicular artery originating superior to the normal testicular artery from the descending abdominal aorta immediately below the origin of the normal left renal artery. In addition to this artery, a variant renal artery was noted with three segmental branches before entering the hilum. It was quite complex type of variation observed.

Salve VM⁷ (2010) observed the rare origin of right testicular artery from right aberrant renal artery.

So, origin of the right testicular artery from the upper surface of renal artery and passing between the right renal vein and artery is a very rare anomaly as noted in the present study. Also this variation was accompanied by another variation that inferior suprarenal artery arising from the superior polar artery which is arising from the renal artery. Normally the inferior suprarenal artery is a direct branch of renal artery.

Conclusion:

The testicular artery may get compressed between the renal artery and vein, which may lead to degeneration of the testis due to hampered vasculature. Multiple vascular variations near the hilum of the kidney can create confusion during renal transplant surgery and also increases the chances of the vascular injuries. So, knowledge of variations of peri-renal vessels is important.

References:

- 1) Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. Larsen's Human Embryology. Elsevier Churchill Livingstone. 2010:410,411.
- 2) Moore KL, Dalley AF. Clinically oriented Anatomy. 5th Ed., Philadelphia, Lippincott Williams & Wilkins 2006;311,384.
- 3) Gupta A, Singal R, Singh D. Variations of Gonadal artery: Embryological basis and clinical significance. Int J Biol Med Res 2011;2(4):1006-10.
- 4) Notkovich H. Variation of the testicular and ovarian arteries in relation to the renal pedicle. Surg Gynecol Obstet 1956;103:487-95.
- 5) Pai MM, Vadgaonkar R, Rai R, Nayak SR, Jiji PJ, Ranade A et al. A cadaveric study of the testicular artery in the South Indian population. Singapore Med J 2008;49(7):551-4.
- 6) Kayalvizhi I, Monisha B, Usha D. Accessory left testicular artery in association with double renal vessels: a rare anomaly. Folia Morphol 2011;70(4):309-11.
- 7) Salve VM, Ashalatha K, Sawant S, Gajendra K. Variant origin of right testicular artery –a rare case. International Journal of Anatomical Variations 2010;3:22-4.