



BILATERAL ACCESSORY RENAL ARTERIES WITH ORIGIN OF TESTICULAR ARTERIES FROM ACCESSORY RENAL ARTERIES-A CASE REPORT.

Dr Preeti Sonje*

(Professor) D.Y.Patil Medical College Hospital And Research Centre ,D Y Patil Vidyapeeth,pune. *Corresponding Author

Dr P Vatsalaswamy

(Professor) D.Y.Patil Medical College Hospital And Research Centre ,D Y Patil Vidyapeeth,pune

ABSTRACT Arterial variations are commonly found in different arteries of the body .Gonadal arteries also show numerous variations which are important in surgeries of posterior abdominal wall. Also these arteries are closely related to renal arteries, so variations in their origin are of utmost importance in renal surgeries. Present case showed variations in the gonadal artery as well as renal artery. Variations in the origin renal surgeries like renal transplant, surgical excision of tumours of posterior abdominal wall, surgeries on abdominal aorta etc. Also these variations are important for radiologists and also for surgeries of varicocele and testicular tumours.

KEYWORDS : Abdominal aorta, Renal artery, Testicular artery.

INTRODUCTION-

Renal arteries branch laterally from aorta just below the origin of superior mesenteric artery .The right renal artery is longer and often higher ,passing posterior to inferior vena cava and right renal vein .The left renal artery is little lower and passes behind the left renal vein. Accessory renal arteries are a common variant present in about 30% of individuals .

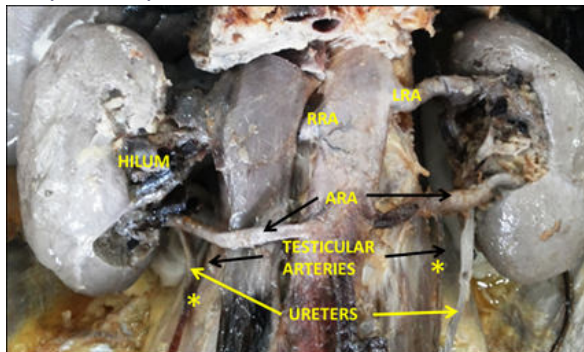
Accessory renal arteries arise from the aorta above or below the main renal artery and follow it to the renal hilum¹ The testicular arteries are the two long slender vessels which arise anteriorly from the aorta a little inferior to the renal arteries. Each passes inferiorly under the parietal peritoneum on psoas major. The right testicular artery lies anterior to the inferior vena cava. The left testicular artery lies posterior to the inferior mesenteric vein. Each artery crosses anterior to the genitofemoral nerve, ureter and the lower part of external iliac artery and passes to the deep inguinal ring to enter the spermatic cord and travel via the inguinal canal to enter the scrotum².

These variations of renal and testicular arteries are important for surgeons as well as for radiologists. They are important in surgeries of posterior abdominal wall, renal transplant surgeries, surgical excision of tumours of posterior abdominal wall, surgeries on abdominal aorta etc³.

CASE REPORT-

During routine dissection Bilateral accessory renal arteries were found in a male cadaver ,3cm below the origin of renal arteries ,also accessory renal arteries were giving origin to testicular arteries on both the sides.

Figure 1- Accessory renal artery giving rise to accessory testicular artery bilaterally.



RRA-right renal artery
LRA-left renal artery
ARA- accessory renal arteries

DISCUSSION-

Identification of accessory renal arteries is of utmost importance for renal transplantation, embolisation of renal artery for various reasons and other surgical approach to kidney.

Accessory renal artery to the lower pole, passing in front of ureter, may compress the ureter and cause hydronephrosis.

Variation in testicular artery is not uncommon. Previous studies show that the variations in testicular artery are more common on right side as compared to left side. Cicekcibai et al⁴ observed that origin of the gonadal artery from the renal artery was found in 5.5% of cases.

Origin of testicular artery at a higher level was found in a study done by Mamatha et al⁵.

Information about the origin and course of the testicular artery is surgically significant as ligature during operative procedures can cause testicular atrophy. So unusual course and location of the testicular artery are important in many different surgical procedures that involve it. Surgeons need to understand the morphologic variations of these arteries and ensure that they are not neglected, compromising oxygenation of the gonads.

Sushma R. Kotian et al⁶ have classified the gonadal vessels according to their level and source of origin, as follows-

- Type I: Testicular artery arising from the abdominal aorta a little inferior to the renal artery (Normal pattern);
- Type II: Testicular artery arising from the abdominal aorta superior to the renal artery ;
- Type III: Testicular artery arising from the renal artery;
- Type IV: Testicular artery arising from the abdominal aorta at the level of the inferior mesenteric artery.

The Testicular artery usually arises from the abdominal aorta inferior to the renal vein. Studies have also reported the origin of testicular artery posterior or superior to the renal vein.

There are also cases in which the right testicular artery emerges from the renal artery and the left from the abdominal aorta, or vice-versa. The testicular artery can even arise from an accessory renal artery, as reported previously. Rarely, the testicular artery can originate from the suprarenal, phrenic, superior mesenteric, lumbar, common iliac, or internal iliac arteries.

The testicular artery can pass as an arched artery in front of the renal vein, as observed in previous studies. This artery has been named the artery of Luschka. In such conditions, the artery may get compressed and cause testicular degeneration⁷.

The anatomy of gonadal arteries has assumed importance because of development of new operative techniques within abdominal cavity for operations like varicocele and undescended testis. During laparoscopic surgery of male abdomen and pelvis complications may occur due to unfamiliar anatomy in operative field, thus it becomes imperative to carefully preserve the gonadal artery in order to prevent any vascular troubles of gonad, the gonadal artery being its unique source of blood supply This indicates the importance of arteriography or Doppler ultrasound examination of renal hilum prior to any surgical procedure in this region⁸.

Knowledge of testicular artery variations is important as its damage may lead to testicular atrophy. Clinicians performing renal transplant surgeries, interventional radiologists should be aware of these variations.

Embryological explanation –Both the kidneys and gonads develop from the intermediate mesoderm during embryonic life ,their blood supply is also derived from the common source i.e. lateral mesonephric branches of dorsal aorta.

Definitive kidney arise in the sacral region and ascends to lumbar region .While ascending they are vascularised by the series of aortic sprouts,so arteries do not elongate with kidneys but they are regressing and replaced by new sets of arteries.So final pair of arteries formed in lumbar region forms definitive renal arteries.

Non regressed inferior pair of renal arteries form accessory renal arteries.

As the embryo grows, the kidney follows an ascending course, whereas the gonads descend. By the time the two organs cross, the testis receives two main branches the one above and the other below the kidney. The lower branch usually atrophies when the organs reach their final position Anomalies during the degeneration of these primitive arteries might lead to variations⁹.

CONCLUSION-

The knowledge about the variations in gonadal vessels is of utmost importance to the urologist, surgeons dealing with kidney retrieval and transplantation, and radiologists. Anatomical knowledge of testicular artery is very essential for performing operative techniques of treating varicocele and undescended testes within abdominal cavity. During varicocelectomy, testicular artery must be preserved in order to prevent testicular atrophy¹⁰.

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