

Research Article

A CADAVERIC STUDY OF THE TESTICULAR ARTERY

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ABSTRACT

The gonadal arteries, lateral branches of the abdominal aorta, usually arise distal to the renal vessels. Knowledge of the origin and course of them, particularly their relationships with renal vessels, are important for uncomplicated surgical procedures on the posterior abdominal wall. So the relationship of the testicular artery and renal vessels were studied in 10 cadavers in D.Y.P.M.C., Kolhapur. We have discussed the possible clinical implications and embryological explanation with review of literature of those variations.

Keywords: *Testicular Artery, Renal Artery, Gonadal Artery*

INTRODUCTION

The testicular arteries are two long slender vessels that arise from the abdominal aorta, a little inferior to the renal artery. Right testicular artery runs anterior to the inferior vena cava, deep to the horizontal part of the duodenum. Left testicular artery runs behind inferior mesenteric vein and crosses genitofemoral nerve and ureter anteriorly to reach inguinal canal (Standring, 2005).

According to Notkovich (1956), the gonadal arteries have been classified into three types based on their anatomical relationship to the renal vein: Type 1 –the gonadal arteries arise from the aorta behind or below the renal vein and passes downward and laterally into the inguinal canal. Type 2-the artery arise from the aorta above the level of renal vein and crosses in front of it.

Type 3 – the gonadal arteries arise from the aorta behind or below the renal vein and courses upwards to arch over the renal vein.

The gonadal artery variations were more commonly found in male than female foetus and more on the right side than the left (Çiçekcibaşı *et al.*, 2002). In the present study, we investigated the origin and course of testicular arteries and discuss their clinical significance and embryonic development. As the number of abdominal surgical interventions and radiological investigations increases, a better understanding of the anatomy of testicular arteries gains importance.

MATERIALS AND METHODS

The posterior abdominal walls of the 10 adults (40-70 years) male cadavers (20 sides) were dissected and studied for the variations in the origin and course of the testicular arteries. The retroperitoneal dissection of the cadavers were done carefully to delineate the testicular vessels and to study their relationship with renal vessels.

RESULTS AND DISCUSSION

Results

We found that in 85% of the cases, the testicular artery was normal in origin, number, and course, as per the description that is usually referred to in standard anatomical textbooks. However, in the remaining 15% various anomalies in the testicular artery were noted. The following variation were seen to be coexisting with multiple renal vessels, either artery or vein.

Variation 1- (12%) high origin of the testicular artery. Three left sides presented a more superior aortic origin of testicular artery as high as the renal artery origin. In all these cases, the testicular artery arched over the ipsilateral renal vein (figure 1).

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Figure 1: Left testicular artery had arched around a tributary of the left renal vein

Variation 2- (3%) the testicular artery as a branch of the inferior polar artery. This anomalous pattern was seen.

Discussion

The anomalies of the testicular arteries include variations of their origin, course and number (Notkovich, 1956; Mijac *et al.*, 1983; Shinohara *et al.*, 1990; Ozan *et al.*, 1995).

They may be missing, or one or both arteries may arise from the renal artery, supra renal artery, or lumbar artery. The testicular artery may get compressed between the renal veins, which may lead to degeneration of the testis. Considering that the incidence of a left arching testicular artery is higher than that of a right one, an arching left artery could be an additional cause of left renal vein (L.R.V.) hypertension (Rudloff *et al.*, 2006) resulting in varicocele, orthostatic proteinuria and hematuria (Naito *et al.*, 2006). compression of the L.R.V. between the aorta and superior mesenteric artery has been termed the nutcracker syndrome: obstruction of L.R.V. outflow results in venous hypertension with the formation of intra and extrarenal collateral and / or the development of gonadal vein reflux (Rudloff *et al.*, 2006). The developmental origins of the testicular blood vessels are very complex (Xue *et al.*, 2005). The first note on the embryological origin of the gonadal artery was made by Felix (1912). Nine lateral mesonephric arteries are divided into the cranial, middle and caudal group. One of the caudal arteries usually persists and differentiates into the definitive gonadal artery. The persistence of a cranial lateral mesonephric artery results in a high-origin of the gonadal artery (Felix, 1912), probably from the suprarenal or from a more superior aortic level (Çiçekcibaşı *et al.*, 2002). Persistence of more than one lateral mesonephric arteries results in doubled, tripled or quadrupled gonadal arteries. If the kidney ascends much higher, carrying its renal vein to a higher level than the origin of the gonadal artery, the latter will be forced to follow an arched course around the vein. The fact that on the left side, the kidney ascends generally higher than on the right, gives us a clear explanation of the higher frequency on the left side (Notkovich, 1956).

A deep knowledge of these variations and their relations to the adjacent structures is very important in avoiding the complications in operative surgery. With the advent of newer surgical and diagnostic techniques, understanding of atypical anatomical presentations gains more importance.

REFERENCES

- Çiçekcibaşı AE, Salbacak A and Seker M *et al.*, (2002). The origin of gonadal arteries in human fetuses: anatomical variations. *Annals of Anatomy* **184** 275-9.
- Felix W (1912). Mesonephric arteries (aa. Mesonephricae). In: *Manual of Human Embryology*, edited by Keibel F and Mall FP (Philadelphia: Lippincott) **2** 820-5.
- Mijac M, Goldner B, Joksimović B and Lolić-Draganić V (1983). Variations in the origin of ovarian and testicular arteries. *Srpski arhiv za celokupno lekarstvo*, Serbian **111** 609-15.
- Naito M, Terayama H and Nakamura Y *et al.*, (2006). Left testicular artery arching over the ipsilateral renal vein. *Asian Journal of Andrology* **8** 107-10.

Research Article

Notkovich H (1956). Variations of the testicular and ovarian arteries in relation to the renal pedicle. *Surgery, Gynecology, and Obstetrics* **103**(4) 487-95.

Ozan H, Gümüşalan Y, Onderoğlu S and Simşek C (1995). High origin of gonadal arteries associated with other variations. *Annals of Anatomy* **177** 156-60.

Rudloff U, Holmes RJ and Prem JT et al., (2006). Meso-aortic compression of the left renal vein (nutcracker syndrome): case reports and review of the literature. *Annals of Vascular Surgery* **20** 120-9.

Shinohara H, Nakatani T, Fukuo Y, Morisawa S and Matsuda T (1990). Case with a high-positioned origin of the testicular artery. *Anatomical Record* **226** 264-6.

Standring SM (2005). *Gray's Anatomy*, 39th edition (London, Elsevier Churchill Livingstone) 1306.

Xue HG, Yang CY and Ishida S et al., (2005). Duplicate testicular veins accompanied by anomalies of testicular arteries. *Annals of Anatomy* **187** 393-8.