CASE REPORT

A RETROCAVAL RIGHT TESTICULAR ARTERY SUPPLYING THE RIGHT SUPRARENAL GLAND AND THE WALL OF THE INFERIOR VENA CAVA WITH AN UNUSUAL ORIGIN FROM THE ABDOMINAL AORTA

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ABSTRACT

The testicular arteries are one of the paired branches of the abdominal aorta being the male homologues of the ovarian arteries of females. There are a number of reports about the variation of the origin and course of these arteries. In this case the right testicular artery is found to unusually arise from the abdominal aorta above the renal arteries, and runs behind the inferior vena cava (retrocaval) providing branches to the right suprarenal gland and the wall of the inferior vena cava. This was detected in a 55 years old male cadaver during the routine dissection program of undergraduate medical students in the Department of Anatomy, College of Medicine and Health Sciences, University of Gondar. Such a case, though rare, could be of vital nephrosurgical importance.

Key words: Retrocaval, testicular artery, suprarenal gland, inferior vena cava, abdominal aorta

INTRODUCTION

According to standard textbooks, testicular arteries develop from the lateral splanchnic branches of the dorsal aortae. These branches of the dorsal aorte which appear very early, can be divided into three groups (1): Ventral splanchnic arteries to the gut and its derivatives, lateral (intermediate) splanchnic arteries to the intermediate mesoderm and dorsolateral somatic intersegmental arteries to the somites, body wall and contents of the vertebral canal.

The lateral (intermediate) branches of the dorsal aortae on each side supplying the intermediate mesoderm are well-developed in the regions of the developing pro-, meso- and meta-nephroi. These branches are represented in the adult by the phrenic, suprarenal, renal and gonadal (testicular/ovarian) arteries (1, 2). That is, normally during the course of development in males two gonadal arteries, two renal arteries and three suprarenal arteries persist on each side. The testicular arteries are, therefore, two long slender vessels arising anteriorly from the aorta a little inferior to the renal arteries at the level of the second lumbar vertebra and descend on the psoas major behind the parietal peritoneum (2, 3).
Even though they frequently arise from the abdominal aorta, the left may occasionally arise from the left renal artery (4, 5). However, variations and abnormalities of number, origin and course of descent of the testicular arteries are commonly encountered and reported by many other authors (6 – 22).

The purpose of this case report is to describe a unique and peculiar case of retrocaval right testicular artery supplying the right suprarenal gland and the wall of the inferior vena cava with an unusual origin from the abdominal aorta which is presented as follows.

CASE REPORT

This variation was detected incidentally in a middle-aged cadaver (about 55 years old) during the routine dissection course of the academic year 2006/2007 for undergraduate medical students in the Department of Human Anatomy of the College of Medicine and Health Sciences, Gondar University. After a careful dissection of the artery, the inferior vena cava was cut and reflected down to make further dissection and exposure of the testicular artery easier. The branches were carefully dissected, painted by red color, photograph was taken by digital camera (Canon Digital IXUS II) and the picture was

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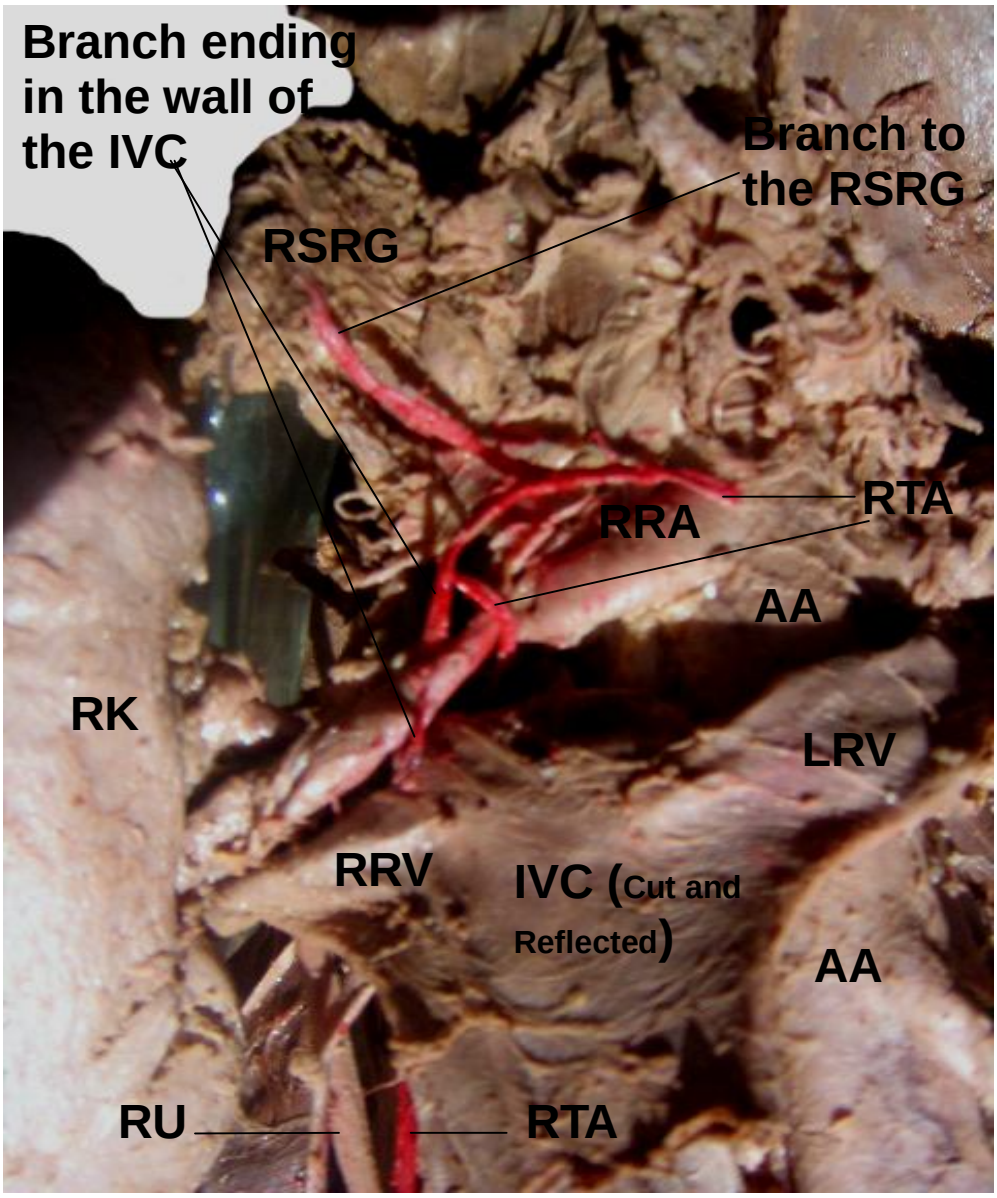
transferred to a computer.

It was foundout that the right testicular artery (RTA) arises from the abdominal aorta (AA) just above but very close to the right renal artery (RRA) and courses obliquely downwards to the right parallel to the right renal artery but behind the inferior vena cava (IVC) for about 3.5 cm where it divides into three branches (Figures 1 and 2):

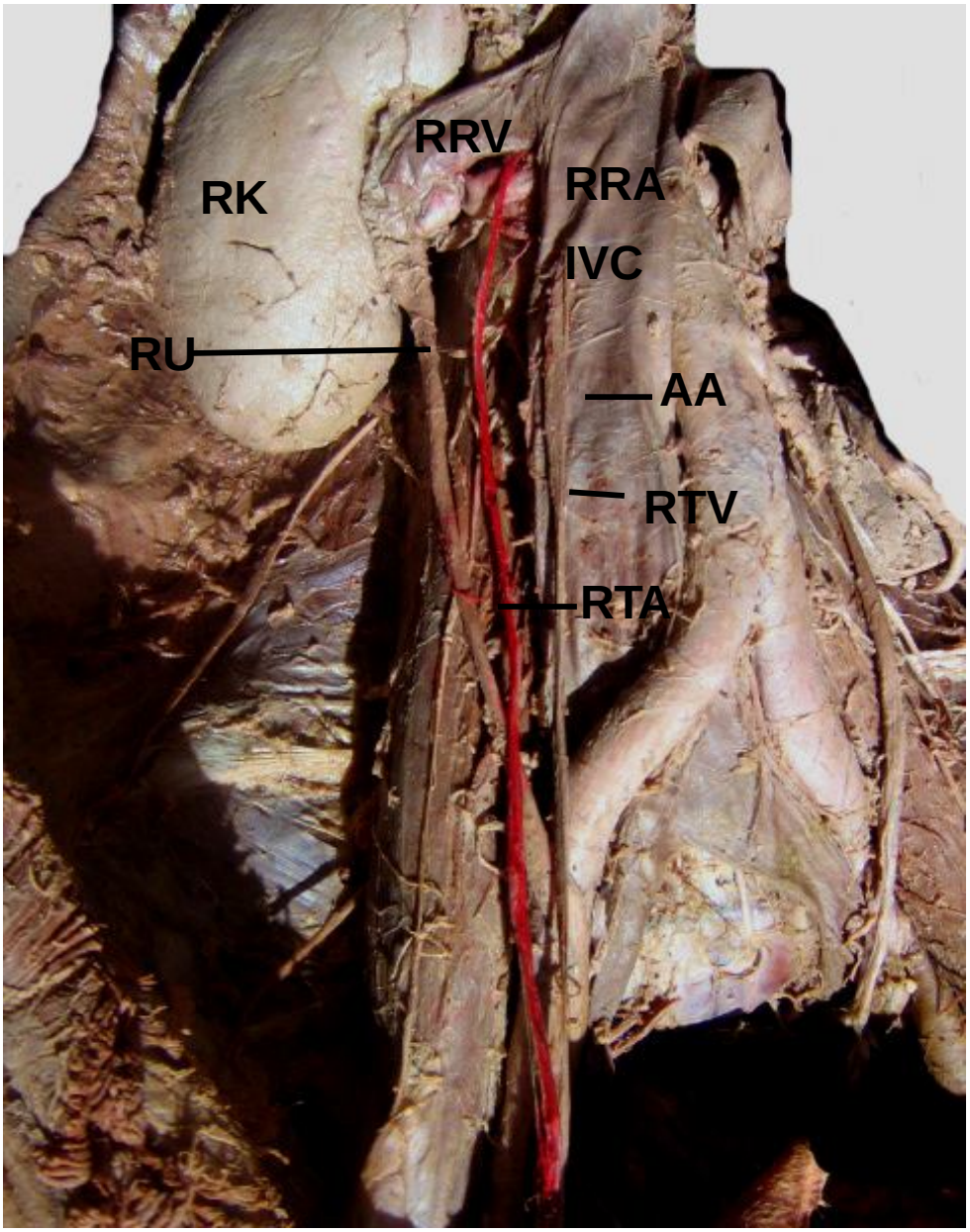
1. An ascending branch to the right suprarenal gland (RSRG) (middle suprarenal artery)
2. A small descending branch that enters and terminates in the wall of the inferior vena cava dorsally at the junction between the right renal vein and the inferior vena cava;
3. A relatively large descending testicular branch that runs between the right renal artery and vein joining the testicular vein to descend to the deep inguinal ring to become a component of the spermatic cord.

The left testicular vessels were normal in their origin and course.



RSRG – right suprarenal gland
RK – right kidney
RTA- right testicular artery
RRA – right renal artery
AA – abdominal aorta
LRV- left renal vein
RRV – right renal vein
VC – inferior vena cava

Figure.1. Shows the origin of the right testicular artery(RTA) from the abdominal aorta(AA) above the right renal artery (RRA), its course behind the inferior vena cava (IVC), and its further divisions to right suprarenal gland ant to the wall of the inferior vena cava (IVC).



RRV- right renal vein
RK – right kidney
RRA- right renal artery
IVC – inferior vena cava
RU – right ureter
AA – abdominal aorta
RTV – right testicular vein
RTA – right testicular artery

Figure.2. Shows the right testicular artery(RTA) passing between the right renal artery(RRA) and vein (RRV), descends downwards along with the right testicular vein(RTV) by crossing over the right ureter (RU).

DISCUSSIONS

The testicular arteries which are also known as the male gonadal arteries or internal spermatic arteries are paired branches of the abdominal aorta that supply blood to the testes being the male homologues of the ovarian arteries . Each crosses obliquely over the ureter and the lower part of the external iliac artery to reach the deep inguinal ring through which it passes with the other constituents of the spermatic cord through the inguinal canal to the scrotum. In addition to the testis, each testicular artery supplies the ureter, cremaster muscle, ductus deferens and epididymis.

Developmentally both testicular arteries represent persistent lateral splanchnic aortic branches that enter the mesonephros and cross ventral to the supracardinal but dorsal to the subcardinal vein (1). During normal development the lateral splanchnic artery that persists as the right testicular artery passes caudal to the supra-subcardinal anastomosis forming part of

the inferior vena cava. When it passes cranial to this, the right testicular artery is behind the inferior vena cava; hence, sometimes the right testicular artery passes posterior to the inferior vena cava (2, 20).

However, most frequently, the testicular arteries arise from the anterolateral aspect of the aorta a little below the renal arteries at the level of the second lumbar vertebra, but they may also originate from the renal artery, the middle suprarenal artery, one of the lumbar arteries, common or internal iliac arteries, or the superior epigastric artery. The other unusual origin is the inferior segmental branch of right renal artery (13, 19). Brohi and his coworkers (15) reported on a high origin of left testicular artery from the anterior surface of the abdominal aorta at the level of the origin of the left renal artery that gave off a branch which supplied the left suprarenal gland.

In the present case, the right testicular artery after arising from the abdominal aorta, just above right renal artery, courses obliquely downward to the right behind the inferior vena cava for about 3.5 cm, gives off a branch that ascends to the right to enter the right suprarenal gland replacing the middle suprarenal artery which is absent in this case. Then it splits into two descending branches one of which enters the wall of the inferior vena cava close to its junction with the right renal vein. The second descending branch, the largest of the three, runs between the right renal artery and the right renal vein and descends along the right side of the inferior vena cava to join the right testicular vein with which it then becomes a component of the spermatic cord at the deep inguinal ring.

Such an artery arising from the abdominal aorta above the renal artery and running behind the inferior vena cava supplying the testis, the suprarenal glands and probably the wall of the inferior vena cava as well, is so unique that no similar report could be detected in any literature. In conclusion, this case report would help nephrosurgeons to be aware of such an abnormality and be cautious during intraoperative ligation of renal vessels to avoid entrapment of the testicular artery.

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