



Abnormal Testicular Vascular Patterns amongst Three Trinidadians: (A Case Report)

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Abstract: During our routine dissections to prepare teaching materials for our students we encountered three abnormal patterns of the testicular arteries in three Afro Trinidadian males. In the first case the right and left testicular arteries arose from accessory renal arteries. Their course to the testis remained unchanged. In the second case the left testicular artery arose from the left renal artery. The course of the artery also remained unchanged. In the third case an additional right testicular artery was identified arising from the ventral aspect of the abdominal aorta at the same level with the normal right testicular artery. This is the first set of abnormal patterns that have been encountered since the inception of the Anatomy department almost twenty years ago.

Key Words: Abnormal testicular vessels, Trinidad and Tobago

INTRODUCTION

Variations in the origin, number and course of the testicular arteries and veins are of significant practical importance in clinical practice particular in surgery and radiology. Angiographic images with abnormal vascular patterns may be incorrectly interpreted in the absence of knowledge of the variation in the pattern of origin of these vessels. Furthermore, knowledge of the relationship of these vessels to the kidney, ureter and other structures on the posterior abdominal and pelvic walls is important especially in abdominopelvic surgical procedures such as renal transplantations^[1]. It is therefore imperative that for accurate diagnosis variations in the origins, courses and relations of structures in these regions should be recognised and well understood.

Aortic origin of the testicular arteries and drainage of the testicular veins into the inferior vena cava on the right side and the left renal vein on the left side is the most constant pattern described in almost all the textbooks^[2,3].

During our routine dissections for preparation of teaching and museum specimens, we observed that three of the cadavers showed abnormal origins and variations in the number of testicular arteries as well as variations in the venous drainage of a testicular vein that have been rarely documented in the literature.

MATERIALS AND METHODS

Using conventional dissecting techniques, the embalmed cadavers of three elderly Trinidadian were dissected. Laparotomy was performed using a midline anterior abdominal incision. The entire anterolateral abdominal wall was removed to provide free access to

the posterior abdominal wall. The entire gastrointestinal parts anterior to the renal components of the abdominal cavity were removed to allow maximum access to the posterior abdominal wall and its contents. Components of the urogenital system on the posterior abdominopelvic wall were identify and dissected finely to expose and separate their arteries and veins from surrounding organs.

Following fine dissection the entire urogenital system was removed from the posterior abdominopelvic wall and photographed.

RESULTS/OBSERVATIONS

In the course of our routine dissection, we observed that the testicular arteries and veins in three elderly Afro Trinidadians presented a number of variations as follows:

1. The right and left testicular arteries originated from accessory renal arteries (the venous patterns were normal): The accessory renal arteries on both sides arose directly from the abdominal aorta and entered the lower part of the hilum of the kidneys separately on both sides (Fig. 1). In spite of the unusual origins of the testicular arteries from accessory arteries, their course and ramifications remained unchanged.
2. The left testicular artery which normally arises from the abdominal aorta arose from the left renal artery (Fig. 2). There was no alteration in the course and ramifications of this artery. (The origin of the right testicular artery and the drainage of the right and left testicular veins were normal).

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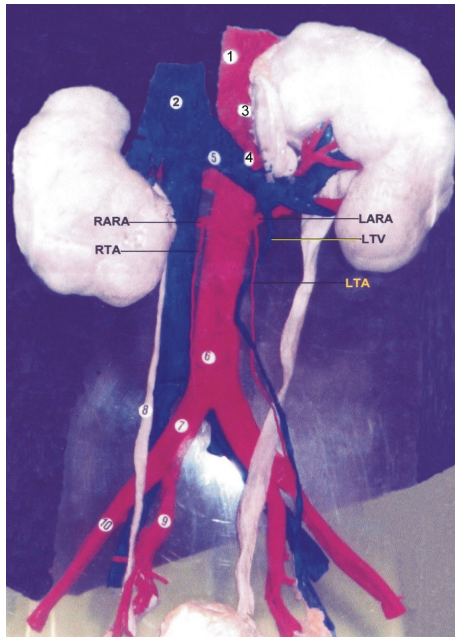


Fig. 1: Photograph of a prosected specimen of the posterior abdominal wall illustrating posterior abdominal vascular tree and renal structures

1.Abdominal aorta; 2.Inferior vena cava;3.Celiac trunk;4.Superior mesenteric artery;5.Left renal vein;6.Inferior mesenteric artery;7.Right common iliac artery;8.Right ureter;9.Right internal iliac artery;10. Right external iliac artery;RARA Right accessory renal artery;RTA Right testicular artery;LARA Left accessory renal artery;LTV Left testicular vein;LTA Left testicular artery

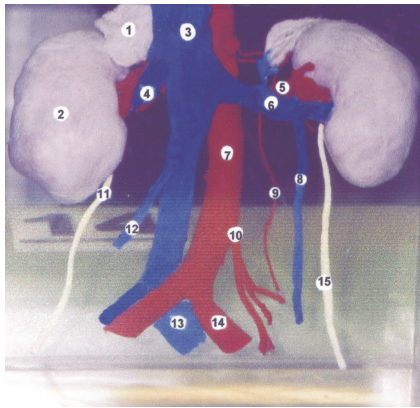


Fig. 2: Photograph of a prosected specimen of the posterior abdominal wall illustrating posterior abdominal vascular tree and renal structures.

1.
2. Right suprarenal gland; 2. Right kidney; 2. Inferior vena cava; 2. Right renal vein; 3. Left renal artery; 4. Left renal vein; 5. Abdominal aorta; 6. Left testicular vein; 7. Left testicular artery; 8. Inferior mesenteric artery; 9. Right ureter; 10. Right testicular vein; 11. Left common iliac vein; 12. Left common iliac artery; 13. Left ureter

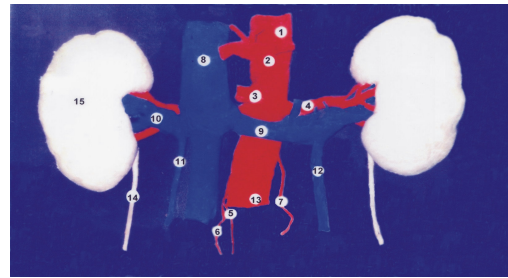


Fig. 3: Photograph of a prosected specimen of the posterior abdominal wall illustrating posterior abdominal vascular tree and renal structures

1. Abdominal aorta; 2. Celiac trunk; 3. Superior mesenteric artery; 4. Left renal artery; 5. Right testicular artery; 6. Right testicular artery; 7. Left testicular artery; 8. Inferior vena cava; 9. Left renal vein; 10. Right renal vein; 11. Right testicular vein; 12. Left testicular vein; 13. Inferior mesenteric artery; 14. Right ureter; 15. Right kidney

3. An additional right testicular artery arose from the ventral aspect of the abdominal aorta at the level of origin of the right renal artery (Fig. 3). This artery remained separate in its course up to the deep inguinal ring after which it joins the main testicular artery to supply the testis. The normal right testicular artery arose from the ventrolateral aspect of the abdominal aorta about one centimeter inferior to the additional right testicular artery. It was also noted in the same specimen, that the right testicular vein which is single, drain directly into the right renal vein instead of the inferior vena cava as is normally the case, thus exhibiting a mirror image of the normal venous drainage pattern of the left side (Fig. 3).

DISCUSSION

Testicular arteries usually arise from the ventrolateral aspect of the abdominal aorta below the origin of the renal arteries^[2,3]. Variations of the testicular vessels are not numerous, but are of immense important in view of their unique localization relative to other abdominopelvic organs and structures. A review of the literature on this subject has revealed only a handful of reports of varying pattern of origin of the testicular artery. In 1956 Notkovitch^[4,5] reported that in 10% of the cases studied the testicular artery had a high aortic origin and descended into the pelvis crossing ventral to the renal veins. The same author also reported that in 12% of the cases the testicular arteries arose from the aorta below the renal artery, ascended and arched over the ventral surface of the renal vein. In both groups, the testicular artery on the right passed dorsal to the inferior vena cava.

Shinohara et al^[6] found that a left testicular artery arose 1 cm cranial to the inferior phrenic artery or, more plainly stated, just beneath the diaphragm. This artery gave rise to two branches, one to the costal part of the diaphragm and the other to the suprarenal gland before descending to the pelvis.

Some other reports have indicated that the testicular arteries arose from the accessory renal arteries^[7,8]. This pattern of origin appears to be in complete agreement with our findings in which the right and left testicular arteries originated from accessory renal arteries.

The cause of the observed anomalies in the present report could be attributed to defects in the embryonic development of the lateral splanchnic aortic arteries^[3,9]. Interruption of or complete arrest of any developmental stage may produce various variations in the origins, number and course these arteries. Furthermore, the origin of the testicular arteries from accessory renal arteries may not be unconnected with the close relationship of the mesonephros and the urogenital ridge in the developing embryo.

It is important to note that anomalous origins, number and courses of testicular vessels are of particular interest in surgical and developmental anatomy as such anomalies if not appreciated and understood could result in various complications during routine surgical procedures relating to the kidney, ureter and other related abdominopelvic structures. For example, the testis could obtain additional blood supply from a branch of the inferior epigastric artery close to the deep inguinal ring in the lower abdominal region (3). In this situation, transaction of the testicular artery in the upper abdominal region would not lead to total disruption of blood supply to the testis benefiting from this variation.

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