

# An unusual case of duplication of the right testicular artery

Ricardo E Esparragoza, Crisol S Chacon, Andrés E Acosta, Jesús E Chacin

Esparragoza RE, Chacon CS, Acosta AE, et al. An unusual case of duplication of the right testicular artery. *Int J Anat Var.* 2017;10(1):008-9.

Duplications of the testicular arteries have been described. Origins of double testicular arteries are variable and associate to other vascular variations. During routine dissection of the abdominal cavity on an adult male cadaver, two testicular arteries on the right side were observed, one of them originated from aorta abdominal and the other arose from a common

trunk along with an inferior suprarenal artery. The common trunk surged from a supplementary renal artery. Combination of these vascular variations is explained by embryological development. Knowledge of the variants in the origin and number of the testicular and renal artery must be taken into consideration in a surgery to avoid complications.

**Key words:** Testicular artery; Supplementary renal artery; Inferior suprarenal artery; Arterial duplication; Anatomical variation

## INTRODUCTION

Testicular arteries are originated from the anterolateral aspect of abdominal aorta. Although, most commonly a single artery is found on each side, duplications of the testicular arteries have been described (1). The origins of duplicate testicular arteries are variable, both can originate from the aorta (2) or one arises from aorta and other from different vessels such as renal (3) or suprarenal arteries (4). Also, variations in renal and suprarenal vessels were reported. Two or more renal arteries are found with a variable frequency (5). The Inferior Suprarenal Artery (ISA), usually originating from the renal artery, can rise from a supplementary renal artery (6). In this report we present an unusual case of duplication of testicular artery associated with variations of suprarenal and renal arteries.

## CASE REPORT

During routine dissection of the abdominal region of approximately 60-years-old male cadaver, conserved with formaldehyde, we observed two testicular arteries in the right side, one of them was placed medially originated from aorta abdominal, the other localized laterally and originated more superiorly (Figure 1). After sectioning the inferior vena cava was observed a supplementary renal artery, which arose from aorta and went to the lower part of right renal hilum. At about 1 cm from its origin, the supplementary renal artery gave off a common trunk, which after of short course, divided into two branches: An ISA and the other testicular artery localized laterally (Figure 2). Then, both testicular arteries approached coursing downward to the region inguinal. In addition, the right main renal artery gave off, prior to its terminal division into two segmental branch, two superior polar arteries and another ISA (Figure 2). On the left side, a single testicular artery originated from aorta and renal vessels exhibit usual anatomic configuration.

## DISCUSSION

Among the variations less frequent of the gonadal arteries include double testicular arteries. Cicekcibasi et al. described the variations of the gonadal arteries in 90 fetuses and classified into four types. The Type IV included duplications of the gonadal arteries, in three cases found two right testicular arteries. The duplications were subdivided into two subtypes: Type IV A, in which both testicular arteries originated from aorta, and Type IV B, with different origin, one of them originated from aorta, the other from the suprarenal artery (4). Our case corresponds to the latter type, but differs as the suprarenal artery originated from a supplementary renal artery and not from main renal artery as it described in that report. In other hand, we considered the aforementioned suprarenal artery as an ISA, since it is a branch of renal artery.



**Figure 1)** Dissection of retroperitoneum, anterior view, shows the right kidney (K) and vessels of the region. The medial testicular artery (black arrows) arises from the aorta abdominal (Ao), the origin of lateral testicular artery (white arrows) is localized behind the inferior vena cava (IVC), into which the right testicular vein (\*) drains (RV Renal vein; U Ureter; L Liver)

In the literature the birthing of a testicular artery from the ISA has been referred as originating of a common trunk. In a study of 34 cadavers, Pai et al. described one case of two right testicular arteries, one lateral arose from artery renal and the other medial emerged from aorta as a common trunk along with the inferior suprarenal and renal capsular arteries (3). Jyothsna et al. reported one case of left double testicular arteries with a common trunk originating from aorta immediately branched in testicular and inferior suprarenal arteries, the other testicular artery arose from aorta (7). Also, Filipovic et al. found one case with two left testicular arteries: One was medial, originating from an accessory renal artery; the other was lateral, debranching from the common trunk together with the left ISA (8). In the present report, we found a medial testicular artery arose from aorta and a lateral testicular artery originated from a common trunk with an ISA, on the right side. The remarkable finding is that an accessory or supplementary renal artery gave off the common trunk, unlike the others cases mentioned.

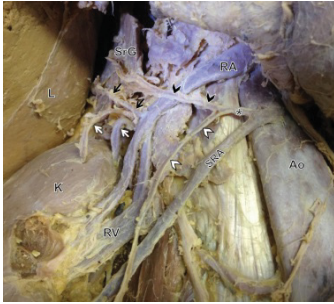
In this study, we found two inferior suprarenal arteries, one originated from the renal artery, which is the most often; the other, together with a testicular artery, arose through of a common trunk from a supplementary renal artery. Bordei et al. found that the ISA can arise from a supplementary renal artery, aorta, or rarely, a gonadal artery (6). In a study with 150 cadavers Asala et al. found just one case of an ISA originating from the artery testicular (2), which is described by other authors as an origin from a common trunk. Panyanetinad reported one case with a common trunk of testicular and inferior suprarenal arteries. The common trunk originated from right main renal artery (9). The mentioned cases did not present duplication of the testicular artery, differing with our report.

Department of the Morphological Sciences, Medical College, University of Zulia (LUZ), Bolivarian Rep. of Venezuela

Correspondence: Dr. Ricardo E. Esparragoza Montero, Cathedra of Anatomy, Department of the Morphological Sciences, Medical College, Medical Faculty, University of Zulia (LUZ), Bolivarian Rep. of Venezuela. Telephone +582642415808, +584265628932, e-mail: ricardoem@gmail.com



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact [reprints@pulsus.com](mailto:reprints@pulsus.com)



**Figure 2)** Dissection of retroperitoneum, anterior view, after sectioning and displacing the inferior vena cava, shows a right supplementary renal artery (SRA) arising from aorta abdominal (Ao). The lateral testicular (white arrowheads) and an inferior suprarenal (black arrowheads) arteries arise from a common trunk (\*) which is branch of SRA. The right main renal artery give off two superior polar (white arrows) and another inferior suprarenal (black arrows) arteries (K Right kidney; SrG Suprarenal gland; RV Renal vein; L Liver)

Renal artery variations regarding number are common and have been reported widely. It is more frequent find two arteries, unilaterally, on the left side and predominance in masculine gender (5). The association of variations in renal and testicular vessels has been highlighted. Bordei et al. studied 16 cases of gonadal arteries originating from the renal artery, both main and supplementary. They found four cases of double gonadal artery, only in one of them the lateral testicular artery originated from the supplementary renal artery and the medial one from the aorta (1). This case is similar to our report, but without the presence of a common trunk with an ISA.

The combination of variations in renal, gonadal and inferior suprarenal arteries is explained by the embryological development of these vessels from the lateral mesonephric branches of the dorsal aorta. Felix divided the mesonephric arteries on three groups: Cranial, middle and caudal. Supernumerary renal arteries occur when persist more than one artery of the middle group. Gonadal arteries usually surge from caudal group, although could be formed from any group (10). The lateral testicular artery of this report could be formed from the middle group, in agreement with Gurses et al. (11), because a supplementary renal artery is involved in its origin.

The report of this case with multiple anatomical variations not only provides knowledge about the embryological development of the retroperitoneal

vessels, but also offers a guide for surgeons in order to avoid possible complications, such an acute hemorrhage resulting from vascular injury in renal hilar dissections and retroperitoneal surgical explorations (12). Therefore, an evaluation of the vascular anatomy with imaging procedures should be carried out.

## REFERENCES

1. Bordei P, Sapte E, Iliescu D, et al. The morphology and the surgical importance of the gonadal arteries originating from the renal artery. *Surg Radiol Anat.* 2007;29:367-71.
2. Asala S, Chaudhary SC, Masumbuko-Kahamba N, et al. Anatomical variations in the human testicular blood vessels. *Ann Anat.* 2001;183:545-9.
3. Pai MM, Vadgaonkar R, Rai R, et al. A cadaveric study of the testicular artery in the South Indian population. *Singapore Med J.* 2008;49:551-5.
4. Cicekcibasi AE, Salbacak A, Seker M, et al. The origin of gonadal arteries in human fetuses: anatomical variations. *Ann Anat.* 2002;184:275-9.
5. Satyapal KS, Haffjee AA, Singh B, et al. Additional renal arteries: incidence and morphometry. *Surg Radiol Anat.* 2001;23:33-8.
6. Bordei P, Antohe STD, Sapte E, et al. Morphological aspects of the inferior suprarenal artery. *Surg Radiol Anat.* 2003;25:247-51.
7. Jyothsna P, Rao K, Somayaji S, et al. Multiple vascular anomalies involving testicular, suprarenal arteries and lumbar veins. *North Am J Med Sci.* 2012;4:154-6.
8. Filipovic B, Stijak L, Filipovic B. An unusual origin of the double left testicular artery in a male cadaver: a case report. *J Med Case Rep.* 2012;6:267.
9. Panyanetinad O. Rare combined variations of renal, testicular and suprarenal arteries. *Int J Anat Var.* 2011;4:17-9.
10. Felix W. Mesonephric arteries (aa. mesonephricae). In: Kiebel F, Mall FP (eds.) *Manual of Human Embryology*, Vol. 2, Philadelphia, Lippincott. 1912;820-5.
11. Gurses IA, Kale A, Gayretli O, et al. Bilateral variations of renal and testicular arteries. *Int J Anat Var (IJAV).* 2009;2:45-7.
12. Ravery V, Cussenot O, Desgrandchamps F, et al. Variations in arterial blood supply and the risk of hemorrhage during percutaneous treatment of lesions of the pelviureteral junction obstruction: Report of a case of testicular artery arising from an inferior polar renal artery. *Surg Radiol Anat.* 1993;15:355-9.