CASE WITH A HIGH - POSITIONED ORIGIN OF THE OVARIAN ARTERY

Hasan OZAN, M.D., Doğan AKŞİT*, Ph.D., Erdal KARAÖZ, M.Sc., Oğuz TAŞKINALP, M.D.

GATA Military Medical School, Department of Morphology,
Hacettepe University, Faculty of Medicine, Department of Morphology*, Ankara, Turkey
Gazi Medical Journal 3 : 5-8, 1992

SUMMARY : *The cadaver of a 55 year old female revealed a right ovarian artery in which the level of origination from the aorta was considerably high with respect to the level of the renal vein. We have not come across similar cases cited in the literature in which the ovarian artery was positioned at such a high level.*

Key Words : *Testicular Artery, Ovarion Artery, Variation..*

INTRODUCTION

The variations in origin and course of arteries of different organs are not only of anatomical and embryological interest but also of clinical importance so that these variotions may be responsible for pathological conditions and that knowledge of them in surgery can result in more accurate treatment.

Variations in origin and course of the testicular and ovarian arteries were described by many authors (Arey, 1974; Felix, 1912; Kitamura et al. 1987; Notkovich, 1956; Shinohara et al. 1990).

During dissections performed in 1990, we encountered a very high-positioned origin of the ovarian artery in a Turkish female aged 55 years.

MATERIALS AND METHODS

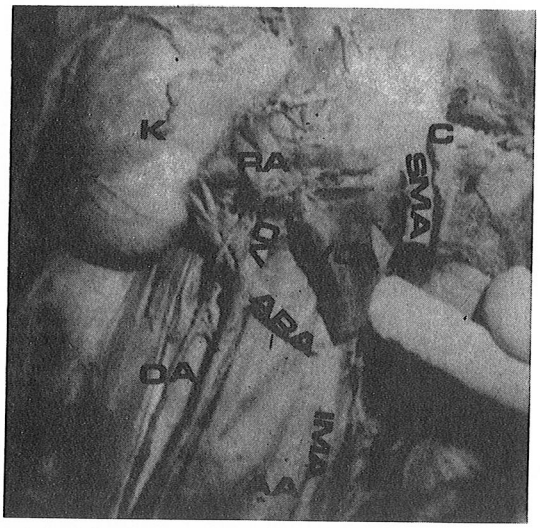
During our routine dissections which were caried out on 40 cadavers in Gülhane Military Medical School and Hacettepe University Faculty of Medicine Department of Anatomy between 1985-1990, we encountered a cadaver of a 55 year old female in which the ovarian artery was very high positioned. The variation was photographed and a schematic diagram was drawn.

RESULTS

The results of the dissection are illustrated in figure 1, 2, 3. The right ovarian artery is seen to commense from the abdominal aorta at a level 1cm. below the superior mesenteric artery, it follows the course of anterior to the renal vein and posterior to the inferior vena cava. It then courses downwards in front of the accessory renal artery together with the ovarian vein, entering the pelvic inlet and finally reaching the ovary (Fig 4).

DISCUSSION

During the last few years, by the aid of developing techniques in arteriography, the knowledge of arteries and their variations has acquired a special importance for correct interpretation of different, and sometimes very complicated, rontgenographic pictures.



Abbrevations

AA	Abdominal Aorta
ARA	Accessory Renal Artery
C	Celiac Trunk
IMA	Inferior Mesenteric Artery
IVC	Inferior Vena Cava
K	Kidney
OA	Ovarian Artery
OV	Ovarian Vein
RA	Renal Artery
SMA	Superior Mesenteric Artery

Fig. 1 : The ovarian artery originating from the abdominal aorta at a much higher level than that of the renal vein (The inferior vena cava has been pulled forward).

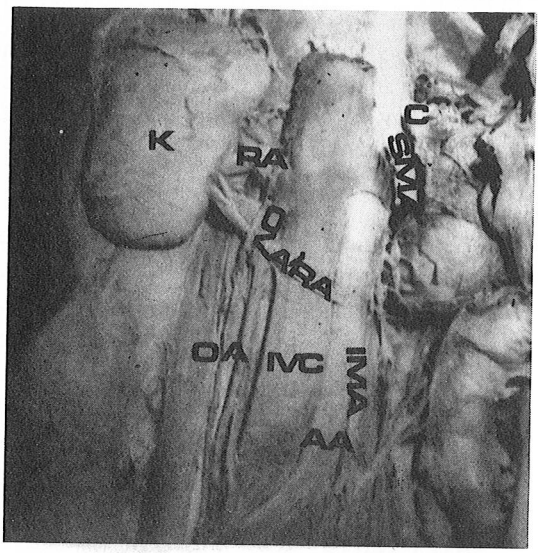


Fig. 2 : The course of the ovarian artery along the right margin of the inferior vena cava after its origin from the abdominal aorta and its course posterior to the inferior vena cava.

The gonadol artery (testicular and ovarian artery) usually arises from the abdominal aorta at a level caudal to the renal artery. It may however, originate from the renal artery or even more rarely as a branch from the suprarenal or lumbar artery (Arey, 1974; Felix, 1972; Kitamura et al. 1987; Linder, 1989; Moore, 1985; Notkovich, 1956; Shinohara et al. 1990; Williams et al. 1989).

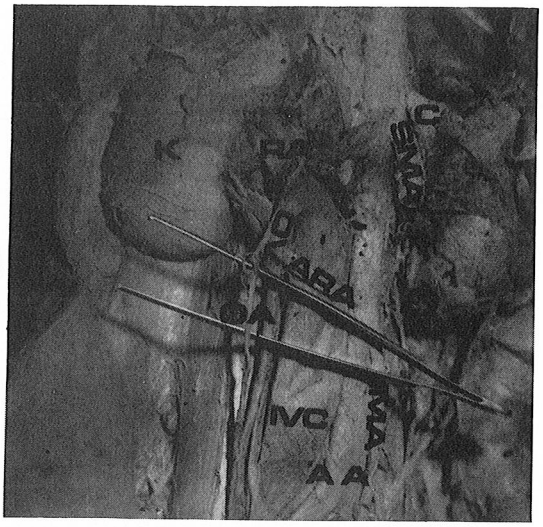


Fig. 3 : Relations and course of the ovarian artery (The inferior vena cava has been cut 1cm. above the ovarian vein).

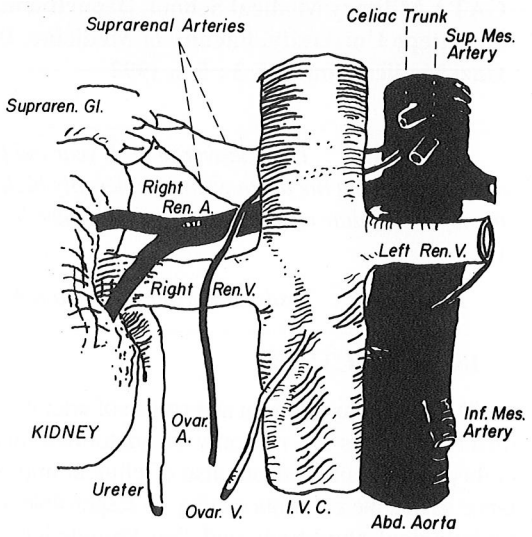
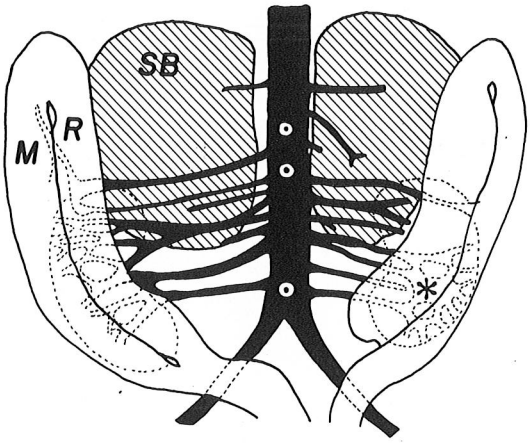


Fig. 4 : Schematic representation of the right ovarian artery.

The structures that arise from the nephrotome region, which are the mesonephros, reproductive glands, metanephros, and suprarenal glands, are supplied by the lateral mesonephric arteries extending from the aorta (Arey, 1974).

According to Felix (1912), the lateral mesonephric arteries, approximately nine in an embryo of 18 mm. are divided into three groups (Fig 5). 1- The cranial group consisting of the Ist. and 2nd. ar-



M : Mesonephros
R : Reproductive Gland
SB : Suprarenal Body
Fig. 5 : A schematic illustration of the lateral branches or aa. mesonephricae (redrawn from Felix, 1912).

teries that are located cranial to the celiac trunk and run dorsal to the suprarenal body, 2- The middle group consisting of the 3rd. - 5th. arteries passing through the suprarenal body, and 3- The caudal group consisting of the 6th. - 9th. arteries that pass over the ventral side of the suprarenal body and from the rete arteriosus urogenitale. Although any one of the nine arteries could become the testicular artery, Felix reported that it usually stems from the rete arteriosus urogenitale. He also stated that the testicular artery was rarely derived from the cranial group (Felix, 1912). Shinohara et al. (1990) reported that in a Japanese male, the left testicular artery originated from the aorta as high as 1cm. cranial to the origin of the left inferior phrenic artery.

There are nine branches on the left side. The cranial two branches are higher than the celiac trunk (the upper white circle). The caudal 7th. -9th. branches are from the rete arteriosus urogenitale (asterisk). The middle and lower white circles indicate the origins of the superior and inferior mesenteric arteries, respectively.

Notkovich has defined the different course and variations of the ovarian and testicular arteries together with the renal vein, through dissections he performed in 183 cadavers (405 arteries), (Notkovich, 1956). These variations could be grouped in three principal types : Type I, the gonadal artery descending directly without contact with the renal vein (this type conforms to the classical description of anatomy books, 8.7 % Right, 76.9 % Left). Type II, the gonadal artery coming from a higher level than the renal vein and crossing in front of it (8.7 % Right, 13.1 % Left). Type III, the gonadal artery coming from a lower than the renal vein and arching around it (7.6 % Right, 20.7 % Left) (Fig 6). However, it has been recorded that in 14 % of cases, the gonadal arteries are of renal origin.

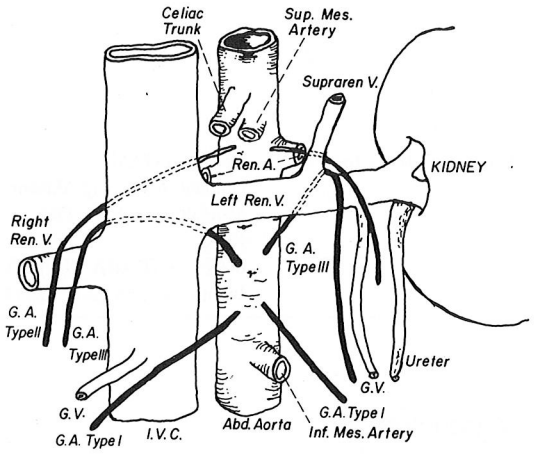


Fig. 6 : Schematic representation of the three types of gonadal arteries of aortic origin on both sides : Type I, descending directly, Type II, crossing in front of the renal vein, Type III, arching over the renal vein (Notkovich, 1956).

These variations can easily be understood on the basis of the embryological development of the gonadal glands and kidneys and their vascular supply. The gonadal arteries are continuations of the mesonephric arteries and are developed from the cranial and caudal parts of he renal pedicle. Type I arteries are formed by the development of the cranial part. But if the artery passes anterior to the renal pedicle due to the descent of the gonadal glands in the caudal portion, then it is termed as a Type II artery. When the renal vein ascends together with the kidneys, Type II develops into a Type III artery (Notkovich, 1956).

Another factor forming the variations of the gonadal artery is thought to be the pressure exerted by the renal vein (Notkovich, 1956; Shinohara et al. 1990).

Shinohara et al (1990) have reported a 58 year old Japanese male cadaver in which the testicular artery originated from the dorsal wall of the aorta, and that the commencement point was 1cm. cranial

to the origin of the inferior phrenic artery.

The artery in our case can be grouped with Notkovich's Type II arteries, since the level of origination of the right ovarian artery was quite above the renal vein and it coursed anterior to the renal vein.

Correspondence to : Dr.Hasan OZAN
Gülhane Askeri Tıp Akademisi
Morfoloji Anabilim Dalı
Etlik
06010 ANKARA - TUKEY
Phone : 4 - 325 12 11 / 2394

REFERENCES

1. Arey LB, Branches of the Aorta In : Developmental Anatomy WB Saunders (Philadelphia and London). 1974, pp. 354-358
2. Felix W : Mesonephric arteries (aa. mesonephrica), in : Manual o Human Embryology, F Keibel, and FP Mall (eds JB Lippincott, Philadelphia and London). Vol 2 :1912, pp. 820-825
3. Kitamura S, Nishiguchi T, Sakai A, Kumamoto K : Rare case the inferior mesenteric artery arising from the superior mesenteric artery, Anat Rec 217 : 99-102, 1987
4. Linder HH : Clinically Anatomy, Prectic - Hall Inc 319 : 521, 1989
5. Moore KL : Clinically Oriented Anatomy Second Edition, William and Wilkins (Baltimore, Hog Kong, London, Sydney). 1985, pp. 284 : 356
6. Notkovich H : Variations of the testicular and Ovarian Arteries in Relation to the Renal Pedicle, Surg Gynecol Obstet 103 : 487-495, 1956
7. Shinohara H, Nakatoni T, Fukuo Y, Morisawa S, Matsuda T : Case with a high - positioned origin of the testicular artery, Anat Rec 226 : 264-266, 1990
8. Williams P, Warwick R, Dyson M, Bannister L : Gray's Anatomy, Thirty - Seventh Edition, Churchill Livingstone, (Edinburg, London, Melbourne and New York). 1989, p. 1437