

ANOMALOUS ORIGIN OF RENAL ARTERIES AND ACCESSORY RENAL VEIN IN MALE CADAVER – A CASE REPORT

Ayurveda

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KEYWORDS

INTRODUCTION

Acharya Sushruta⁽¹⁾ was an ancient Indian physician, known as the main author of the treatise The Compendium of Suśruta (ca. 600 BCE) has clearly mentions about the importance of dissection on the fact that, one who is intended to acquire definite knowledge of surgery should keenly study the anatomy from the books as well as from the dissection.

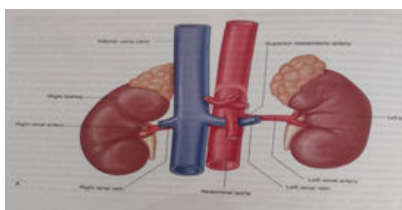
A detailed knowledge of the variations of the renal vasculature has grown in significance with the increasing numbers of renal surgeries, transplants, vascular reconstruction and radiological techniques. With raise in incidence of renal diseases & renal transplants, there is a need of research work aimed at enhanced and exact knowledge of variations of the blood vessels supplying the kidneys. A single large renal artery, a lateral branch of abdominal aorta, supplies each kidney. These vessels usually arise just inferior to the origin of the superior mesenteric artery between vertebra L1 & L2. The left renal artery arises usually a little higher than the right, and the right renal artery is longer and passes posterior to the inferior vena cava. As each renal artery approaches the renal hilum, it divides in to anterior and posterior branches, which supply the renal parenchyma.⁽²⁾

CASE STUDY:

During the routine dissection class for the UG's in the male cadaver aged 60 yrs, Anomalies were noted on both sides of the abdominal aorta. On the **Left side** there is an accessory renal artery which arising from the distal end of the abdominal aorta and terminated to the hilum below the accessory renal vein, and also there is an accessory renal vein which is arising from inferior vena cava. On the **Right side** anomalous renal artery arising below the inferior mesenteric artery from the abdominal aorta and terminated to hilum of the kidney.

Normal Origin of Renal Artery –

Image no – 1



OBSERVATION -LEFT KIDNEY

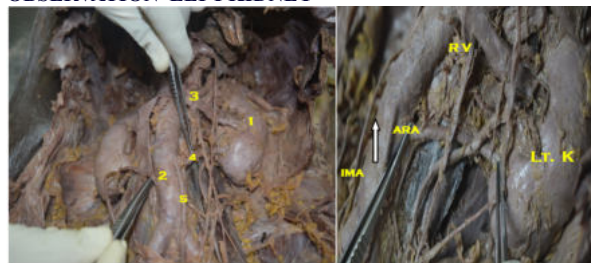


FIG-02[A]

FIG-03[B]

1- LEFT KIDNEY, 2- ABDOMINAL AORTA, 3- RENAL VEIN, 4- ACCESSORY RENAL ARTERY, 5- INFERIOR

MESENTERIC ARTERY, IMA- INFERIOR MESENTERIC ARTERY, ARA- ACCESSORY RENAL ARTERY

RIGHT KIDNEY

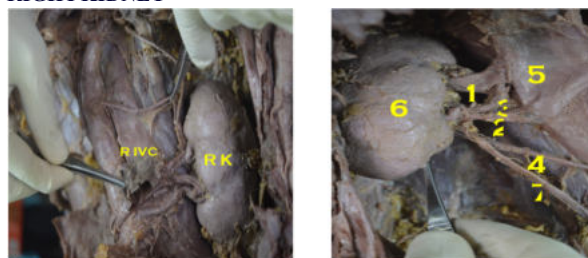


FIG NO-04[A]

FIG NO-05[B]

RIVC- REFLECTED IVC, RK- RIGHT KIDNEY, 1- RENAL VEIN, 2- ASSESSORY RENAL VEIN, 3- RENAL ARTERY PROPER, 4-ASSESSORY RENAL ARTERY, 5-INFERIOR VENACAVA, 6- RIGHT KIDNEY, 7- URETER

Embryology:

DEVELOPMENT OF RENAL VASCULATURE

Usually kidneys are developed from the three forms in the intrauterine life of humans i.e. pronephrons (non-functional), mesonephrons (function for short period) metanephrons (permanent kidney)

Kidney in the intrauterine life is in the pelvic region gradually on growth of the body by lumbar and sacral regions and diminution of body curvature it ascends to the abdominal region. During its ascent to abdominal region the kidneys get vascularized by arteries that originate from the abdominal aorta at continuously higher levels. The lower level arteries usually degenerate but some may remain as accessory renal arteries.

TABLE NO -01⁽³⁾

Arteries:		
Variations in Number:	1 to 6 per Kidney	
Variations of Origin:	Aorta Adrenal Gonadal Common Iliac External Iliac Internal Iliac Median Sacral	
Variations in the Point of Penetration:	Superior Pole Inferior Pole Hilus (mid-portion)	
Source of Penetrating Artery	Superior (Apical) Pole:	Suprarenal Aorta Renal
	Inferior (Lower) Pole:	Renal Aorta Gonadal Common Iliac External Iliac Internal Iliac Median Sacral
	Hilus (Middle part):	Aorta Renal
Veins:		
Unusual Position of Inferior Vena Cava, on Left Side.		
Retroaortic Anastomosis of Veins.		

Presence of Vein at Superior Pole.		
Presence of Vein at Inferior Pole:	Opening Into:	Renal Vein Vena Cava Iliac Vein

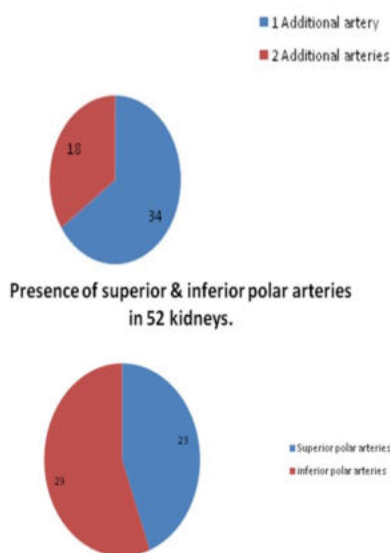
Table No – 02 ⁽⁴⁾

Number of renal artery	Right kidney (%)	Left kidney (%)	Total (%)
One artery	14/37 (37.8%)	16/37 (43.2%)	30/74 (40.5%)
Supernumerary renal artery	23/37 (62.2%)	21/37 (56.8%)	44/74 (59.5%)
(A) Aorta origin	18/37 (48.6%)	17/37 (45.9%)	35/74 (47.3%)
HSA	09/37 (24.3%)	07/37 (18.9%)	16/74 (21.6%)
UPSA	06/37 (16.2%)	05/37 (13.5%)	11/74 (14.9%)
LPSA	03/37 (8.1%)	05/37 (13.5%)	08/74 (10.8%)
(B) Renal origi	05/37 (13.5%)	04/37 (10.8%)	09/74 (12.2%)
HSA	03/37 (8.1%)	03/37 (8.1%)	06/74 (8.1%)
UPSA	01/37 (2.7%)	01/37 (2.7%)	02/74 (2.7%)
LPSA	01/37 (2.7%)	0/37 (0%)	01/74 (1.4%)

HSA: hilar supernumerary renal artery, UPSA: upper polar supernumerary renal artery, LPSA: lower polar supernumerary renal artery.

TABLE NO-03 ⁽⁵⁾

Presence of Additional arteries in kidneys



DISCUSSION-

Variations of such arterial patterns are extremely common but their significance in clinical aspects is very essential. The various types of (accessory, additional, supplementary, and aberrant) renal arteries, their positions, and segmentation were observed extensively by a number of authors. But generally these types of variations are not clearly available during our routine dissection manual for undergraduates as well as post graduates. And specific terminologies for these arteries are not obtainable. These arteries may reside in a certain vascular area within the kidney or from the main branch or from the direct branch of aorta. Merklin and Michels ⁽⁶⁾ has classified these supernumerary renal arteries depending upon origin as supernumerary renal arteries originating from aorta, supernumerary renal arteries originating from the main renal artery, and supernumerary renal arteries originating from other arterial sources, clinically, the supernumerary renal arteries are very important. The anatomical knowledge of supernumerary renal arteries is essential before performing any transplantation surgeries

CONCLUSION

Accessory arteries and renal veins are very much important for radiologists, Urologists but most significantly Anatomy teachers who will have a better knowledge of such type of variations and documentation of these structures will certainly help the graduates and post graduates during their dissection classes so that from the beginning they are much aware of such anatomical anomalies.

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