



International Journal of Medical Research & Health Sciences

www.ijmrhs.com

Volume 3 Issue 4

Coden: IJMRHS

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ISSN: 2319-5886

Received: 26th June 2014

Revised: 16th July 2014

Accepted: 11th Aug 2014

Case report

THE ABERRANT RENAL VESSEL AT LOWER POLE OF KIDNEY: A CASE REPORT

*Meshram Pritee M¹, Khedekar Deepak N¹, Hattangdi Shanta S³

¹Assistant Professor, ²Professor & Head, Department of Anatomy, LTMMC & GH, Sion, Mumbai, India

*Corresponding author email: prt_meshram@yahoo.co.in

ABSTRACT

A sound knowledge of the normal and variations in blood supply of kidney is a prerequisite to having a favourable surgical outcome. Knowledge of the commonly occurring variations assumes even more significance in the era of diagnostic imaging and minimally invasive surgical approaches. We describe a case of variation of the renal blood vessel found during the routine dissection. A male cadaver, approximately of 60 years, presented an aberrant renal artery on the left side. Variation in the number, source, branching and course of the renal arteries occurs frequently. Any variation in arterial supply is important to clinicians undertaking surgery or other intervention renal procedures.

Keywords: Renal artery, Aberrant Renal artery, Polar artery.

INTRODUCTION

The renal arteries originate from the abdominal aorta and enter the renal hila to supply the kidneys. Traditionally, each kidney receives irrigation from a single renal artery. However, many studies report great variability in renal blood supply, the number of renal arteries and the arrangement of hilar structures¹⁻⁵. Here a case is described where; an aberrant renal artery is seen on the left side. The aberrant artery took origin from the main left renal artery. These aberrant arteries account for about 30% of existence, while 70% owes for the normal type. An aberrant artery is the artery that supplies the kidney without entering its hilum⁶.

CASE REPORT

During the routine dissection in 10% formalin fixed male cadaver of approximately 60 years in the Department of Anatomy, Lokmanya Tilak Municipal Medical College, Sion, Mumbai, the posterior abdominal wall was dissected. After opening the abdomen, when the renal vessels were dissected and

traced carefully it was found that there is a single renal artery on the right side. However, while tracing the left renal artery it was found that the main renal artery originated at the level of the lower border of the L1 vertebra. It was then running horizontally along with left renal vein towards the hilum of the left kidney and enters the left kidney. After the origin of the main artery an aberrant renal artery originated from the main renal artery (Fig 1) it continued downward and laterally towards the lower pole of left kidney. It passed posterior to the lower pole of left kidney and entered the kidney through its posterior aspect. No other aberrant renal vessel was found at the upper pole of the same kidney. No aberrant vessel was found on the right side. Such variation has great implications when surgery is indicated, as in renal transplants, urological and radiological procedures.

DISCUSSION

Normally the renal arteries arise from the abdominal aorta at the L1-2 vertebral body level, inferior to the origin of the superior mesenteric artery.



Fig 1: The Aberrant Renal Artery
A: left kidney, B: cut left artery, C: aberrant renal artery entering lower pole of left kidney

The right renal artery courses inferiorly and passes posterior to the IVC and the right renal vein to reach the renal hilum. The left renal artery passes more horizontally, posterior to the left renal vein to enter the renal hilum. Both the renal arteries have anterior and posterior divisions. The anterior and posterior divisions divide into segmental branches which then divide into lobar branches. The lobar arteries successively branch into interlobar, arcuate and interlobular arteries. The afferent arterioles, which supply the glomeruli, originate from the interlobular arteries. According to Felix⁷ there are nine pairs of lateral mesonephric arteries arising from the dorsal aorta. These mesonephric arteries extend from sixth cervical segment to third lumbar segment. The cranial arteries disappear and the upper lumbar arteries form a network called the rete arteriosum urogenitale that supplies in future the metanephros. The metanephros in future develops into adult kidney deriving its blood supply from the rete arteriosum. Most of the roots forming this network degenerate only a few roots which form renal artery persists. Thus the aberrant renal vessel can be considered as persisting segmental arteries. The presence of the aberrant renal vessel can be considered as the developmental defect. The studies by F.T Graves⁸ has classified these aberrant renal vessels into three groups

Group 1: arising at the hilum

Group 2: arising in the pedicle

Group 3: arising from the aorta.

According to this classification the aberrant vessel in our case belongs to group 2. Some studies suggest the presence of aberrant renal vessel at the lower pole in 2 % population⁹. The aberrant renal arteries compressing the ureter have been considered to be etiologic agents in the production of hydronephrosis^{5,9}. An aberrant inferior polar renal artery of aortic origin, arching around the renal vein is described in 7% of cases¹⁰. These arteries were more common on left side. These arteries were reported of causing orthostatic proteinuria and orthostatic hypertension. In our study the lower polar artery was found on left side but no such arching around the renal vein found. In Studies by Bakheit MA¹, Motabagani MA multiple anomalies of the posterior abdominal wall arteries were found in a single male cadaver aged 50-years². These anomalies were accessory renal, a pre-hilar division of the renal, unilateral origin of the inferior phrenic artery from the renal and aberrant suprarenal arteries. No such abnormalities were found in the present study. In the present study the lower polar artery has been seen which has a great clinical significance. It has been seen that failure to restore circulation in such artery after surgery may lead to segmental ischemia and necrosis.

CONCLUSION

The precise knowledge of renal vasculature and the variations in the renal vessels are important for surgeons, a urologist for vascular reconstructions, renal endoscopic surgeries and renal transplant surgeons performing any renal surgeries should have the proper knowledge of renal vasculature and the variations. Thus the present study highlights the presence of the aberrant renal vessel at the lower pole of the kidney and its clinical significance. As the number of renal surgical and radiological interventions increase, a better understanding of the anatomy of renal arteries and their branches gain importance.

Conflicting Interest: Nil

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