A STUDY OF SUPERNUMERARY RENAL ARTERIES IN SOUTH INDIANS
S. Uma Maheswararao¹, M. Narendra Naik², K. Chitti Narasamma³

¹Assistant Professor, Department of Anatomy, Andhra Medical College, Visakhapatnam.
²Assistant Professor, Department of Anatomy, Government Medical College, Ananthapuramu.
³Professor & HOD, Department of Anatomy, Government Medical College, Ananthapuramu.

ABSTRACT

BACKGROUND
Normally each kidney is supplied by one renal artery, which is originating from the abdominal aorta. The present study is aimed at the supernumerary renal arteries and their importance.

MATERIALS & METHODS
20 cadavers which are used for undergraduate dissection constitute the material for study. During routine abdominal dissection of cadavers, kidneys and renal arteries are exposed, morphological variations are noted.

RESULTS
We observed supernumerary renal arteries in 12 out of 20 cadavers. In these, 7 cadavers showed abnormalities on Right side, 5 cadavers showed abnormalities on Left side. In 6 cadavers out of 7, supernumerary arteries were arising from abdominal aorta. In 1 cadaver out of 7, supernumerary arteries were arising from renal artery. In 4 cadavers out of 5, supernumerary arteries were arising from abdominal aorta. In 1 cadaver out of 5, supernumerary arteries were arising from renal artery. These supernumerary renal arteries enter into the kidney through hilum or superior pole or inferior pole.

CONCLUSION
Renal artery variations are very important for surgical procedures over the kidneys like renal transplantation, urological procedures, renal angiographic studies.

KEYWORDS
Kidney, Renal Artery, Supernumerary Renal Artery, Superior Pole, Inferior Pole.

HOW TO CITE THIS ARTICLE:

INTRODUCTION: Normally renal artery arises from abdominal aorta that supplies respective kidney.¹,² Usual variations of renal artery are variation in number and unusual branching pattern.³,⁴,⁵,⁶ Variations in number of renal arteries have been named as supplementary renal arteries. We studied the supernumerary renal arteries according to Merklin classification.⁷ Accessory renal arteries are common (30% of individuals), and usually arise from the aorta above or below the main renal artery and follow it to the renal hilum. They are regarded as persistent embryonic lateral splanchnic arteries. Accessory vessels to the inferior pole cross anterior to the ureter and may, by obstructing the ureter, cause hydronephrosis. Rarely, accessory renal arteries arise from the coeliac or superior mesenteric arteries near the aortic bifurcation or from the common iliac arteries.⁸,⁹

MATERIALS & METHODS: The formalin-fixed twenty cadavers were used as main material for the study.

During routine abdominal dissection which is conducted for undergraduate MBBS students at the Department of Anatomy, the kidneys along with their arteries were observed and the structural and numerical variations of renal arteries were noted. We observe the origin of supernumerary renal arteries according to Merklin and Michel classification,⁷ they are: (1) Supernumerary renal arteries originating from aorta; (2) Supernumerary renal arteries originating from main renal arteries; (3) Supernumerary renal arteries originating from other sources.

RESULTS: The supernumerary renal arteries entered the kidney through hilum as hilar supernumerary renal artery, through superior pole as superior polar supernumerary renal artery and through inferior pole as inferior polar supernumerary renal artery. We observed supernumerary renal arteries in 12 out of 20 cadavers. In these, 7 cadavers showed abnormalities on right side, 5 cadavers showed abnormalities on left side. In 6 cadavers out of 7, supernumerary arteries were arising from abdominal aorta. In 1 cadaver out of 7, supernumerary arteries were arising from renal artery. In 4 cadavers out of 5, supernumerary arteries were arising from abdominal aorta. In 1 cadaver
out of 5, supernumerary arteries were arising from renal artery. These supernumerary renal arteries enter into the kidney through hilum or superior pole or inferior pole. We are unable to find out any supernumerary arteries which take origin from other arterial sources like testicular arteries, ovarian arteries etc.
DISCUSSION: Merklin and Michels classified (23) these supernumerary renal arteries depending upon origin as 1) Supernumerary renal arteries originating from aorta 2) Supernumerary renal arteries originating from the main renal artery 3) Supernumerary renal arteries originating from other arterial sources. Virendra bhudiraja et al(12) reported that in 48.6% cases supernumerary renal arteries originated from aorta and in 13.5% cases originated from renal arteries on right side & in 45.9% cases supernumerary renal arteries originated from aorta and in 10.8% cases originated from renal arteries on left side. In present study, 50% cases showed supernumerary renal arteries arising from aorta, 10% cases showed origin of supernumerary arteries from main renal artery. In this 50% cases, 30% cases showed supernumerary renal arteries on right side and 20% cases showed supernumerary renal arteries on left side. In the 10% cases of origin of supernumerary renal arteries from main renal artery, 5% cases showed on right side and 5% cases showed on left side.

Clinical Importance: Usually Superior polar and inferior polar supernumerary renal arteries originating from renal arteries are directed towards superior and inferior poles of kidney. These supernumerary renal arteries are having a vertical relation in comparison to supernumerary renal arteries taking origin from aorta. Vertical relation of these supernumerary renal arteries can lead to infarction of renal poles. These supernumerary renal arteries can also be injured during and surgical procedures of kidneys. Ureteropelvic junction obstruction is a common complication with inferior polar supernumerary renal arteries. The anatomical information about the relations and number of supernumerary renal arteries is very useful before any type of renal surgeries like kidney transplantation procedures, renal vascular surgeries for urologists and gynaecologists. Usually acute tubular necrosis, acute & chronic graft rejection develop as a complication while using the kidneys with supernumerary renal arteries as a transplant.

CONCLUSION: We thought that knowledge of variations of supernumerary renal arteries is necessary for surgical management during kidney transplantation surgeries, repair of abdominal aortic aneurysm, and urological procedures and for angiographic procedures. This study is useful for General Surgeons who are performing kidney surgeries.

REFERENCES


