ABSTRACT

The kidneys are paired reddish brown structure present on posterior abdominal wall on either side of vertebral column. The renal artery arises laterally from abdominal aorta just below the origin of superior mesenteric artery at the level of second lumbar vertebra. The right renal artery is little longer and left renal artery is slightly higher in its origin. The right renal vein is shorter than left renal vein and finally drained into the inferior vena cava at L1-L2 vertebra. It ran towards the hilum of left kidney. Here it passed through the renal hilum. The renal hilum is formed due to fusion of two layers of perirenal fat around kidney, renal capsule and renal sinus. The right renal artery and vein lies below to it and get sandwiched between the two leaves of renal capsule. The renal pelvis is formed due to fusion of calyces. The renal pelvis continues as a ureter. The renal artery gives rise to the renal branches to the kidney. The renal veins are present anterior to renal arteries and drain into inferior vena cava. The right renal vein is slightly shorter than left renal vein described by Bolla SR. The renal arteries are important prior to surgical interventions and procedures in the abdomen as they act as road map.

In 70% individuals each kidney is supplied by a single renal artery and in 30% of individuals accessory renal arteries are present. However the classical description of the renal vasculature, formed only by one artery and one vein, occurs in less than 25% of cases. Variations in pattern of renal arteries have been reported more frequently than any other large vessels in the body. Feller I et al. described that knowledge of these variations has great importance when a surgical approach is made to abdominal aorta which has basic anatomical relationship with the neighbouring structures.

Materials And Method
The material taken for the present study was formalin fixed fifteen cadavers of both the sexes. The material collected from routine abdominal dissection of embalmed cadavers done for medical undergraduate students over a period of five years in the Department of Anatomy, B.P.S Medical College for women, Khanpur Kalan, Sonipat. During the dissection kidneys along with their vessels were dissected carefully and the morphological variations of vessels were noted.

RESULTS

In 1st case on left side inferior phrenic artery take origin from left renal artery. Knowing the anatomy, variations and pattern of the renal vessels are important prior to surgical interventions and procedures in the abdomen as they act as road map.

Keywords

Kidneys, Renal Artery, Renal vein, Vessels.
Phrenic artery arises from the renal artery. Pia O, Pulakunta, Loukas, mentioned same observation that inferior renal artery. This variation was similar with previous studies done by In 3 specimen on right side the inferior phrenic artery arises from a renal vein. A left renal vein, a circumaortic venous ring and a retroaortic bifid left inferior vena cava. Senecail and Nonent reported two rare anomalies of described double renal veins but they drained separately into the inferior vena cava. Mandal et al., Dhar and Persaud arteries are due to different positions of kidney during development.

The variations of renal vessels in origins, course, branches have been studied in detail in present study. It was found that in one specimen the right renal artery is double and both were arising from abdominal aorta. Level of origins of both the arteries were different. Superior one was arising approximate 0.5cm below the superior mesenteric artery at the level of L1-L2 vertebra and inferior artery approximate 1.5cm below the superior mesenteric artery at the level of L2 vertebra. The distance between the origins from the aorta of double renal arteries was approximate 1cm. This is comparable with the study conducted by Satyapal et al. that the distance between the double renal arteries was highly variable with an average ranging between 1-2mmto 4-6cm. Bordeti et al observed double renal arteries and triple renal arteries in their study. Neellesh Kanaskar et al reported double renal arteries. Janschek EC et al. in reported incidence of multiple arteries 20.2% and 19% on right and left sides, respectively. There was discrepancy regarding the side in which additional arteries were present, Vilhova I et al. reported a higher frequency on the left side, while Khamanarang et al. and Nayak S reported this variation to be more frequent on the right side. In same specimen the origin of left renal artery is normal between L1 and L2. These variations in renal arteries are due to different positions of kidney during development.

In 2nd specimen double renal veins were present. Both were emerging from hilum at different level but they drain commonly into the inferior vena cava as accessory renal vein unite with the main renal vein before draining into inferior vena cava. Mandal et al., Dhar and Persaud described double renal veins but they drained separately into the inferior vena cava. Senecail and Nonent reported two rare anomalies of left renal vein, a circumaortic venous ring and a retroaortic bifid left renal vein.

In 3rd specimen on right side the inferior phrenic artery arises from a renal artery. This variation was similar with previous studies done by Pia O, Pulakunta, Loukas, mentioned same observation that inferior phrenic artery arises from the renal artery.

Variations of renal vessels are very important for surgeons due to increased in frequency of renal diseases and renal transplantation as it enhance the quality of patient life. Verma P et al.mentioned that variations in anatomy of left renal artery is most critical as it is referred site for resecting donor kidney.

CONCLUSION
Knowing the anatomy, variations and pattern of the renal vessels are important prior to surgical interventions and procedures in the abdomen as they act as road map. A failure in identifying these variations can cause serious complications like haemorrhage, necrosis of kidney etc. Presence of multiple vessel is impotant cause of patient unfit for many surgical procedures.
Figure 3: Showing variation of origin of Inferior Phrenic artery from the right renal artery. (D- Diaphragm, RSRG- right suprarenal gland, ISRA- Inferior suprarenal artery, SPA- Superior polar artery, HA- Hilal artery, RK- Right kidney, RRA- Right renal artery, AA- Abdominal aorta, SMA- Superior mesenteric artery, CT- Coeliac trunk, IPA- Inferior phrenic artery.)

REFERENCES: