Original Research Paper

Volume - 10 | Issue - 11 | November - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Ayurveda

ACCESORY RENAL ARTERY ON LEFT SIDE – A CASE REPORT

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ABSTRACT In the abdomen it is not uncommon to find anatomical variations in the origin of vessels. During dissection of the abdomen, it was noticed that the kidney on the left side had an accessory renal artery and an accessory renal vein. Vascularization of Kidney is one of the interesting field for both anatomists and surgeons. Now a days kidney transplantation is very common surgery with the advent of laparoscopic renal surgeries, and donor nephrectomies.

KEYWORDS : renal artery, left side , kidney, vascularization.

INTRODUCTION

Vascularization of Kidney is one of the interesting field for both anatomists and surgeons. Now a days kidney transplantation is very common surgery with the advent of laparoscopic renal surgeries, and donor nephrectomies, it becomes necessary for surgeons to understand the variations that exist in the renal vasculature otherwise renal laparoscopic and nephrectomies could be jeopardized [1]. The renal arteries are paired branches of the abdominal aorta giving out at the level of L1,L2. The paired renal arteries take 20% of cardiac output to supply organs that represent less than one-hundredth of total body weight. They supply the kidneys through a number of subdivisions described sequentially as segmental, lobar, interlobar, and arcuate arteries. These are end arteries with no anastomoses. The arcuate arteries further divide into interlobular arteries which give rise to the afferent arteries to the glomeruli. The renal arteries branch laterally from the aorta just below the origin of the superior mesenteric artery. Both cross the corresponding crus of the diaphragm at right angles to the aorta. The right renal artery is longer and often higher, passing posterior to the inferior vena cava, right renal vein, head of the pancreas and descending part of the duodenum. The left renal artery is a little lower and passes behind the left renal vein, the body of the pancreas and splenic vein. It may be crossed anteriorly by the inferior mesenteric vein. A single renal artery to each kidney is present in 70% of individuals. The arteries vary in their level of origin and in their calibre, obliquity and precise relations. In its extrarenal course each renal artery gives off one or more inferior suprarenal arteries, a branch to the ureter and branches which supply perinephric tissue, the renal capsule and the pelvis. Near the renal hilum, each artery divides into an anterior and a posterior division, and these divide into segmental arteries supplying the renal vascular segments. 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. Existence of aberrant arteries is accountable in cases of renal pathologies, radiological interventions, renal transplants and other surgical approach on them. Altered state of hemodynamics was thought of in cases of multiple arteries supplying the renal [2]. In this present study we reported the accessory left renal artery giving out by the aorta at the level of L2 vertebra and its associated clinical significance.

OBSERVATIONS

During routine dissection of abdomen of 58 years old embalmed male cadaver in the Department of Sharir Rachana, Jammu institute of ayurveda and research, Nardani, Jammu it has been observed that accessory renal artery on the left side. Kidney received two renal arteries on left side. Both renal arteries originated from abdominal aorta. Main left renal artery originated 2 cm below the superior mesenteric artery and entered the the hilum of the kidney. Accessory renal artery originated 2.5cm below the superior mesenteric artery and entered the hilum of the kidney. (Fig 1). The main left renal artery arose from lateral aspect of the abdominal aorta and reached the hilum of the kidney by passing behind the inferior vena cava. The accessory inferior renal artery originated from anterior aspect of the abdominal aorta 2.5 cm below the superior mesenteric artery. The inferior renal artery reached the hilum of the kidney by passing anterior to the inferior vena cava.

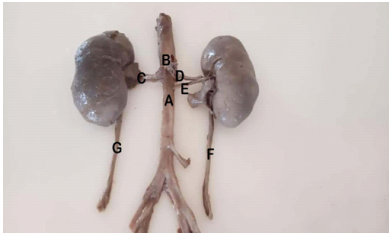

Fig. 1: Showing Accessory Renal Artery

A- Abdominal Artery, B- Superior Mesenteric Artery, C- Right Renal Artery, D-Left Renal artery, E- Accessory Renal Artery, F- Left Ureter, G- Right Ureter

DISCUSSIONS

Knowledge of the existence of the aberrant renal arteries is important because they may be inadvertently damaged during renal surgery and their presence must be considered in evaluating a donor kidney for possible renal transplantation.

Brodei et al in their study on renal vascularization found 54 cases of accessory renal artery that was taking origin from aorta. They also noted that some cases of accessory renal artery were associated with other urovascular variations such as presence of accessory renal vein in four cases on the same side and persistence of the fetal renal[3] Persistence of certain of the cephalic mesonephrose vessels, however may result in the arterial abnormalities [4]. These mesonephric arteries extend from C6 – L3 during development. Most cranial vessels disappear while the caudal arteries persist to form a network, the rete arteriosum urogenitale that supply the future metanephros. The metanephros in future develop into the adult kidney deriving its blood supply from the from the lowest suprarenal artery which gives out a permanent renal artery. Persistent roots of the network form these segmental arteries of the adult kidneys having variations at their point of origin. The kidney grafts with multiple arteries resulted in post transplant morbidity and graft loss following the ligation of the polar arteries. The transplantation of the kidneys with the single renal artery is technically easier compared to the kidneys with multiple arteries [5]. Aberrant or accessory renal arteries have been of interest to the clinicians for some years mainly because of the possible part the vessel play in the causation of hydronephrosis. However judging by the many description of these vessels in the literature, it is evident that there is no established criterion for aberrance: the term have been applied equally to an additional artery.in the renal pedicle, or to a vessel entering the kidney at either pole weather derived from the main artery or from the aorta or a branch of the aorta [6]. Literatures have shown that aberrant renal arteries are common in fused kidneys but this was not the case here. Aberrant arteries perforate the substance of the kidney rather than entering its Hilum as observed here, the accessory renal artery pierced the inferior pole of the kidney. These arteries could arise as high as the inferior phrenic arteries or as low as the internal iliac arteries. The unusual vessel may originate from the aorta, as well as gonadal,

common iliac, median sacral artery, external and internal iliac arteries, superior or inferior mesenteric arteries [7]. The presence of additional renal artery is very probable when the main renal artery has a diameter of less than 4.15mm. Here we measure the diameter of the main right renal artery and it was found to be 3.87mm. Kidney presenting a main renal artery diameter to be 5.5mm very probably do not present with additional renal arteries. So the renal artery diameter is a factor which should be considered as predicting the presence of additional renal arteries [8]

CONCLUSION

Considering the increase in incidences of the accessory renal arteries and their clinical implications in renal laparoscopic surgery, hypertension, renal transplantations and hydronephrosis, it becomes necessary to report such observation any where it is found so that surgeon will become more aware of this occurrence. Otherwise, renal transplant and renal laparoscopy may be jeopardized. This is also important for academic and radiological procedures.

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