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ACCESSORY RENAL ARTERY: A CASE REPORT

* Archana U Shekokar, ** Vandana A Tendolkarndolkar

* M.S. (Anatomy), Professor,

* M. Sc. Anatomy (Medical Faculty), SKNMC & GH, Narhe (Ambegaon), Pune, Maharashtra, India.

ABSTRACT

Accessory renal arteries are a frequently found variation. Familiarity about the possible variations in the renal arterial pattern is important for clinicians dealing with surgical and radiological procedures, including kidney retrieval and transplantation. The aim of the present case report is to increase awareness of the presence of such anatomical arrangements. The variation was found during routine dissection in an approximately 60 years old male cadaver, apparently healthy with no other anomaly. There was a unilateral, left-sided accessory renal artery to the lower pole of the kidney, which crossed the anterior aspect of the ureter. When accessory renal arteries occur, each supplies a distinct renal segment, with no collateral perfusion. Thus it is an end-artery. The key issue then is to determine the technical implications of surgical procedures on the kidney as well as post-operative management of the case.

Keywords :

INTRODUCTION

The renal arteries are two large lateral branches of the abdominal aorta, arising below the inferior mesenteric artery. Each crosses the corresponding crus of the diaphragm at right angles. As it approaches the renal hilum, each divides into an anterior and a posterior division. The segmental branches that arise from these divisions supply renal vascular segments.

Among the large vessels, the renal arteries have most frequently been reported to present variations in their pattern. According to Graves¹, any artery arising from the aorta in addition to the main renal artery should be called 'accessory', while renal arteries arising from sources other than the aorta should be called 'aberrant'.

Accessory renal arteries are seen in 30% of individuals². These arteries arise from the aorta above or below the main renal artery, and follow it to the renal hilum, though an accessory renal artery may pass to the upper or lower pole of the kidney. An accessory renal artery to the lower pole invariably crosses the anterior aspect of the ureter, a feature significant in the occurrence of hydronephrosis. These accessory renal arteries are regarded as persistent embryonic lateral splanchnic arteries.

CASE REPORT

During routine cadaveric dissection of a male cadaver, age 60 years, a unilateral, left-sided accessory renal artery to the lower pole of the kidney was found. The accessory renal artery crossed the anterior aspect of the ureter. No other variation was found in the cadaver.



DISCUSSION

The definitive kidney begins its development from metanephros early in the fifth week of embryonic life. Initially the metanephric buds lie in the pelvis, ventral to the sacrum and close to the midline. As the abdominal and pelvic cavities expand following growth of their walls, the kidneys gradually move apart from one another and move upwards along the posterior abdominal wall. This 'movement' results mainly from growth of the lower part of the embryonic body, rather than an actual ascent.

As the kidneys 'ascend' from the pelvis to their definitive position in relation to the supra-renal glands, they receive their blood supply from sources close to them. Thus, the renal arteries, initially branches of the common iliacs, subsequently become branches of the aorta, arising at increasingly higher levels. Finally, the definitive renal arteries arise from the aorta as lateral branches just below the inferior mesenteric artery. Most of the abnormalities in the renal arteries are due to the various developmental positions of the kidney³.

In about 75% of people there is a single renal artery to each kidney. In about 25% of people each kidney has two to four renal arteries³. These accessory or supernumerary renal arteries usually arise from the aorta above or below the main renal artery, and follow it to the renal hilum. However, the accessory renal arteries may enter the kidney directly, through the superior or inferior poles. An accessory renal artery to inferior pole lies anterior to the ureter. In this position the accessory renal artery may obstruct the flow of urine through the ureter, leading to hydronephrosis- distension of the renal pelvis and renal calyces with urine³.

CLINICAL SIGNIFICANCE

Significance of familiarity about the possibility of accessory renal arteries lies in clinical practice. A thorough knowledge of the renal vascular pattern would be necessary for assessing the feasibility of surgical intervention and post-operative management. Before considering ligation of the renal arteries, it is important that the surgeon realizes that the renal arteries are end-arteries; otherwise the part of renal tissue supplied by the

accessory renal artery is likely to become ischaemic. Knowledge of possibility of accessory renal arteries is also of great relevance to kidney retrieval and transplantation, as well as to various endoscopic procedures⁴.

It is thus of great importance that the clinician is aware of the presence of such anatomical arrangements, failing which, complications may arise.

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