Annals of Clinical Anatomy

Case Report
Published: 25 Mar, 2019

Bilateral Accessory Renal Arteries in a Male Cadaver of Asian Origin - A Case Report

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Abstract

The knowledge of the variations of the renal artery is important with the increasing numbers of renal transplants, vascular reconstructions and endoscopic surgeries of kidneys. In the routine educational dissection in the department of anatomy, Siddhartha Medical College, Vijayawada in the academic years (2018-2019), in a male cadaver, the accessory renal arteries were arising bilaterally below the renal arteries and supplying the lower poles of both kidneys. Knowledge of the variations of the renal arteries is important for urologists, radiologists and surgeons in general.

Keywords: Renal arteries; Renal transplants; Endoscopic surgeries

Introduction

Renal arteries are a pair of lateral branches from abdominal aorta. Normally each kidney receives one renal artery. However, accessory renal arteries can also exist. The normal renal arteries enter the kidney through its hilum where as the accessory renal arteries might enter through the hilum or through the surfaces of the kidney.

Case Presentation

In the routine educational dissection for the undergraduate students in the department of anatomy, Siddhartha medical college, Vijayawada in the academic years (2018-2019), in a male cadaver, the accessory renal arteries were arising at about 8 cm below the origin of normal renal arteries from the abdominal aorta on both sides and entering the lower poles of both kidneys. Both accessory renal arteries passed posterior to the ureters of both sides and also the right accessory renal artery passed anterior to the inferior vena cava (Figure 1).

Discussion

According to standard textbooks, kidney receives a single renal artery in about 70% and 75% of cases, respectively [1,2]. Accessory renal arteries are common in 20% to 30% of individuals, usually arising from the aorta above or below the main renal artery. In a study of 530 adult cadavers, two renal arteries were present in 18.86% of specimens on the left side and in 22.64% of specimens on the right side [3]. Most of the accessory renal arteries were placed superiorly in their study. Saldarriaga et al. [4] reported 97 kidneys having accessory arteries out of 390 cases (24.9%). The frequency of accessory renal artery was 43.5% on the right side and 56.3% on the left side in their study [4]. In a study of angiographic evaluation of 855 patients, the origin of main renal arteries and accessory renal arteries off the aorta was between the upper margin of L1 and lower margin of L2 vertebra in 98% and 74% of the patients respectively [5]. Bilateral duplication of renal vessels was reported by Bordei et al. [6] and by Mir et al. [7] Abolhassan B et al. [8], reported the presence of accessory renal artery bilaterally on digital subtraction angiography performed on a renal transplant donor. The variation in the number of renal arteries is due to persistence of lateral splanchnic arteries [1] or due to the persistence of blood supply from lower level than normal as development of the kidneys start in the pelvic region [9]. Lower pole arteries on either side can cross anterior to the collecting system, causing obstruction at the ureteropelvic junction [10]. On the right side, the lower pole arteries usually also cross anterior to the inferior vena cava [1]. Multiple renal arteries occurred bilaterally in 10.2% of donors in renal transplantations and unilaterally in 20.8%, a total incidence of 31% [11]. There was a higher incidence of vascular-related complications following transplantation of kidneys with multiple renal arteries. The inferior polar arteries have been implicated as an etiological factor in a form of hydronephrosis correctable by surgery [12].

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Received Date: *25 Feb 2019*
Accepted Date: *21 Mar 2019*
Published Date: *25 Mar 2019*

Citation:
Shakthi Kumaran R, Chitra R. Bilateral Accessory Renal Arteries in a Male Cadaver of Asian Origin - A Case Report. Ann Clin Anat. 2019; 1(1): 1005.

Figure 1: Bilateral lower polar accessory renal arteries passing posterior to the ureters of both sides.

Conclusion

Computerized tomographic angiography performed with volume rendering is extremely accurate in the preoperative evaluation of renal vascular anatomy for surgeons. Accessory renal arteries stenosis, detected by using the same procedure is an important pathological sign that radiologist has to evaluate and assess because of its association with hypertension.

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