Bilateral Multiple Renal Arteries

V Balachandran*

Abstract
Variations in the renal vessels and supernumerary renal arteries have been observed frequently, either in routine dissections or in clinical practice which warrants considerations in a variety of urologic, renal transplantation, laparoscopic surgeries and retroperitoneal operations. The variations of renal arteries are considered critical issues that surgeons should have thorough envision and appreciation of the condition. Renal artery variations including their number source and course are very common.1-3 But more than 6 renal arteries on either side is rare and we present a case of multiple renal arteries in an asymptomatic young hypertensive and to our knowledge it is the first of its kind reported in literature.

Case Report
A 32-year old male patient was seen as outpatient for headache with a BP of 220/126 mmHg. Physical examination was unremarkable. All basic investigations, RFT, VMA, Prothrombotic markers, Serum K, ECG, X-ray chest, USG abdomen were normal. There was no renal artery bruit. Contrast CT abdomen was performed concentrating on the kidneys which showed multiple supernumerary renal arteries, 6 in numbers on either side arising from abdominal aorta and its branches like inferior mesenteric, external and common iliac arteries entering kidneys at hilum as well as at the poles (Figures 1 and 2).

Discussion
Supernumerary renal arteries vary in number from two to four, although there may be, rarely, five or six, arranged either unilaterally or bilaterally. A single renal artery on one side and multiple (two, three, or four) renal arteries on the other is not unusual.5 Within an 8 year study of the renal blood supply, the Bordei and Antohe assessed 14 cases of triple renal arteries, 2 of them bilaterally (both on human foetuses), a total of 16 triple renal arteries.6 Merklin et al, who reviewed 11,000 necropsy studies, reported that triple renal arteries were found to be in 70 (0.6 %) cases.7

There may be several renal arteries on each side, or the renal artery may divide close to its origin into several branches. The renal artery may arise from the bifurcation of the aorta or
from the common iliac, internal iliac, or inferior mesenteric artery. Branches of the renal artery may perforate the substance of the kidneys instead of entering from the hilus (so called accessory branches). Accessory renal arteries varying in size and are generally derived from the aorta are common and may enter kidneys at various levels. Accessory renal arteries were more prone to develop stenosing lesions and more importantly, he also speculated that they are longer and their caliber is smaller than the main arterial trunk, thus raising resistance and potentially predisposing to under perfusion according to the law of Hagen-Poiseuille. Accessory renal arteries were more prone to develop stenosing lesions and more importantly, he also speculated that they are longer and their caliber is smaller than the main arterial trunk, thus raising resistance and potentially predisposing to under perfusion according to the law of Hagen-Poiseuille.

Almost all of the studies of this kind of renal artery variations were made and evaluated by the anatomists. Knowledge of the renal arterial supply is necessary since it may influence urological and renal transplantation surgeries, vascular reconstruction, endovascular repair of abdominal aortic aneurysm and renal artery stenosis, endoscopic surgery, uro-radiological procedures and our understandings of the pathogenesis of renovascular hypertension. Renal arteries are terminal vessels, which necessitate the removal of that segment of the kidney supplied by accessory arteries with its ligation. Accessory renal arteries tend to be longer and narrower than the main renal arteries, resulting in lower perfusion pressure and higher resistance across the artery. Accessory renal arteries most often pass anterior to the ureter. The retroureteral variant is likely to be associated with ureteropelvic junction obstruction and hydronephrosis. It should alert physician’s causal role of accessory renal arteries in patients with severe and difficult to manage hypertension. The investigation of the anatomy of the renal arteries and the possible variations by imaging techniques such as conventional or CT angiography is an important part of preoperative evaluation of patients undergoing donor nephrectomy and renal transplant.

References