ORIGINAL RESEARCH PAPER

Volume-8 | Issue-3 | March-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF RENAL AND ACCESSORY RENAL ARTERIES-ANATOMICAL STUDY

Anatomy

Dr. K. Egeswari Assistant Professor, Institute of Anatomy, Madurai Medical College, Madurai

Dr. H. Raja Kohila* Assistant Professor, Institute of Anatomy, Madurai Medical College, Madurai
*Corresponding Author

ABSTRACT

In recent years, more conservative methods of surgery of the renal artery are coming up. Hence, a precise knowledge of renal vasculature has become a necessity. Knowledge of the existence of accessory renal arteries is important; otherwise, they may get inadvertently damaged during renal surgery. Furthermore, their presence must be considered while evaluating a donor's kidney for possible renal transplantation. The study may also be useful to clinicians performing invasive techniques, vascular surgeries, other uro-radiological procedures, and in cases of trauma. Keeping this in mind, this study was conducted on 100 adult cadavers. A total of 200 kidneys obtained from these cadavers were dissected and accessory renal arteries were looked for; 26 % of the specimens showed the presence of accessory renal arteries. In 20% one accessory renal artery was found, and in 3.5 % of specimens, two accessory renal arteries were seen.

KEYWORDS

Renal anatomy, kidney, renal artery ,vascularity .

1.INTRODUCTION

The advent of more conservative methods in renal surgery has necessitated a more precise knowledge of renal vasculature. Anson and Kurth1 in 1955 have quoted "experience shows that super-numerary arteries and veins repre- sent the rule in renal vasculature, not the exception." Being "end arteries," ligation or accidental injury to renal artery may lead to renal infarcts. This observation is important during renal transplants for a complete and accurate anastomosis with all the arteries of the donor kidney. Kem2 et al in 2005 have reportedtwo relatively young patients with significant hypertension, both having an accessory renal artery. The presence of variant renal arteries may also be associated with other underlying renal pathological conditions such as hydro- nephrosis.

2.METHODS &METHODOLOGY :

The study was based on dissection of 100 adult cadaveric kidneys Ethical Committee approval was obtained. Comprehensive dissection was carried out, and observations on the origin and course of the renal artery were made. The presence of accessory renal arteries and their relation to the main renal artery was noted. The specimens were colored by stan- dard color code after applying gelatin suspen- sion, and color photographs were obtained.

3.RESULTS

FIGURE 1: RENALARTERY

FIGURE 2: RENALARTERY

4.DISCUSSION

The incidence of a number of renal arteries was compared with previous studies According to Standring3 and Moore and Persaud,4 kidney receives a single renal artery in about 70% and 75% of cases, respectively. In the present study, single renal artery was observed in 74.99% of cases The incidence of accessory renal artery according to Standring3 is about 30%. In the present study, the incidence of accessory renal artery was 26 % Decker and Du Plessis5 have quoted that there is an accessory renal artery in 15% and 20% of cases on the right and left side, respectively. When all accessory renal arteries were taken into consideration in the present study, higher figures were noted on the right side than on the left side . Unilateral double renal vessels were reportedby Mohammed6 in 2012. Bilateral duplication of renal vessels was reported by Bordei et al7 in 2004 and by Mir et al8 in 2008. The same was also observed in the present study Bilateral triple renal arteries were observed by Pestemalci et al9 in 2009. Anson et al10 and Reis and Esenther11 have noted four arteries on the right as well as the left side. A maximum number of arteries were observed by Carson.12 He has reported five arteries on the left side. In the present study, maximum of three renal arteries was found The anatomic relation of these accessory renal arteries to the main renal artery was looked for. Sykes14 has noted that inferior accessory renal arteries are more common. However, Olsson16 has stated that superior accessory renal arteries are common. The present study showed a higher percentage of superior accessory renal arteries The diversity of vascular pattern can be explained on the basis of its development. The kidney that initially develops in the sacral region gradually ascends up. As it starts ascending, newer renal arteries start developing from the aorta. With the appearance of newer arteries, the caudal branches normally involute and disappear. A less complete reduction results in extra-renal branching or in multiple arteries arising independently from theaorta. Due to this unique character of the kidney, this unusual pattern of vascular distri- bution is observed. The study conclusively proved the complex nature of renal vascular distribution in the population of Western India. This emphasizes the necessity of the knowledge of renal vasculature to a surgeon operating on the kidney. With the advent of laparoscopic renal surgeries and donor nephrectomies, it becomes mandatory for the surgeon to understand the abnor- mality or variations in the renal vasculature. If this is not identified, it may jeopardize the renal transplantation. The detailed information of the vasculature will reduce the chance of hemorrhage due to accidental trauma to acces- sory renal artery. This can avoid unwanted postoperative morbidity and mortality.

5.REFERENCES:

1. Anson BJ, Kurth LE. Common variations in the renal blood supply. Surg Gynecol Obstet 1955;100:157-62.
2. Kem DC, Lyons DF, Wenzl J, Halverstadt D, Yu X. Renin-dependent hypertension caused by nonfocal stenotic aberrant renal arteries: Proof of a new syndrome. Hypertension 2005; 46:380-5.
3. Standring S. Gray's Anatomy. The Anatomical Basis of Clinical Practice. 40th ed. Edinburg: Churchill & Livingstone; 2008. p. 1231, 1233.
4. Moore KL, Persaud TV. The Developing Human – Clinically Oriented Embryology. 6th ed. Philadelphia: W.B. Saunders Co.; 1999. p. 311.

5. Decker GA, Du Plessis DJ. Lee Mc'Gregor's synopsis of surgical anatomy. Indian Edition. 12th ed. Bombay: K.M. Varghese Co.; 1986. p. 289-300.
6. Mohammed AM, Abdalrasol RG, Abdalhai KA, Hamad MG. Accessory renal vessels. Acta Inform Med 2012;20:196-7.
7. Bordei P, Sapte E, Iliescu D. Double renal arteries originating from the aorta. Surg Radiol Anat 2004;26:474-9.
8. Mir NS, Ul Hassan A, Rangrez R, et al. Bilateral duplication of renal vessels: Anatomical, medical and surgical perspective. Int J Health Sci (Qassim) 2008;2:179-85.
9. Pestemalci T, Mavi A, Yildiz YZ, Yildirim M, Gumusburun E. Bilateral triple renal arteries. Saudi J Kidney Dis Transpl 2009;20:468-70.
10. Anson BJ, Richardson GA, Minear WL. Variations in the number and arrangement of renal vessels- a study of blood supply of four hundred kidneys. J Urol 1936;36:211.
11. Reis RH, Esenther G. Variations in the pattern of renal vessels and their relation to the type of posterior vena cava in man. Am J Anat 1959; 104:295-318.
12. Carson WJ. Anomalous renal vessels and their surgical significance. West J Surg Gynecol Obstet 1932;40:597.
13. Adachi B. Das Arteriensystem der Japaner II. Kyoto, Tokyo: Maruzen Publishing Co.; 1928. p. 73-8. 14. Sykes D. The arterial supply of the human kidney with special reference to accessory renal arteries. Br J Surg 1963;50:368-74.
15. Geyer JR, Poutasse EF, Cleveland MD. Incidence of multiple renal arteries on aortography. J Am Med Assoc 1962;182:120-5.
16. Olsson CA. Campbell's Urology. 5thed., Vol. I. Philadelphia: W.B. Saunders Co.; 1986. p. 311.