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Original Research Article

Comparative study in Hydronephrosis among population of Gujarat with clinical importance

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Abstract

Background & Methods: The aim of the study is to study cadaveric sturdy on hydronephrosis of kidneys and its clinical importance. Hydronephrosis is dilatation of renal pelvis and calyces resulting from intermittent and incomplete obstruction to the urine outflow with incidence of 1:100. Abdomen was opened in layers as per the dissection manual to expose the fascia and muscles like External obique, Internal Oblique, Transversus abdominis and peritoneum. Made a vertical incision over the parietal peritoneum, Identified and lifted up the greater omentum. Identified the arterial arcade in the greater omentum. Anterior layers of the greater omentum was cut 2-3cm inferior to the arteries to open the lower part of the omental bursa.

Results: Mean length and Standard deviation are compared On both sides .P value is 0.009 which is > 0.005 . Significant side difference is noted in length of renal arteries on comparing both sides. Mean length and Standard deviation are compared On both sides .P value is 0.009 which is > 0.005 . Significant side difference is noted in length of renal arteries on comparing both sides.

Conclusion: Data indicated that through diagnosis management should be considered while encountering an adult with moderate severe hydronephrosis. Nevertheless, an adult with mixed hydronephrosis should not be considered clinically insignificant but can be categorized as a carrying a low risk of Uropathy.

Keywords: cadaveric, sturdy, hydronephrosis & kidneys.

Study Design: Comparative Study.

1. Introduction

Hydronephrosis has now become a frequent diagnosis with the increasing use of ultrasonography. The estimated incidence of hydronephrosis is 1-5% and this “is one of the most common detected ultrasound” anomalies[1-4].

Though majority of the cases of detected hydronephrosis resolves spontaneously, some may be a marker of serious underlying urinary tract abnormalities such as pelviureteric junction obstruction (PUJO), vesicoureteralreflux(VUR), urethral obstruction, megaureters, posterior urethral valve etc. Hence strict postnatal followup becomes a necessity to prevent the subsequent morbidity and mortality due to chronic kidney diseases.

Variations in the configuration of the renal arterial supply are common and so a description of the “normal pattern” is somewhat arbitrary. These variations are of considerable practical importance. The advent of more conservative methods of renal surgery has necessitated the

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precise knowledge of renal vascularisation, which has consequently assumed a new vista in the transplant surgery[2].
The kidneys are pair of essential excretory organs which elaborate urine and eliminate nitrogenous waste products of protein metabolism from the blood and maintain electrolyte and water balance of the body[2]. They also have endocrine functions like production of renin, erythropoietin and 1,25-hydroxycholecalciferol.
Each kidney is situated retroperitoneally in the posterior abdominal wall by the side of the vertebral column, extends from T12 to L3 vertebra. Right kidney is slightly lower than the left kidney due to the presence of liver[3]. Externally the kidneys are bean shaped with hilum directed medially and reddish brown in colour. Each kidney presents two poles-upper and lower, two surfaces-anterior and posterior and two borders- concave medial and convex lateral.

Medial border presents with hilum, the structures passing through renal hilum antero posteriorly are renal vein,renal artery and renal pelvis[4]. The paired renal arteries take 20% of cadiac output to supply organs that represent less than one hundredth of the total body weight. The renal arteries branch laterally from the aorta just below the origin of the superior mesenteric artery between L1-L2. 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 venacava, 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[5&6].

2. Material and Methods

The present study was carried out in 150 specimens obtained from formalin preserved human cadavers of Institute of Anatomy, Parul Institute of Medical Sciences and Research, Waghodia, Vadodara. Abdomen was opened in layers as per the dissection manual to expose the fascia and muscles like External obique, Internal Oblique, Transversus abdominis and peritoneum. Made a vertical incision over the parietal peritoneum, Identified and lifted up the greater omentum. Identified the arterial arcade in the greater omentum. Anterior layers of the greater omentum was cut 2-3cm inferior to the arteries to open the lower part of the omental bursa. Anterior layer of the peritoneum from the lesser omentum was removed close to the lesser curvature of the stomach. Stomach, Small intestine and colon were removed to expose the pancreas. The tail and body of the pancreas were turned to the right. Pulled the Liver downwards and the anterior layers of the coronary and left triangular ligament were divided.

INCLUSION CRITERIA

The cadavers belonging to different age groups and both the sexes available were included in the study. Embryologically defective kidneys were included in the study.

EXCLUSION CRITERIA

The specimens which were damaged during dissection or the specimens which have suffered from any Surgeries or any mass lesions were excluded from the study.

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3. Result

TABLE 1: Total No. of Cadaveric Kidney

Source	**No.**
Right Kidney	**79**
Left Kidney	**71**
Total	**150**

The comparative study was also carried out by obtaining genal agiograms of patients from Muljibhai Patel kidney hospital, Nadiad.

TABLE 2: Presence of hydronephrosis

Right	**07**
Left	**04**

Total no. of kidney 11 out of 150

TABLE 3: Larger than usual

Right	**15**
Left	**13**

Total no. of kidney 28 out of 150

Table 4: Polycystic Kidney

Right	**07**
Left	**04**

Polycystic Kidney 11 out of 150

4. Discussion

Henry Hollinshead (1956)[7] by diessecting 400 renal pedicles in 200 cadavers studied about the mechanism of obstruction of ureters and consequent hydronephrosis by aberrant renal vessels.He repoted that the aberrant lower polar artery arising from the aorta arched over the renal vein and ureter (3.5%) causing orthostatic hypertension and consequent hydronephrosis.
Boijsen (1959)[8] confirmed that the majority of supplementary renal vessels go to the lower pole or enter the lower part of the hilum. Anson et al (1961) studied 235 kidneys by dissection method and reported that the accessory renal arteries arising from the inferiorphrenic and suprarenal arteries enter the upper pole of the kidney. Those arising from the gonadal arteries enter the lower pole of the kidney.
James Ross and Erric Samuel (1961)[9] by gross dissection and aortogram gave an account on the number and length of both renal artery and vein and assessed their suitability for renal transplantation.
David skyes (1963)[10] by studying corrosion casts and angiograms of 208 human kidneys discussed the role of aberrant renal arteries in causing hydronephrosis and the dangers of ligating such a vessel during surgery.

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Renal arteries arise as lateral branches of aorta at L1 – L2 interval. Aberrant or accessory arteries have been of interest to the clinicians for some years, mainly because of the possible part the vessel may play in the causation of hydronephrosis. However, judging by the many descriptions of these vessels in the literature, it is evident that there is no established criterion for aberrance; the term has been applied equally to an additional artery in the renal pedicle, or to a vessel entering the kidney at either pole, whether derived from the main renal artery, from the aorta or from a branch[11].

SMA, aortic bifurcation or common iliac arteries. Level of origin of renal artery may vary-upper or lower border of L1, L2 or at L3 level. ERA may be accessory or aberrant with an incidence of 27 – 30% Deficiency in the development of lateral splanchnic arteries – mesonephric arteries result in more than one renal artery. Presence of additional renal artery is probable when the main renal artery has a diameter of less than 4.15 mm. The incidence of EBRA is 10 -12%[12].

Variational anatomy forming part of any system in human anatomy gains more importance day after day with the advent of transplant surgeries. Either to the variational anatomy, having found a small area of importance had gained momentum since the first transplant surgery in heart, kidney and liver. The advent of renal transplantation has opened new vistas for the study of variational anatomy of renal arteries.

5. Conclusion

Data indicated that through diagnosis management should be considered while encountering an adult with moderate severe hydronephrosis. Nevertheless, an adult with mixed hydronephrosis should not be considered clinically insignificant but can be categorized as a carrying a low risk of Uropathy.

6. References

1. Graves FT. The aberrant renal artery. J Anat. 1956; 90: 553–558.
2. Saldarriaga B, Perez AF, Ballesteros LE. A direct anatomical study of additional renal arteries in a Colombian mestizo population. Folia Morphol. 2008;67:129–134.
3. Kara A, Kurtoglu Z, Oguz I ˙dt., et al. Two accessory renal arteries with histological properties. Turk J Med Sci. 2006;36:133–138.
4. Husted TL, Hanaway MJ, Thomas MJ, Woodle ES, Buell JF. Laparoscopic living donor nephrectomy for kidneys with multiple arteries. Transplant Proc. 2005;37629-30.
5. Kok NF, Dols LF, Hunink MG, Alwayn IP, Tran KT, Weimar W. Complex vascular anatomy in live kidney donation: imaging and consequences for clinical outcome. Transplantation 2008;851760-5.
6. Chedid MF, Muthu C, Nyberg SL, Lesnick TG, Kremers WK, Prieto M. Living donor kidney transplantation using laparoscopically procured multiple renal artery kidneys and right kidneys. J Am Coll Surg. discussion 152 2013;217144-52.
7. Henry Hollin Shead ,"The kidney , Ureter and Suprarenal Gland",Anatomy for surgeons 1956;2:544.
8. Boijsen E,Angiographic studies of the anatomy of single and multiple renal arteries.Acta.Radiaol Stockh:1959
9. James A.Ross Eric Samuel and David.R.Millar,Variations in the Renal Vascular Pedicle, British Journal of Urology 1961;33:478-485.

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10. David Skyes, The correlation between Renal vascularization and lobulation of the kidney, British Journal of Urology 1966:549-55
11. He B, Mou L, Mitchell A, Delriviere L. Meticulous use of techniques for reconstruction of multiple renal arteries in live donor kidney transplantation. Transplant Proc. 2013;451396-8.
12. Verma P et al, Variation in branching pattern of renal artery and arrangement of hilar structures in left kidney, Italian journal of Anatomy and Embryology 2012;117(2):118-22.