



RENAL VASCULAR DISPARITIES AMONG KIDNEY DONORS PRESENTED AT RENAL TRANSPLANT UNIT- A SINGLE CENTRE STUDY



is an investigation into the variations in vascular anatomy observed in kidney donors at our renal transplant center. This research aims to understand how these disparities impact the outcomes of kidney transplants and donor health.

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01. Introduction

The increasing prevalence of kidney disease and the crucial role of vascular anatomy in renal transplantation have led to a heightened interest in renal vessel variations, observed in 48% to 53% of kidney donors. These variations include differences in renal arteries and veins, such as early branching and extra arteries. With the global rise in end-stage renal disease (ESRD), kidney transplantation is favored for improving patient quality of life, emphasizing the need for living donor transplants due to cadaveric organ shortages. Preoperative evaluations, especially using spiral computed tomography angiography (CTA), are vital for assessing the donor's renal system to ensure successful transplants and prevent complications. Assessing glomerular filtration rate (GFR) and albuminuria is crucial for evaluating the risk of adverse effects post-donation. Comprehensive medical evaluations, predominantly through CT angiograms, are fundamental for the anatomical assessment of renal donors, with MRI/MRA and ultrasound being secondary options.



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02. Objective

To investigate the variations in renal vascular anatomy among kidney donors and understand how these variations impact the outcomes of kidney transplantation and the health of the donor.

- **Old records**
- **Investigations**
- **CT Angiogram**
- **Ultrasound**

03. Methodology

The current study was carried out at the Renal Transplant Unit of the DOW University of Health Sciences' (OJHA Campus), Karachi, Pakistan. This was a retrospective cross-sectional study based on an institution and a review of old records from transplant unit. All kidney donors who had donor nephrectomy between 2020 and 2022 were the subject of the study. 24 patients' records from 247 kidney donor were excluded from this study because they had CT angiography done from other hospital.

In another study of 240 kidneys from 120 donors, 46 donors (38.8%) exhibited renal vascular variations, more common in males, with the accessory renal artery (23.3%) being the most prevalent variation and no significant laterality association.



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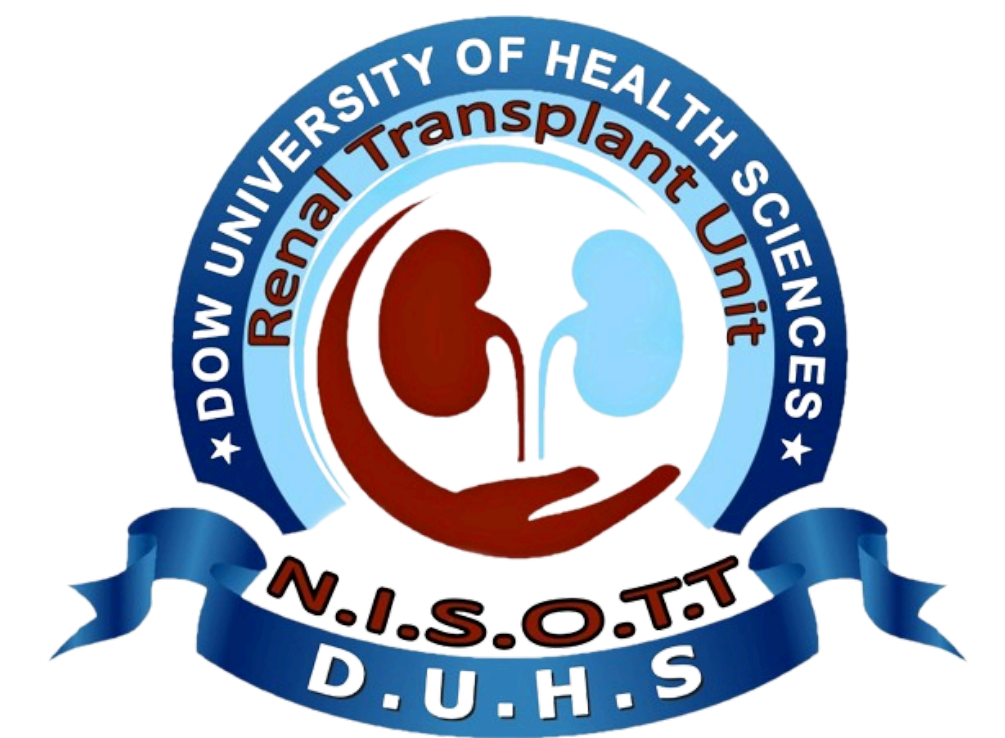
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04. Results/Findings

- The study involved 223 kidney donors, with 46.2% men and 53.8% women, and a mean age of 34.36 years.
- Out of these, 112 donors showed vascular variations, more common in males (30.0%) than in females (20.17%), though this difference was not statistically significant ($p=0.38$).
- Significant correlation was found between vascular variations and laterality ($p<0.001$), with more variations observed on the right side (25.1%) compared to the left side (13.9%).
- Double arteries were more prevalent in males, especially on the right side (31.25% in males vs. 13.39% in females).
- Double veins were more frequently found in females than in males on the right side (14.3% vs. 11.6%).
- There was no significant correlation found between vascular variation and the number of vessels.
- Accessory renal arteries most commonly originated from the lower pole (36.8%).
- Both genders exhibited arterial and venous variations, such as accessory renal veins and retroaortic veins; however, bifurcation variations were exclusively identified in females.



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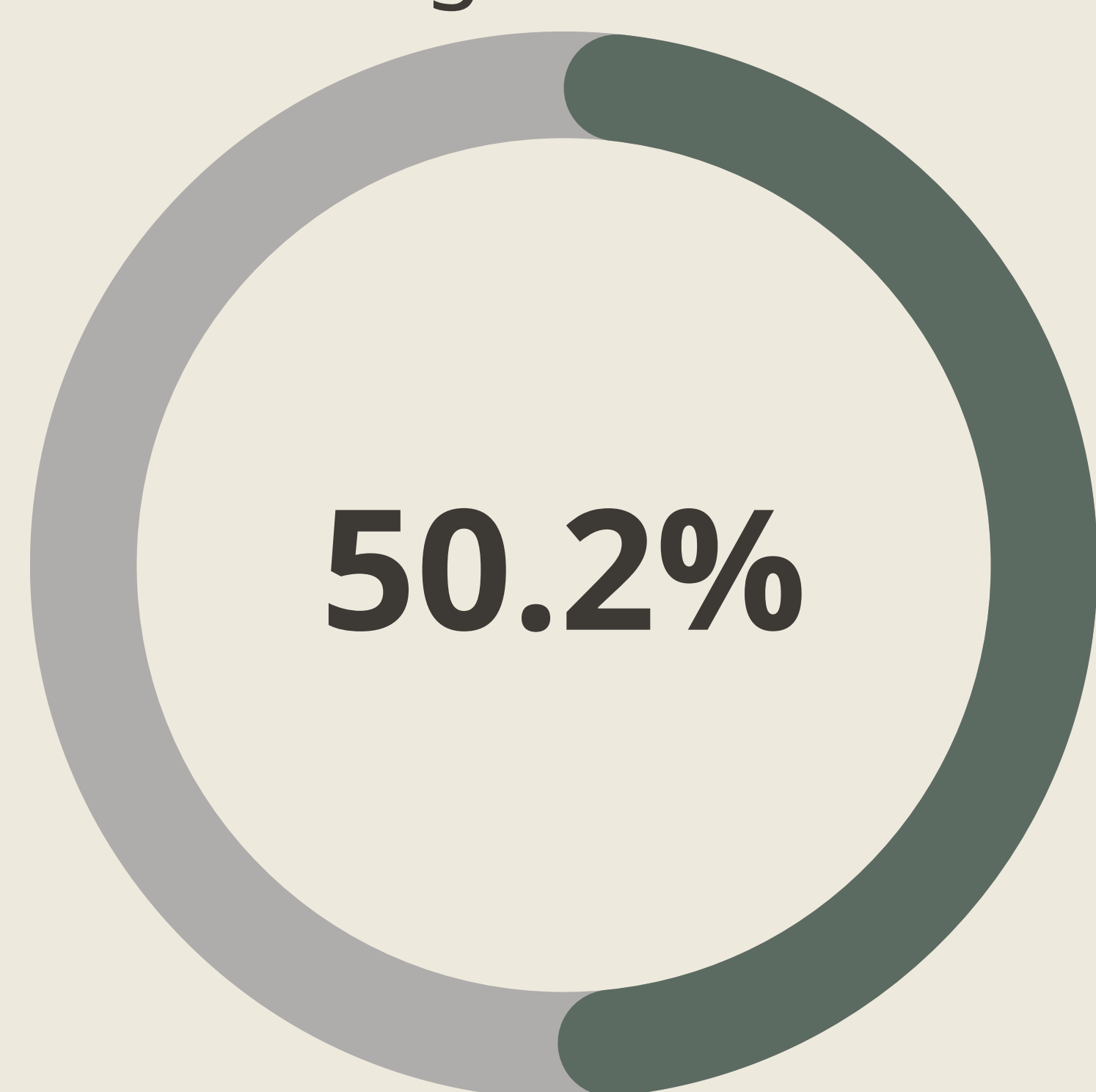
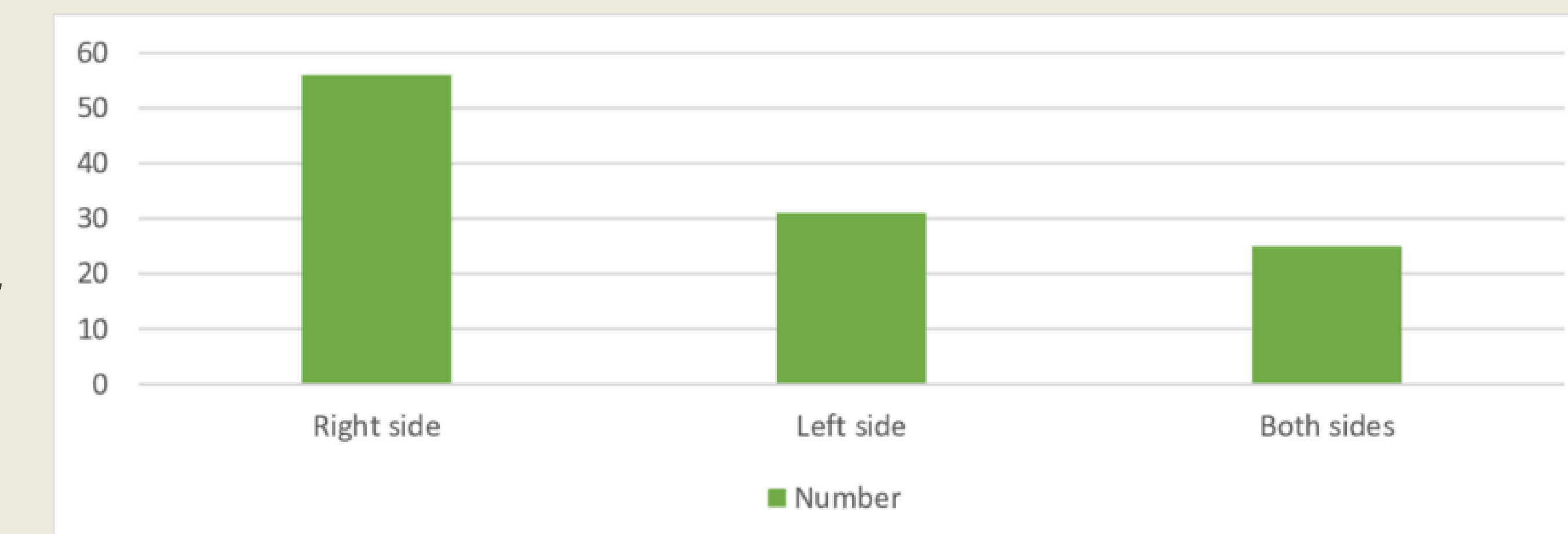


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05. Analysis

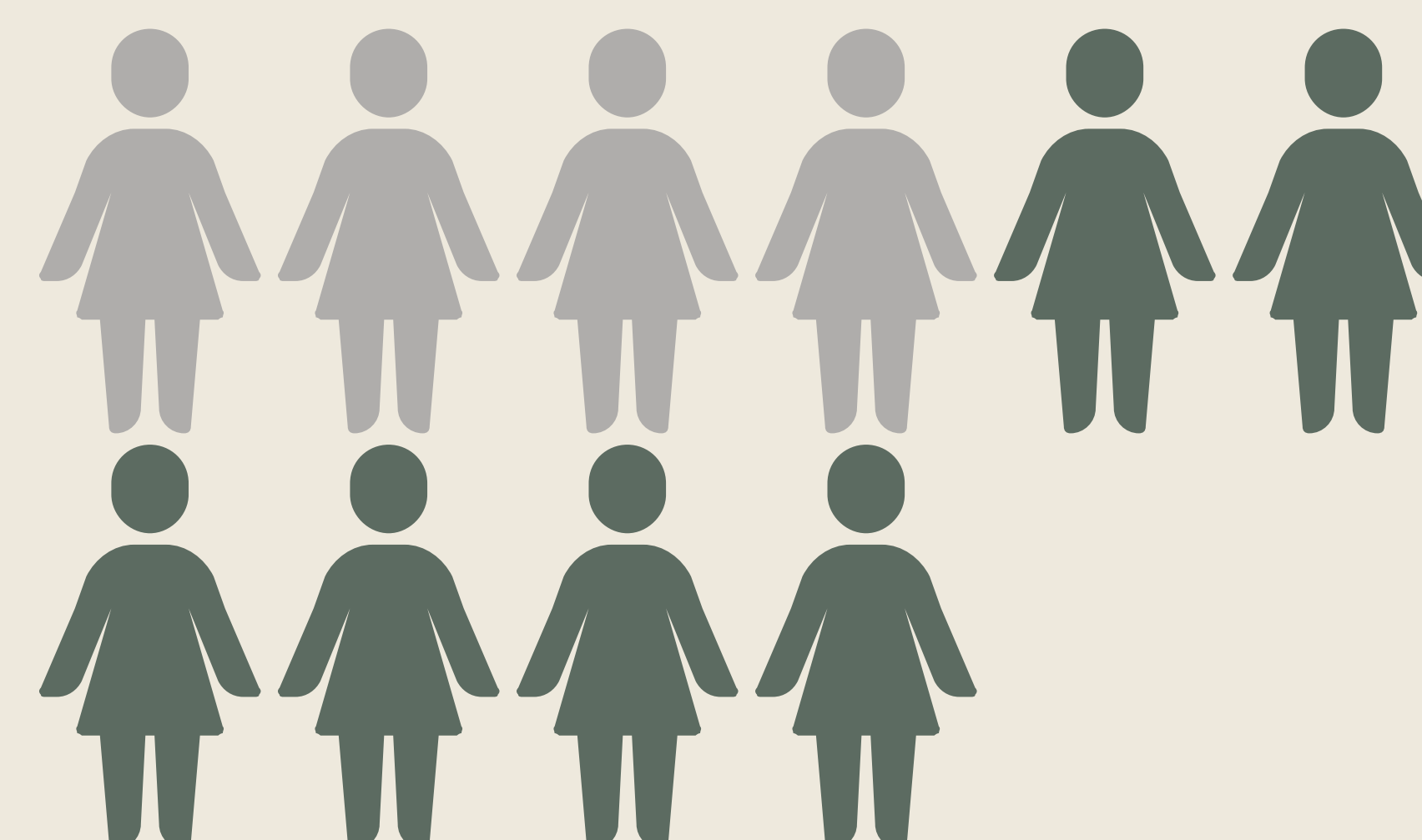
After being coded, cleaned up, and entered into Epi-data version 4.4, all the collected data was exported to SPSS version 20 for analysis. Calculated descriptive statistics included frequencies and percentages. With regard to the gender and laterality, the information on the renal vascular structure was assessed. For categorical data, the chi-square test was used, and $p\text{-value} < 0.05$ was regarded as statistically significant.



Percentage of anatomical variations found



Every 6 in 10 males have different renal vessels anatomy



Every 4 in 10 females have different renal vessels anatomy

Type of variation	Gender		Total
	Male	Female	
Arterial			
Upper Polar	6(7.9)	4(5.3)	10(13.2)
Hilar	8(10.5)	12(15.8)	20(26.3)
Lower pole	20(26.3)	8(10.5)	28(36.8)
Early branching	12(15.8)	6(7.9)	18(23.7)
Venous variation			
Accessory vein	6(16.7)	8(22.2)	14(38.9)
Retro-aortic vein	5(13.9)	5(13.9)	10(27.8)
Early branching	3(8.3)	3(8.3)	6(16.6)
Bifurcation	0(0)	6(16.7)	6(16.7)



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06. Conclusion

This study concluded that Pakistani population have differences in their renal venous and arterial anatomy. The planning of surgical procedures can be significantly influenced by these variations and risk per-operative complications. To avoid diagnostic mistakes and to optimize surgical techniques to prevent undesired postsurgical morbidities, radiologists and surgeons need to be aware of all potential variants.

