

Pig kidney: anatomical relationships between the renal venous arrangement and the kidney collecting system

Bagetti Filho, HJS.¹, Pereira-Sampaio, MA.², Favorito, LA.³ and Sampaio, FJB.³

¹Faculdade de Medicina Veterinária, FESO

²Departamento de Morfologia, Universidade Federal Fluminense

³Unidade de Pesquisa Urogenital, Universidade do Estado do Rio de Janeiro

Many animals have been used as experimental models for urologic procedures, but the pig is more often used because its kidney is the one that most closely resembles the structural features of the human kidney. The objective of this work was to present a systematic study of the anatomical relationship between the intrarenal veins and the kidney collecting system in pigs and to compare these new data with previous findings in humans. The intrarenal anatomy (collecting system and veins) was studied in 61 three-dimensional endocasts of the pig kidney collecting system together with the intrarenal veins. As in human kidneys, pig kidneys have free anastomoses between the intrarenal veins. The renal vein was formed by two (88.5%) or three (11.5%) large trunks, different from humans, where two trunks in 28.8% and three trunks in 53.8% of the cases were identified¹. In pigs, only the ventral surfaces of the cranial and caudal poles were drained by large veins; while the dorsal surfaces drained by anastomoses into the ventral interlobar veins. In humans, the superior caliceal group has both a dorsal (posterior) and a ventral (anterior) venous plexus in 84.6% of the cases and the inferior caliceal group in 50% of the cases¹. Due to these anatomical differences, we should expect that dorsal infundibular puncture in pigs will likely not damage large veins and therefore cause less hemorrhage. At the ureteropelvic junction in pigs, there are large veins in close relationship to the ventral surface (90.2%) and to the dorsal surface (3.3%). Also in pigs, 33 of the 61 (54.1%) specimens had one or two small veins on the dorsal surface of the renal pelvis. This venous arrangement on the dorsal surface of the renal pelvis of pigs is quite different in man, where there are no large veins¹. This information could pose some limitations on using the pig kidney to investigate procedures on this region. Although some results of intrarenal venous arrangement in pigs could not be completely transposed to humans, many similarities of pig and human kidneys support its utilization as the best animal model for urologic procedures.

Financial support: This work was supported by grants from the National Council of Scientific and Technological Development (CNPq) and Foundation for Research Support of Rio de Janeiro (FAPERJ), Brazil.

References

1. Sampaio FJ, Aragão AH (1990) Anatomical relationship between the renal venous arrangement and the kidney collecting system. *J Urol* 144, 1089-1093.