Bovine kidney collecting system analysis contribution for research in urology

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Even with the many similarities between the pig and human kidney, other animals have been used as urologic models. Recently, the bovine kidney has been used to develop partial nephrectomy surgical techniques. The objective of this work was to describe the collecting system of the bovine kidney and to compare these new data with previous findings in humans. The collecting system was studied in 37 three-dimensional polyester endocasts obtained by using an injection-corrosion technique. A renal pelvis was identified in nine of the thirty-seven casts (24.3%), a variation from the classical text of veterinary anatomy. In the remaining 28 casts (75.7%), the cranial and caudal major calices (ureteral branches) unite and form the ureter without an enlargement, therefore, there was no renal pelvis in these casts. The lateral border of renal pelvis was convex or concave. When there was no renal pelvis, the lateral junction with the major calices was indicated by an angle, making easy to define the junction between the two major calices. Furthermore, in casts where a renal pelvis was found, a funnel-shape region was located at the origin of the ureter. The mean number of minor calices was 22.7, ranging from 13 to 64, quite different from the pig and human kidneys, which have a mean of 8.6 and 8.2, respectively. The caudal pole presented the highest number of minor calices (mean of 11.1) and the cranial pole had the lowest number of minor calices (mean of 4.4).[1,2] There was a correlation between the number of minor calices and the number of renal lobes in all kidneys. However, the caudal pole presented more minor calices than renal lobes ($p \leq 0.05$) and the hilar region had more renal lobes than minor calices ($p \leq 0.05$). The lobated bovine kidney is quite different from the human kidney, but the collecting system with minor and major calices in all kidneys and a renal pelvis in 24.3%, show that bovine could be a useful model for endourologic procedures, mainly when the collecting system is the most important point.

References

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2. SAMPAIO, FJB., PEREIRA-SAMPAIO, MA. and FAVORITO, LA. The pig kidney as an endourological model. Anatomic contribution. J. Endourol. 1998, vol. 12, p. 45-50.