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A RADIOGRAPHICAL STUDY OF THE FELINE
URINARY SYSTEM

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ABSTRACT

Although radiographical techniques to examine the urinary system are well established in dogs and humans, these techniques have not been widely accepted or applied to examine the feline urinary system. Considerable confusion and controversy exist regarding anatomical features and radiographical interpretation of the feline urinary system. Much of the currently available information on the feline urinary system has been assumed from comparative studies in other species, particularly the dog.

This study comprises a comprehensive literature review of the anatomy and radiography in the feline urinary tract and includes results of a limited radiographical study of the urinary tract in 27 clinically normal cats.

The cats studied were prepared for radiography and restrained with various anaesthetic agents and techniques. Radiographical examinations of the urinary system involved standard radiography, and the use of an image intensifier connected with a television monitor and 70 mm spot films. The kidney was studied using plain radiography, intravenous and intramuscular excretory urography, renal arteriography and renal venography. With these techniques the kidney location, size, outline, radiographical density and blood supply were observed. Changes in kidney position in various postures relative to the lumbar vertebrae were also studied. The ureteral course, size and blood supply were studied following excretory urography and in some cats the presence of vesico-ureteral reflux enabled retrograde ureterography. The location, shape, size and radiographical density of the urinary bladder were studied by plain radiography, excretory radiography and retrograde cystography including positive, negative and double contrast techniques. The urethral course, shape, size and sex differences were studied by retrograde and micturating urethrography. Following the radiographical studies, all cats were euthanized and their urinary system were macroscopically examined at postmortem.

Selective findings of this study are as follows. The internal structures of the kidney, namely the cortex, medulla, renal columns, pelvic diverticuli, pelvis and renal vessels were visualized using contrast radiography. The internal venous drainage of the kidney was demonstrated by selective renal venography. As previously described in the literature, the kidney location varied in individual cats posture respiratory phase and the geometrical relationship between the x-ray tube and the animal. However the angle of the longitudinal axis, the length and width of the kidney and the ratio between the length of the kidney and lumbar vertebrae were relatively consistent. The proximal ureters had a characteristic step-wise course. Vesico-ureteral reflux was observed in 36% of cats studied during mic-turating cysto-urethrography but no evidence of this reflux was found in cats sedated with xylazine. Although the urinary bladder expanded proportionally during filling, it assumed an hour-glass-shape during micturition. The male urethra narrowed at the levels of the prostate and bulbourethral glands. The female urethra formed a bulbous enlargement immediately proximal to its narrow external orifice. The total length of the urethra was 111.3 mm in the male and 64.2 mm in the female.

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"Minasan Taihen Arigato Gozai Mashita."

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