Directional Difference of Urethral Pressure Profile in Anterior, Posterior and Lateral Components of Canine Urethra

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The urethral pressure profile (UPP) is usually recorded using a catheter with several eyes around the circumference of the tip, because the errors in reproducibility is small. Recently anatomical evidence suggests that the urethral musculature is asymmetrically distributed in its anterior and posterior walls, and symmetrically distributed in its lateral wall (Gosling and Dixon 1982). In this paper we report the result of the prospective differences in the UPP of the anterior, posterior and lateral walls of the canine urethra, using a new designed catheter with only one eye around the circumference of the tip for UPP recording.

Five male and five female mongrel dogs weighing 15~24 kg were used for this study. UPP was recorded under anesthesia, withdrawing the catheter at a rate of 25 mm/min by a mechanical puller and infusing water into the catheter at a rate of 2.0 ml/min. A newly designed 10 Fr. catheter with only one eye which was 0.8 mm in diameter around the circumference 8 cm away from the tip was used to measure four directional UPP; from anterior, posterior, and right and left lateral portions of the urethra.

As shown in Figs. 1 and 2, the wave of UPP from the posterior wall (UPP\text{post}) rised from the baseline of the vesical pressure earlier than the wave of UPP from the anterior wall (UPP\text{ant}) in male and female dogs. As for the maximal urethral pressure (UPP\text{max}) it was revealed that UPP\text{max} of UPP\text{ant} was higher than that of UPP\text{post} in the male dogs, on the other hand, UPP\text{max} of UPP\text{ant} was almost equal to that of UPP\text{post} in female dogs. The patterns of UPP from the right side (UPP\text{right}) and the left side (UPP\text{left}) were very similar to each other, revealing a gentle elevation which showed no peak of UPP\text{max} unlike UPP\text{ant} and UPP\text{post}.

Martinez and Constantinou (1982) have observed asymmetrical organization of the female urethra. Using the catheter with several eyes around the circumference, it is impossible to record the urethral pressure in specific direction of urethra. It is also difficult to measure the male urethral pressure by the microtip transducer which Martinez...

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and Constantinou (1982) employed, because the catheter has no adequate flexibility. The differences in LJPP between the anterior, posterior and lateral aspects of the urethra were demonstrably proved using the newly designed catheter with only one eye. Our recording is useful for studying the continence mechanism in the urethral dynamics.

Fig. 1. Recording of urethral pressure profile in anterior (----), posterior (-----), right (-----) and left (-----) portions of the male canine urethra.

Fig. 2. Recording of urethral pressure profile in anterior (----) and posterior (-----) portions of the female canine urethra.

References
