Comparison of Urinary Catheterization Techniques

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In the literature

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FROM THE PAGE ...

Placement of urinary catheters is associated with many complications, including UTIs and traumatization of tissue.[1-10] To reduce complications, urinary catheters should be efficiently placed aseptically and atraumatically.[1,6-8,11,12] Although there are multiple placement techniques, there are no studies comparing them.[1,2]

The objective of this study was to describe a novel catheterization technique in female dogs and compare its ease of learning and duration of placement with traditional techniques. Nine fourth-year veterinary students with no prior catheterization experience were enrolled in the study. A 30-minute tutorial was provided by experienced veterinary technicians that included descriptions and videos of 3 catheterization techniques: visualization with speculum, blind palpation, and visualization with a novel catheterization device. An appropriately sized Foley catheter with stylet was used for all catheterizations.

Nine canine cadavers of varying sizes were used. Each student catheterized a small (<22 lb [10 kg]), medium (33-55.1 lb [15-25 kg]), and large (>66.1 lb [30 kg]) dog using all 3 catherization techniques. Time to perform each technique was measured, and a maximum time of 40 minutes was allotted. A poststudy questionnaire assessed students' ease of learning, ease of performance, and preference for technique.

All catheterization attempts were completed during the allotted time, with only 23 of 27 attempts completed for the blind palpation group. Regardless of dog size, visualization with speculum and visualization with a novel catheterization device were faster than blind palpation. Median time to catheterization was shortest for visualization with speculum (300 seconds) and longest for blind palpation (725 seconds). Although the novel catheterization device technique took longer to perform (420 seconds) as compared with speculum, it remained significantly faster than blind palpation. Visualization with a novel catheterization device was considered the easiest technique by 6 of the 9 students, and none considered it the hardest technique.

... TO YOUR PATIENTS

Key pearls to put into practice:

1. An ideal urinary catheterization technique should be easy to learn and perform while maintaining sterility. Using a technique that allows visualization of the urethral papilla may result in increased success of placement of female urinary catheters.
2. Although both visualization with speculum and with a novel catheterization device provide visualization of the urethral papilla, the novel catheterization device technique may be less cumbersome and easier to perform. In addition, this technique offers a sterile pathway to the urethral papilla, thus potentially increasing sterility.
3. Maintaining sterility during urinary catheterization remains paramount, regardless of technique used.

References

1. Aldrich J. Urinary catheterization. In: Davis H, Burkitt Creedon JM, eds. *Advanced Monitoring and Procedures for Small Animal Emergency and Critical Care*. John Wiley and Sons; 2012:395-406.
2. Smarick SD, Haskins SC, Aldrich J, et al. Incidence of catheter-associated urinary tract infection among dogs in a small animal intensive care unit. *J Am Vet Med Assoc*. 2004;224(12):1936-1940.
3. Biertuempfel PH, Ling GV, Ling GA. Urinary tract infection resulting from catheterization in healthy adult dogs. *J Am Vet Med Assoc*. 1981;178(9):989-991.
4. Nacey JN, Delahunt B, Tulloch AG. The assessment of catheter-induced urethritis using an experimental dog model. *J Urol*. 1985;134(3):623-625.
5. Stickler DJ. Bacterial biofilms in patients with indwelling urinary catheters. *Nat Clin Pract Urol*. 2008;5(11):598-608.
6. Barsanti JA, Blue J, Edmunds J. Urinary tract infection due to indwelling bladder catheters in dogs and cats. *J Am Vet Med Assoc*. 1985;187(4):384-388.
7. Ogeer-Gyles J, Mathews K, Weese JS, Prescott JF, Boerlin P. Evaluation of catheter-associated urinary tract infections and multi-drug-resistant *Escherichia coli* isolates from the urine of dogs with indwelling urinary catheters. *J Am Vet Med Assoc*. 2006;229(10):1584-1590.
8. Bubenik LJ, Hosgood GL, Waldron DR, Snow LA. Frequency of urinary tract infection in catheterized dogs and comparison of bacterial culture and susceptibility testing results for catheterized and noncatheterized dogs with urinary tract infections. *J Am Vet Med Assoc*. 2007;231(6):893-899.
9. Bubenik L, Hosgood G. Urinary tract infection in dogs with thoracolumbar intervertebral disc herniation and urinary bladder dysfunction managed by manual expression, indwelling catheterization or intermittent catheterization. *Vet Surg*. 2008;37(8):791-800.
10. Freshman JL, Reif JS, Allen TA, Jones RL. Risk factors associated with urinary tract infection in female dogs. *Prev Vet Med*. 1989;7(1):59-67.
11. Sullivan LA, Campbell VL, Onuma SC. Evaluation of open versus closed urine collection systems and development of nosocomial bacteriuria in dogs. *J Am Vet Med Assoc*. 2010;237(2):187-190.
12. Beal MW, Brown DC, Shofer FS. The effects of perioperative hypothermia and the duration of anesthesia on postoperative wound infection rate in clean wounds: a retrospective study. *Vet Surg*. 2000;29(2):123-127.