



Mini Review

Volume 9 Issue 5 - February 2019
DOI: 10.19080/JDVS.2019.09.555775

Dairy and Vet Sci J

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Diagnostic and Therapeutic Cystocentesis in Dogs and Cats: Considerations



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Submission: February 01, 2019; **Published:** February 11, 2019

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Abstract

Cystocentesis is considered a safe but invasive procedure and its diagnostic and therapeutic value in domestic animals has been recognized for over 80 years. Ultrasound guide can be useful to correctly localize the position of urinary bladder and to evaluate the distension and thickening of the wall before performing the procedure. Complications of cystocentesis in dogs and cats can occur but if performed with caution are usually rare. Ultrasound can be useful to recognize potential complications and can be important to make the proper diagnosis, to take the right treatment and avoid further unnecessary diagnostic procedures.

Keywords: Cystocentesis; Dog, Cat; Ultrasound

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Cystocentesis is a procedure in which a needle is inserted through the abdominal wall into the urinary bladder to withdraw urine [1]. The procedure is commonly performed in veterinary practice and has both diagnostic and therapeutic use [2]. Diagnostic cystocentesis circumvents many of the potential problems associated with collection of urine specimens by normal micturition, manual compression of the urinary bladder, or catheterization [1,2]. The main advantage of cystocentesis is that contamination of voided urine with blood, exudates, microorganisms, and other debris from the urethra, genital tract, and integument that may complicate interpretation of routine urinalysis findings is avoided [1,3]. When transurethral catheterization is unsuccessful in animals with urinary obstruction decompressive cystocentesis is advised as therapeutic intervention. In addition to reducing pressure on bladder wall and preventing rupture, it facilitates repulsion of urethral plugs or urethroliths and improves the ease of catheterization case [4-6].

Cystocentesis is considered a simple but an invasive procedure with a potential risk of complications. It requires trained staff and might not be possible in all clinical situations [7]. The main contraindications to cystocentesis are an insufficient volume of urine in the urinary bladder and the animal's resistance to restraint [1]. The procedure is also contraindicated in patients with pyometra [7], recent abdominal surgery or trauma, coagulopathy, thrombocytopenia and under anticoagulant therapy [3]. Finally, cystocentesis is not recommended in patients with urinary bladder neoplasia [3]. Usually wetting the skin with an alcohol solution is often

used to see where the needle will puncture the skin, and not primarily as a disinfectant. If the animal is not clean the area can be shaved and scrubbed prior to performing cystocentesis; however, according to some author under routine circumstances this is not necessary [1]. Results of a study in 22 cats suggested that contamination of urine samples collected by cystocentesis does not occur even when the hair is not clipped or the skin disinfected [8]. The recommended technique to perform cystocentesis without risk to the animal involves palpation and immobilization of the urinary bladder as well as planning the site and direction of the needle puncture [9].

Currently, ultrasound-guided centesis has become the preferred method to safely collect urine [2]. In fact ultrasound guide can be useful to correctly localize the position of urinary bladder and to evaluate the distension and thickening of the wall before performing the procedure. Usually 22G-23G needles are used [2,3,4,10] connected to a 5 ml syringe [10]. Iatrogenic loss of urine into the peritoneal cavity during or after properly performed cystocentesis is unlikely unless there is extensive necrosis or inflammation of the bladder wall, which can occur after prolonged urinary tract obstruction. Furthermore, leakage can occur when there is movement of the patient during procedure and when pressure is applied to the bladder during procedure [1,4]. Septic peritonitis can occur after leakage of contaminated urine into peritoneal cavity [4,10]. Urosepsis is considered uncommon in veterinary practice, but can accompany uroabdomen if the patient has a concomitant urinary tract infection [10,11]. On rare occasions, cysto-

centesis has been associated with a form of reversible collapse in cats secondary to a possible excessive vagal stimulation [12]. Occasionally, small submucosal hematoma formation has been observed in experimental cats after cystocentesis, but this had no notable adverse effects associated with it [1]. However urine analysis should be evaluated with caution (hematuria secondary to iatrogenic trauma from cystocentesis). Accidental penetration of a bowel loop can result in a false-positive bacteriuria [2]. Laceration of the bladder wall or big vessels can occur if the animal is not properly restrained, if the needle length is too great for the size of the animal or due to inexperience of the operator [10,13].

Laceration of the aorta can result in life-threatening complications secondary to massive blood loss [13]. However, abdominal aorta and vena cava perforations during cystocentesis reported in a case series were not life threatening [10]. Acute abdomen with formation of a large blood clot was reported in a cat [10]. Other minor complications are nodular fat necrosis, subcutaneous abscess, bladder wall hematoma, endoluminal bladder blood clots, skin hematoma, mural bleeding, bladder wall detachment, focal perivesical peritonitis. All these conditions were self limited or required medical therapy and follow-up. In conclusion, serious complications after cystocentesis are rare and the introduction of ultrasound in performing urine aspiration may have contributed to the low number of complications. The possibility to check the urinary bladder before, during and after the procedure can be important to make the proper diagnosis, to take the right treatment and avoid further unnecessary diagnostic procedures.

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DOI: [10.19080/JDVS.2019.09.555775](https://doi.org/10.19080/JDVS.2019.09.555775)

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