

the number of deaths and the possibility of undergoing legal processes could significantly be reduced. Whenever an animal dies, regardless the situation, necropsy must be performed to establish the cause of death. A bath and grooming environment must have been seen as a harmless place because a healthy animal can die during these procedures as a result of physical or stress traumas (MARIA; REGO; MAIORKA, 2013).

References

ASSOCIAÇÃO BRASILEIRA DA INDÚSTRIA DE PRODUTOS PARA ANIMAIS DE ESTIMAÇÃO. **Indústria nacional fatura R\$ 15,2 bilhões e já representa 0,31% do PIB nacional 2014**. Disponível em: <<https://goo.gl/CVU03n>>. Acesso em: 19 mar. 2015.

CONSELHO REGIONAL DE MEDICINA VETERINÁRIA DO ESTADO DE SÃO PAULO. **Informativo nº 60**. São Paulo: CRMV-SP, 2015. 28 p. Disponível em: <<https://goo.gl/owVJDd>>. Acesso em: 23 mar. 2016.

GERDIN, J. A.; MCDONOUGH, S. P. Forensic pathology of companion animal abuse and neglect. **Veterinary Pathology**, Thousand Oaks, v. 50, n. 6, p. 994-1006, 2013.

MARIA, A. C. B. E. **Principais alterações encontradas em necropsias de cães e gatos que vieram a óbito durante procedimentos em petshops e similares**. 2010. 114 f. Dissertação (Mestrado) – Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, São Paulo, 2010.

MARIA, A. C. B. E.; REGO, A. A. M. S.; MAIORKA, P. C. Necropsy findings in dogs that died during grooming or other pet service procedures. **Journal of Forensic Sciences**, Chichester, v. 58, n. 5, p. 1189-1192, 2013.

MARIA, A. C. B. E. *et al.* Óbitos de cães e gatos durante procedimentos de banho e tosa: uma realidade pouco conhecida no Brasil. **Revista de Educação Continuada em Medicina Veterinária e Zootecnia do CRMV-SP**, São Paulo, v. 13, n. 2, p. 24-29, 2015.

MOBERG, G. P.; MENCH, J. A. **The biology of animal stress: basic principles and implications for animal welfare**. Oxon: CAB International, 2001.

PACAK, K.; MCCARTY, R. Acute stress response: experimental. In: FINK, G. (Ed.). **Encyclopedia of stress**. San Diego: Academic Press, 2007. v. 1, p. 7-14.

PETBRASIL. **Mercado brasileiro**. São Paulo, [201-]. Disponível em: <<http://www.petbrasil.org.br/mercado-brasileiro>>. Acesso em: 23 mar. 2016.

SALVAGNI, F. A. *et al.* Patologia veterinária forense: aplicação, aspectos técnicos e relevância em casos com potencial jurídico de óbito de animais. **Clínica Veterinária**, São Paulo, v. 19, n. 112, p. 58-72, 2014.

SELYE, H. The birth of the G.A.S. In: _____. **Stress of life**. New York: McGraw-Hill, 1956. p. 25-43.

SELYE, H. A. Syndrome produced by diverse noxious agents. **Nature**, New York, v. 138, p. 32, 1936.

IATROGENIC BLADDER RUPTURE FOLLOWING REPEATED CYSTOCENTESIS

MATOS, M. G.¹; VIANA, D. A.²; LOPES, C. E. B.¹; PIMENTEL, S. P.¹; RODRIGUES, F. R. N.¹

¹ Undergraduate Student of Veterinary Medicine at Universidade Estadual do Ceará (Uece). E-mail: magna570@gmail.com.

² Professor of Animal Pathology, MSc, DSc. Universidade Estadual do Ceará and Technical Scientific Director of Laboratório Pathovet – Anatomia Patológica e Patologia Clínica S/S LTDA (<http://www.pathovet.com.br>), Fortaleza.

Introduction: Cystocentesis is a medical procedure to collect urine for diagnostic evaluation and also temporarily decompress the urinary bladder in animals with urethral obstruction. When performed correctly is a safe procedure, as long as it is performed by trained personnel. Otherwise there is risk of rupture of the bladder leading to uroabdomen and hemorrhage, culminating in some cases with patient's death. Medical procedures are a major reason to perform forensic autopsy, as some of these can cause iatrogenic conditions, which represent a state of illness, adverse effects or complications caused by or resulting from medical intervention, sometimes considered as an error. A medical error can be seen as the result of interactions between the cognitive limitations of an individual and the environment or system which influences their decisions. So, there are a lot of reasons such as lack of technical knowledge or practical ability, illness or even effects of stress, but whatever the reason of the medical error was, it could end up causing a major negative effect on the

patient's life or, in the worst case scenario, contribute to the patient's death. The role of veterinary forensic pathology in the investigation of animal abuse, neglect, or even medical veterinary errors is documenting the condition of animals presented as evidence. In this matter, a male cat, previously diagnosed with a renal insufficiency that was undergoing palliative treatment for this condition, started to present clinical signs of urethral obstruction (difficulty for eliminate urine due to a physical obstruction of its natural path), for this reason, the owner looked to a veterinary clinic where the animal was attended sedated and was put through a cystocentesis procedure in order to improve wellness for the patient and collect samples for lab analysis. After the medical procedure the cat was sent home, and started presenting signs such lethargy, gasp, sialorrhea, two hours after medical release, unfortunately passing away in his home. The cat's owner found strange that the animal was fine when he left the clinic ended up developing such morbid process few moments after he just got home so he requested a necropsy procedure in order to clarify what happened to his pet. **Methods:** The owner requested a necropsy procedure, in order to clarify the reason why his pet died, considering its renal condition was under control, and a urethral obstruction did not look like enough reason for such morbid process. The necropsy procedure was performed by the service of Pathology and Legal Medicine of Laboratório PATHOVET – Anatomia Patológica e Patologia Clínica Veterinária LTDA, using a modified technique of Armed Forces Institute of Pathology (2001) veterinary necropsy protocol. All image records were taken there. The biological samples were analyzed in the same laboratory. **Results:** On external examination of the body, there was a recent bruise on the abdominal medial area (Figure 1 – A) that was correspondent with a massive clot located right above the convex zone of the bladder (Figure 1 – B). In addition, there was fluid in the abdomen which after biochemical and microscopic evaluation it was recognized as uro and hemoperitoneum. Externally, the bladder presented a pattern of multiple irregular hemorrhagic and necrotic areas also seen in the internal face mucosa. Histopathological analysis revealed a necrotic cystitis with extensive hemorrhage, confirming the macroscopic diagnosis for the bladder lesion. A massive congestion and edema was seen in the lungs

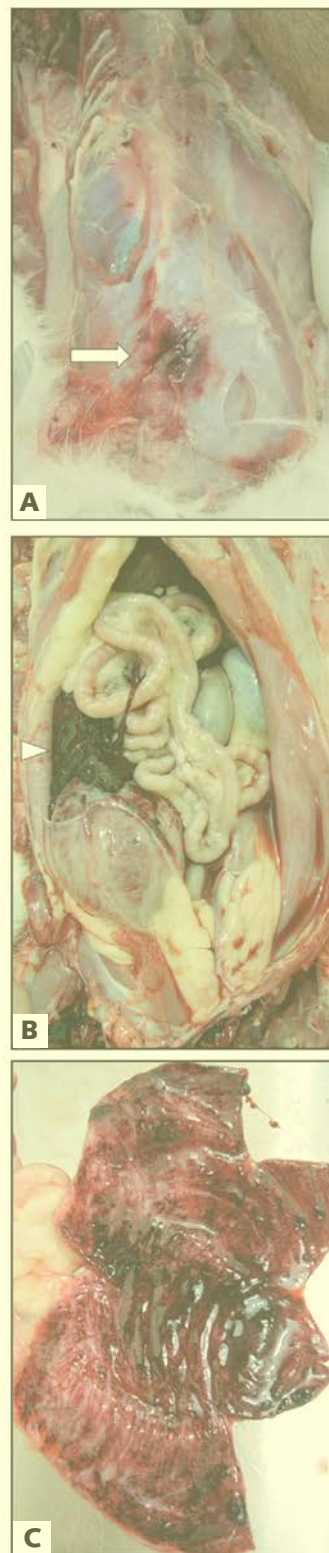


Figure 1 - Abdominal bruise (arrow) (A) and correspondent big clot right above convex zone of the bladder (arrow head) (B) as an evidence of hemoperitoneum. (C) Hemorrhage and necrosis in the urinary bladder mucosa. Source: Personal file.

The cause of death was attributed to hypovolemic shock and respiratory failure with the main findings consisting in lung massive edema and congestion, uro/hemoperitoneum, and necrotic hemorrhagic cystitis (Figure 1 – C).

Discussion: Urethral obstruction is a common and potentially life-threatening manifestation of feline lower urinary tract disease. Many aspects in its management are considered to be universal and typically include initial relief of the obstruction through catheterization or cystocentesis. Although there are many benefits to performing a cystocentesis many practitioners doesn't perform this technique because it could result in tearing or bladder rupture with resultant development of uroperitoneum and possible hypovolemic shock when significant hemorrhage occurs. A prior cystocentesis helps to relieving the back-pressure against the obstruction (whether stone, plug, or spasm) making for easier passage of a urinary catheter and decrease potential for urethral trauma. So it can be used as a therapeutic procedure once before catheterization. Multiple cystocentesis in a short period of time with the aim of relieving bladder pressure without proper catheterization is practice not indicated. In the present case the pattern of lesions found indicates that the hypovolemic shock could be explained by the intense hemorrhage triggered after a series of mismanaged cystocentesis procedures. Indeed, the patient went through seven different attempts of cystocentesis (revealed by the vet after the necropsy exam), none of them ultrasound-guided, which can easily make the damage in the bladder that was found in the necropsy and also result in urine extravasation from the bladder to the abdomen, even more likely to happen in an animal that was already presenting a clinical symptoms of urinary obstruction, meaning that the bladder was probably full and completely distended. There are aspects related to skill level and technique that might also impact the risk associated with the procedure of cystocentesis in urethral obstruction in cats, but as more distended, pressurized, and friable the bladder is (ie, the sicker the patient), greater is this risk of an accident. The patient here reported was diagnosed with chronic kidney disease two years before and was undergoing treatment for this condition. Multiple cystocentesis in

a friable bladder wall can lead to its rupture with the consequent leakage of urine and severe hemorrhage leading to the hypovolemic shock that killed the animal.

Conclusion: This case report is a suitable example of a mismanaged medical procedures that can result in an animal death, consequently being classified as an animal-related crime. Deaths by mismanaged medical procedures are common in forensic pathology both veterinary and medical, which makes important the analysis and Discussion: of this kind of occurrence to be described protocols of necropsy and even necropsy reports that could be used, for instance, as a tool in a court.

References

- ARMED FORCES INSTITUTE OF PATHOLOGY. **Technical Bulletin Med. nº 283:** veterinary necropsy protocol for military working dogs and pathology specimen submission guidelines. Washington, D.C.: Department of the Army, 2001.
- AUMANN, M.; WORTH, L; DROBATZ, K. J. Uroperitoneum in cats: 26 cases (1986–1995). **Journal of the American Animal Hospital Association**, Elkhart, v. 34, n. 4, p. 315-324, 1998.
- BROWNLIE, H. W. B.; MUNRO, R. The veterinary forensic necropsy: a review of procedures and protocols. **Veterinary Pathology**, Lawrence, v. 53, n. 5, p. 919, 2016.
- CUEVAS, S. E. C. *et al.* Papel da patologia forense veterinária na investigação de óbito sob circunstâncias desconhecidas de um cão. **Revista de Educação Continuada em Medicina Veterinária e Zootecnia do CRMV-SP**, São Paulo, v. 14, n. 1, p. 49, 2016.
- FORRESTER, S. D. Urogenital Diagnostic Procedures. In: ETTINGER, S. J.; FELDMAN, E. C. (Eds.). **Textbook of veterinary internal medicine**. 6. ed. St. Louis: Elsevier Health Sciences, 2005. v. 1. p. 299-301.
- FRANÇA, G. V. **Medicina legal**. 10. ed. Rio de Janeiro: Guanabara Koogan, 2015. 748 p.
- LOCKWOOD, R.; ARKOW, P. Animal abuse and interpersonal violence: the cruelty connection and its implications for veterinary pathology. **Veterinary Pathology**, Lawrence, v. 53, n. 5, p. 910-918, 2016.