

## Urolithiasis in Boer Bucks

M.S. Shahrom<sup>1,2\*</sup> and M. Zamri-Saad<sup>1</sup>

<sup>1</sup>*Department of Veterinary Pathology & Microbiology,  
Faculty of Veterinary Medicine, Universiti Putra Malaysia,  
43400 UPM, Serdang, Selangor, Malaysia*

<sup>2</sup>*Korporasi Pembangunan Desa (Rural Development Corporation),  
Aras 2, Wisma Pertanian Sabah, Jalan Tasik,  
(Off Jalan Maktab Gaya), Beg Berkunci 86,  
88998 Kota Kinabalu, Malaysia  
\*E-mail: drsharom@yahoo.com*

### ABSTRACT

This paper describes three cases of urolithiasis in adult Boer bucks. The affected bucks were among the 50 breeders kept under intensive system given cut and carry Napier grass at the rate of 2 kg/animal/day. In addition, the animals were also supplemented with commercial goat pellets at the rate of 300 g/animal/day, 200-300 g of palm kernel expeller (PKE) and mineral block. The affected animals showed clinical signs of stranguria, anorexia, prolonged urination, dribbling urine, tail flagging and abdominal pain. Prior to death, they appeared to be depressed, recumbent, and showed abdominal distension. Supportive treatments in the form of anti-inflammatory drugs and oral drench of ammonium chloride (1%) were attempted. All the animals in this study died within 2 weeks following the onset of depression. Post-mortem examinations revealed swollen testis and severe haemorrhages in the urethra with blackish sandy material deposited within the lumen. There were ascites and swollen kidneys, while cloudy and thick urine filled the bladder. Histological examinations revealed the presence of purplish sandy material, either within the lumen or closely associated with the wall of the urethra. The urethral areas where the calculi were in-contact with the wall showed extensive necrosis with destruction of the epithelial layer and haemorrhages. Urinary calculi have a complex aetiology, but management, nutritional, and anatomical considerations can be helpful.

**Keywords:** Urolithiasis, Boer bucks

### INTRODUCTION

Urolithiasis is a condition of the urinary tract, in which insoluble mineral and salt aggregate around a nidus of proteinaceous material within the bladder or urethra (Belknap & Pugh, 2002). These stones consist of combinations of various minerals and come in many shapes and sizes. Once the stones become too numerous or too large, they cause obstruction of the urethra at

the vermiform appendage, the ischial arch or the neck of the bladder (Pinsent & Cottom, 1987). Urolithiasis can rapidly progress to bladder or urethral rupture, uremic crisis, and death (Baxendell, 1984). Males are more likely to be affected as females generally have a shorter, wider urethra (Matthews, 1999). Uroliths can occur in all species but they are a common problem in domestic ruminants (Matthews, 1999; Belknap & Pugh, 2002).

---

Received: 9 August 2010

Accepted: 23 September 2010

\*Corresponding Author

In the past, urolithiasis had rarely been reported in Malaysia. However, with the increase in the import of and goat rearing, especially the Boer goat, urolithiasis has been promoted in the recent years. This paper describes the occurrence and pathological changes in Boer goats with urolithiasis.

### CASE DESCRIPTION

#### *Case History*

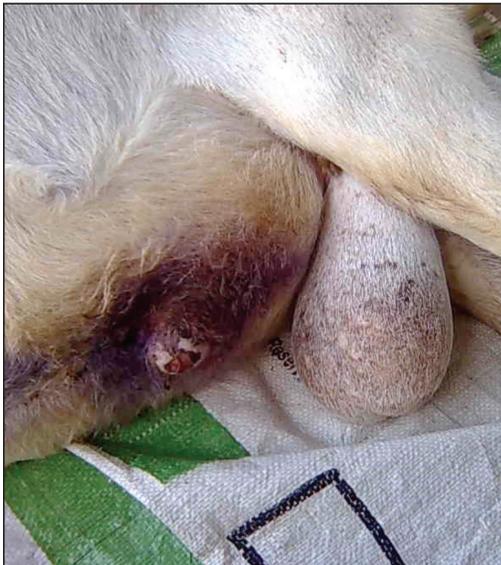
This report describes three cases of urolithiasis involving imported adult Boer bucks aged >2 years old. The affected bucks were among the 50 breeder males kept under the intensive system. They were fed cut and carry Napier grasses at the rate of 2 kg/animal/day and supplemented with commercial goat pellets at the rate of 300 g/animal/day, palm kernel expeller (PKE) and mineral block. The affected animals showed clinical signs of stranguria, anorexia, prolonged urination, dribbling urine, tail flagging, and abdominal pain. Prior to death, they appeared to be depressed, recumbent and showed abdominal distension. Supportive treatments in the form

of anti-inflammatory drugs and oral drench of ammonium chloride (1%) were attempted. Nonetheless, all the affected animals died within 2 weeks following the onset of depression.

### CASE FINDINGS

In all cases, the post-mortem examination revealed swollen testis due the accumulation of fluid in the scrotum (*Fig. 1*). The prepuce was stained while the abdomen was distended, containing fluid (*Fig. 2*). Upon opening the urogenital system, there were severe haemorrhages and necrosis along the urethra with blackish sandy material within the lumen (*Fig. 3*). The urinary bladder contained cloudy and thick urine, while the kidneys were swollen with hydronephrosis (*Fig. 4*).

Histopathological examination revealed the presence of purplish sandy material, either within the lumen or closely associated with the wall of the urethra (*Fig. 5*). The urethral areas, where the calculi were in-contact with the wall, showed extensive necrosis with destruction of the epithelial layer and haemorrhages with numerous inflammatory cells (*Fig. 6*).



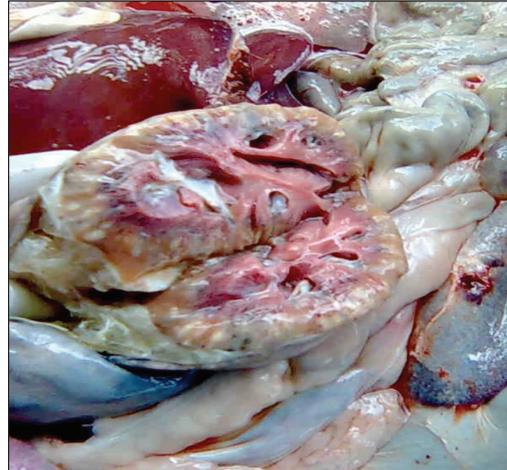
*Fig. 1: Swollen testis with subcutaneous oedema and soiled prepuce*



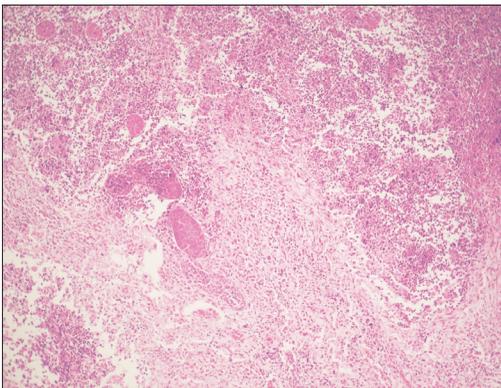
*Fig. 2: Fluid-filled the abdominal cavity*



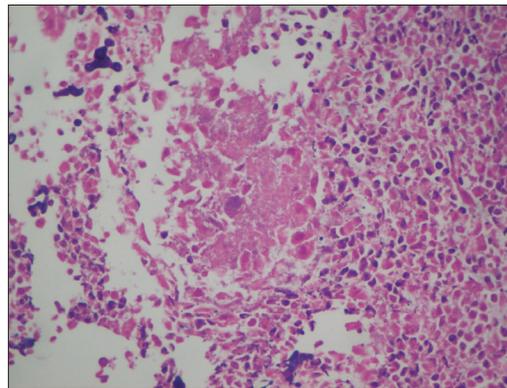
*Fig. 3: Urethra of affected goat showing necrosis and accumulation of blackish, sandy materials*



*Fig. 4: Swollen kidneys with evidence of hydronephrosis*



*Fig. 5: A photomicrograph of an affected urethra showing the presence of urolith and surrounding necrosis (HE x40)*



*Fig. 6: A photomicrograph showing the urolith, haemorrhages and inflammatory cells (HE x400)*

### DISCUSSION

Goats of various breeds and purposes have been documented with urolithic stone problems in captivity (Bellenger *et al.*, 1981; Smith & Sherman, 1994; Gutierrez *et al.*, 2000). These stones often occur when concentrated or supplemented feed with high phosphorus content is presented to the goats (Blood *et al.*, 1989; George *et al.*, 2007). Therefore, diet and

animal management are considered as important risk factors in the formation of uroliths in ruminants (Blood *et al.*, 1989; Kahn *et al.*, 2005; George *et al.*, 2007). Although the relationship between diet and urolith formation in goats has not been clearly established, previous studies have suggested that particular diets contribute to the formation of struvite calculi (Blood *et al.*, 1989; Aitken, 2007). High-concentrated

grain diets with approximately equal proportions of calcium and phosphorus and diets high in magnesium, potassium, and phosphorus are thought to predispose animals to calculi (Huang *et al.*, 1999).

Therefore, obstructive urolithiasis remains an often deadly problem for male goats, kept intensive. The solution involves understanding and implementing a proper balance of minerals and nutrients in their diets, while mitigating environmental factors to minimize the risk of this disease.

#### ACKNOWLEDGEMENTS

We would like to thank the staff of KPD Boer Goat Kabang Farm JPHPT Veterinary Laboratory Kepayan, Kota Kinabalu, for the processing of the samples, Dr. Shahiruddin Shamsudin, Puan Jamilah Jahari and the staff of the Post-mortem Room and Histopathology Laboratory of the Faculty of Veterinary Medicine, UPM, for their excellent technical assistance.

#### REFERENCES

- Aitken, I.D. (2007). *Diseases of sheep* (4<sup>th</sup> ed). Iowa, USA: Blackwell Publishing.
- Belknap, E.B., & Pugh, D.G. (2002). Diseases of the urinary system. In D.G. Pugh (Ed.), *Sheep and goat medicine*. Philadelphia: W. B. Saunders Company.
- Blood, D.C., Radostits, O.M., & Arundel, J.H. (1989). *Veterinary Medicine* (7<sup>th</sup> ed). London, UK: Baillière Tindall.
- Bellenger, C.R., Rutar, A.J., Ilkiw, J.E., & Salamon, S. (1981). Urolithiasis in goats. *Australian Veterinary Journal*, 57, 56.
- Baxendell, S.A. (1984). Urethral calculi in goats. In Univ. of Sydney Post-Graduate Committee in *Veterinary Science Refresher Course for Veterinarians Proceedings* No. 73(pp. 495-497).
- George, J.W., Hird, D.W., & George, L.W. (2007). Serum biochemical abnormalities in goats with uroliths: 107 cases (1992–2003). *Journal of the American Veterinary Medical Association*, 230, 101-106.
- Gutierrez, C., Escolar, E., Juste, M.C., Palacios, M.P., & Corbera, J.A. (2000). Severe urolithiasis due to trimagnesium orthophosphate calculi in a goat. *Veterinary Record*, 18, 534.
- Huang, K.H., Wang, X.L., Yu, Z.H., Zhou, D.D., Gao, J.B., Li, H.Q., Shen, X.Z., Xu, J., Huang, Y.C., Ji, Y.S., Qiu, X., & Yang, G.B. (1999). Pathogenesis of urolithiasis in Chinese swamp buffalo calves caused by feeding high-level cottonseed meal diet. *Buffalo Journal*, 15, 292-301.
- Kahn, C.M., Line, S., & Aiello, S.E. (2005). *The merck veterinary manual* (9<sup>th</sup> ed). Pennsylvania, USA: Merck and Company Inc.
- Matthews, J. (1999). *Diseases of the goat*. Malden, MA: Blackwell Science Inc.
- Pinsent, J., & Cottom D.S. (1987). Metabolic diseases of goats. *Goat Veterinary Society Journal*, 8, 40-42.
- Smith, M.C., & Sherman, D.M. (1994). *Goat medicine*. Philadelphia PA: Lea & Febiger.