Case Report

Urinary Obstruction in a Castrated Male Goat: A Case Report

Krishna Adhikari[1]*, Akash Adhikari[2], Sujan Adhikari[3], Manoj K Shah[4]

[1]M.V.Sc. Surgery and Radiology, Department of Veterinary Surgery and Pharmacology, Faculty of Animal Science, Veterinary Science and Fisheries (FAVF), Agriculture and Forestry University (AFU), Rampur, Chitwan, Nepal; [2]B.V.Sc. & A.H., Institute of Agriculture and Animal Science (IAAS), Paklihawa Campus, Tribhuvan University (TU), Rupandehi, Nepal; [3]B.V.Sc. & A.H., Faculty of Animal Science, Veterinary Science, and Fisheries (FAVF), Agriculture and Forestry University (AFU), Rampur, Chitwan, Nepal; [4]Department of Veterinary Surgery and Pharmacology, Faculty of Animal Science, Veterinary Science, and Fisheries (FAVF), Agriculture and Forestry University (AFU), Rampur, Chitwan, Nepal.

Abstract | Obstructive urolithiasis is a life-threatening condition in small ruminants, especially in castrated males. This case report describes the diagnosis and surgical management of urinary obstruction in a 7-month-old, crossbreed, castrated male goat presented to the Veterinary Teaching Hospital, FAVF, AFU, Nepal. The goat showed clinical signs of anorexia, anuria, abdominal straining, and a distended abdomen. Clinical examination revealed increased HR, RR, CRT, and a congested mucous membrane. Laboratory tests showed elevated PCV, BUN, creatinine, and serum potassium concentration preoperatively, which normalized by day 10 postoperatively. Cystocentesis and urine analysis showed a pH of 8.5, hematuria, and struvite crystals. Based on clinical findings, husbandry practice, and dietary history - specifically a high-concentrate, low-roughage diet during winter - a presumptive diagnosis of obstructive urolithiasis was made. A tube cystostomy was performed using a size 14 F Foley catheter under epidural anesthesia. The urinary bladder was accessed via a left ventrolateral abdominal incision, and a subcutaneous tunnel was created for catheter placement. Normal urination resumed on day 10, and the catheter was removed on day 12, with complete healing by day 14. Postoperative care included antibiotics, analgesics, and oral ammonium chloride. This case highlights the effectiveness of tube cystostomy as a practical, low-resource surgical option and emphasizes preventive dietary strategies and husbandry practice to reduce recurrence in goats.

Keywords | Urinary tract disease, Urinary obstruction, Obstructive urolithiasis, Surgical tube cystostomy, Dietary management, Husbandry practice

Received | February 19, 2026; **Accepted** | April 06, 2026; **Published** | May 02, 2026
***Correspondence** | Krishna Adhikari, M.V.Sc. Surgery and Radiology, Department of Veterinary Surgery and Pharmacology, Faculty of Animal Science, Veterinary Science and Fisheries (FAVF), Agriculture and Forestry University (AFU), Rampur, Chitwan, Nepal; **Email:** vet.krishna22@gmail.com
Citation | Adhikari K, Adhikari A, Adhikari S, Shah MK (2026). Urinary obstruction in a castrated male goat: A case report. Res J. Vet. Pract. 14(2): 23-28.
DOI | https://dx.doi.org/10.17582/journal.rjvp/2026/14.2.23.28
ISSN | 2308-2798

INTRODUCTION

In goats, lower urinary tract affections include a range of conditions affecting the urethra, bladder, and associated structures. These conditions are primarily characterized by clinical signs such as dysuria, stranguria, hematuria, and urinary incontinence, leading to severe complications impacting the health and productivity of these animals (Kumar *et al*., 2024). Urinary obstruction in animals can stem from ureteral anomalies in young animals, urolithiasis, prostatic hypertrophy, pregnancy, or urinary tract infection (Cianciolo and Mohr, 2016). The majority of cases of urine retention in animals, where an animal is unable to empty the bladder, are due to urethral obstruction (urolith/ calculi and stricture) or issues with the functional mechanism of the bladder (atonic bladder or spasm of the bladder neck) (Lai *et al*., 2017). One of the common causes of urethral obstruction is urinary stones or uroliths,

resulting in difficulty urinating, urine retention, distention, rupture of the urinary bladder, and death in untreated cases (Yohannes and Tesfay, 2024). Urine retention due to the presence of stones (urolith/ calculi) and sediments, also known as urolithiasis, is a serious, potentially fatal, and life-threatening condition requiring early recognition, intervention, and prompt treatment (Darwish, 2023; Makhdoomi and Gazi, 2013).

Obstructive urolithiasis is a widespread and economically significant problem in livestock, particularly in small ruminants. In a regional analysis done in India involving 777 reported cases of domestic animals over an academic session of 1 year at IVRI, the incidence was reported to be higher (92.92%) in ruminant animals (Sharun *et al.*, 2021). Beyond animal welfare, associated severe pain and complications result in a high fatality rate. This highlights the need for comprehensive strategies to safeguard both animal well-being and agricultural sustainability, particularly in regions where goats play a vital role in the agricultural economy.

Case presentation, history, examination, and diagnosis

A 7-months old, non-descript, cross-breed, and castrated male goat was presented at the Veterinary Teaching Hospital, FAVF, AFU for treatment with a history of anorexia, anuria, and straining with stretched forelimbs and hindlimbs. During the presentation and physical examination, a markedly tense and distended abdomen was noted, accompanied by straining with signs similar to those of colic. On clinical examination, heart rate (HR) and respiratory rate (RR) were slightly higher than the normal and basal HR and RR; capillary refill time (CRT) > 2 seconds; and congested mucous membrane (MM), suggesting tachycardia, tachypnoea, dehydration, and hemodynamic disturbance. On hematology, serum biochemistry, and electrolyte evaluation, increased PCV, WBC count, BUN, creatinine, and serum potassium concentration were observed (Table 1). Suspecting obstructive urolithiasis, a cystocentesis and urinalysis were performed, which revealed (Table 1) a pH of 8.5, hematuria (RBCs: 50–60/hpf), and microscopic crystals resembling struvite (Magnesium Ammonium Phosphate) with coffin lid appearance, which are typically found in an alkaline urine environment after a goat is fed with a concentrate and low roughage diet for a prolonged duration. There was unavailability of modern diagnostic imaging tools (radiography and ultrasonography) during the period of case presentation. Thus, a presumptive diagnosis of obstructive urolithiasis was made solely based on history, husbandry practices, feeding habits, clinical findings, and analysis of predisposing factors during the period (winter season, concentrate diet, low roughage, and green fodder). Assuming the urgency of the case, it was decided to proceed further with the surgical treatment option, and thus, surgical tube cystostomy using a Foley catheter (Size 14 F) was performed.

Table 1: Preoperative and postoperative diagnostic findings.

Parameter	Preoperative (Day 0)	Postoperative (Day 10)	Reference range
Hematology			
PCV (%)	44	30	22–38
WBC (/μL)	19,500	11,000	4,000–13,000
Neutrophils (%)	80	45	30–48
Biochemistry			
BUN (mg/dL)	48	16	10–20
Creatinine (mg/dL)	3.5	1.2	1.0–1.8
Potassium (mmol/L)	7	4.5	3.5–6.7
Calcium (mg/dL)	8.3	9.5	8.9–11.7
Urinalysis			
Urine pH	8.5	7.2	7.0–8.0
RBCs	50-60/ hpf	<5/ hpf	<5/ hpf

MATERIALS AND METHODS

Preoperative preparation and anesthetic procedure

The goat was restrained manually, and the dorsal lumbosacral area was prepared aseptically after clipping and shaving the hair from the area. For the regional block, 1 ml of 2% lidocaine hydrochloride (20 mg/ml) was administered at a dose of 0.8 mg/kg body weight (body weight of goat – 25 kg) in the epidural space in between the last lumbar and first sacral vertebrae with an 18 G 1.5-inch hypodermic needle (dorsal lumbosacral vertebral space – high epidural). The needle was guided perpendicular through the vertebral space till the resistance subsided and a pop was felt. The passage of lidocaine hydrochloride without resistance confirmed the needle position in the epidural space. After confirming that the goat was unable to stand and walk on its hind legs due to the regional anesthetic effect of the local anesthetic, the goat was restrained on the surgical table in right lateral recumbency. A 22-G intravenous cannula was fixed on the right ear vein, and fluid (Ringer-Lactate) therapy was initiated at a dose rate of 10 ml/ kg/ hr. to maintain physiological needs and compensate for electrolyte abnormalities. The surgical site in the left ventral abdominal region near the proximity of the left inguinal region, extending craniocaudally from the left mid-lateral abdominal region to the inguinal region and dorsoventrally from the ventrolateral abdominal region to the midventral region, was clipped, shaved, and aseptically prepared for surgery. The site was scrubbed with Savlon®

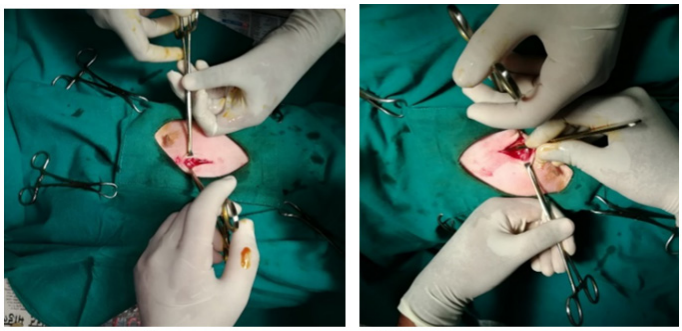
(chlorhexidine gluconate and cetrimide), 70% ethanol, and povidone-iodine solution.

The surgical procedure was decided to be performed with the animal on mild to moderate sedation; thus, 1 ml of diazepam (5 mg/ ml) was administered IM (Intramuscular) at a dose of 0.2 mg/ kg body weight. Prophylactic antibiotic: 5 ml of Megapen® (ampicillin 500 mg + cloxacillin 500 mg + 10 ml of sterile water for injection) was given IM at a dose of 20 mg/kg body weight of ampicillin and 20 mg/ kg body weight of cloxacillin after reconstitution in 5 ml of sterile water for injection. For perioperative pain management, 1 ml of meloxicam (5 mg/ml) was given IM at a dose of 0.2 mg/kg body weight.

Intraoperative procedure

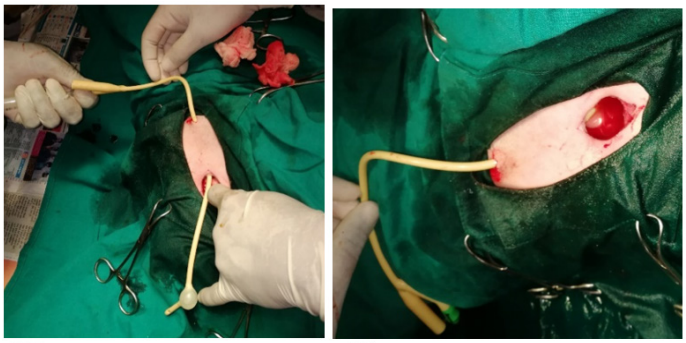
The goat was secured in right lateral recumbency with the left hind limb flexed and away from the body, the right hind limb and forelimbs were extended caudally and cranially, respectively, and secured with a rope on the surgical table. The animal was positioned to provide a larger surgical field for enhanced visualization and manipulation by the surgeon (Figure 1). A sterile surgical drape was placed over the surgical site. About a 2–3-inch skin incision was made obliquely parallel to the midventral line and caudal end of the incision ending at the level and lateral to the rudimentary left teat (Figure 2A). The subcutaneous fat, muscles, and peritoneum were bluntly dissected (Figure 2B), which allowed visualization of a distended urinary bladder. The patency and appearance of the urinary bladder were checked and noted to be distended with urine. A subcutaneous tunnel was made in the craniolateral abdominal region from the incision site and parallel to the ventral midline. At the cranial end of the subcutaneous tunnel (at the level of the preputial opening), a small stab incision was made. A Foley catheter (Size 14 F) (tip towards the incision site) was passed along the length of the tunnel up to the level of the urinary bladder with a curved Kelly hemostat forceps (Figure 3A).

Figure 1: Preoperative photograph after patient positioning and surgical site preparation. (Left to Right = Cranial to Caudal).



(A) (B)

Figure 2: (A, B): Abdominal wall layers (Skin, Subcutaneous, Muscle, Peritoneum) incision to approach the urinary bladder. (Left to Right = Cranial to Caudal).



(A) (B)

Figure 3: (A, B): Tunneling of the subcutaneous tissue layer and insertion of a Foley catheter in the urinary bladder. (Left to Right = Cranial to caudal).

The tip of the Foley catheter was held in Kelly hemostat forceps and stabbed into a distended urinary bladder at an avascular area (Figure 3B). The stab in the urinary bladder was closed in a purse-string suture pattern with chromic catgut (USP 2-0) around the periphery of the stab to hold the Foley catheter and prevent urine seepage in the abdominal cavity. The balloon at the tip of the Foley catheter was then inflated with 15 ml of sterile water to retain it within the urinary bladder and drawn against the bladder wall. The layers of the abdominal wall were closed in four distinct layers. The peritoneum, all three muscle layers, and the subcutaneous layer were sutured in a simple continuous suture pattern with chromic catgut (USP 2-0), (USP 1-0), and (USP 2-0), respectively. In contrast, the skin was sutured in a simple interrupted suture pattern with nylon (USP 0) (Figure 4A). The cranial incision of the subcutaneous tunnel containing the Foley catheter tube was secured with a single interrupted suture with nylon (USP 0). The excess of the Foley catheter with external outlet was secured at the level parallel to the prepuce on the left lateral abdominal region with multiple interrupted sutures with nylon (USP 0) (Figure 4B). A fly-repellant herbal ointment was applied at the periphery of the wound (Figure 5).

(A) (B)

Figure 4: (A, B): Closure of abdominal wall layers and fixation of the Foley catheter ventrolateral and external to the abdominal wall. (Left to Right = Cranial to Caudal).

Figure 5: Post-operatively, passage of urine from the Foley catheter after closure of the abdominal incision and fixation of the Foley catheter. (Left to Right = Cranial to Caudal).

Postoperative care and advice

Antibiotic 1.25 ml enrofloxacin (100 mg/ ml) was given IM at the dose rate of 5 mg/ kg body weight once a day consecutively for 5 days. For anti-inflammatory and analgesic effects, 1 ml of meloxicam (5 mg/ml) was administered SC (Subcutaneous) at a dose of 0.2 mg/kg body weight once a day, consecutively for 2 more days. For the dissolution of urolith, 3 g of urinary acidifier ammonium chloride salt (NH_4Cl) PO (Peroral) at the dose rate of 120 mg/ kg body weight once daily till the urolith dissolves and normal urination resumes. The owner was advised to perform wound dressings daily for 5 days, then on alternate days thereafter. Regarding husbandry and feeding practices, the owner was advised to provide green forage, ad libitum water, an adequate mineral mixture, and vitamin supplements, and to limit concentrated rations.

RESULTS AND DISCUSSIONS

The surgical wound was intact with slight swelling in the periphery without any discharge the next day after surgery. There was a slight dribbling of urine from the external urethral orifice on the seventh and 8th day and a very low stream of urine on the 9th day. The external opening of the Foley catheter was sealed to allow normal outflow of urine from the external urethral orifice. The owner was asked to observe urination and remove the seal if no urine output is observed for 12-18 hrs. On the 10th postoperative day, the owner noted and reported normal urinary flow from the external urethral orifice. The Foley catheter was removed on the 12th day after confirming normal urine and patency of the urethral tract. The catheter was pulled after deflating the balloon and removing the sutures that secured it to the left ventrolateral abdominal region. The surgical wound had healed, and the external skin suture was removed on the 14th postoperative day.

This case is reported in a subtropical setting in Nepal, where seasonal and dietary variations and water scarcity are evident. The finding is similar to reports from temperate (Riedi *et al.*, 2018) and tropical regions (Bamal *et al.*, 2023), where struvite urolith is predominant. This suggests commonality of urolith composition across diverse geographical areas. The presence of alkaline urine and urinary crystals resembling struvite strongly correlates with the dietary practice of goats, commonly reported in previous studies (Jones *et al.*, 2017; Kumar *et al.*, 2024). The obstruction is predisposed by early castration, which exacerbates the urethral narrowing (Riedi *et al.*, 2018).

In obstructive urolithiasis, hematological alterations were marked by hemoconcentration (increased PCV and WBC count), serum biochemistry revealed elevated BUN and creatinine, indicating renal dysfunction, while electrolyte imbalance, such as hypocalcemia and hyperkalemia, were observed (Kumar *et al.*, 2024). This case illuminates the systemic impact of obstructive urolithiasis, where preoperative azotemia, hyperkalemia, and leukocytosis have reflected the compromised renal system with indication of inflammation. The return of PCV, WBC, BUN, creatinine, and serum potassium concentration within the normal reference range (Table 1) by day 10, along with a return of urine pH to a more neutral (7.2) level, indicates restoration of renal function and systemic homeostasis.

Tube cystostomy is a surgical technique in which an indwelling Foley catheter is placed in the urinary bladder to provide an alternative route for the passage of urine over a period during which urethral inflammation and injury subside, while uroliths dissolve and pass out in response to medical treatment (Todhunter *et al.*, 1996). Tube cystostomy is a practical intervention when other advanced techniques, such as urethrostomy or laser lithotripsy, are unavailable. Since most obstructive cases require surgical intervention, alternative approaches such as urethral process amputation, urethrotomy, perineal urethrostomy, bladder marsupialization, laser lithotripsy, and urethral

flushing can be viable options (Mejia *et al*., 2022; Oman *et al*., 2019). The disadvantages of surgical tube cystostomy might include the risk of anesthesia in animals already suffering from metabolic derangements, treatment costs, displacement and dislodgement of the Foley catheter, and catheter-associated urinary tract infection. The temporary indwelling Foley catheter, maintained for 12-14 days, may increase the risk of catheter-associated urinary tract infection (CAUTI), necessitating the use of enrofloxacin for both prophylaxis and treatment (Adhikari and Shah, 2025). Similarly, a study involving 89 sheep and goats with obstructive urolithiasis that underwent tube cystostomy showed a high recurrence rate (41.3%) following initial successful treatment (Eicher *et al*., 2023). The utility of tube cystostomy is supported in this individual case, as normal urination was achieved by day 10 and wound healing by day 14. As tube cystostomy was successful in this case, it is important to contextualize it among the other surgical options. The rapid postoperative recovery also underscores tube cystostomy as a minimally invasive, cost-effective solution, ideal for resource-limited settings. The dissolution of the urolith was likely facilitated by the administration of ammonium chloride (Streeter *et al*., 2002), which is evidenced by normal urination by day 10 in this case. Similarly, the return of hematology and biochemistry values within the normal reference range (Table 1) by day 10 validates the success of tube cystostomy, along with urine acidification and supportive care for urinary obstruction, as observed in this particular case of urinary obstruction.

For the prevention of obstructive urolithiasis, dietary recommendations include increased roughage, ad libitum water, and mineral supplementation, which is targeted at correcting dietary imbalances to reduce urolith formation. Achieving and maintaining an ideal Calcium: Phosphorus ratio of 1.2-1.5:1 is necessary. The addition of sodium chloride, at a 3-5% of total dry matter, can significantly increase water consumption and urinary output, which helps to dilute urinary solutes (van Metre, 2015). Furthermore, routine biochemical and urine monitoring is critical for detecting early metabolic imbalances, such as hyperkalemia or alkaline urine pH, to guide preventive measures.

CONCLUSIONS AND RECOMMENDATIONS

Obstructive urolithiasis is an acute and life-threatening condition requiring immediate intervention. Tube cystostomy, along with dietary modification and urine acidification with ammonium chloride, proves to be an effective measure to treat the acute cases of obstructive urolithiasis in goats in a low-resource setting, even with the lack of sufficient diagnostics. The preventive strategy depends on adequate husbandry and dietary management based on the geographic region.

ACKNOWLEDGMENT

The authors are grateful to the Department of Veterinary Surgery and Pharmacology and Veterinary Teaching Hospital, Faculty of Animal Science, Veterinary Science and Fisheries (FAVF), Agriculture and Forestry University (AFU), Nepal, for facilitating the necessary surgical equipment and medications for the study.

NOVELTY STATEMENT

The case report presented here describes a single case of obstructive urolithiasis in a small ruminant (a castrated male goat). The comprehensive diagnostic data presented here in this case report are limited, mainly due to resource constraints. Therefore, the lack of complete preoperative biochemical and urine analyses reports, due to resource constraints, highlights the need for improved diagnostic infrastructure in veterinary settings. This reinforces the importance of investing in and utilizing the diagnostic capabilities. The data presented in this study aims to enhance the regional literature. However, future studies should focus on longitudinal monitoring of these parameters in Nepalese sheep and goat populations to establish region-specific risk profiles and optimize preventive strategies. Additionally, studies to explore genetic and environmental factors influencing urolith composition in cross-bred goats can be helpful to develop targeted nutritional guidelines.

AUTHOR'S CONTRIBUTION

KA: Performed the procedure, writing-original manuscript draft, writing-reviewing and editing the manuscript draft.
AA: Writing-revised manuscript draft.
SA: Writing-revised manuscript draft. MKS: Writing-reviewing and editing the manuscript draft.

Consent

The objectives of the study were explained to the animal owner, and written informed consent was obtained from the animal owner.

Data availability statement

The laboratory data generated in this study are available upon request. Interested researchers may contact the corresponding author to access the data.

Funding statement

There was no funding from any source associated with this study.

Generative AI and AI assisted technology statement

The authors declare that no generative AI and AI assisted technology was used in the creation of this manuscript.

Conflicts of interest

The authors have declared no conflict of interest.

REFERENCES

Adhikari K, Shah M (2025). Obstructive urolithiasis in small ruminants: A global review relevant to the Nepalese context. Vet. Sci. Res. Rev., 11: 128–145. https://doi.org/10.17582/journal.vsrr/2025/11.2.128.145

Bamal PS, Kumar V, John JK, Tyagi SK, Malik V, Shahi UP (2023). High urinary trace element concentrations: A possible indicator of urolithiasis in goats? J. Trace Element. Miner., 4: 100060. https://doi.org/10.1016/j.jtemin.2023.100060

Cianciolo RE, Mohr FC (2016). Urinary system. Jubb, Kennedy and Palmer's Pathology of Domestic Animals: 2: 376–464. https://doi.org/10.1016/B978-0-7020-5318-4.00010-3

Darwish A (2023). Clinicopathological studies on urine retention in Barki Rams. Adv. Anim. Vet. Sci., 11. https://doi.org/10.17582/journal.aavs/2023/11.10.1673.1680

Eicher L, Zablotski Y, Knubben-Schweizer G, Voigt K (2023). Composition of ovine and caprine uroliths, and short- and long- term treatment success following obstructive urolithiasis - a retrospective analysis of clinical records of a Southern German veterinary hospital Open Access CC BY-NC-ND 4.0 2. https://doi.org/10.2376/1439-0299-2022-25

Jones ML, Gibbons PM, Roussel AJ, Dominguez BJ (2017). Mineral composition of uroliths obtained from sheep and goats with obstructive urolithiasis. J. Vet. Intern. Med., 31(4): 1202–1208. https://doi.org/10.1111/jvim.14743

Kumar PK, Lakshmi K, Nagaraj P, Rani MU (2024). Haemato-biochemical and serum electrolyte alterations in goats with lower urinary tract disorders: A retrospective study. Int. J., 8(12s): 880–883. https://doi.org/10.33545/26174693.2024.v8.i12Sk.3209

Kumar P, Lakshmi K, Nagaraj P, Rani M (2024). Occurrence of lower urinary tract affections in goats: A retrospective study. Int. J. Adv. Biochem. Res., 8: 876–879. https://doi.org/10.33545/26174693.2024.v8.i12Sk.3208

Lai JM, Chang MH, Hwang MY, Wang JH (2017). Urinary retention caused by a botched castration in a goat. Taiwan Vet. J., 43(2): 89–94. https://doi.org/10.1142/S1682648515720130

Makhdoomi DM, Gazi M (2013). Obstructive urolithiasis in ruminants: A review. Vet. World, 6: 233. https://doi.org/10.5455/vetworld.2013.233-238

Mejia S, McOnie RC, Nelligan KL, Fubini SL (2022). Small ruminant urinary obstruction: Decision trees for treatment. J. Am. Vet. Med. Assoc., 260(S2): S64–S71. https://doi.org/10.2460/javma.22.02.0071

Oman RE, Reppert EJ, Streeter RN, Jones M (2019). Outcome and complications in goats treated by perineal urethrostomy for obstructive urolithiasis: 25 cases (2010-2017). J. Vet. Intern. Med., 33(1): 292–296. https://doi.org/10.1111/jvim.15360

Riedi AK, Knubben-Schweizer G, Meylan M (2018). Clinical findings and diagnostic procedures in 270 small ruminants with obstructive urolithiasis. J. Vet. Intern. Med., 32(3): 1274–1282. https://doi.org/10.1111/jvim.15128

Sharun K, Manjusha KM, Kumar R, Pawde AM, Malik YP, Kinjavdekar P, Maiti SK, Iraqi A (2021). Prevalence of obstructive urolithiasis in domestic animals: An interplay between seasonal predisposition and dietary imbalance. Iraqi J. Vet. Sci., 35(2): 227–232. https://doi.org/10.33899/ijvs.2020.126662.1358

Streeter RN, Washburn KE, McCauley CT (2002). Percutaneous tube cystostomy and vesicular irrigation for treatment of obstructive urolithiasis in a goat. J. Am. Vet. Med. Assoc., 221(4): 546–549. https://doi.org/10.2460/javma.2002.221.546

Todhunter P, Baird AN, Wolfe DF (1996). Erection failure as a sequela to obstructive urolithiasis in a male goat. J. Am. Vet. Med. Assoc., 209(3): 650–652. https://doi.org/10.2460/javma.1996.209.03.650

van Metre DC (2015). Urolithiasis in small ruminants: Surgical and dietary management. https://api.semanticscholar.org/CorpusID:19569950

Yohannes G, Tesfay S (2024). Review on surgical managements of urolithiasis in ruminants. Mathews J. Surg., 7. https://doi.org/10.30654/MJS.10029