

Diet-related feline lower urinary tract disease in a mixed-breed angora cat: a case report

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ABSTRACT: Feline Lower Urinary Tract Disease (FLUTD) encompasses bladder and urethral disorders in cats and is influenced by factors such as diet, care, litter hygiene, and activity levels. An eight-year-old mixed-Angora queen weighing 4.1 kg presented with haematuria at the Udayana University Veterinary Teaching Hospital. Despite being active and displaying typical vital signs, the cat experienced abdominal discomfort on palpation. Diagnostic evaluations including macroscopic and microscopic urine analyses revealed haematuria, proteinuria, and struvite crystals. Radiographic and ultrasonographic examinations identified radiopaque material and uroliths in the bladder, with concurrent bladder wall thickening, although the blood parameters were normal. The cat was diagnosed with FLUTD due to urolithiasis and cystitis, and underwent dietary management, increased water intake, and daily CYSTOID Plus® supplementation. In this case, the prognosis remained positive. After 14 days, a significant improvement was noted in the absence of haematuria, and the urine appeared bright yellow without turbidity.

Keywords:

cat, cystitis, diet, FLUTD, urolithiasis

INTRODUCTION

Effective dietary management ensures the health, vitality, and longevity of the pets. Various dietary components, such as moisture content (Buckley *et al.* 2011), sodium levels (Hawthorne & Markwell 2004), and ingredients influencing urine pH, can affect Relative Supersaturation (RSS) values. These factors can provoke urolith formation and other disturbances in the urinary tract (FDA 2023). Feline Lower Urinary Tract Disease (FLUTD) represents a common group of syndromes affecting the lower urinary tract in cats, often triggered by multiple factors, including diet (Lund *et al.* 2016).

Tavinia *et al.* (2023) and Piyarungsri *et al.* (2020) indicated that cats on dry food diets had a higher risk of FLUTD than those on wet or mixed diets. Cats primarily hydrate through their food; therefore, dry diets may lead to inadequate hydration due to low moisture content, increasing the risk of urine crystallisation and urolith formation. Additionally, dry foods high in minerals, such as magnesium phosphate, are associated with struvite uroliths (Tefft 2021). Research on this dietary issue in Indonesia is limited and studies on this topic are scarce. This report describes a case of FLUTD in a female cat that was likely linked to dietary mismanagement.

CASE

Anamnesis and Signalment: An 8-year-old mixed Angora queen weighing 4.1 kg, with a light brown coat featuring white patterns (Figure 1A), presented with haematuria and periuria, as reported by the owner. **Physical Examination:** Heart rate of 156 bpm, pulse rate of 156 bpm, respiratory rate of 28 bpm, and body temperature of 39.1°C. The capillary

refill time < 2 s. The cat displayed signs of discomfort on abdominal palpation. **Urinalysis:** The urine appeared reddish and cloudy (Figure 1B) with leukocytes, red blood cells, and

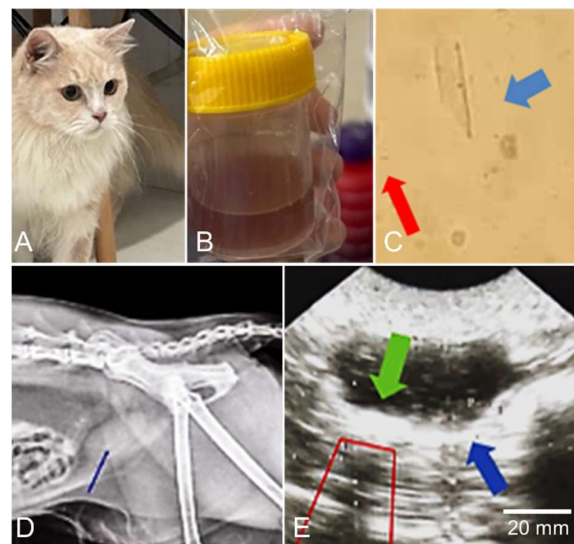


Figure 1. Diagnostic Images and Microscopic Findings in Feline Urolithiasis. (A) The cat patient exhibiting clinical signs, (B) Sample of reddish and cloudy urine, (C) Microscopic examination (objective lens 10x) showing red blood cells (red arrow) and struvite crystals (blue arrow), (D) Radiographic lateral view of the bladder showing radiopaque material (thin blue arrow), and (E) Ultrasonographic image of the bladder depicting a urolith (green arrow) with associated acoustic shadowing (red marking) and bladder wall thickening (blue arrow).

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proteins. Microscopic examination revealed numerous red blood cells and struvite crystals (Figure 1C). **Supporting Examination:** Blood parameters were within normal ranges. Radiographic (Figure 1D) and ultrasonographic (Figure 1E) examinations revealed bladder uroliths and mucosal wall thickening. **Diagnosis:** Urolithiasis and cystitis. **Prognosis:** Considered good (Fausta). **Treatment:** Recommended treatments include dietary management to increase water intake and daily supplementation with CYSTAID Plus®.

■ RESULTS AND DISCUSSION

FLUTD was diagnosed using various methods, with risk factors including age, neuter status, body weight, activity level, indoor environment, stress, and diet. The cat was fed a commercial dry diet twice daily. An abnormal urinalysis revealed leukocyturia, proteinuria, haematuria, red blood cells, and struvite crystals. Struvite forms in neutral to alkaline urine and can be promoted by high dietary levels of certain minerals and moderate-to-low protein content (Grauer 2015). Radiographs and ultrasonography have indicated struvite uroliths and bladder wall thickening, suggesting cystitis, which can have various causes, although many cases in cats are idiopathic (Sparkes 2018).

The exact cause of the disease was undetermined; however, diet-related urolith formation leading to cystitis was suspected. Nutritional analysis of the dry food revealed that it contained 30% crude protein, 9% fat, 4% fibre, 10% ash, 1% calcium, 0.8% phosphorus, and less than 10% water, meeting the AAFCO requirements for growing and reproductive-phase cats (AAFCO 2015). However, these levels may be too high for mature sterilised adult cats. Adult cats need lower levels of crude protein, calcium, and phosphorus, suggesting that the diet is overly nutrient-rich. Reduced drinking frequency likely exacerbated this issue by decreasing hydration and promoting mineral overload, leading to urolith formation.

Dietary management aims to dissolve struvite with a low-magnesium and urine-acidifying diet, effectively managing struvite urolithiasis (Caney 2023). Urinary Care Wet feed was selected to ensure sufficient water intake, and the owner was encouraged to use a syringe to increase urine volume, dilute urinary crystals, and reduce the risk of new urolith formation (Julianta *et al.* 2022). Supportive treatment with CYSTAID Plus® enhanced bladder regeneration, reduced inflammation, and maintained a protective mucosal layer. After 14 days, significant improvement was noted, with the cat no longer showing signs of haematuria or periuria. Owners were advised to switch to adult-specific feed for appropriate nutrients to minimise future diet-related conditions.

■ CONCLUSION

Dietary management is crucial for animal health, emphasising the need to tailor nutrition to the specific life stages of pets. An imbalance, excess, or deficiency can lead to health issues, underscoring the importance of appropriate dietary choices to maintain optimal health.

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Author Contributions

The manuscript was written through contributions of all authors. All authors have given approval to the final version of the manuscript. ‡These authors contributed equally.

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