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# Study on various affections of lower urinary tract in dogs

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**Abstract**
A total of 55 cases were selected with the different affections of lower urinary tract from year September-2017 to July-2019. The age and sex wise distribution of different disorders of lower urinary tract revealed the age of dogs ranged from one and half year to eighteen years. The age and sex wise distribution of different disorders of lower urinary tract revealed the age of dogs ranged from one and half year to eighteen years. Urolithiasis (52.73 %, n=29) was higher in 7 to 9 years aged dogs (18.18 %), in male dogs (38.18 *Vs.* 14.55 %). The dogs having non-urolithiasis conditions (n=26, 47.27 %), comprised percent cystitis (n=17), mass in bladder (n=8) (30.91 and 15.54, respectively) and a case of lodged catheter in bladder. The incidence of cystitis and mass in bladder were higher in the age of up to 3 (14.54 %) and 7 to 9 years (9.10 %), respectively. The male dogs were found to be suffering more from cystitis (25.45 %) and mass in bladder (36.36 %) than female dogs (5.45 % and 9.09%, each affection). Labrador and Pug dogs had higher urolithiasis and cystitis up to 14.54 and 7.23 %, each, respectively, whereas German Shepherd had a mass in bladder up to 5.45 %. The dogs given commercial food had higher (31.03 %) urolithiasis. The morbidity period of 24 to 48 hours was observed in dogs having urolithiasis (41.38 %) and cystitis (52.94 %) whereas for dogs having mass in the bladder (52.50 %) had the morbidity lasting for more than a week. The most pronounced clinical signs in dogs having urolithiasis and cystitis were distended bladder in 48.28 % (14) and 70.59 % (12), respectively, whereas haematuria in all cases of mass in bladder. A dog with a lodged catheter in bladder was morbid for more than 72 hrs with a dribbling of urine.

**Keywords:** Urolithiasis, cystitis, mass, incidence, diet, duration, symptoms, dog

## Introduction
Urolithiasis is a very common condition of dogs and almost all breeds are affected. Male dogs are more affected than females. Obstructive urolithiasis of lower urinary tract is the most common condition affecting the urethra in dogs. Lodging of the calculi are most often encountered in the groove of the os penis and just behind the level of the os penis [9]. UTI is one of the most common canine infections and among the most common indications for antimicrobial therapy. 10% of all canine patients attended by Veterinarians for any reason have UTI [25]. Signs of bladder infection include frequent urination, painful or difficult urination, and urinating in inappropriate places. There may also be blood in the urine. This may be more noticeable at the end of the urine stream. Occasionally, dogs with a bladder infection may show no signs at all. Other surgical affections of urinary system in dogs include transitional cell carcinoma (TCC) of urinary bladder, which contributes only 0.50-1.00 percent of all canine cancers [1]. On screening through the available literature, it was found that the work done so far on detailed reporting towards age, sex, breeds, duration and clinical symptoms exhibited by animals due to lower urinary tract affections is very less. Hence forth present study presents a various incidence of affections of lower urinary tract in dogs.

## Materials and Methods
The present study was undertaken in 55 dogs presented at the Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Anand Agricultural University, Anand from September 2017 to July 2019 with affections of lower urinary tract. Complete history of all the cases were recorded and detailed information were collected and per cent incidence of affections in relation to age, sex, breeds, diet given, duration of illness, and clinical symptoms were carried out.

**Results and Discussion**

The age and sex wise distribution of different disorders of lower urinary tract revealed the age of dogs ranged from one and half year to eighteen years. The age wise distribution of different affections of lower urinary tract were higher in age group of 7-9 year (30.91 %) followed by age group 13-15 years (20.00 %), age group 10-12 years (14.54 %), age group 0-3 years (12.73 %), lowest in age groups 4-6 and 16-18 years (10.91 %, each). The incidence was higher in male dogs (76.36 %) than in female dogs (23.64 %**)** (Fig. 1). The breed wise distribution was found higher incidence was in Labrador (25.45 %) followed by Pug (23.64 %) followed by German shepherd (14.54 %), equally in Doberman and Pomeranian (9.09%), Non-descript (5.45%), Cocker Spaniel (3.63 %) and Rottweiler, Himalayan Mastiff, Sitzu, Lhasa Apso and Saint Bernard (1.82 %, each) (Fig. 2).

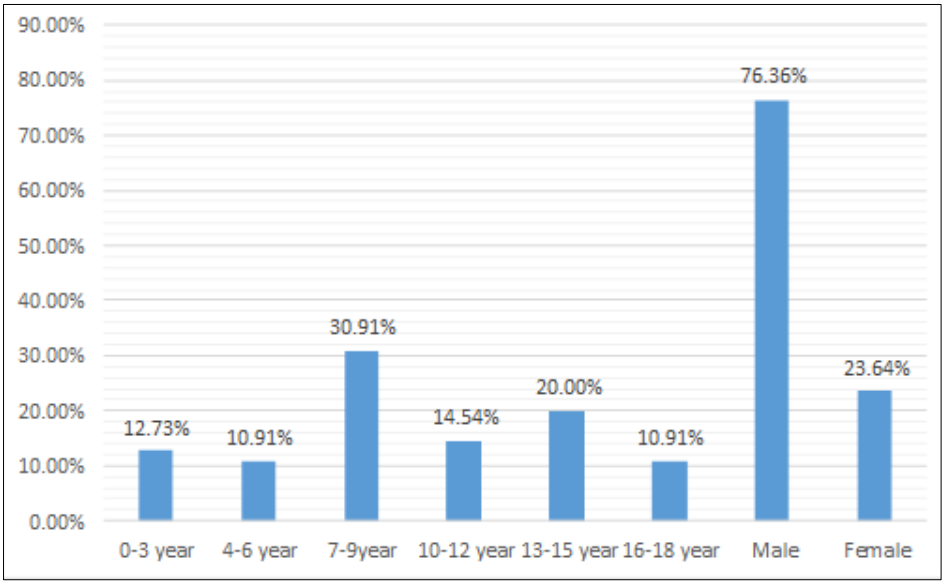


**Fig 1:** Age and sex wise distribution of different disorders of lower urinary tract from September-2017 to July- 2019

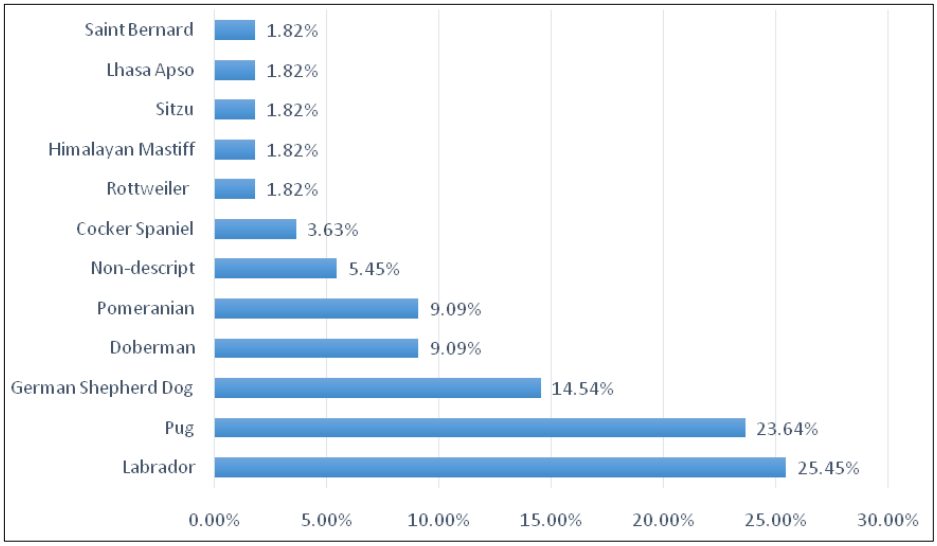


**Fig 2:** Breed wise distribution of different disorders of lower urinary tract from September-2017 to July-2019

Out of 55 cases studied for lower urinary affections, 52.73 per cent cases (29) were recorded for urolithiasis. Among them, the age wise per cent incidence of urolithiasis was higher in 7-9 year age group (18.18) followed by 4-6 years (12.72), 0-3 year (10.9), 10-12 year (9.09) and lower in 16-18 year (1.81) were recorded Incidence of urolithiasis was higher in male dogs (38.18) than female dogs (14.55) (Table 1). The breed wise distribution, highest (14.54 %) cases of urolithiasis was recorded in Labrador and Pug breeds, each, followed by Pomeranian (9.09 %), German shepherd, Doberman, Non-descript (3.63 %, each) and the lowest (1.81 %, each) in Himalayan Mastiff and Lhasa Apso while only in one case of lodged catheter in urinary bladder was found in male Saint Bernard (1.81 %) dog of one and half year age (Table 2). Similar findings to the present findings were reported [12, 21] while the higher incidence also reported in male dogs of 7 to 10 years of age group [10]. The urolith formation was also associated with increasing age [7]. The findings of Singh *et al*. (2005) [20] are in agreement to present findings regarding age and sex but they reported the higher incidence of urolithiasis in Spitz followed by Doberman in comparison to findings of the present study whereas higher incidence in male dogs between 4 to 8 years age also reported [and also stated that urolithiasis is common in Labrador Retrievers, German shepherd and Pomeranians breeds of dogs [19]. The case of lodged catheter in urinary bladder reported in six year male Spitz dog [16] while retained catheter in urethra of eleven year old male Spitz dog [6].

Out of 55 cases studied for lower urinary affections, 25 cases (45.45 %) cases were having conditions other than urolithiasis comprising cystitis and mass in urinary bladder. The age wise per cent incidence of cystitis and mass in urinary bladder were recorded to the tune of (30.91 and 15.54, respectively). The incidence of cystitis was higher in 0-3 year age group (14.54 %), followed by 7-9 year (12.73 %) and 4-6 year (3.64 %) age groups. The cases of mass in urinary bladder were recorded to be higher in age group of 7-9 year (9.10 %) than the age group of 4-6 year (5.45 %). The male dogs were found to be suffering more (25.45 %) from cystitis than female dogs (5.45 %). The per cent incidence of neoplasia in urinary bladder was higher in male (36.36) than female (9.09) dogs (Fig. 3).The highest cases of cystitis were recorded in Labrador and Pug breeds (7.23 %, each) followed by German shepherd (5.45 %), Doberman (3.63 %), followed by Non- Descript, Rottweiler, Sitzu and Cocker Spaniel (1.81%, each) dogs. Breed wise per cent incidence of mass in urinary bladder was the highest in German shepherd (5.45) followed by Labrador (3.63), Pug, Doberman and Cocker Spaniel (1.81, each) recorded (Fig. 4). Cystitis reported more common in older female dogs [22]. Comparatively higher incidence was reported in German Shepherd (27.78 %)

**Table 1:** Age and sex wise distribution (per cent) of surgical affections of lower urinary tract from September-2017 to July-2019

| Sr. No. | Conditions | Age | Male | Female | Total | Per cent |
|---|---|---|---|---|---|---|
| 1 | Urolithiasis | 0-3 | 4 | 2 | 6 | 10.91 |
| 2 | | 4-6 | 4 | 3 | 7 | 12.72 |
| 3 | | 7-9 | 7 | 3 | 10 | 18.18 |
| 4 | | 10-12 | 5 | 0 | 5 | 9.09 |
| 5 | | 13-15 | 0 | 0 | 0 | 0.00 |
| 6 | | 16-18 | 1 | 0 | 1 | 1.81 |
| | Total | | 21 | 8 | 29 | 52.73 |
| | Per cent | | 38.18 | 14.54 | | |
| 7 | Lodged Catheter | 0-3 | 1 | 0 | 1 | 1.81 |
| Total of Both Conditions | | | 22 | 8 | 30 | 54.55 |

**Table 2:** Breed wise distribution (per cent) of surgical affections of lower urinary tract from September-2017 to July-2019

| Sr. No. | Condition | Breed | Male | Female | Total | Per cent |
|---|---|---|---|---|---|---|
| 1 | Urolithiasis | Labrador | 6 | 2 | 8 | 14.54 |
| 2 | | Pug | 4 | 4 | 8 | 14.54 |
| 3 | | Pomeranian | 5 | 0 | 5 | 9.09 |
| 4 | | German Shepherd Dog | 2 | 0 | 2 | 3.63 |
| 5 | | Doberman | 1 | 1 | 2 | 3.63 |
| 6 | | Non-descript | 2 | 0 | 2 | 3.63 |
| 7 | | Himalayan Mastiff | 1 | 0 | 1 | 1.81 |
| 8 | | Lhasa Apso | 0 | 1 | 1 | 1.81 |
| Total | | | 21 | 8 | 29 | |
| Per cent | | | 38.18 | 14.55 | 52.73 | |
| 1 | Lodged Catheter | Saint Bernard | 1 | 0 | 1 | 1.81 |
| | Total of Group | | 22 | 8 | 30 | 54.55 |

and Doberman (5.55 %) [3] whereas higher rate of tumours of the bladder were reported in dogs (17.69 %) with older age in both sexes [17].

A total of 29 cases of urolithiasis in dogs were analysed with respect to the diet given. The per cent incidence of urolithiasis was found to be the highest in the dogs given diet comprising commercially available market food (31.03), followed by the dogs given vegetarian di*et al*one and mixed diet of vegetarian with commercial food (24.14, each) and in dogs fed with vegetarian and non-vegetarian mixed diet (20.69) (Fig. 5)**.** Pandurangrao (2017) [13] reported comparable results to the present findings. However, higher incidence was reported in dogs fed mixed diet of vegetarian and non-vegetarian diet [21] and also reported in dogs fed with homemade diet combined with commercial food [10]. Commercially available canned foods with the high amount of protein, fat, calcium, phosphorus, magnesium, sodium, potassium, chloride or moisture are associated with a decreased risk of urolith formation and also the canned diets with the highest amount of carbohydrate associated with an increased risk of urolith formation [7].

The duration of the illness in dogs covered under the present study was recorded/assessed based on the history and clinical signs. The duration wise per cent incidence of illness due to urolithiasis was found to be the highest (41.38) for the duration lasting for 24 to 48 hours, followed by morbidity hours of more than 72 hours (31.03), more than a week (27.58), one month (13.79) and less than 24 hours (10.34) recorded. A case of a dog with urethral tumour was presented with a complaint of dribbling of the urine due to lodged catheter since more than 72 hours (Table 3). Maximum cases of urinary tract obstructions falling in to category of 48 to 72 hours of illness were also reported [13]. The lodged catheter reported in urinary bladder in six year Spitz dog since ten days [16] and retained catheter in urethra of eleven year old intact male Spitz since three years [6]. While in the dogs having cystitis, the duration wise incidence of illness was observed to be the highest (52.94 %) for the duration lasting for 24-48 hours, followed by morbidity hours of more than 72 hours (35.29 %), less than 24 hours and more than a week (11.76 %, each) whereas in cases of dogs having mass in the urinary bladder, the duration of illness was recorded to be the highest (52.50 %) for more than a week, for 24-48 hours, more than 72 hours and one month (12.50 %, each) (Table 4). Urinary tract infection reported in six year aged male dog since

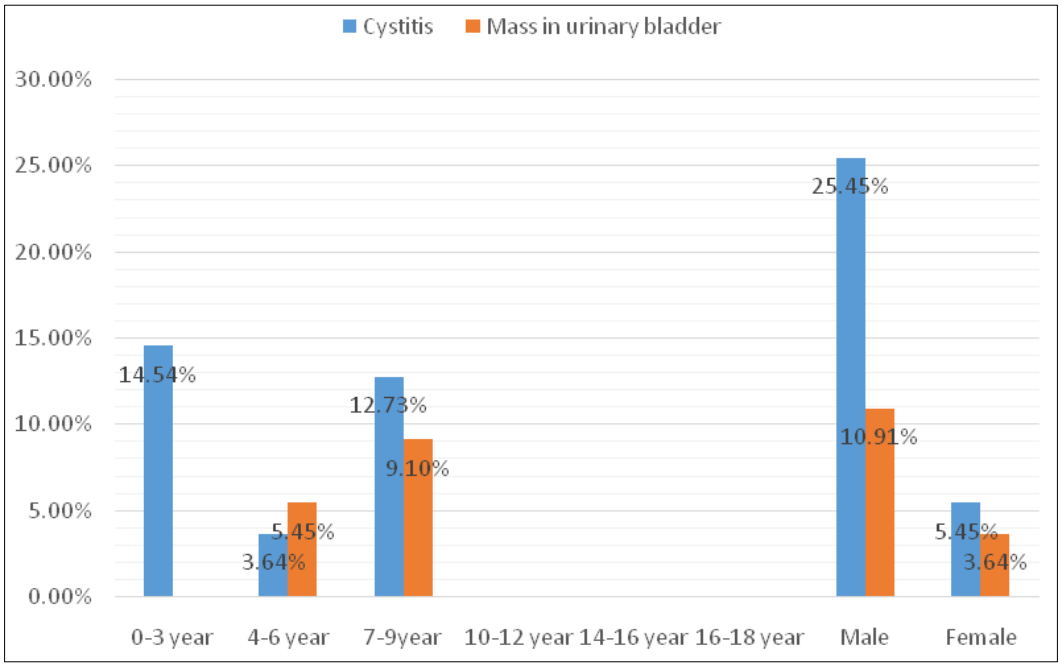


**Fig 3:** Age and sex wise distribution of non-urolith conditions of lower urinary tract from September-2017 to July- 2019

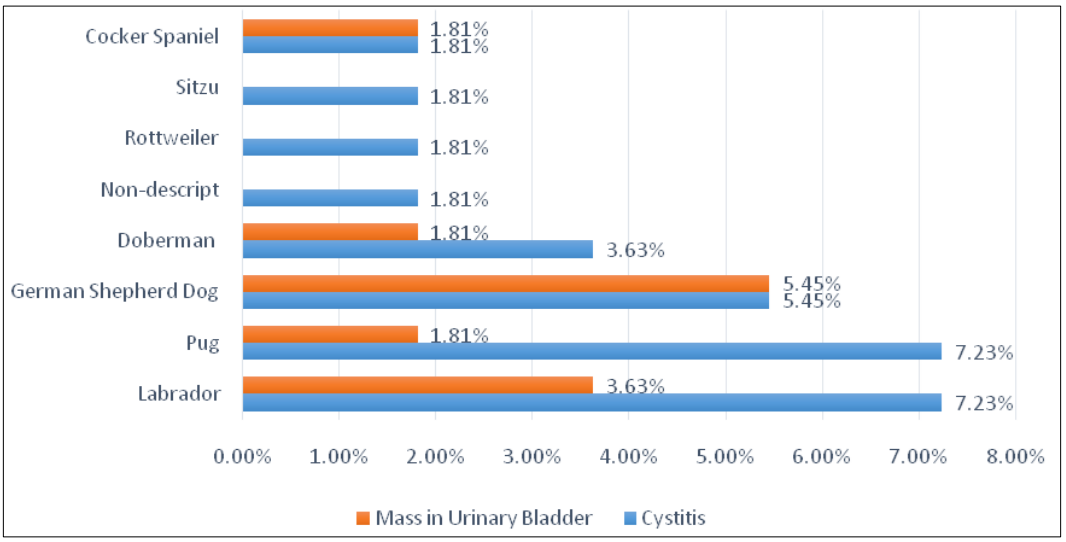


**Fig 4:** Breed wise distribution (per cent) of non urolith conditions of lower urinary tract from September- 2017 to July-2019

two weeks [24]. In the present study duration of neoplasia of urinary bladder was highest at more than a week whereas two weeks duration for mass in urinary bladder was reported [2] while primary malignant lymphoma of the urinary bladder since five months in dogs [4].

The dogs covered under the study were categorised based on their clinical symptoms. Among the total of 29 dogs studied for urolithiasis, the highest recorded clinical symptoms was distended bladder in 48.28 (14) per cent dogs, followed by dullness (37.93 %, 11), straining (34.48 %, 10), haematuria, anorexia and dribbling of urine (27.58 %, 8 each), and depression (13.79 %, 4). The present findings are supported by the observations reported by Maden *et al.* (2016) [8] and Reddy (2017) [14]. However, in contrary to the present findings distension of bladder in Doberman and haematuria in seven year old Lhasa Apso female had urolithiasis [23] were absent. In the present study a case of lodged catheter in urinary bladder having symptoms of haematuria, straining and distended bladder was recorded. Symptoms of dullness, depression and dehydration reported in similar cases [16] while anorexia, stranguria and dysuria with signs of intermittent urine retention for several days in eleven year old intact male Spitz having retained catheter in urethra [6]. Among the total 17 cases of cystitis in dogs, the symptoms of distended bladder was noticed in 12 cases (70.59 %), being the highest, followed by haematuria in ten cases (58.82 %), anorexia in seven cases (41.18 %), straining in five cases (29.41 %), dullness in four cases (23.53 %), dribbling of urine in three cases (17.64 %), depression and chronic cystitis in one case each (5.88 %). No comparable reports could be located on the same line for symptoms of distended bladder, However, supportable findings to the present findings were reported [3, 25]. Among the dogs having mass in urinary bladder, the per cent incidence of haematuria was recorded to be the highest in all cases (100.00), dullness in four cases (50.00), anorexia in three cases (37.50), distended bladder in two cases and straining in two cases (25.00) and dribbling of urine in one case (12.50) out of eight cases. The present findings are supported by the observations reported by Konwar *et al.* (2017) [5] and Saharan *et al.* (2019) [18]. However, in contrary

to the present findings, intermittent haematuria reported in nine year old Bernese Mountain dog had metastasis of transitional cell carcinoma of urinary bladder [15]. Other recorded symptoms in the present study are in agreement with findings of Nandini *et al*. (2016) [11] and Shaharan *et al*. (2019) [18].

## Conclusions

The age and sex wise distribution of different disorders of lower urinary tract revealed the age of dogs ranged from one and half year to eighteen years. The age wise different affections of lower urinary tract were higher in age group of 7-9 year, in male and Labradr.

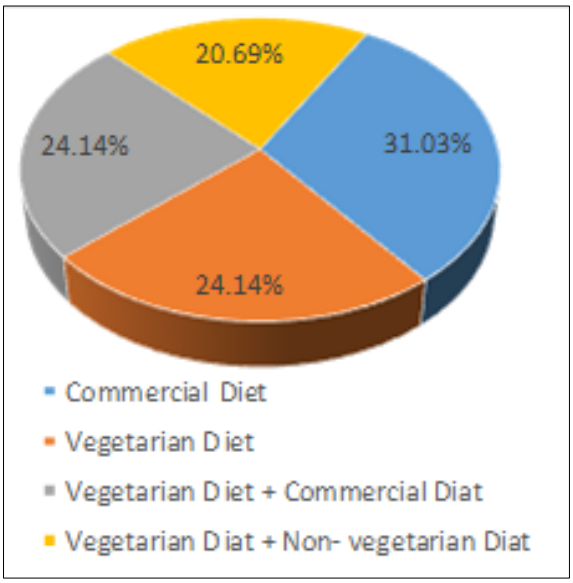


**Fig 5:** Diet wise incidence (per cent) of urolithiasis in dogs

**Table 3:** Duration wise incidence (per cent) of urolithiasis and lodged catheter in dogs

| Affections | <24 hrs. | 24-48 hrs. | >72 hrs. | > a week | One Months | Total |
|---|---|---|---|---|---|---|
| Urolithiasis | 10.34 (3) | 41.38 (12) | 31.03 (9) | 27.58 (8) | 13.79 (4) | 100.00 (29) |
| Lodged Catheter | | | 100.00 (1) | | | 100.00 (1) |
| Figures in the parenthesis indicate number of animals. | | | | | | |

**Table 4:** Duration wise incidence (per cent) of cystitis and mass in urinary bladder

| Affections | <24 hrs. | 24-48 hrs. | >72 hrs. | > a week | One Months | Total |
|---|---|---|---|---|---|---|
| Cystitis | 11.76 (2) | 52.94 (9) | 35.29 (6) | 11.76 (2) | - | 100.00 (17) |
| Mass in Bladder | - | 12.50 (1) | 12.50 (1) | 52.50 (5) | 12.50 (1) | 100.00 (8) |
| Figures in the parenthesis indicate number of animals. | | | | | | |

Urolithiasis was higher in 7-9 year age group, in male dogs and in Labrador and Pug breeds while only one case of lodged catheter in bladder was found in Saint Bernard. The cystitis was higher in 0-3 year age group, in male dogs and in Labrador and Pug breeds whereas mass in urinary bladder were higher in age group of 7-9 year, in male and German shepherd. The urolithiasis was higher in the dogs given commercially available market food. The duration wise incidence of urolithiasis and cystitis was highest lasting for 24 to 48 hours whereas in cases of dogs having masses in the bladder, the duration of illness was more than a week. In urolithiasis and cystitis, the highest recorded clinical symptom was distended bladder whereas haematuria in all cases with mass in urinary bladder ladder in dogs.

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