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ULTRASONOGRAPHIC ASPECTS IN URETEROHYDRONEPHROSIS IN DOGS

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Abstract

Ureterohydronephrosis is characterised by progressive dilatation and urine accumulation inside the renal basinet and/or ureters. A number of 40 dogs were evaluated, from different breeds with different ages by physical, imagistic and laboratory (hematologic and biochemical) examination. The aim of this study was the evaluation of ultrasonographic aspects and blood changes in ureterohydronephrosis in dogs. Physical examination revealed abdominal distension (23/40), pain sensibility (31/40) and uremic syndrome signs (21/40), Laboratory investigations revealed hemoconcentration (18/40), hypochrome anemia (13/40) and leucocytosis (12/40). Ultrasonographic, different degrees of basinet and ureters dilatation were noticed accompanied by renal structural changes.

Key words: *dogs, ultrasonography, ureterohydronephrosis.*

INTRODUCTION

Ureterohydronephrosis is characterized by a nephropathy with reduced incidence in dogs, caused by progressive dilatation by urine accumulation in renal basinet level and/or ureters. This aspect is the result of urinary ways obstruction and is accompanied by atrophic changes of compressive type in renal parenchyma level. (Codreanu M.D. 2010)
Ureterohydronephrosis presents clinical aspects of different intensities produced by varied causes and some metabolic correlations depending on renal lesion.
Usually, hydronephrosis appears unilateral and remains without a clinical response because of function overtaking by the other kidney (M. Codreanu, 2008). Bilateral hydronephrosis appears rare, usually secondary to lesion in trigon, prostate or urethral level (Christie, B.A. Bjorling, 1993).

MATERIALS AND METHODS

This study was carried out inside the clinic of Faculty of Veterinary Medicine Bucharest on a number of 40 dogs with ages between 6 to 15 years suspected for ureterohydronephrosis, which were examined clinically, ultrasonographic, hematologic and biochemical, suspicioned of ureterohydronephrosis.
Clinical examined was carried out through general methods according to instruction from specialty materials (Vlăgioiu, 2007). In hematologic examination, red cellular series were investigated (direct erythrocyte constants, derived erythrocyte constants) as well as leucocyte series by quantity (number) and quality (percentage). In biochemical examination, the following parameters were examined: urea, creatinine, albumin, globulin and total protein.
Imagistic, ultrasonographic investigations were carried out, appreciating abdominal distension degree as well as renal lesions as a result of ureterohydronephrosis.

RESULTS AND DISCUSSIONS

Clinical examination revealed abdominal distension of different degrees, uremic syndrome (inapetence, vomiting, hypothermia and neurodepresive syndrome) and pain sensibility in profound palpation in renal level. Abdominal distension was present in 23 of 40 dogs (57.5%), uremic syndrome in 21 of 40 dogs (52.5%) and pain sensibility in 31 of 40 dogs (77.5%)
Hematologic examination revealed leuocytosis aspects (increase in white cells number) in 12 out of 40 dogs (30%), hemoconcentration and hemoglobin level increase in 18 out of 40 dogs

(45%) and hypochrome anemia (decrease of corpuscular hemoglobin concentration) in 13 out of 40 dogs (32.5%).

In biochemical examination, increased values of serum urea were noted as follows: between 45 and 95 mg/dl in 22 out of 40 dogs (55%), 95-160 mg/dl in 12 out of 40 dogs (30%) and over 160 mg/gl in 6 out of 40 dogs (15%). Increase in serum creatinine level was noted in 17 out of 40 dogs (42.5%) with values between 2 and 3 mg/dl, 16 out of 40 dogs (40%) with values between 3 and 6 mg/dl and values over 6 mg/dl in 7 out of 40 dogs (17.5%).

Decrease in serum albumin was severe in 15 out of 40 dogs (37.5%) and moderate in 21 out of 40 dogs (52.5%).

Abdominal echography has revealed ureterohydronephrosis aspects which affected one kidney (unilateral) in 35 out of 40 dogs (87.5%) or both kidneys (bilateral) in 5 out of 40 dogs (12.5%)

From renal lesion degrees point of view, the following were determined:

- ureterohydronephrosis of first degree (Fig. 1), in 5 out of 40 dogs (12.5%), by dilatation of basinet, ureter and calices. Caliceal structure was appreciated as normal.

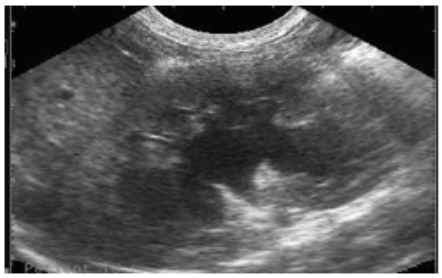

Figure 3. ureterohydronephrosis third degree

- ureterohydronephrosis of second degree (Fig. 2), in 12 out of 40 dogs (30%) characterized by basinet, ureter and renal calices dilatation.
- ureterohydronephrosis of third degree (Fig. 3) in 11 out of 40 dogs (27.5%), with basinet, ureter dilatation and caliceal cup reverse (excentric convexity)
- ureterohydronephrosis of fourth degree (Fig. 4) in 10 out of 40 dogs (25%) with obvious basinet, ureter and calices dilatation with reduction of parenchyma index.
- ureterohydronephrosis of fifth degree (Fig. 5) in 2 out of 40 dogs (5%), with extreme dilatation of urinary ways and lack of renal parenchyma.

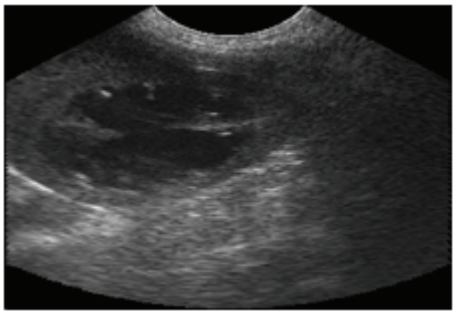

Figure 1. ureterohydronephrosis first degree

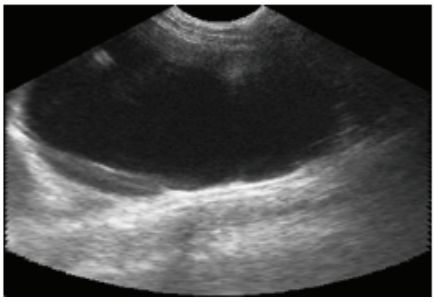

Figure 4. ureterohydronephrosis fourth degree

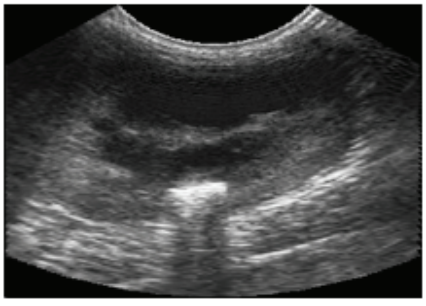

Figure 2. ureterohydronephrosis second degree

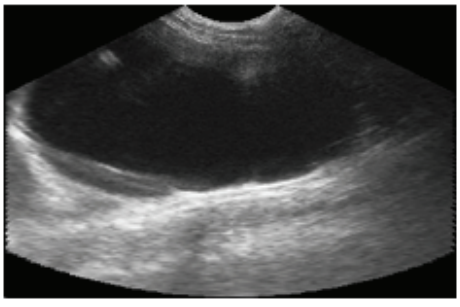

Figure 5. ureterohydronephrosis fifth degree

Analysis of obtained data evidences abdominal pain presence, of different intensities, in ureterohydronephrosis, being the main sign in this lesion type, fact related in previous studies (Ettinger, 1989; Stone, 1990; Osborne et al, 1995; Abd-El-Roofy, 2005).Hematologic changes registered in this study, represented by hemoconcentration and hypochrome anemia are similar with results obtained by Rousset et al. (2011).Abd-El-Roofy (2005) didn't meet red cellular series changes in his study.Regarding biochemical examination, our results showed increase in serum urea and creatinine levels, changes noted by other autors as well (Abd-El-Roofy, 2005; Mehmet et al., 2005). Serum albumin has registered low values, our results being similar to those recorded by other authors (Nelson and Cottfo, 1992; Dan woo and Chang, 2001; Abd-El-Roofy, 2005).

Causes that lead to ureterohydronephrosis, in dogs evaluated in this study, were connected to urethral obstructions in most cases, fact known in specialty literature (Osborne and Finco, 1995; Mehmet et al., 2005). Other than these causes, in ureterohydronephrosis pathogenesis, adherences after ovariohysterectomy can be included (Dragu I., 2012).

Age of animals included in this study varied from 6 to 15 years with an average of 10.4 years. Still, a large number of cases were registered in 7 and 13 years old dogs. Our results demonstrate that this affection was encountered in adult and respectively old animals. Unlike these results, previous studies have identified ureterohydronephrosis in much younger animals, 6 months (Mehmet et al., 2005), respectively 9 months (Rousset et al., 2011), being considered as consequences of embrio development disorders.

CONCLUSIONS

1. From clinical examination of 40 dogs with ureterohydronephrosis, abdominal distension of different degrees, pain sensibility in profound palpation in renal level as well as specific signs for uremic syndrome (inapetence, comiting, hypothermia and neurodepresive syndrome).

2. Hematologic, changes in red cellular series were encountered, translated by hemoconcentration, hypochrome anemia, and in white cellular series, leucocytosis.

3. Biochemical analysis registered increased values in serum urea and creatinine levels and decrease of serum albumin, specific in renal functional failure.

4. Ultrasonographic, basinet, ureters and calices dilatation of different degrees ending with renal parenchyma disappearance.

5. Anamnestic information correlated with clinical and paraclinical (ultrasonography, hematology and biochemistry) in a number of 40 dogs suspicioned with ureterohydronephrosis, represent an optimum protocol in diagnosis of urinary system pathology.

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