# URETEROENTEROSTOMY IN THE DOG AND THE RESPONSE OF THE HEMATOLOGICAL PARAMETERS AFTER SURGERY

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***Abstract***
*Monitoring the blood parameters in dogs undergoing ureteroenterostomy surgery reveal major changes in their values. Two weeks after surgery, creatinine, hemoglobin and total protein levels are within normal limits in case 1 and 2. In exchange, urea remains high compared to normal values even two weeks after the surgery.*

***Keywords:*** *uretero-enterostomy, dog, urea, creatinin, total protein.*

## INTRODUCTION

Preoperative assessment of renal function in dogs undergoing surgery for ureteroenterostomy and post-op assessment through the ability to eliminate urine through the intestine, permeability of the ureteral in the anastomosis to the intestine, absorption of urinary components in the gut with consequent increases in blood levels was performed by monitoring the parameters: urea, creatinin, hemoglobin and total protein.

## MATERIALS AND METHOD

Three clinically healthy dogs respective three females aged 1.2 (case 1), 1.5 (case 2) and 6 years (case 3) underwent surgery for ureteroneterostomy. The animals were subjected to a diet food (not fluid) for 12 hours before surgery. Since the ureteroenterostomy operation has functional consequences on the urinary organs, we collected blood and urine to assess the integrity of the urinary function, based on laboratory tests (Eberhard, 1998; Capatana et al., 1994).
We determined the blood concentrations of urea, creatinin, hemoglobin and total proteins. Of the urine samples were determined: density, pH, proteinuria. We examined the urinary sediment (both organized and unorganized) as well as the macroscopic aspect.
Before the operation we determined bleeding and clotting times.

## RESULTS AND DISCUSSIONS

Before ureteroenterostomy operation, in the case of the three animals on which the experiment was performed, we used the assessment of the kidney function through blood parameters determined by laboratory examination in order to evaluate the condition of the urinary tract (Gherghariu et al., 2000).

Table 1. Normal values of blood parameters monitored

| Blood | Urea mg/dl | Creatinin – mg/dl | Hemoglobin – g/dl | Total protein – g/dl |
|---|---|---|---|---|
| Normal values | 20 - 50 | 0,5 – 1,6 | 12 - 18 | 5,5 – 7,5 |

Table.2. Preoperative values of blood parameters in case 1

| Blood | Urea – mg/dl | Creatinin mg/dl | Hemoglobin – g/dl | Total protein – g/l |
|---|---|---|---|---|
| 5.03.2002 | 39,2 | 1,44 | 19 | 6,6 |

In case 1 (table 1.), the values obtained were compared with normal blood values and the following results were found: urea, creatinine and total protein fall within physiological limits, hemoglobin is slightly low (above the maximum physiological value of 1g/dl).

Table.3. Preoperative blood parameters values in case 2

| Blood | Urea – mg/dl | Creatinin mg/dl | Hemoglobin – g/dl | Total protein – g/l |
|---|---|---|---|---|
| 13.03.2002 | 13,7 | 0,59 | 17,1 | 6,6 |

In case 2 (table 2.), preoperative urea is low, with 6.3 mg / dl compared to the lower limit, and creatinine, hemoglobin, total proteins fall within the normal range.

Blood parameter values in case 3, preoperatively, are as follows: urea is within normal limits, creatinine slightly increased, slightly decreased hemoglobin, total proteins slightly decreased.

Postoperative laboratory examinations were performed to assess the ability to eliminate urine out through the intestine, the permeability of the ureteral anastomoss to the intestine and possible absorption of urinary components in the gut with consequent increases in blood levels.

Table 4. Evolution of blood parameters, in case 1 postoperative

| Nr. | Blood parameters | | Surgery day 5.03. | 6.03 | 8.03 | 10.03 | 19.03 |
|---|---|---|---|---|---|---|---|
| 1 | Urea | mg/dl | 39,2 | 112,3 | 210,5 | 153,3 | 97 |
| 2 | Creatinin | mg/dl | 1,44 | 1,22 | 1,58 | 1,41 | 1.28 |
| 3 | Hemoglobin | g/dl | 19 | 16,4 | 16,6 | 16,5 | 16,3 |
| 4 | Total protein | g/dl | 6,6 | 6,8 | 7,0 | 7,2 | 7,1 |

Table 5. Evolution of blood parameters, postoperatively in case 2

| Nr. | Blood parameters | | Surgery day 13.03. | 14.03 | 16.03 | 18.03 | 27.03 |
|---|---|---|---|---|---|---|---|
| 1 | Urea | mg/dl | 13,7 | 125,5 | 212,7 | 193,2 | 75,5 |
| 2 | Creatinin | mg/dl | 0,59 | 1,24 | 1,60 | 1,57 | 1,15 |
| 3 | Hemoglobin | g/dl | 17,1 | 15,3 | 16,8 | 16,5 | 13,2 |
| 4 | Total protein | g/dl | 6,6 | 6,7 | 8,0 | 6,8 | 5,94 |

Table 6. Evolution of blood parameters after surgery in case 3

| Nr. | Blood parameters | | Surgery day 12.03. | 13.03. | 15.03. | 17.03. | 26.03. |
|---|---|---|---|---|---|---|---|
| 1 | Urea | mg/dl | 24,5 | 161,8 | 317,5 | - | - |
| 2 | Creatinin | mg/dl | 1,7 | 1,68 | 3,01 | - | - |
| 3 | Hemoglobin | g/dl | 11,2 | 13,3 | 16,7 | - | - |
| 4 | Total protein | g/dl | 5,3 | 7,9 | 9,8 | - | - |

Before the ureteroenterostomy operation, the blood urea falls within physiological limits, slightly decreased in case 2. Following surgery, blood urea increased to very high values compared to the physiological limits,

reaching a maximum value about three days after surgery, and then begins to decrease, reaching two weeks after surgery almost to the upper limit, but still at increased values compared to normal (table 4,5,6). In the 6 years old dog, the general condition worsened progressively, so that on the third day after surgery the animal produced hypothermia (36.2), clonic contractions of the head muscles with pronounced trismus, neck muscle myoclonus, all these symptoms are correlated with blood urea values of 317.5 / which is a huge value compared to the normal (table 6.)(Jubb et al., 1985). On the fourth day after surgery, the animal died. Correlated with other determinations, creatinine and total proteins, this increase in the urea was due on the one hand to the disturbance of urinary flow in the anastomosis and on the other hand to the absorption of urinary components in the gut, of course to little extent.

In all three animals subjected to ureteroenterostomy surgery, creatinine increased postoperative, reaching a maximum on day 3, very close to the upper limit in the first case (table 4), at the upper limit in case 2 (table 5) and slightly above in case 3 (table 6). Monitoring the postoperative creatinine values, they are found to be within the normal range, respective a good renal tolerance of the renal parenchin of the surgery on the lower urinary tract (Gherghariu et al., 2000).

In all three cases which were evaluated postoperative, hemoglobin decreased slightly after surgery due to intraoperative bleeding, but returned rapidly to values falling within physiological limits.

Postoperatively, it is interesting to see the increase in the values, which exceeded the upper limit in cases 2 and 3, but gradually return to normal after the $4^{th}$ day after surgery.

## CONCLUSIONS

After ureteroenterostomy surgery in dogs, monitoring the blood parameters reveals four major changes of values.

Two weeks after surgery, creatinine, hemoglobin and total protein are within normal limits in case 1 and 2.

Urea remains high compared to normal values even two weeks after the surgery.

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