Surgical Management of Uroabdomen in a Dog

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Uroabdomen is a relatively common condition in canine practice. An eight year male Spitz dog weighing about 10 kgs was presented with the history of anorexia, lethargy and anuria. Abdominocentesis and peripheral blood was collected for analysis. Abdominal fluid and peripheral blood creatinine concentrations were 5.8 mg/dL and 1.8 mg/dL, respectively. Potassium concentration of abdominal fluid and peripheral blood were 12.6 mmol/L and 7.2 mmol/L, respectively. Since the animal was active and stable it was successfully managed by performing immediate surgery and postoperative fluid therapy. Upon Coeliotomy urinary bladder was exteriorized and urinary bladder wall rupture was noticed at caudoventral wall. Calculi were noticed in the urinary bladder and removed. Bladder rupture was closed with double layer of inversion sutures (Cushing followed by Lambert) using polydioxonone No.3-0 suture material. Abdominal cavity was thoroughly lavaged with warm normal saline. The dog recovered uneventfully.

Keywords: Uroabdomen, Creatinine, Potassium, Abdominocentesis

Uroabdomen is presence of urine within the peritoneal cavity. This condition is relatively common in canine medicine, and frequently observed in dogs as a result of blunt abdominal trauma due to motor vehicle accidents, leading to rupture of the urinary bladder or ureters (Rieser, 2005). Uroabdomen can also be observed following obstructive urolithiasis, traumatic bladder expression or catheterization, transitional cell carcinoma, or postoperative leakage following cystotomy procedures (Gannon and Moses, 2002). Early clinical signs of uroabdomen may be nonspecific. As disease progresses acute onset of severe lethargy, anorexia, vomition and restlessness are the signs. Radiography, ultrasonography and abdominal fluid evaluation are the main criteria for diagnosis. Acute management involves stabilization of the patient with IV fluid therapy. Once the patient is stable for anesthesia, surgical repair, if indicated, can be performed (Waldron, 2003). The present paper reports a case of uroabdomen in a Spitz dog due to obstructive urolithiasis and its surgical correction.

Case History and Observations

An eight year male Spitz dog weighing about 10 kgs was presented to the Department of Surgery and Radiology with the history of anorexia, lethargy and anuria for two days followed by dribbling of urine for a day. Abdominal distension (Fig. 1) and dehydration were observed during physical examination. Animal was hypothermic. Tachycardia and weak peripheral pulse were evident on clinical examination. Based on the history, the case was tentatively diagnosed as obstructive urolithiasis. Lateral abdominal survey radiograph revealed no radiodense calculi in bladder and urethra, and more importantly urinary bladder wall was not evident on radiograph and glassy abdomen revealed presence of abdominal fluid. Abdominocentesis and peripheral blood was collected for analysis. Abdominocentesis yielded a clear, yellow, odorless fluid. Abdominal fluid potassium (mmol/L) and creatinine concentrations (mg/dL) were recorded. Abdominal fluid and peripheral blood creatinine concentrations were 5.8 mg/dL and 1.8 mg/dL, respectively. Potassium concentration of abdominal fluid and peripheral blood were 12.6 mmol/L and 7.2, mmol/L, respectively. Based on the History, physical examination findings and laboratory results the case was diagnosed as uroabdomen. Since the animal was active and stable, decision was made to manage the condition surgically.

Treatment

Animal was premedicated with Diazepam 0.5 mg/Kg, BW, I/V. Ventral abdomen was clipped and prepared for
aseptic surgery. Urethral catheterization was performed. Animal was connected with intravenous fluids (0.9% saline). General anesthesia was induced and maintained with Isoflurane and Oxygen mixture. Coeliotomy was performed via caudal midline incision and abdominal fluid was rushed out (Fig. 2). Urinary bladder was exteriorized and examined for wall perforations. Bladder wall rupture was noticed at caudoventral wall of the urinary bladder (Fig. 3). Calculi were noticed in the urinary bladder and same were removed. Bladder rupture was closed with double layer of inversion sutures (Cushing followed by Lambert) using polydioxonone No.3-0 suture material. Abdominal cavity was thoroughly lavaged with warm normal saline. Abdominal incision was closed with standard suture pattern. Postoperatively dog was administered with ampicillin–cloxacillin 10 mg/kg, BW, IV, twice daily for five days and meloxicam 0.2 mg/kg, IM, for three days. 0.9% saline was administered for five days to correct electrolyte imbalance. Skin sutures were removed on 10th post operative day. Animal recovered uneventfully.

Discussion

In the present case, the cause for uroabdomen was prolonged lower urinary tract obstruction. Clinically, animals with uroperitoneum may be presented with hemodynamic collapse. They can be having metabolic acidosis, chemical peritonitis, profound azotemia, hyperkalemia, hypernatremia, and hyperphosphatemia, it is accordance to Jennifer and Joseph (2013). Presence of an osmotically active particle, creatinine, results in the movement of water into the peritoneal cavity at the expense of the intracellular and intravascular fluid. This result in significant volume depletion and hemodynamic compromise. The dehydration that occurs further exacerbates abnormalities by decreasing the glomerular filtration rate, and thus the excretion of urea and creatinine also mentioned by Brown (2011). In the
In the present case, creatinine was noticed in the peritoneal fluid which could be the cause of dehydration. Calculi were not evident on survey radiograph but noticed following coeliotomy. Reason for this could, the calculi might be radiolucent. Definitive diagnosis of uroabdomen is based upon paired (abdominal fluid and blood) potassium and creatinine concentrations. A ratio of the creatinine concentration in the effusion to serum creatinine above 2:1 is diagnostic for uroperitoneum in dogs. A ratio of the potassium concentration in the effusion to serum potassium above 1.4:1 is diagnostic for a uroperitoneum as also reported by Schmidt et al. (2001). Similarly, in the present case, paired creatinine ratio was > 2:1 and paired potassium ratio was more than 1.4:1 which confirmed the condition as uroperitoneum. Uroperitoneum is a medical emergency. Initial treatment should be aims to stabilize the patient, correct any electrolyte and acid–base abnormalities, and provide fluid volume replacement with 0.9% or 0.45% saline with 5% dextrose it is in agreement to Fossum (2009). In our study, the patient was stable and active so immediate surgical correction was undertaken along with the fluid therapy.

References