

A Clinical Case: Bladder Rupture Associated With Massive Fecal Impaction (Fecaloma) in Caspian Miniature Horse

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Abstract: An 8-years old male Caspian miniature horse was referred to the Veterinary Teaching Hospital of the University of the Islamic Azad University, Science and Research Branch due to depression, anorexia, sub acute abdominal pain, restless, intermittent pawing on the ground and anuria. Abdominocentesis demonstrated a high peritoneal creatinine: serum creatinine ratio. The ratio of the creatinine in the peritoneal fluid to the creatinine in the serum is 72 mg/dl and 8.1 mg/dl and in the abdominal fluid 152 mg/dl and 41 mg/dl. Despite aggressive treatment the horse showed a poor response to treatment with dullness and inappetence. Therefore we decided perform to surgical therapy but on the lowing day the horse died. At necropsy we observed massively distended rectum and small colon filled the pelvic cavity. This produced bladder outlet obstruction, followed by massive dilatation and rupture of the urinary bladder. Also we remove about 15 liters of yellowish, bad smelling fluid, obviously urine and rupture of urinary bladder and sever peritonitis was diagnosed. In fact, some cases die before surgery, probably from cardiac arrest partially due to elevated potassium levels. Surgery consists in the closure of the urine bladder and the washing of the abdominal cavity. When diagnosed quick, in general, the prognosis is favorable: about 80-90% patients survive.

Key words: Bladder rupture, Uroperitoneum, Fecaloma, Caspian miniature, horse.

Case Presentation:

An 8-years old 320-kg male Caspian miniature horse was referred to the Veterinary Teaching Hospital of the Islamic Azad University, Science and Research Branch with sign of depression, anorexia, sub acute abdominal pain, restless, intermittent pawing on the ground and anuria. On admission, a general physical examination revealed tachycardia. The stallion pulse rate was 84 and weak and respiration rate was 76 and shallow. Her capillary refill time had increased from two to four seconds. Gastrointestinal borborygmi were reduced in all quadrants and fluid wave felt on ballottement of the abdomen.

Analysis of serum electrolytes in these cases generally shows lower sodium and chloride value than normal and a higher potassium value. We also usually find elevated serum creatinine levels. These abnormalities result from the concentration of these substances found in the urine of a stallion, the amount of urine that accumulates in the abdomen, and the ability or inability of the abdomen to reabsorb these substances. Abdominocentesis was obtained using an 8" canine urinary catheter following surgical preparation and local anesthesia. Evaluations of the peritoneal fluid and the blood were performed for concentrations of sodium, potassium, phosphorus and creatinine. The peritoneal fluid was examined for color, specific gravity, clarity and total protein concentration. The ratio of the creatinine in the peritoneal fluid to the creatinine in the serum is 72 mg/dl and 8.1 mg/dl and in the abdominal fluid 152 mg/dl and 41 mg/dl. Blood work show decreased sodium (128 Mmol/ L) and chloride (92 Mmol/ L) levels and an elevated potassium (4.7 Mmol/ L).

The horse was medicated with antibiotics, liquid paraffin for 5 days. Fluid therapy was also given depending upon degree of dehydration. Also urine was removed from the bladder with the catheter 2 times daily. On the seventh day, despite aggressive treatment the horse showed a poor response to treatment with dullness and inappetence. Therefore we decided perform to to surgical therapy but on the lowing day the horse died. The only remarkable finding was a dilated abdomen. At necropsy we observed massively distended rectum and small colon filled the pelvic cavity. This produced bladder outlet obstruction, followed by massive dilatation and rupture of the urinary bladder. Also we remove about 15 liters of yellowish, bad smelling fluid, obviously urine and rupture of urinary bladder and sever peritonitis was diagnosed.

Discussion:

To the authors' knowledge, this is the first report of bladder rupture in a Caspian miniature horse. The Caspian horse is an ancient breed previously believed to have been extinct for over 1,000 years. This breed is

probably the most direct ancestor of the Oriental breeds and subsequently of all light horse breeds. The Caspian miniature horse was re-founded in the northern part of Iran around the Caspian Sea in 1969 (Firouz, 1969). The conformation of the Caspian horse is similar to that of the horse (*Equus caballus*), and apart from the height, there are only a few minor anatomical differences between this animal and *E. caballus* (Firouz, 1971). The overall impression of the Caspian miniature horse is that of a very small, well-proportioned horse. The Caspian head is short and fine with large eyes, a small muzzle, and large nostrils. The legs are slim with dense, strong bone, and no feathering at the fetlock. The color ranges from bay, gray, or chestnut and occasionally black. The Caspian horse is gentle, intelligent, and very willing to work, thus making it very well suited as a riding horse for children (Hatami-Monazah and Pandit, 1979). Subsequent studies confirmed the visual picture osteologically and proved that the Caspian is a miniature horse, not a pony (Hendricks, 1995; Mason, 1996). Bladder rupture is a tear or leaks in the urinary bladder that result in uroperitoneum. Uroperitoneum, the accumulation of urine in the peritoneal cavity, can also result from disruption of other parts of the urinary tract. Ruptured urinary bladder is the most common bladder disorders in neonatal foals. The incidence is between 0.2 to 1%. On occasions, bladder rupture may occur in adult horse.

The exact pathophysiology uroperitoneum is not fully understood. It was once thought that high pressure exerted on a full bladder during parturition was the main causes (Bain, 1954; Du Plessis, 1958; Whitwell, 1980; Hackett, 1984). Other proposed that a full bladder and obstruction due to a partial umbilical cord torsion may be a cause of rupture during parturition (Whitwell, 1980; Hackett, 1984). Clinical signs of straining to urinate and a distended abdomen will be suggestive of urine in the peritoneal cavity, or uroperitoneum, but several diagnostic tests will aid in a positive diagnosis of a ruptured bladder. Usually there is also an elevated blood creatinine if the horse is dehydrated. Ultrasound of the abdomen will reveal the presence of a large amount of fluid. Visualization of the bladder with the ultrasound may be difficult because it is small. Your veterinarian may take a small sample of the abdominal fluid with a needle and analyze it for creatinine. If the creatinine in the abdomen is higher than the creatinine in the blood it is a confirmed ruptured bladder. Confirmation of a suspected case requires laboratory data, diagnostic imaging techniques, and ancillary tests. Abdominocentesis with peritoneal to serum creatinine ratio is an easy and accurate test to perform (Du Plessis, 1958; Behr *et al.*, 1981). The serum urea nitrogen in mature horses was elevated in this study in less than a day remained high throughout the experiment. Peritoneal urea nitrogen : serum urea nitrogen ratios are thought to be useful in diagnosis of ruptured bladders (Richardson and Kohn, 1983). Hematology and peritoneal fluid examination was compatible with the development of an acute peritonitis associated with urine contamination. A ruptured bladder leading to uroperitoneum is a medical emergency rather than a surgical emergency, although once the animal is stabilized, surgery will be needed to repair the ruptured bladder. The assistance of a veterinarian to properly diagnose the condition and begin treatment is essential.



Fig. 1: Diffuse proliferative peritonitis over the intestinal surfaces.



Fig. 2: The apex of the bladder was discolored, and the edges of the rupture.

Initial treatment for a ruptured bladder consists in correcting fluid and electrolyte balances as soon as condition is discovered. Since hyperkalemia is a life-threatening condition, fluids containing potassium should not be administered. In most cases a 0.9% chloride sodium is used to correct the fluid and electrolyte imbalances. Before surgery to correct the ruptured bladder, the urine that has accumulated in the abdomen should be slowly drained. Prognosis is closely associated with concurrent illness, especially septicemia. Uncomplicated uroperitoneum from the defect in the bladder has a good prognosis (Whitwell, 1980; Richardson and Kohn, 1983; ADAMS *et al.*, 1988; Kablack *et al.*, 2000). If the location of the lesion is other than the bladder, the prognosis is historically not as favorable. Richardson and Kohn reported only 1 of 10 survivors with lesions found in the urachus or ureters (Richardson and Kohn, 1983). This may have been due to concurrent septicemia, which was not factored into risk factors for survival in that study. Foals with septicemia have a much poorer prognosis. Adams and Koterba reported a 50% long-term survival rate in 18 foals on their study. Seven of the nine survivors had bacterial or fungal infections (F.W. Oheme, 1974; Edwards 3rd *et al.*, 1995).

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