



Serum-Peritoneal Creatinine Ratio in the Diagnosis of Uroperitoneum in A Gir Bull

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Abstract

A 6-year-old Gir bull was referred to the Veterinary Clinical Complex, Veterinary College and Research Institute Orathanadu, Thanjavur with a history of anuria and anorectic for the past 5 days. Clinical examination revealed a distended abdomen with fluid thrill, shrunken eyeball, and pale conjunctival mucus membrane. On rectal examination, slightly distended urinary bladder and no feces in the rectum. Trans-rectal ultrasonographic examination revealed a thickened urinary bladder and around the bladder anechoic fluid content was noticed. On trans-abdominal ultrasonographic examination anechoic fluid and floating of the abdominal viscera. Serum biochemistry revealed elevated BUN (40 mg/dl) and creatinine (2.6 mg/dl) were noticed. Similarly, in peritoneal fluid also increased BUN (112 mg/dl) and creatinine (15 mg/dl) were observed. The peritoneal-serum creatinine ratio was greater than 5, which indicates the presence of urine in the peritoneum. Based on the ultrasound and serum-peritoneal creatinine ratio the present case was diagnosed as uroperitoneum in a Gir bull.

Keywords: Abdominocentesis, Anuria, Cattle, Serum-Peritoneal Creatinine Ratio, Uroabdomen.

Introduction

Urinary bladder rupture (cystorrhexis) is common in working bullocks (Floek, 2009; Saravanan *et al.*, 2017). Cystorrhexis occurs due to urethral obstruction by urolith in male animals. Delay in treatment of urethral obstruction may result in rupture (Tharwat and EL-Deeb, 2015). In recent days abdominal ultrasound has become an effectual supporting imaging tool for large animal practice. By abdominal ultrasound examination, the presence of fluid in the abdomen and its nature can be assessed very easily, and also USG guided centesis is very useful for sample collection for further confirmation. Abdominocentesis in cattle is considered to be an important procedure to differentiate various abdominal affections. Comparing the serum and peritoneal fluid indices could facilitate confirmatory diagnosis, especially in the suspected cases of bladder rupture (Braun *et al.*, 2006). Similarly, in the present case also diagnosed as uroperitoneum by estimation of serum-peritoneal creatinine ratio in a Gir cattle.

Case Presentation and Observations

A 6-year-old Gir bull was referred to the Veterinary Clinical Complex, Veterinary College and Research Institute Orathanadu, Thanjavur with a history of abdominal distention, anuria and anorectic for the past 5 days. Clinical examination revealed distention (Fig 1) of the abdomen as looks like as water belly and fluid thrill was noticed on both sides of the abdomen.



Fig 1: Bilaterally distended abdomen due to bladder rupture

Physical examination revealed a shrunken eyeball, pale conjunctival mucus membrane, and other vital parameters were normal. On rectal examination, a slightly distended urinary bladder and no feces in the rectum, and also fluid thrill were observed. Ultrasonographic examination was performed in a standing position without any sedation by using esoate my lab one vet® with trans-rectal linear (8-10 MHZ) and convex probe (2.5-5 MHZ). Trans-rectal ultrasonographic examination revealed a thickened bladder (6.3mm) and a small amount of anechoic viscid urine without any echo shadows were noticed (Fig 2). On trans-abdominal ultrasonographic examination, anechoic fluid was noticed up to the level of mid-third of the abdomen, and floating of the abdominal viscera and shreds was noticed (Fig 3) within the peritoneal fluid with mixed echogenicity.

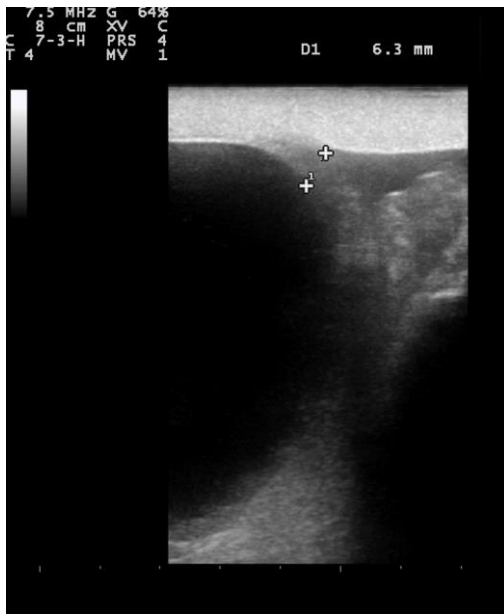


Fig 2: Trans-rectal USG: Thickened bladder wall (6.3mm) with a small amount of anechoic fluid without any echo shadow



Fig 3: Trans abdominal USG: Mixed echogenic fluid observed in the abdomen

By abdominocentesis collected peritoneal fluid was transudate in nature and peritoneal fluid was free flowing. Blood samples were collected for hematobiochemical analysis. Hematology revealed 9.5 g/dl Hb, 31% PCV, 4.5million/cmm RBCs, 6200 cells/cmm WBCs and differential count of 42% neutrophils, 52% lymphocytes, 3% eosinophils, and 3 % monocytes were recorded. On serum biochemical analysis 40 mg/dl BUN, 2.6 mg/dl Creatinine, 7.1 g/dl total protein, and 3.5 g/dl albumin were noticed. Peritoneal fluid analysis revealed few numbers of neutrophils in cytology and biochemical analysis of the fluid showed 112 mg/dl BUN, 15 mg/dl Creatinine, 2.8 g/dl total protein, and 2.2 g/dl albumin. The serum-peritoneal creatinine ratio was 5.76. The increased serum-peritoneal creatinine ratio (> 5) indicates urine in the peritoneum further which was supportive evidence of the presence of fluid in the abdomen by USG. Based on the ultrasound and peritoneal-serum creatinine ratio the present case was diagnosed as uroperitoneum in a Gir bull due to cystorexhisis.

Discussion

Urolithiasis, urethral obstruction, and bladder injury were more common in working bullocks, which may further cause cystorrhexis if the case has not been addressed earlier (Floeck, 2009; Saravanan *et al.*, 2017). The clinical signs recorded in the present case were correlated with Braun *et al.* (2006); and Tharwat and EL-Deeb (2015). In a consequence of bladder rupture, accumulation of the urine in the peritoneal cavity which leads to changes in osmotic pressure and the hypertonic nature of urine causes movement of extracellular fluid into the peritoneal cavity and leads to dehydration, water belly, ruminal stasis, and reduced fecal output followed by empty rectum (Schott, 2004). Ultrasonographic examination of the abdomen has a pivotal role in the diagnosis of various abdominal disorders in cattle (Abdelaal *et al.*, 2016), in the present case also USG facilitates to assessment of the presence of fluid within the peritoneum and helps to differentiate other abdominal affection. In the present cases peritoneal fluid creatinine level was higher than that of serum creatinine has confirmed the bladder rupture. Previous authors Radostits *et al.* (2007) and Saravanan *et al.* (2017) also suggested that a two to five times serum-peritoneal creatinine ratio was confirmative for bladder rupture.

Conclusion

Based on these findings authors concluded that the estimation of serum-peritoneal creatinine ratio has diagnostic value in the suspected case of bladder rupture in cattle.

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Contribution by Authors

Equal contribution. All authors declared that ‘written informed’ consent was obtained from the approved parties for the publication of this article and accompanying images.

Conflict of Interests

There is no conflict of interest.

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