

# Increased Potassium in Peritoneal Effusion

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## In the Literature

Oz JB, Aroch I, Segev G. Increased ratio of peritoneal effusion-to-serum potassium concentration in a dog with gastric perforation. *J Vet Emerg Crit Care (San Antonio)*. 2016;26(6):793-797.

## FROM THE PAGE ...

With abdominal effusion, a combination of fluid analysis and cytology often helps narrow the differential list. This case report describes a patient for which atypical diagnosis was made relative to information obtained from fluid analysis.

A 6-year-old male crossbreed dog underwent femoral fracture repair after being hit by a car. All other presenting data were normal. Four days postoperatively, the patient was weak and painful on abdominal palpation. CBC and serum chemistry analysis revealed neutrophilia with toxic changes, hypoglycemia, and hyperbilirubinemia, with normal serum creatinine and potassium. Urinalysis showed urine specific gravity of 1.045 with bacteriuria and pyuria. Abdominal ultrasonography revealed a moderate volume of effusion. Fluid cytology of the effusion revealed degenerative neutrophils; intracellular bacteria were not seen. Paired effusion-to-serum glucose, however, showed a difference of 22 mg/dL (with serum higher), which was supportive of septic (vs nonseptic) peritonitis. Fluid bilirubin was equal to peripheral blood, which helped rule out bile peritonitis. Effusion to serum creatinine ratio was found to be mildly increased (1.36), whereas the effusion to serum potassium ratio was found to be markedly elevated (>2.67). Collective findings were suggestive of a septic uroabdomen.

Abdominal radiography revealed free abdominal gas; contrast cystourethrogram did not reveal urinary tract leakage. Abdominal exploratory confirmed an intact urinary tract but revealed gastric perforation as the cause for septic peritonitis. The relatively high potassium concentration of gastric secretions (10-20 mmol/L in dogs) may be the cause for an increased effusion to serum ratio. Postoperatively, the dog progressed to anuric renal failure and was euthanized.

## ... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** When abdominal effusion is discovered, abdominocentesis should be performed to help determine underlying cause.
- 2** Consider the following analyses of abdominal fluid (values specific to dogs):
  - ▶ Packed cell volume if suspect hemorrhage (>5%)
  - ▶ Fluid cytology and smear evaluation
  - ▶ Nucleated cell count and total protein to classify effusion (transudate, modified transudate, or exudate)
  - ▶ Paired effusion-to-serum bilirubin levels if concern for biliary rupture (effusion > serum)
  - ▶ Paired effusion-to-serum glucose and lactate levels if concern for septic peritonitis (glucose difference >20 mg/dL, lactate difference >2 mmol/L)
  - ▶ Paired effusion-to-serum creatinine and potassium if concern for uroabdomen (creatinine ratio >2, potassium ratio >1.4)
- 3** Consider gastric perforation if effusion-to-serum potassium ratio is increased, particularly if the concurrent effusion-to-serum creatinine ratio is <2.