

SIGNALMENT:

Bailee, 3 year old Staffordshire Terrier (FS), weight 21kg, # 8675309

HISTORY:

Bailee was referred to the Ontario Veterinary Hospital for evaluation of possible septic peritonitis. She had undergone an exploratory laparotomy and multiple enterotomies six days previous to remove a linear foreign body from the jejunum. Prior to that, she had a two week history of intermittent vomiting and diarrhea.

INITIAL PHYSICAL EXAM:

Upon presentation, Bailee appeared very depressed. She was pyrexia (39.7C), a little tachycardic (120bpm), respiratory rate 40, with very injected and tacky mucous membranes. Dorsal pedal pulses palpable, but non-invasive BP measurements revealed hypotension (115/53, MAP 69). Dehydration was estimated at 10%. A grade II/VI systolic heart murmur was noted. Lung sounds were normal. Her abdomen was distended and a fluid wave was palpable. Serosanguinous fluid was seen dripping from the abdominal incision site. EKG revealed a normal sinus rhythm.

INITIAL INTERVENTIONS:

I placed two cephalic, 18G 2" IV catheters. A 2L bolus of P-148 was initiated and given over the next hour. A 300 ml bolus of Pentastarch was given as an initial intervention for the hypotension. Antibiotics were started (enrofloxacin 5mg/kg). I drew the entry blood for our ICU's quick assessment tests, in addition to a CBC. An abdominal tap was performed by the veterinarian. It revealed many degenerative neutrophils and both intracellular and extracellular bacteria (rods and cocci). An immediate exploratory laparotomy was planned.

LAB RESULTS:

Laboratory tests revealed an elevated PCV (55%) and moderate hypoproteinemia (TS 4.6/L). Considering her hypovolemic state, her true PCV/TS were assumed to be considerably lower. Glucose was low normal at 3.7mmol/L. Her blood urea nitrogen stick (Azostix) was elevated at 30-40mg/dl. Electrolytes showed a hyponatremia (129mmol/L) and a decreased chloride (100mmol/L), potassium was normal. Blood gases revealed a metabolic acidosis with little or no respiratory compensation (pH 7.330, PaCO₂ 36.4, HCO₃ 18.1, ABE -5.6). Her activated clotting time (ACT) was prolonged at 135 seconds. I placed a urinary catheter and Bailee was taken to surgery.

SURGICAL INTERVENTION:

The exploratory laparotomy revealed a large volume of serosanguinous fluid with particulate matter. All three previous enterotomy sites had dehisced. A markedly inflamed and edematous pancreas was seen. Cultures and tissue samples were

taken. Two enterotomy sites were debrided and repaired. Eight inches of jejunum around the last enterotomy site was dissected and an anastomosis performed. The abdomen was lavaged with large amounts of sterile saline, but due to the severity of the septic peritonitis, the abdomen was left open to facilitate drainage and a sterile abdominal bandage was applied.

PATIENT MANAGEMENT CONCERNS:

- Hypotension; due to decreased oncotic pressure secondary to protein loss into the abdomen, and/or hypovolemia due to third spacing into the abdomen, and/or vasodilation related to sepsis (visible by Bailee's already injected mucous membranes)
- Pain management; involving both the post-operative requirements and the potential for severe pain from the concurrent pancreatitis
- Decreased renal perfusion; an issue due to the potential for hypotension and hypovolemia (if MAP is <60, then renal perfusion can be compromised)
- DIC (Disseminated Intravascular Coagulation), a concern in any severe trauma or disease state due to the large inflammatory response, and Bailee's elevated ACT
- Rapid correction of the hyponatremia: if the Na is increased faster than 0.5mEq/hr, there is danger of neurological signs secondary to the loss of cellular equilibrium in the brain. Na moves quickly into the cells and water moves too quickly out, the cell shrinks resulting in possible lethargy, seizures, and coma
- Adequate nursing care; due to the recumbent nature of the patient and the known potential for extreme fluid loss in the abdomen, watching for seepage from the abdominal bandage, and closely monitoring this patient's ins and outs is vital

IMMEDIATE POST-OPERATIVE INTERVENTIONS:

A nasal cannula was placed by the ICU nurse and oxygen was delivered at 2L/min, as during surgery Bailee's oxygenation was poor. The first of two FFP transfusions over the next 8 hours was started (following standard test dose protocol and monitoring for reaction). Her post-operative PCV was 32%, with a TS of 3.0g/L. Bailee was very hypotensive (52/35, MAP 40). A dopamine CRI was started at an inotropic dose of 5ug/kg/min, this was eventually increased to 10ug/kg/min, needed to maintain her Map over 60.

Over the next 8 hours, urine production was poor, just reaching 1ml/kg/hr with sp. G 1.040-1.050. Crystalloid therapy remained P-148, at 3-4 times maintenance rates. Several 150ml boluses were given to increase urine production and to keep up her blood pressure. A 20ml/hr CRI of Pentastarch was also maintained. In addition to the FFP, this was given to try and maintain her oncotic pressure and keep fluids in the intravascular space.

Oxymorphone IV (0.05mg/kg) was given frequently for pain management. Temperature, heart rate and respiration were monitored constantly, all remained elevated. Continuous EKG showed a normal sinus rhythm. Her post-operative ACT was significantly greater (>4 min.). Bailee continued to have a metabolic acidosis. Her electrolytes were slowly improving and by 12 hours post presentation, her sodium was 134mmol/L.

Her bandage was monitored for signs of seepage, which would make a bandage change necessary. If the outer layers of the bandage get wet, they can 'wick' bacteria into the open abdomen. Clindamycin (10mg/kg) was added to her antibiotic regime.

FURTHER INTERVENTIONS:

Into the second day, Bailee became more stable. Blood pressure improved (MAP 100), and the dopamine CRI was slowly weaned off. Urine production improved to normal limits. The metabolic acidosis had resolved. The fluids were changed to 0.9% NaCl with 20 mEq/L KCl to further improve her slight hyponatremia. Fluids remained at four times maintenance rates, but potassium administration did not exceed 0.5mEq/kg/hr. Arterial blood gases showed good oxygenation, and the oxygen administration was decreased to 1L/min.

Her ACT had increased slightly (140 sec). The veterinarian decided she should receive two additional FFP transfusions through the day, to treat increasing ACT and the growing concern of DIC. Heparin therapy was also initiated to prevent possible DIC. Her total solids were maintained from around 3.2 to 3.4g/L. A human albumen transfusion was started, but after a few hours of administration, Bailee developed significant facial swelling. I stopped the transfusion, notified the veterinarian, and she was treated with diphenhydramine IV (2mg/kg). The swelling subsequently improved. Her PCV decreased by 8%, and a packed RBC transfusion was given. The PCV subsequently increased to 24%.

I assisted with the placement of a double lumen jugular catheter (MILA). Partial parenteral nutrition was then initiated. Due to the pancreatitis and the state of her GI tract, it would be a while before Bailee would be able to have any oral nutrition. Oxymorphone continued to be administered as needed (q4hr), and bandage changes occurred almost every 8 hours. She continued to lose copious amounts of fluid into her abdomen.

All vitals continued to be monitored frequently (she was at risk for fluid overload and subsequent pulmonary edema, due to the hypoproteinemia and high fluid rate). All remained within normal limits. Fluid ins and outs were closely monitored and appeared balanced. Recumbent patient care was initiated. The patient was moved from right to left lateral recumbency to decrease the risk of lung atelectasis and peripheral edema. Physiotherapy was initiated. All catheters were checked and maintained to reduce the risk of infection.

CONTINUED CARE: Over the next 3-6 days, Bailee continued to improve. On the third day she went back to surgery for a laparotomy and lavage and on the sixth day this was repeated and the abdomen closed. Post-operative blood pressures remained

stable. She continued to receive a number of FFP transfusions during this time to keep up with the protein losses and because of her pancreatitis. Vital stats remained within normal limits. Laboratory values remained stable, including the ACT, which was within normal limits on the fifth day. Urine production was good and her fluid rate was decreased slowly. Bailee's attitude and demeanor were improving rapidly.

By the sixth day, blood work revealed normal pancreatic values and that evening she was started on oral food. Small amounts of an intestinal formulation (very easily digestible) were offered and accepted readily. Once her oral intake met her caloric requirements, the PPN was discontinued. The urinary catheter was pulled. She developed frequent episodes of diarrhea, but this was attributed to a number of factors; gastrointestinal irritation and motility problems secondary to the resolving septic abdomen and the reintroduction of solid food. This slowly improved. Bailee was discharged home 11 days after presentation to the unit.