A 3 year old male neutered Cockapoo was presented to the Royal (Dick) School of Veterinary Studies Internal Medicine service for investigation of progressive anorexia, haemorrhagic diarrhoea and tenesmus over the proceeding three weeks. Prior to this he had a long history of intermittent dietary sensitivities and scavenging. He had also lost about 20% of his body weight in the last six months. He had been vaccinated, but had missed his most recent booster by 4-6 weeks due to him being unwell.
The dog had a poor body condition (3/9) with poor muscling. He weighed 7.8kg and had previously been 11kg. He was dull and much less interactive. The mucous membranes were tacky, capillary refill time was prolonged at 3 seconds and there was a positive skin tent. The cardiovascular examination was unremarkable (HR: 144 bpm, no murmur, regular. Pulses reasonable quality. RR: 24 bpm, normal thoracic auscultation). There was mild generalised discomfort on abdominal palpation, and faecal staining around anus with fresh blood. The rectal temperature was 38.9°C.

1) **What are your differential diagnoses for the chronic haemorrhagic diarrhoea, weight loss and anorexia in this dog?**

The fresh blood and tenesmus indicate large bowel disease

- Chronic enteropathy- food responsive, antibiotic responsive or inflammatory bowel disease.
- Neoplasia- gastrointestinal lymphoma, adenocarcinoma.
- Infection- *Giardia, Salmonella, Campylobacter, Enteropathic E.coli*. Parvovirus would be less likely due to the chronic nature of the disease, as with other parasites. *Clostridium perfringens* has been indicated as a possible cause of acute haemorrhagic syndrome, but these signs are too chronic to be consistent with this disease process.
- Systemic bleeding disorder- unlikely.

The weight loss indicates small intestinal disease, malabsorption or a cachexia due to a systemic disease

- Exocrine pancreatic insufficiency
- Inflammatory bowel disease
- Neoplasia
The abdominal pain could be due to gastrointestinal disease (inflammation and distension of bowel loops) but could also be secondary to other processes

- Pancreatitis
- Peritonitis
- Neoplasia
- Foreign body
- Hypoadrenocorticism

should also be a consideration for chronic gastrointestinal signs and gastrointestinal haemorrhage, though melena would be more likely than haematochezia.

2) What supportive treatment is this dog likely to require?

This dog needed intravenous fluid therapy to correct his dehydration. Electrolytes and acid base status were assessed prior to this to also see if additional corrections were required.

The anorexia was complete and for a protracted time so a naso-oesophageal feeding tube was placed to provide nutrition and once he was more stable an oesophageal feeding tube was placed to allow more specific feeding requirements. For a period during hospitalisation we also provided parenteral nutrition due to falling protein levels (see below).

Analgesia was started for the abdominal pain. No evidence of peritonitis was identified with an A-FAST (Abdominal Focused Assessment with Sonography in Trauma).

3) What diagnostic evaluations would you perform in this dog?

1. Haematology, Serum biochemistry and Coagulation times
2. Basal cortisol
3. Abdominal radiographs – looking for obstruction/foreign body/free gas
4. Abdominal ultrasound
5. Parvo snap test
6. cPLI snap test
7. Faecal parasitology including Giardia ELISA and faecal culture.
8. Clostridium perfringens toxin test
9. TLI, cobalamin and folate serum

RESULTS

1. Haematology, marked neutrophil toxic changes and left shift, otherwise measurements within normal limits
   Coagulation times unremarkable
   Serum biochemistry below:
2. Basal cortisol – excluded hypoadrenocorticism
3. Abdominal radiographs – no obstruction/foreign body/free gas
4. Abdominal ultrasound - Hyperechoic liver and several hypoechoic lesions (8mm) in the spleen. The jejunal lymph nodes were enlarged, with two of them containing gas. The colic LN was also prominent (5.6mm). The duodenum was corrugated. The jejunum had a thickened wall (3.7mm) with local evidence of moderate steatitis. The large intestine had a thickened wall (up to 4mm).
5. Parvo snap test - negative
6. cPLI snap test - negative
7. Faecal parasitology including Giardia ELISA and faecal culture - negative
8. Clostridium perfringens toxin test - negative
9. TLI, cobalamin and folate serum - TLI <1 (ref 6.1-35ug/l), folate 6.2 (ref 8.2-13.5ug/l), cobalamin 251 (ref >275ug/L)

4) What diagnosis has been made from these results so far? Does it explain everything?

Hypoalbuminaemia and hypocalbaminaemia consistent with malabsorption and protein losing enteropathy.

Exocrine Pancreatic Insufficiency due to reduced TLI. This would explain the prolonged weight loss and history of scavenging, but would not typically result in haemorrhagic diarrhoea and the structural changes seen with ultrasound so there may another concurrent disease process.

5) How do you interpret the ultrasound findings?

Hyperechoic liver differentials would include hepatitis, infectious or inflammatory, vacuolar change and infiltrative neoplasia.

The hypoechoic lesions in the spleen could be benign nodules (extramedullary haemaopoeisis or hyperplasia) or neoplasia.
The jejunal lymph nodes were enlarged, with two of them containing gas which is rarely seen in lymph nodes and would be most indicative of reduced intestinal barrier function and haematogenous movement of gas or spread of a gas-producing bacterium. Less likely these changes could be due to neoplasia, e.g. lymphoma.

The other intestinal changes could be due to an inflammatory, infectious or neoplastic process.

6) **How would you proceed for further investigations and treatment?**

Pancreatic enzyme replacement and cobalamin were provided. This dog had fine needle aspirates taken of the spleen, liver and abnormal lymph nodes. No evidence of neoplasia was identified and no infectious agents were seen, but a reactive process/inflammation was present in the liver and lymph nodes.

Broad spectrum intravenous antibiotics were started due to the indication for possible infection and development of sepsis.

Gastrointestinal endoscopy was performed and pinch biopsies were taken as the risks of complication from surgical biopsies were perceived to be high. This showed marked ulcerative colitis with several bleeding erosions. The biopsies were also very fibrous indicating chronicity. There was also inflammation throughout the gastrointestinal tract.

Since the colon was very thickened and the main abnormality that was identified with ultrasound and endoscopy, biopsy samples were also submitted for fluorescent in situ hybridization (FISH) to assess for *E. coli*-associated ulcerative colitis.

This dog improved minimally with the addition of enrofloxacin for the treatment of *E.Coli* ulcerative colitis and a hydrolysed diet to manage the generalised chronic enteropathy. After no further improvement was seen, prednisolone was added to the treatment regime at immunosuppressive doses for inflammatory bowel disease.

**Outcome**

This dog was able to leave the hospital after several days of hospitalisation. His feeding tube has been removed as his appetite is great and the albumin is now in normal limits. There is still some tenesmus and diarrhoea, but he is doing well and putting on weight.

His current treatment regime is as follows:

1. Enrofloxacin every 12 hours for a 6 week course
2. Pancreatic enzyme supplementation to be continued indefinitely.
3. Prednisolone to hopefully be tapered at a later date
4. Cobalamin (B12) injections weekly for 6 weeks, then in one month, then measurements.
5. Hydrolysed prescription diet