

## Successful medical management of asymptomatic feline triaditis: cholangiohepatitis-pancreatitis-inflammatory bowel disease (IBD)

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### Abstract

A neutered male cat was presented to the Milford Veterinary Clinic for periodic health check and annual vaccination. The overweight adult cat had no apparent health issues. However, abnormally high values of several hepatic function blood parameters raised serious clinical concerns. Abdominal ultrasound profiles suggested concurrent cholangiohepatitis, chronic pancreatitis and inflammatory bowel disease (IBD), “triaditis”. Dietary treatment regimen with nutraceuticals were advised to the owner.

**Keywords:** Triaditis, Abdominal ultrasound, Nutraceuticals, Cat

Cat specific cholangitis, pancreatitis, and inflammatory bowel disease (IBD), empirically named “triaditis”, of presumptive shared etiology, remains to be clearly deciphered (Marks, 2013; Simpson, 2015). Whereas the clinical signs of cholangitis predominate, pancreatitis and IBD are the major contributors (Fragkou *et al.*, 2016). A similar clinical condition has not been recorded in dogs. Intestinal inflammation may escalate ascending bacterial infection from the duodenum into the liver and pancreas (Widdison, 1994). Notably, in cats, the single pancreatic duct and the bile duct join and enter the duodenum together, with increased chance of microbial infection leading to inflammatory disorders (Scherk, 2010). The duodenal resident bacterial load, mainly *Escherichia coli* (Simpson, 2012) is, therefore, markedly higher in the cat, compared to the dog (Rothrock, 2013). Vomiting may cause reflux entry of duodenal fluid into the pancreatic and bile ducts leading to cascading inflammatory bioepisodes (Twedt, 2014). In the pathogenesis of triaditis, an immune component is also stated to be involved (Clark *et al.*, 2011).

Feline triaditis may be manifested in the acute or chronic form on presentation (Scherk, 2010). Physical examination reveals non-specific clinical signs, namely weight loss, anorexia, vomiting, lethargy, diarrhea, painful abdominal distension, icterus, palpable mass, and hepatomegaly (Marks, 2013). There is no breed/gender predilection. Middle-aged mature cats are more susceptible. The diagnostic protocol includes cyanocobalamin (vitamin B<sub>12</sub>) assay, hemogram, serum biochemistry panel, abdominal radiography and ultrasonography (Baez *et al.*, 1999; Dossin, 2011).

The remedial strategy is focused on the major disease component. Supportive protocol includes oral rehydration fluid therapy, nutraceuticals back-up, adequate pain relief with amelioration of nausea and vomiting. Prognosis depends on the severity of disease, and improves significantly with timely diagnosis and treatment.

### Case History and Observations

Trapper Sellers, 8 years old, slightly overweight (9.5 kg), domestic short hair neutered male cat was presented to the Milford Veterinary Clinic on September 1, 2020 for periodic health checks and vaccination schedule (feline leukemia, feline distemper and rabies) with no apparent health issues. Moderate dental tartar was noted. Physical examination revealed rectal temperature 100.8<sup>0</sup> F, heart rate 160/minute, respiration rate 44/ minute, capillary refill time (CRT) <2 seconds and body condition score (BCS) 4.5/5. Since, the patient was gradually gaining weight, a blood panel was recommended to the owner. The hemogram (Table 1) was normal, except marginally low neutropenia.

### Diagnosis and Treatment

The abnormal values of the liver and gall bladder (Table 2) prompted in-clinic ultrasound probe into the abdominal internal organs (Fig.1-4) by the visiting imaging specialists (23.09.2020).

Veterinary Information Network (VIN) triaditis regimen (Rothrock, 2013) was followed. Nutraceuticals, Ursodiol generic 300 mg caps (AMEX LCI) and SAME (S-adenosyl methionine) 200 mg caps, one each OD, PO continuously for 5 weeks promoted the natural cell

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Fig. 1. Echo profile of the patient's gall bladder.



Fig. 3. Echo profile of the patient's intestine



Fig. 2. Echo profile of the patient's liver



Fig. 4. Echo profile of the patient's pancreas

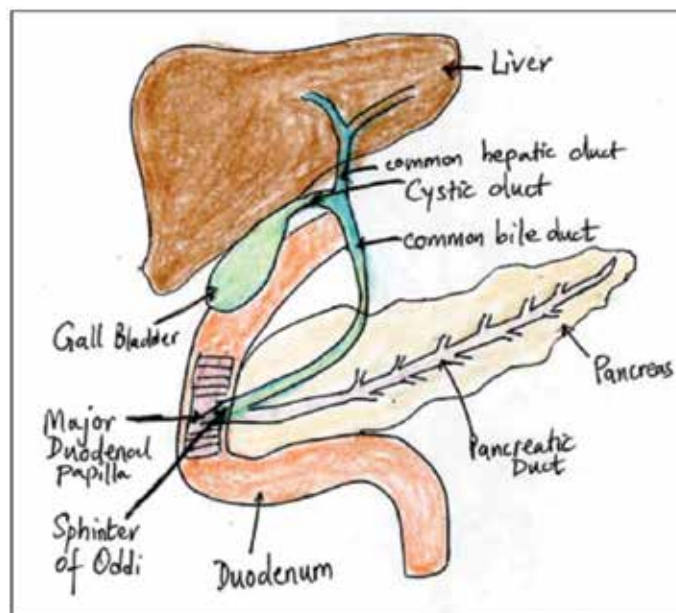


Fig. 5. Common bile duct join the pancreatic duct and open into the duodenum (Jergens and Allenspach, 2016).

**Table 1: Patient's hemogram**

Parameter (Units)	Result	Range	Status
TEC ( $1 \times 10^6 / \mu\text{l}$ )	10.58	6.54-12.20	Normal
Hematocrit (%)	51.9	30.3	Normal
Hemoglobin (g/dL)	16.1	9.8-16.2	Normal
MCV (fL)	49.1	35.8-53.1	Normal
MCH (g/dL)	15.2	11.8-17.3	Normal
MCHC (g/dL)	31.0	26.1-35.8	Normal
Reticulocyte (%)	9.5		
Reticulocyte ( $1 \times 10^3 / \mu\text{L}$ )	49.7	3.0-50.0	Normal
TLC ( $1 \times 10^3 / \mu\text{L}$ )	5.20	2.87-17.02	Normal
Neutrophil (%)	42.7		
Lymphocyte (%)	50.2		
Eosinophil (%)	4.2		
Monocyte (%)	2.1		
Basophil (%)	0.8		
Neutrophil ( $1 \times 10^3 / \mu\text{L}$ )	2.22	2.30-10.29	Low
Lymphocyte ( $1 \times 10^3 / \mu\text{L}$ )	2.61	0.92-6.88	Normal
Eosinophil ( $1 \times 10^3 / \mu\text{L}$ )	0.22	0.17-1.57	Normal
Monocyte ( $1 \times 10^3 / \mu\text{L}$ )	0.11	0.05-0.67	Normal
Basophil ( $1 \times 10^3 / \mu\text{L}$ )	0.04	0.01-0.26	Normal
Thrombocytes ( $1 \times 10^3 / \mu\text{L}$ )	307.0	151-600	Normal
IDEXX Laboratories Procyte Dx Auto cell counter			

**Table 2: Patient's blood chemistry panel**

Parameter (Units)	Result	Range	Status
Glucose (mg/dL)	150	71-159	Normal
SDMA ( $\mu\text{g/dL}$ )	9	0-14	Normal
Creatinine mg/dL)	1.7	0.8-2.4	Normal
BUN (mg/dL)	23	16-36	Normal
BUN/Creatinine ratio	14		
Phosphate (mg/dL)	4.5	3.1-7.5	Normal
Calcium (mg/dL)	0.0	7.8-11.3	Normal
Total protein (g/dL)	10.5	5.7-8.9	High
Albumin (g/dL)	4.6	2.3-3.9	High
Globulin (g/dL)	5.9	2.8-5.1	High
A/G ratio	0.8		
ALT (U/L)	313	12-130	High
ALKP (U/L)	343	14-111	High
GGT (U/L)	106	0-4	High
Total Bilirubin (mg/L)	4.9	0-0.9	High
Cholesterol (mg/dL)	192	65-225	Normal
Amylase (U/L)	97.3	500-1500	Normal
Lipase (U/L)	428	100-1400	Normal
Na <sup>+</sup> (mmol/L)	161	150-165	Normal
K <sup>+</sup> (mmol/L)	3.6	3.5-5.8	Normal
Na <sup>+</sup> / K <sup>+</sup> ratio	45		
Cl <sup>-</sup> (mmol/L)	121	112-129	Normal
Total T4 ( $\mu\text{g/dL}$ )	2.1	0.8-4.7	Normal
IDEXX Laboratories Catalyst Dx Autoanalyzer			

healing process. Cobalamin supplement @ 250  $\mu\text{g}$  SC q for 7 days proved highly beneficial. Supportive therapy comprised use of home food, effective pain management with alleviation of nausea/ vomiting. Recovery was evidenced by the progressive improvement in body condition with increased activity.

## Discussion

In the instant case, abdominal internal organs echo-profiles (Fig.1-4) indicated concurrent cholangio-hepatitis, chronic pancreatitis and inflammatory bowel

disease (IBD), named "triaditis". The prognosis is less favourable in acute pancreatitis (Brister, 2020). The mute question is why triaditis is frequently observed in the cat, but not in the dog? The feline pancreatic duct and the common bile ducts join and enter the duodenum together (Fig. 5) with the markedly increased chance of bacterial translocation and infection (Jergens and Allenspach, 2020). Abdominal ultrasound proved crucial in the chance discovery of triaditis in the feline patient, Trapper Sellers before the onset of clinical symptoms. The owner is currently aware that if the symptoms flare up, the above

treatment is available to the patient *im promptu* for the much-needed relief.

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