

Integrated Western and traditional Chinese medicine therapy in a dog with acute pancreatitis

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Abstract

A 23kg, 12-year-old intact male Siberian Husky crossbred dog was brought to the animal hospital on October 25, 2020, due to sudden anorexia, vomiting, and praying posture for two days. After physical examination, a completed blood count (CBC), serum biochemistry profile, canine SNAP cPL test, abdominal radiography, and ultrasonography were performed for differential diagnosis. According to clinical symptoms, medical history, and diagnostic test results, it was diagnosed as acute pancreatitis (AP). Integrated Western and traditional Chinese medicine therapy were used, including supporting treatment, aquapuncture, and traditional Chinese herbal formulas. The clinical signs showed significant improvement after treatment. The results indicated that integrated Western and traditional Chinese medicine can be used as an alternative therapy for acute pancreatitis.

Keywords: acute pancreatitis, aquapuncture, traditional Chinese medicine, dog

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Introduction

Acute pancreatitis (AP) is defined as inflammation of the exocrine pancreas that is not associated with permanent histopathologic changes, such as fibrosis and atrophy (Watson, 2015). The pathogenesis of canine AP is poorly understood, but the causes may include stress, obesity, excessive consumption of high-fat foods, ascending infection of gastrointestinal bacteria, liver disease, etc. (Mansfield, 2012). Acute pancreatitis is characterized by high mortality (Watson, 2015). The symptoms of severe AP include dehydration, anorexia, vomiting, abdominal pain, diarrhea, jaundice, and fever. In addition, multiple organ failure, systemic inflammatory response syndrome (SIRS), and disseminated intravascular coagulation (DIC) are important factors leading to the death of canine AP (Petrov *et al.*, 2010).

Histopathology was considered definitive for the diagnosis of pancreatitis. However, collecting the sample by biopsy was quite invasive. Serum pancreatic lipase immunoreactivity (PLI) concentration is currently considered the clinicopathological test of choice for diagnosing canine and feline pancreatitis (Xenoulis, 2015).

The treatments for AP are nonspecific and tend to be symptomatic supporting therapy. Several areas surrounding the treatment of acute pancreatitis have not been fully evaluated and may have the potential to improve outcomes in affected dogs (Mansfield, 2012). Previous studies indicated that integrated traditional Chinese medicine could improve acute pancreatitis (Gao and Liang, 2015). In this case, integrated Western and traditional Chinese medicine therapy was used for treating a dog with acute pancreatitis.

Case description

A 23kg, 12-year-old intact male Siberian Husky crossbred dog was brought to the animal hospital on October 25, 2020, due to sudden anorexia, vomiting, and praying posture for two days. The symptoms worsened gradually, including not drinking, diarrhea, and low urine volume. Physical examination revealed tachypnea, tachyarrhythmia (170 beats/min), prolonged capillary refill time (CRT), jaundice, abdominal pain, 6% dehydration and mild hypothermia (37.4°C). Gastrointestinal disease is initially suspected, and completed blood count (CBC), serum biochemistry profile, canine SNAP cPL test (IDEXX Laboratories, Westbrook, Maine, USA), abdominal radiography, and ultrasonography were performed for differential diagnosis. CBC showed increased neutrophils and decreased hematocrit. Serum biochemistry profile showed that total protein, urea, creatinine, alanine aminotransferase (ALT), alkaline phosphatase (ALKP), total-bilirubin and phosphorus were significantly increased, while potassium and chloride ions were decreased (Table 1). The canine SNAP cPL test was abnormal and there were no pathological findings in abdominal radiography (Figure 1) and ultrasonography. The radiology interpretation was performed by a certified veterinary radiologist.

Based on overall information from the owner's description, clinical symptoms, medical history, and

diagnostic test results. The inappropriate feeding, poisoning, gastric torsion, obstruction of the biliary tract, or intestinal lumen as possible reasons for the patient's gastrointestinal signs and pain had been ruled out. Additionally, excessive bleeding, heart failure, shock, transfusion reaction, nephrotoxic drugs, and obstructive uropathy that contribute to acute kidney injury (AKI) should also be excluded. So, the preliminary diagnosis of AP and the following reasoning were made. An increase in neutrophils indicated an inflammatory reaction. The decrease in chloride and potassium was attributed to anorexia and vomiting. Significant ALT, ALKP, and total-bilirubin increase were suspected to be secondary to pancreatic inflammation. A severe increase in urea, creatinine, and phosphorus may be induced by AKI due to AP. A decreased blood volume ratio was presumed to be induced by the shortened red blood cell life caused by azotemia. Although serum lipase was increased but there was no diagnostic specificity because of the value less than three times of normal.

In traditional Chinese medicine, the pancreas is included within the spleen. The Spleen governs transformation and transportation, controls the blood, and dominates muscles and limb health. Spleen Qi deficiency (loss of splenic function) can cause anorexia, vomiting, diarrhea, and abdominal pain. Moreover, the patient had reduced urinary volume, increased heart rate, and jaundice. According to the theory of TCVM, these symptoms could be attributed to Damp-Heat in the Middle Burner. Therefore, the diagnosis of TCVM in this case is spleen Qi deficiency and Damp-Heat in the middle burner.

This case was treated with integrated Western and traditional Chinese medicine. Firstly, supporting treatment with lactated Ringer's solution was applied intravenously (100 ml/h, for 12 hours) to correct dehydration. Aquapuncture was performed by using Vitamin B12 diluted twice with water for injection at the following acupoints, including BL-18, BL-19, BL-20, BL-21, BL-22, ST-36, ST-37, and ST-44. A dose of 1.5 ml was injected into the acupoints of the bladder meridian and 0.5 ml for the acupoints of the stomach meridian (Table 2 and Figure 1). Moreover, traditional Chinese herbal formulas including 2 grams of Da Chai Hu Tang granules (Table 3) and 2 grams of Yin Chen Wu Ling San granules (Table 4), were administered orally every 8 hours. Twenty-four hours after treatment, respiratory rate slowed down, dehydration improved, and vomiting was no longer observed. The patient was discharged, and the owner was instructed to continue giving traditional Chinese medicine and to try to feed the prescribed canned food (Hill's i/D digestive care; Hill's Pet Nutrition, Inc., USA).

During the first follow-up visit (3 days post-discharge), the patient's spirit further improved, he began to drink water actively, and urination increased, but still had no appetite. Physical examination revealed normal body temperature, breathing rate, and CRT; abdominal distension and pain improved, and jaundice persisted. The patient was administered subcutaneous infusion therapy (Dextrose 5% and Sodium Chloride 0.225%, 500ml) and aquapuncture. Traditional Chinese herbal formulas were continuously given for 7 days.

At the second follow-up visit, the patient's spirit and appetite improved significantly. Physical examination revealed no abnormalities. Aquapuncture treatment was performed once again, and the patient was kept on the same prescription (Chinese herbal formulas) for 7 days.

At the third follow-up visit, all values of the completed blood count and serum biochemistry profile, especially renal function indexes, showed significant improvement (Table 1).

Table 1 Complete blood (cell) count and biochemical profile results before treatment, October 25, 2020, and post-treatment, November 11, 2020.

Parameter	Oct. 25	Nov. 11	Reference	
Neutrophils	13.58	14.1	2.95-11.64	10 ³ /μL
Hematocrit	29.3	40	37-55	%
Total protein	8.7	8.1	5.2-8.2	g/dl
Globulin	5.9	2.5	2.2-3.0	g/dl
Phosphorus	15.4	6.5	2.5-5.9	mg/dl
Urea	>150	31	7-27	mg/dl
Creatinine	>15	1.9	0.5-1.8	mg/dl
ALT	734	262	10-125	U/L
ALKP	936	545	23-212	U/L
Total-bilirubin	1.2	0.7	0.1-0.7	mg/dl
Lipase	4700	2600	200-1800	U/L
Na	150	148	145-153	mEq/l
K	3.9	4.6	4.2-5.6	mEq/l
Cl	100	113	110-118	mEq/l

Bold text indicates numerical anomalies.

Table 2 Anatomical location and function of acupoints used in this case.

Acupoints	Location	Function
BL-18 Gan-shu	On the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process T-10	Strengthen the Liver's function
BL-19 Dan-shu	On the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process T-11	Strengthen the Liver's function
BL-20 Pi-shu	On the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process T-12	Strengthen the spleen's function
BL-21 Wei-shu	On the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process T-13	Strengthen the stomach's function
BL-22 San-jiao-shu	On the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process of L1	Regulates the transformative function of Qi
ST-36 Hou-san-li	On the craniolateral of the pelvic limb, 3 cun distal to ST-35, 0.5 cun lateral to the cranial aspect of the tibial crest, in the belly of the cranial tibialis muscle	Normalizes the down-leading of the stomach
ST-37 Shang-ju-xu	On the cranial aspect of the pelvic limb, 6 cun distal to ST-35, 0.5 cun lateral to the cranial aspect of the tibia, over the cranial tibialis muscle	Regulates the spleen, intestines, and stomach
ST-44 Nei-ting	Distal to the metatarsophalangeal joint proximal to the web margin between the third and fourth digits of the pelvic limb	Clears heat and drain damp from the stomach and spleen

Table 3 Ingredients and functions of Da Chai Hu Tang.

Ingredient	Function
Bupleurum	Soothes Liver
Scutellaria	Clears Damp Heat, Detoxifies
Pinellia	Stop Vomiting
Paeonia	Nourishes Blood
Aurantium	Moves Qi, Relieves Pain
Rheum	Clears Heat
Zingiberis	Harmonizes the Spleen and Stomach
Jujube	Harmonizes, Tonifies Middle Jiao

Table 4 Ingredients and functions of Yin Chen Wu Ling San.

Ingredient	Function
Artemisia	Clears Damp Heat in the Liver
Alisma	Drains Damp
Poria	Drains Damp, Strengthens Spleen
Polyporous	Drains Damp
Atractylodes	Strengthens Spleen
Cinnamomum	Resolves Stagnation, Relieves Pain



Figure 1 Lateral and ventrodorsal abdominal radiograph.

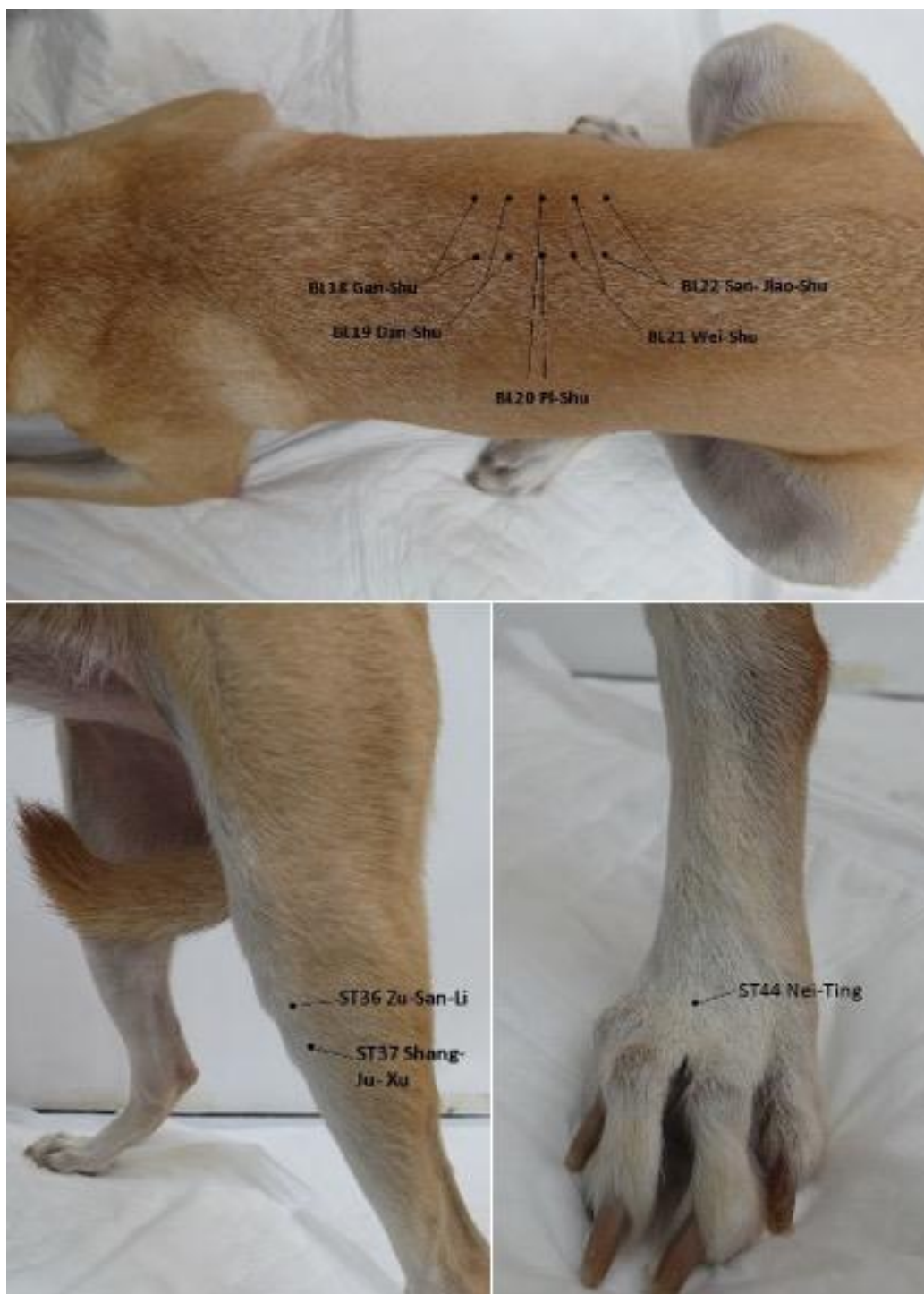


Figure 2 A Locations of the acupoints used in this case.

Discussion

Pancreatitis is the most common disorder of the exocrine pancreas in dogs and cats. Ante-mortem canine and feline pancreatitis diagnosis can be challenging (Xenoulis, 2015). Histopathological evidence is seen as the gold standard for the diagnosis of canine AP. However, the risks of anesthesia and the results of the histopathological examination may be inconsistent with clinical symptoms, all of which reduce the utility of histopathology in the diagnosis of canine AP. Currently, the specific canine pancreatic lipase immunoreactivity test (Spec cPLI or cPLI) has been found to have high sensitivity and specificity for

diagnosing canine AP (Xenoulis, 2015). SNAP cPL test is most frequently used by clinicians. It is equivalent to Spec cPLI $>200 \mu\text{g/dl}$ if the result is abnormal. Although the patient showed acute kidney injury at the time of diagnosis, however, some possible reasons for AKI had been ruled out, and treatments of acute pancreatitis resulted in significant improvement in renal function indexes. Therefore, the AKI, in this case, is considered to be caused by AP.

According to the etiology of TCVM, many factors may cause AP including Liver Qi stagnation, food stagnation, Damp-Heat in the Middle Burner, and Spleen Qi Deficiency (Li *et al.*, 2019). This case was diagnosed as spleen Qi deficiency and Damp-Heat in

the middle burner. Traditional Chinese medicine (TCM) has had the unique advantage of treating AP for a long time in China. Clinically, TCM formulas such as Da-cheng-qi decoction, Chai-qin-cheng-qi decoction, Qing-yi decoction, Da-chai-hu decoction, and Da-huang-fu-zi decoction are widely administrated to AP patients. All of these TCM formulas can improve gastrointestinal function, regulate the inflammatory response, and enhance immunity, thus preventing complications and reducing the mortality rate and financial burden (Yang *et al.*, 2021). Da-chai-hu decoction could reduce the IL-8, CRP, and TNF- α levels, and reduce the APACHE II score in humans with severe acute pancreatitis (Hu, 2021). Xiao *et al.* (2023) demonstrated that Da-chai-hu decoction alleviates AP by regulating inflammation and inhibiting apoptosis.

There are many methods to stimulate the acupoints in TCVM, including dry needle acupuncture, aquapuncture, and moxibustion. The method used in this case was aquapuncture, which is the injection of a small amount of liquid, usually vitamin B12 and/or Saline, into a specific acupoint. The liquid could stimulate the specific acupoint for a more extended period, giving a stronger and longer lasting response to treatment.

TCVM treatment in dogs with severe AP should not be limited to the pancreas but instead regulate functions of the entire digestive tract. Include clearing away the heat-evil, supplementing the Qi (vital energy), draining the Damp, nourishing the Yin (body fluid), and activating blood circulation to dissipate blood stasis in order to normalize the functions of the biliary system and gastrointestinal system (Li *et al.*, 2017). Antiemetics and analgesics were not used in this case indicating that acupuncture has a significant effect on relieving nausea and vomiting, improving gastrointestinal motility, relieving organ pain, and reducing or even replacing the use of antiemetics and analgesics.

This case report describes the use of integrated Western and traditional Chinese medicine to treat an individual animal diagnosed with acute pancreatitis. To confirm the application of integrated Western and traditional Chinese medicine treatments in veterinary clinical practice, more numbers of such cases should be collected.

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