

Case report

# The use of Complementary medicine and Pneumo-Acupuncture to treat muscle atrophy and chronic respiratory disorders in a dog: A case report

Madalina Florina Dragomir<sup>\*1</sup>, Alina Ardelean<sup>1</sup>, Lorena LLoret Nadal<sup>2</sup>, Ciprian Ober<sup>1</sup>

<sup>1</sup> Department of Surgery and Anesthesiology and Intensive Care, University of Agricultural Science and Veterinary Medicine Cluj-Napoca, Calea Mănăştur no. 3-5, 400372, Cluj, România.; [madalina.dragomir@usamvcluj.ro](mailto:madalina.dragomir@usamvcluj.ro), [alina.ardelean@usamvcluj.ro](mailto:alina.ardelean@usamvcluj.ro), [ciprian.ober@usamvcluj.ro](mailto:ciprian.ober@usamvcluj.ro).

<sup>2</sup> Director of Chi University Europe, Veterinary Specialists Ireland, Summerhill, County Meath, Ireland; [lore-nalloretnadal@gmail.com](mailto:lore-nalloretnadal@gmail.com)

\* Correspondence: M.F.D., [madalina.dragomir@usamvcluj.ro](mailto:madalina.dragomir@usamvcluj.ro).

**Abstract:** A 5-year-old female Malinois dog was referred to the Faculty of Veterinary Medicine of Cluj-Napoca for complementary medicine treatment. The patient was diagnosed with severe muscular atrophy in the temporal region but also with ab-ingestis pneumonia due to improper use of the masticatory muscles. After 2 months of symptomatic therapy, partial cure of pneumonia was achieved, but the patient was left with an acute cough during the night. We decided to start a therapeutic protocol combining various Chinese therapies including acupuncture, electroacupuncture, pneumo-acupuncture and herbal therapy. The patient's condition improved considerably even after the first sessions, coughing episodes were reduced and breathing became normal. As for muscle atrophy, the results were partially improved. At the end of the treatment scheme, although the patient was not completely cured, the quality of life was significantly improved.

**Keywords:** canine, acupuncture, pneumo-acupuncture, muscle atrophy.

## 1. Introduction

In dogs, lung lesions are very similar to those seen in humans mostly characterized as interstitial pneumonia(1). A common clinical diagnosis is represented by the bacterial pneumonia and the underlying causes may include viral infections, aspiration injury and inhalation of foreign body(1). From a traditional Chinese medicine point of view, forms of pneumonia are known as "acute febrile disease caused by Pathogenic Wind" or "invasion of the Lung by Pathogenic Heat"(2).

The atrophy of the frontal temporal muscles can have different causes which might include a low level of body fat with pronounced or rapid weight loss, exaggerated skeletal contours, progressive idiopathic atrophy, deformities due to impaired nerve function or even post-operative, also depending on the patient's age and health (3).

Pneumo-acupuncture is a Traditional Chinese veterinary medicine (TCVM) treatment that involves injecting subcutaneous air into specific acupuncture points. Large animals, such as horses, are more commonly treated with this procedure, although large dogs can also benefit. This technique is frequently used to treat Deficiency conditions like Wei Syndrome, paresthetic conditions such as suprascapular nerve paresis, facial nerve paresis, or any other local muscular atrophy(4).

Although the exact mechanism by which acupuncture improves breathing is not fully understood, evidence suggest that it may assist the relax of the muscles involved in breathing. Acupuncture has been shown to release chemicals that dilate the airways, making breathing easier(4).

Received: 7 December 2021

Accepted: 22 February 2022

Published: 28 June 2022

DOI:10.52331/cvj.v27i1.38



**Copyright:** © 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

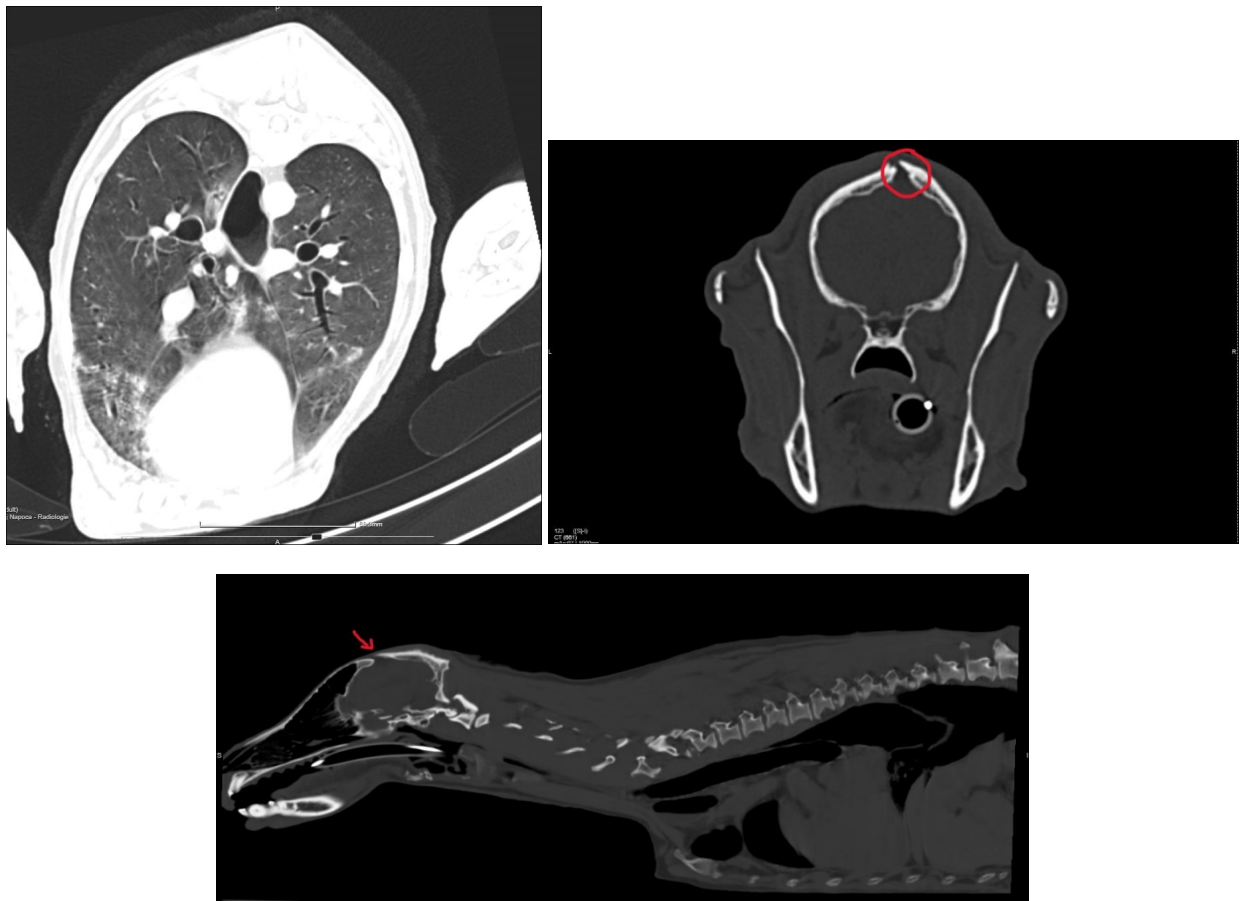
The aim of this study was to present and analyze the benefit of complementary medicine. From the author's knowledge, there are few information in the literature about this type of treatment for dogs with respiratory disorders.

## 2. Materials and Methods

### Case description

A five-years-old, Malinois breed female dog, was presented because of respiratory disorders and progressive muscle atrophy in the temporalis region. The dog jumped on a fence and felt on her back two-months prior consult. According to the owner, the dog suffered hindlimb ataxia for the following three days after the accident, but the symptoms improved significantly after getting one dose of NSAIDs. The dog began to eat less after two weeks and experienced anorexia and muscular atrophy in the temporalis area (Figure 1). The neurological examination showed the following: the menace and palpebral reflex response were present, so were the vibrissae, oculocephalic and gag reflexes. For the auricular reflex, when we twitched the ear, the dog responded, but when we stimulated the skin on the temporalis region, the dog did not respond. We decided to pursue with the imagistic investigations.

Imagistic investigations suggested, such as radiographs and Computed tomography (CT) scan revealed lesion that correspond with late episode of pneumonia, possible aspiration (Figure 2), and on the head revealed a skull chronic fracture with thickening of the calvarium on the medial surface due to healing process. There is also a severe muscle of the temporal and zygomatic muscles (Figure 3A, B). A muscle biopsy was performed; however, it came negative for masticatory muscle myositis. The blood samples for serum chemistry profile were in normal range, except for the ALT which might have been increased because of the muscular dystrophy (Table 1), while the CBC showed a slight leukocytosis (WBC:  $21.5 \cdot 10^9/l$ , N: 5.5-19.5). As a conventional therapy, the dog received antibiotics, bronchodilators, NSAID's as well as steroids, vitamins, essential amino acids, and L-carnitine for almost 3 months. After no major improvements, we decided to try also Traditional Chinese medicine to improve the breathing and the temporalis muscle.



**Fig. 2.** CT image of a dog with diffuse pneumonia; **3A, B.** CT scan of the head showing fracture of the skull and local hemorrhage. (Original archive)

From a TCVM examination, the dog was an Earth Constitution. She was friendly with people and other dogs; she used to be active and laid-back type. According to the owner, the dog has become increasingly sleepy in recent weeks and more sedentary. The tongue was pale, wet, with cackles (Figure 4), the nose was dry, the ears and feet were cold. The cough is more severe during the night. The dog prefers cold instead of heat. The pulse was weaker on the left side. At palpation, it was sensitive to paravertebral muscle, for Bladder Meridian – BL-20/21/23.

The TCVM diagnosis was Kidney Jing Deficiency and Spleen Qi sinking with Lung Qi Deficiency.



**Fig. 1.** Muscle atrophy in the temporalis area (Before treatment); **Fig. 4.** Tongue is wet, thin with crackles. (Original archive)

A combination of dry-needle, electroacupuncture, pneumo-acupuncture and Herbal Chinese Medicine was performed and at least 10 weekly treatment sessions were planned (Figure 5). The treatments aimed to tonify Kidney Qi and the Spleen Meridian. The treatments were performed using sterile disposable stainless-steel Ac needles with cooper coil handle, size 0.25x0.25mm, guide tubes (Acimut) and stainless-steel Ac needles with plastic handle, size 0.16x20mm, without guide tubes (Cloud and Dragon). Dry needling (insertion at 1-1.5 cm with an intermittent manipulation of the point by twirling clockwise) and EA (40-100 Hz, 1-3V, increasing progressively for 15-20 minutes/session). Pneumo-acupuncture involved air injection, up to 5 ml into subcutaneous tissue in the temporalis region. In order to prevent air embolism, each time before injecting air, we aspirated. For the first days after the treatment, we recommended the owner to keep the dog rested for the air to diffuse without causing undue pressure on surrounding nerves and vessels.

**Table 1. Blood sample – Biochemistry**

ALB	3.7	2.5-4.4 g/dL
ALP	41	20-150 U/L
ALT	184*	10-118 U/L
AMY	348	200-1200 U/L
TBIL	0.4	0.1-0.6 mg/dL
BUN	18	7-25 mg/dL
CA	10.2	8.6-11.8 mg/dL
PHOS	5.1	2.9-6.6 mg/dL
CRE	0.8	0.3-1.4 mg/dL

GLU	104	60-110 mg/dL
NA+	145	138-160 mmol/L
K+	4.3	3.7-5.8 mmol/L
TP	7.3	5.4-8.2 g/dL
GLOB	3.6	2.3-5.2 g/dL
Hct	51%	30-45 %
Lac	1.8	1-3 mmol/L

### 3. Results

The principle of treatment was to restore smooth flow of vital energy of Spleen and invigorating the function of the Kidney Qi. The acupoints used are presented in Table 2. During each treatment, a maximum of 10 points were used, depending on the dog's reaction and status health. The acupoints were selected according to TCVM principles, by a trained acupuncturist. For the first two weeks, the treatment sessions were twice per week, and after that one time per week for the following two months.

After the first 3 sessions, the dog began to breath more easily, her cough subsided, and she was becoming more comfortable especially during the night. During each treatment we performed Pneumo-acupuncture in the ST-5, ST-7, SI-19, TH-21, GB-20.

We maintained the treatments for over two months, with significant improvement in breathing (only occasionally cough) but a mild response in muscle atrophy (Figure 6). The dog had a good appetite and began to be more active and playful, that she'd been previously.



**Fig. 5.** Aspects during electroacupuncture treatment. **Fig. 6.** After 4 treatments. (Original archive)

We've added herbal formula Qi Performance 0.5g/10 kg twice daily for two months. We started with half a dose for the first three days to make sure there are no adverse reactions.

From a TCVM point of view, the commonly applied principles of treatments are based on the relationship between Yin (vital essence) and Yang (vital function), and between the Meridians (Zang-fu organs). When it comes to pathology, there is an imbalance between the two systems mentioned above, so the relationship is replaced with an abnormal, unbalanced condition, either an Excess or a Deficiency between them.

In our case, we discuss about a Deficiency due to a chronic, long course disease with specific symptoms. The longer the course of the disease, the greater the Deficiency in the body is and more treatments or combination of techniques are needed to achieve a satisfactory result. Tonifying and Warming the body, from a TCVM point of view, involves treating the Deficiency complexes to get the Qi energy, Blood, Vital Essence, and Functions moving(2).

**Table 2. Acupoints used**

<b>Local points</b>	<b>GB3, ST5/6/7</b>
<b>Distal points</b>	GV6, LIV3, LI4/11, SP3/9, ST36/37, LU5/9
<b>Association points</b>	GV20, BL20/21/22/23/24, Bai-Hui

#### 4. Discussion

Reinforcement of the organism consists in using different tonics, for example electroacupuncture or pneumo-acupuncture, to correct the Deficiency of vital energy in the Spleen and Lung Meridians. The most common symptoms of Spleen Deficiency are restlessness, anorexia, muscle atrophy, diarrhea, lack of energy, while the symptoms of Lung Deficiency are shortness of breath, weakness, mucous pallor(4). All Chinese herbs have specific properties that are important signs of their actions. Knowing these properties and flavors helps to guide medical practice. In our case, we used the formula Qi Performance which is the modified Ba Zhen Tang (Eight-Treasure Decoction) and is a tonifying formula, commonly used to treat Qi and Blood Deficiency(5). According to pharmaceutical research when this formula is used in conjunction with enteral nutrition in gastric cancer patients post-operatively, it can further promote elevation of growth hormone levels and improve both nutritional state and immune function(6). In anemic mice with bone marrow depression induced by cyclophosphamide, it promotes proliferation of bone marrow cells. Huang Qi (*Astragalus membranaceus*) is the main herb in the formula and the tonifying effects of this herbs may be due to an increase in muscle glycogen storage and oxygen carrying capacity together with a reduction in creatine phosphate and protein metabolism, which help combat fatigue(7).

The most common signs of chronic lung condition include daily coughing, shortness of breath or wheezing for more than 2 months. Often the cough can be more pronounced during the night, when the animal is quiet, and can reduce in frequency while is awake and active. In such situations, the differential diagnosis may even be heart failure, pneumonia, allergic lung disease and lung cancer(8). Routine blood test results cannot be considered specific for aspiration pneumonia; however, certain abnormalities may be considered compatible with this condition. Leukocytosis or leukopenia, often with toxic changes present in neutrophils, may be seen on a CBC, but nevertheless a normal result cannot exclude aspiration pneumonia. A serum chemical profile may have normal values or specific results with a comorbidity. An interesting fact is that in Kogan et al's study(9), an increase liver enzymes and a decrease in albumin levels were demonstrated in more than half of the 58 dogs diagnosed with aspiration pneumonia(10).

The imagistic findings showed a chronic fracture of the skull which could be responsible for the muscle atrophy in the temporal region but cannot explain all the symptoms. Even if the CT scan did not show any tumors in the brain, we still decided to pursue for a muscle biopsy in order to exclude other disorders. The result came negative for masticatory myositis, so we did not check for muscle enzymes or inflammatory markers such as creatin kinase or canine C reactive protein. As a differential diagnosis we could have had tumors, autoimmune diseases, or inflammation of one or more components of the central nervous system. The dog also received first NSAID's and then corticosteroids, but still did not improve. Unfortunately, due to financial issue we could not pursue with any other clinical or paraclinical investigations.

Pneumo-acupuncture is a Traditional Chinese veterinary method through which air is introduced under the skin, in the subcutaneous space, to produce a pressure that might stimulate specific acupoints, as well as the muscles and nerves from the affected region(11). Unfortunately, there are few information regarding the efficacy of this procedure, mostly it is mentioned in the literature its use for muscle atrophy, but we could not find relevant study to prove it. Furthermore, the fact that in our case it gave only slight improvement, we still question its efficacy. We can recommend its use for muscles with a lower degree of atrophy, as well in the acute phase of the disease.

While it is not fully understood how the mechanism of acupuncture is working to improve breathing, some researchers suggest that dry needling and electroacupuncture treatments may help to relax muscles involved in breathing(12). It has also been shown that this type of treatment can release vascular and immunomodulatory factors that distend the airways, making it easier to breath(12). In our case the results were visible during each treatment we performed. Also, we cannot forget about the herbs we mentioned earlier which might also had their role in improving the breathing. In human medicine, a quite common scale used for dyspnea is the modified Borg Dyspnea Scale, which is a 0 to 10 rated numerical score reported by the patient during submaximal exercise after a period of exercise(13). For animals you can see the degree of honking, coughing, inspiratory effort, or the activity status, which can be subjective, and we cannot exclude the owner's assessment of willingness to treat his dog.

The study's limitations include the lack of even more detailed investigations to establish a concrete diagnosis from the classical medicine point of view. These limitations were also due to financial reasons. Furthermore, specific blood samples (for e.g., blood gas analysis before and after each treatment session), MRI, oxygen saturation could be considered important for a good diagnosis. We suggest further studies to be done using TCVM for each pathology on a larger number of patients in order to find the optimum technique for a better outcome.

## 5. Conclusions

For the respiratory disorder, the patient had a good outcome, while for the muscular atrophy had a modest response. Despite the fact we were unable to cure completely the dog, we were successful in improving quality of life and dyspnea. Acupuncture and herbal medicine are effective for the treatment of chronic respiratory disorders and may be considered a complementary viable treatment.

**Author Contributions:** Conceptualization, M.F.D, Writing-review and editing, M.F.D and A.A, Supervision, L.L.N and C.O.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** This study was made with the written consent of dog's owner.

**Data Availability Statement:** The data used to support the findings of this study are included in the article.

**Acknowledgments:** This research received no specific grant from any funding agency in the public, commercial, or non-profit sectors.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Dear JD. Bacterial Pneumonia in Dogs and Cats. *Vet Clin North Am Small Anim Pract.* 2014 Jan;44(1):143–59.
2. Liu Yanchi. The essential book of traditional chinese medicine. In New York: Columbia University Press.; 1988. p. 1–14; 43–4; 254.
3. Gordon CR, Yaremchuk MJ. Temporal Augmentation With Methyl Methacrylate. *Aesthet Surg J.* 2011 Sep 1;31(7):827–33.
4. Huisheng Xi, Vanessa Preast. Traditional Chinese Veterinary Medicine. In: Traditional Chinese Veterinary Medicine. 2nd ed. Reddick, Florida: Chi Institute Press; 2016. p. 119–21.
5. Aituan Ma. Clinical Manual of Chinese Veterinary Herbal Medicine. In Gainesville, Florida; Ancient Art Press; 2016. p. 52.
6. Wang H. Effects of modified Ba Zhen decoction in assistant with enteral nutrition on the growth hormone, the nutritional state, and the immune function in patients with gastric cancer after operation. *Zhongguo Zhong Xi Yi Jie He Za Zhi.* 2011;31(10):727–31.
7. Li C et al. Some mechanism of Huang Qi extract on the resistance of exercise-induced fatigue. *China J Mod Med.* 2012;22(23):58–61.
8. Blue pearls Specialists. Chronic Bronchitis: Symptoms, Diagnosis and Treatment. Blue Pearl Vet [Internet]. Available from: <https://bluepearlveter.com/medical-articles-for-pet-owners/canine-chronic-bronchitis/>
9. Kogan DA, Johnson LR, Jandrey KE, Pollard RE. Clinical, clinicopathologic, and radiographic findings in dogs with aspiration pneumonia: 88 cases (2004–2006). *J Am Vet Med Assoc.* 2008 Dec;233(11):1742–7.

10. Heidi M Schulze L j R. Aspiration Pneumonia in dogs: Pathophysiology, Prevention, and Diagnosis. In: Compendium [Internet]. vetlearn.com; 2012. p. 5. Available from: [https://s3.amazonaws.com/assets.prod.vetlearn.com/5a/6680503b2211e2a929005056ad4736/file/PV1212\\_Schulze1\\_CE.pdf](https://s3.amazonaws.com/assets.prod.vetlearn.com/5a/6680503b2211e2a929005056ad4736/file/PV1212_Schulze1_CE.pdf)
11. Justin Shmalberg HX. Acupuncture. UF Health [Internet]. Integrative Medicine. Available from: <https://largeanimal.vethospitals.ufl.edu/hospital-services/equine-integrative-medicine/acupuncture-rehabilitation/>
12. Feng J, Wang X, Li X, Zhao D, Xu J. Acupuncture for chronic obstructive pulmonary disease (COPD): A multicenter, randomized, sham-controlled trial. *Medicine (Baltimore)*. 2016 Oct;95(40):e4879.
13. Kendrick KR, Baxi SC, Smith RM. Usefulness of the modified 0-10 Borg scale in assessing the degree of dyspnea in patients with COPD and asthma. *J Emerg Nurs*. 2000 Jun;26(3):216–22.