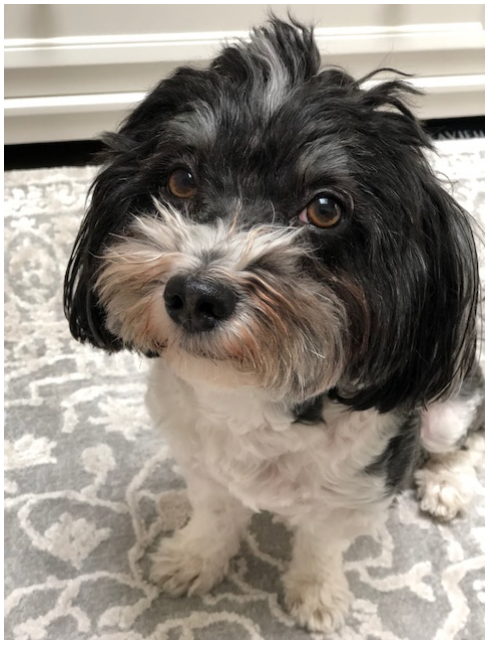
REHABILITATION FOLLOWING BICEPS BRACHII AND SUPRASPINATUS TENDINOPATHIES IN A 5-YEAR-OLD HAVANESE

Integrative Pet Care



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Introduction:

Miles is a 5-year-old male neutered Havanese weighing 9.5kg. He was first seen at Integrative Pet Care (IPC) in Chicago on 12/14/18 for a comprehensive rehabilitation evaluation after an approximately 3-month history of left front limb lameness. He was referred to IPC following an orthopedic consult and CT scan which revealed "chronic left biceps tenosynovitis, degenerative joint disease of the left shoulder and left supraspinatus tendinopathy." His initial treatment plan at IPC included class IV laser therapy, massage, therapeutic exercises, and underwater treadmill. After a worsening of lameness, his treatment program was modified to include therapeutic ultrasound and shockwave (ESWT). At the end of the eight-week rehabilitation program Miles' lameness had completely resolved. Medications and supplements used during Miles' program included Metacam, omega fatty acids and Dasuquin Advanced.

Clinical Findings/Assessment:

Miles was presented to his primary care veterinarian on 9/14/2018. According to medical records lameness was present for several days prior to presentation. Physical exam revealed elbow pain and Metacam was dispensed. There was no improvement in lameness and Miles was next seen by Dr Wilson, DVM, DACVS-SA at Blue Pearl Animal Hospital in Skokie, IL on 11/13/2018. An orthopedic consult and CT scan were performed. Miles was diagnosed with chronic left biceps brachii tenosynovitis, degenerative joint disease of the left shoulder, and left supraspinatus tendinopathy. Rehabilitation was recommended as were possible future PRP injections if needed.

On 12/14/2018, Miles was evaluated by Dr. Megan Ridley, DVM, CCRT, CVA, CVSMT at IPC. Per owner history a left front limb lameness was present for several months and seemed worse after Miles first got up from a prone position. The owner had not limited the length of walks but

was carrying Miles up and down the stairs which are numerous and not covered with carpet or runners. Floors in the house are hard wood with some carpeting in the basement. Miles was otherwise healthy at time of presentation.

At his initial evaluation, Miles was given a score of 1/4 on the CSU Pain Scale. He had a body condition score of 7/9 and a left front limb lameness score of II/V. When gaiting, he had mild internal rotation of the left front and shifted his weight to the right front when standing still. There was no skipping or hopping noted in the hind limbs, however there was mild internal rotation of the right hind limb. When seated, there was an obvious decrease in weight bearing on the left front limb. On palpation, mild muscle atrophy was noted over the left scapular muscles including the supraspinatus and infraspinatus and Miles was reactive to palpation over the origin of the biceps brachii. There was mild resistance to left shoulder extension and an occasional click was palpated though it was difficult to assess if this was coming from the elbow or shoulder. The elbow had good range of motion with no discomfort. Spinal palpation was normal. There were no neurologic deficits or abnormalities noted.

Miles started his rehab program on 12/19/18 with laser therapy, massage and active stretching exercises. Sessions continued twice a week until 1/15/2019, when Miles had a 4 week recheck with Dr. Ridley. His left front limb lameness had worsened from a grade II/V to grade III/V and he would occasionally pick up the left front while standing. On palpation, the left front had increased resistance to shoulder extension compared to his initial exam, mild thickening over the origin of the biceps brachii and active trigger points in the left triceps and deltoids. The right front limb had normal range of motion and the hind limbs and spine remained normal.

Rehabilitation Treatments/ Modalities:

1. Photobiomodulation to the left shoulder, biceps brachii (tendon origin, insertion and muscle belly) and supraspinatus tendon (insertion) was performed to increase blood flow and decrease inflammation (4). Treatments were performed twice a week for the first 4 weeks of therapy using the Cutting Edge Class IV laser at 3.99 J/cm2. At the 4-week mark, we started using a Companion laser instead of the Cutting edge. The scanning and superficial heating component of the Companion laser made it a better option for Miles at this point due to the increase in active trigger points (ATrPs) in the thoracic limb musculature. The pain/trauma setting (0-20 pounds/Ave body type/ short hair/ med coat color/ light skin color/720 total joules) was used once weekly for weeks 4-8 and then every other week for weeks 9-15 of the rehabilitation program.
2. Massage was performed throughout the rehabilitation program but was increased during weeks 4-12 due to the increase in ATrPs. Sessions started and ended with effleurage for assessment as well as to increase perfusion to the tissues. A combination of compression and petrissage was also performed, concentrating on the left shoulder musculature. Transverse friction at the left biceps and supraspinatus tendons was performed to induce a small amount of inflammation, therefore initiating a healing response (5).
3. Therapeutic exercises including cookie stretches, seated and sternal extension, paw lifts, foam walking, and Cavaletti rails were slowly introduced from week 1–4. The purpose of these exercises was to encourage weight bearing and strengthen the front limb musculature. From weeks 5-8, Miles' activity was restricted due to an increase in his lameness. The previously mentioned exercises were slowly reintroduced from weeks 9-16 and high fives and balance exercises (on a balance disc) were added to encourage left

front limb weight bearing and to improve elbow and shoulder range of motion as well as muscle mass.

4. Sessions in the underwater treadmill were to start at week 4 but did not begin due to the set back at week 4.
5. Therapeutic ultrasound (3.3mhz/ 0.5 to 0.8 w/cm2/20% pulsed) using a one-inch sound head was performed for four minutes to the left supraspinatus and biceps brachii tendons. Treatments were once a week from weeks 4-8, with the goal of increasing blood flow and decreasing inflammation. Because of the proximity to bone, pulsed setting was used to decrease the likelihood of bone injury (6).
6. PiezoWave ESWT was performed once weekly from weeks 4-8 and then every other week during weeks 9-12. Slow regeneration rate and poor vasculature of tendons make them difficult to treat. The acoustic energy emitted by the shockwaves has been shown to be effective in assisting tissue regeneration and improving tendon function (1, 8, 9). Approximately 2000 total shocks were delivered to the left shoulder (Number 10 pad/6 Hz/ energy level 2-3). Area of focus included the biceps brachii and supraspinatus tendons as well as the surrounding musculature, including the ATrPs in the triceps and deltoids (13).

Treatments/Modalities: in addition to the above modalities, the following were discussed with the owner:

1. Weight loss – Prior to his injury, Miles was an active dog. With rest came an increase in weight. It has been shown that lameness can decrease significantly with a decrease in weight and that dogs with appropriate body condition scores live longer, healthier lives (8, 9). Our goal for Miles was a body condition score (BCS) of 5/9. The owner

decreased the amount of food offered and limited the number of treats given. As Miles' activity increased toward the end of his rehabilitation program, he began to lose weight, but his BCS remained a 7/9.

2. Exercise restriction – Due to persistent lameness it was recommended that Miles be restricted from exercise, stair use and jumping. Walks were restricted to three, ten-minute walks daily. The owner initially had a difficult time limiting Miles from jumping on and off the furniture. When lameness worsened at week 4 the owner was able to limit Miles' access to furniture, thereby preventing concussive, repetitive injury caused by jumping.
3. Omega fatty acids – These supplements are shown in dogs to decrease the enzymes responsible for the breakdown of certain components of the cartilage. A large study using peak vertical force showed that dogs with osteoarthritis that were fed a diet rich in omega-3 fatty acids had improved weight bearing compared to dogs that were fed a control diet with no omega-3 fatty acids (11, 12).
4. Dasuquin Advanced – Although studies show variability in the effectiveness of glucosamine and chondroitin sulfate, the possible benefits and lack of side effects make the supplements worth using (14, 15, 16). Research shows that antioxidants are useful in reducing the negative effects of inflammation (17). Dasuquin Advanced also contains alpha-lipoic acid, which has antioxidant properties to combat oxidative stress; Boswellia serrata extract, which may decrease the inflammatory response; Curcumin Longa extract, which is an anti-oxidant that can also act as an anti-inflammatory; and Manganese Ascorbate, one of the enzymes used for the production of cartilage that has been shown to decrease the inflammatory response.

5. Metacam – Although NSAIDS are often ineffective with tendinopathies due to the avascular nature of the tendons, Metacam was prescribed at week 4 due to the presence DJD in the shoulder and a worsening of the lameness (12).

Outcomes/Results:

At Miles' 8 week recheck, he did not exhibit any left front limb lameness. Exam revealed very mild resistance to left shoulder extension. All the surrounding shoulder musculature palpated normal. The right front limb and hind limbs remained normal on palpation. Exercise was slowly reintroduced and Metacam was weaned. Miles continued to have a normal gait for the next 8 weeks of his rehabilitation program and remained comfortable with both passive and active ROM to the left shoulder. Miles' last session at IPC was on 4/26/19. On 5/7/2019 Miles' human baby sister was born. Currently Miles is taking a break from a formal rehabilitation program while his parents concentrate on his new baby sister. When I last spoke with the owner on 8/2/2019, Miles was doing well and adores the new member of his family. He continues to show no signs of lameness. The owners are doing their best to keep up with home exercises and plan to return to IPC for maintenance rehabilitation once life settles down.

Summary:

Miles is a shy dog. We used high value treats (cheese and hot dogs) during his therapies. During the first few weeks of therapy, Miles would hide behind his owner and it was difficult to engage him in exercises. At week 3, the owner left IPC briefly to move her car. During her absence, Miles was more focused for his therapies. From weeks 4-8, the owner remained in the waiting room during Miles' treatments. Within a few sessions, Miles was more relaxed and was excited for his sessions. Once we started to reintroduce active exercises, Miles' owner joined the

sessions again and Miles was able to maintain his focus (for the most part) on his exercises and the hot dog.

Rest and exercise restriction were key in this case. Limiting Miles' activity and concentrating on healing/pain control modalities allowed Miles' body the time it needed to heal. The combination of ESWT and ultrasound/laser decreased the tension in the triceps and deltoids, while ESWT and friction massage created a necessary inflammatory response allowing the biceps brachii and supraspinatus tendons to heal. Once Miles' lameness improved, therapeutic exercises could be used to improve strength and active range of motion of the left thoracic limb.

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