

# Beagle Body Builders: *A rare genetic syndrome*

by *Jemma Cooper-Boot* BSc RVN Dip. Ani. Phys MIAAT

MUSLADIN-LUEKE SYNDROME (MLS), commonly known as Chinese Beagle syndrome, is a hereditary recessive disorder found in Beagle dogs that manifests with extensive fibrosis of the skin and joints caused by gene defects affecting fibrillin-1, a major component of tissue microfibrils (Bader et al, 2010).

Typically, affected beagles have shorter outer toes and walk very upright on their front feet resembling a ballerina stance on digits 3 and 4. In some cases, all four feet are affected. They have tighter skin with limited scruff and their bodies feel hard due to tight tendons and muscles. Often, they appear very well muscled, almost hypertrophied to an extent, with a noticeably flat skull, higher ear set, ear folds, extra ear cartilage and slanted eyes (Siracusa et al, 2017). Generally, these dogs are shorter than the average beagle.

Often this can be diagnosed at approximately 2-4 weeks of age, but the syndrome progressively worsens until about 1 year of age when the dog stabilises. There is also varying degrees of “affectedness” and many aspects of the syndromes traits should be considered before a diagnosis of the syndrome or potential MLS carrier. The only way to ensure a 100% diagnosis is a genetic marker test, mainly available in the States.

Due to such limited research into MLS, treatment was based on the human disease geleophysic dysplasia – a similar condition, where replacement of tissues with collagen causing inability to flex joints. In people, it is managed with analgesia and physiotherapy, with the potential to use muscle relaxants in severe cases, but has limited value.

## **MILLY – Neutered Female Beagle – approximately 4y 5m**

Milly arrived at a local re-homing centre in April 2017, and presented with clinical symptoms typical of MLS. She displayed a very stiff, prancing gait, with all 4 limbs in rigid extension during ambulation, walking very upright on all four feet. Tail carriage was low and tail tone rigid. There was excessive wear on digit 3 and 4 nails on all four feet, with the front feet being worst affected. She had a very limited range of movement in her limb joints, conscious, and under general anaesthetic. To be able to get up a curb, she would need to lean backwards onto her hind limbs and lurch forwards with straight forelimbs in order to get clearance. To sit, she could only put her hind limbs protracted straight out in front of her, and generally stays ‘sat’ for only a few seconds before lying down with full protraction of her forelimbs. She was much happier to be exercised on grass areas than on concrete and would always avoid hard grounded areas. She was initially very wary of having her forelimbs/ forefeet touched, mainly due to how sore her feet and nails were from walking on ‘tip toes’. Milly found, and still finds it, very challenging to remain focused in her sessions, and generally acts very hyperactive in most situations.

After a few physiotherapy consultations, changes in her behaviour and movements became apparent. She was able to reach further with her back legs and able to scratch her ears, her sit became more flexed at the stifle and she was able to hold it for longer periods of time. She began to play more with toys and people as she gained more function and movement, and her flexion and extension of all joints improved with every session. 7 months on, she is well settled into a routine with her new owners, incorporating physiotherapy techniques into every day life. Flexion and extension in her joints seemed to hit a plateau, but her muscle tone continues to improve.

## **CHESTER – Neutered Male Beagle – approximately 5y 3m**

Chester arrived in a local re-homing centre in October 2017, and presented with clinical symptoms typical of MLS. Again, he showed a very stiff, prancing gait, with all 4 limbs in rigid extension during ambulation, very upright feet, but with a high rigid tail carriage. Excessive wear was noted on digit 3 and 4 of the forelimb nails and of most nails on the hind limbs. Chester appeared to not be as badly effected as Milly, and had more flexion and extension of joints, and walked slightly flatter footed. He was also calmer than Milly, but instead used his voice to show his appreciation – often! Again, Chester, similar to Milly, has problems with getting onto objects such as curbs, sofas and avoided hard grounded areas.

Chester received the same treatment protocol Milly undertook, and similar changes were noted. They found that after a couple of months of sessions, he was able to scratch his ear with his back foot, not just flick the pinna, he had started curling into a ball – a ‘fox-like’ position to sleep and became more playful and interactive. Chester also began to have a scruff again, and the skin really loosened around his neck, chest and over his back. Chester continues to improve with the physiotherapy sessions and home exercises undertaken with his foster carers.



Chester

Treatment for both cases involved red light phototherapy to encourage cell regeneration, repair, circulation and endorphine release prior to massage. It was also used to support skin flexibility as these dogs suffered with very taught, 'stuck' skin. A variety of massage techniques were used, but it became apparent that these animals found the firmer types of massage, such as trigger point therapy more uncomfortable than patients not suffering with MLS. Pulsed Electro Magnetic Field Therapy was used over main muscle groups to increase blood flow, encourage removal of toxins and allow fresh nutrients and oxygen to the muscles to promote repair and normal function (please see protocol for treatment details).

Home regimes involved heat therapy, massage and basic physiotherapy exercises, such as passive range of movement, sit to stand exercises, proprioceptive path walking and active

stretches, being performed on a daily basis. Protective dog boots were a necessity in improving the condition of their feet and protecting their nails and pads from abrasive surfaces. These boots were used in both dogs with massive positive effects, not only physically, but improved their behaviour becoming keener to exercise and allowed touching of their feet. A strict feeding regime was implemented with both cases to ensure no weight gain, as keeping these animals in an ideal body condition score (as with any animal) will immensely aid their joints and muscles.

Both these animals continue with regular physiotherapy sessions, but without a home plan and owner compliance I doubt that the results seen would be as positive, not only for the patients, but their owners as well!

## REFERENCES

Bader, H. L., Ruhe, A. L., Wang, L. W., Wong, A. K., Walksh, K. F., Packer, R. A., Mitelman, J., Robertson, K. R., O'Brien, D. P., Broman, K. W., Shelton, G. D., Apte, S. S., and Neff, M. W., (2010). *An ADAMTSL2 Founder Mutation Casues Musladin-Lueke Syndrome, a Heritable Disorder of Beagle Dogs, Featuring Stiff Skin and Joint Constructures, Journal Pone*, 0012817.

Siracusa, A., Raschi, A., Mnannucci, T., Matteini, A., Carlucci, F., and Citi, S., (2017). *Musladin- Leuke Syndrom's Beagle: first Italian report, Veterinaria (cremona)*, Vol 31, No1, pp 51-55.

## JEMMA COOPER-BOOT

BSc RVN Dip. Ani. Phys MIAAT

After completing a degree in Equine Science in 2009 through the University of Wales, Aberystwyth, Jemma went on to gain her Registered Veterinary Nurse qualification in 2014, working within a busy mixed practice in South Wales. This allowed Jemma to further her Veterinary knowledge and understanding of both small animal and equines. During her education, Jemma always had a keen interest in physiotherapy techniques, so it was only natural that she undertook the animal physiotherapist qualification with The College of Animal Physiotherapy Ltd. She works closely with vets and has worked in practice to rehabilitate many dogs undergoing orthopaedic procedures, neurological conditions and various ailments through the methods of physiotherapy and veterinary nursing combined.

