Subjective gait assessment in dogs: some of the basics

DETECTING AND GRADING LAMENESS IN DOGS, especially that of the pelvic limb, can be challenging.

At least two studies (Waxman, 2008; Quinn, 2007) have demonstrated poor agreement between clinicians, and between subjective scores and force platform results. Still, gait analysis is a skill that can be learned and constantly improved, but resources on the subject are scarce.

In a small survey of six orthopaedic-minded colleagues (including three specialists) on the kinematic markers that they look for when assessing lameness, there was unanimous consensus that a “head nod” is the most useful marker for thoracic limb lameness.

At stand, approximately 60% of a dog’s bodyweight is distributed via the two thoracic limbs. The cranio-caudal centre of gravity (COG) of a dog is believed to lie just behind the elbow. This is because the head and the neck “overhang” the forelimbs by some distance, whereas there is very little mass overhanging the pelvic limbs caudally (only the tail).

This overhang of mass offers the dog an opportunity to shift the COG in a caudal direction by elevating the head and effectively shortening the lever-arm of the head and neck mass (see Figure 1).

If we are considering lameness as an adaptation to reduce force transfer through a painful region, then this shift of mass may be an effective and reliable way to reduce force through the forelimbs. Remember Newton’s second law of motion: “Force = Mass x Acceleration”.

In the same survey as above, there was no consensus on a single marker for pelvic limb lameness, and the total list was much longer.

There is much less capacity for dogs to shift their COG further forward to reduce mass through hind limbs. This does occur, and dogs with severe, bilateral hind-limb lameness may ambulate with very low head carriage, or even completely on their forelimbs.

Some dogs also demonstrate a confusing hind-limb lameness head nod. However, there is a more reliable and repeatable marker for asymmetric hind limb lameness: the pelvic lift. If the head nod aims to reduce the “mass” in Newton’s equation, the pelvic lift may be an adaptation to reduce the “acceleration”. Not the forward acceleration of the dog as a whole, but the downward acceleration of bodyweight as the painful limb enters stance phase. The dog effectively “throws” its pelvis upwards, minimally supporting it with the painful limb, and “catches” it again when the non-painful limb enters stance phase.

In Figure 2, compare the height of the pelvis in image 2 (lame, left hind limb) with that in image 4 (sound, right hind limb stance phase). By carefully watching a dog at trot, the observer can appreciate the pelvic lift, and identify the lame hind limb as the one starting stance phase when the pelvis is at its highest point.

Unlike the forelimb lameness head nod, which is usually evident at walk and trot, the pelvic lift is best assessed in the trotting dog. At a walk, other gait adaptations to pelvic limb lameness are easier to observe.

One is a difference in stance time: the dog will generally try to spend less time with the painful limb in weight bearing this is best appreciated by trying to appreciate a difference in paw speed during the swing phase of each limb. When a limb is in swing phase, the opposite limb is, by definition, in stance phase. The sound limb will generally move through swing phase more quickly in order to minimise the duration of the stance phase of the lame limb.

Another useful kinematic marker for pelvic limb lameness at walking gait is the “hip sway”. Some resources describe the hip sway as being characteristic of hip dysplasia, but in fact it may be present in other conditions. For example, many dogs with failure of the cranial cruciate ligament (CCL) walk with a more flexed stifle (see Figure 3).

This stifle flexion effectively “shortens” the working length of
**Joint conference of ESVOT and BVOA in September**

The European Society of Veterinary Orthopaedics and Traumatology (ESVOT) and the British Veterinary Orthopaedic Association (BVOA) are holding a collaborative conference at the Queen Elizabeth II Conference Centre in London from 8th to 10th September.

This, say the organisers, will be the largest gathering of veterinary orthopaedic experts and practitioners in the world, with the aim of sharing research and best practice on the latest cutting-edge developments in orthopaedics and traumatology.

For details go to www.esvot.org.

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**New support slings for dogs**

ORTHOPETS Europe has introduced the GingerLead Support Sling, the latest addition to its range of rehabilitative products for elderly, recuperating and special needs dogs.

The firm has been appointed European distributor of this padded sling which has a detachable leash allowing the handler to not only support the hindquarters, but also maintain control at the front end – all with one hand; and the “easy on/easy off” fitting, says the firm, is ideal for dogs just requiring hind end support when rising or gaiting.

The product is designed for short-term use and not to be left on a dog. There are seven sizes for toy through to giant breed dogs, with “male” versions also available. Prices start at £29.95. For details go to www.orthopets.co.uk.

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**How accurate are you in administering joint injections?**

DR Kathryn Seabaugh, assistant professor of equine lameness and sports medicine at the University of Georgia College of Veterinary Medicine in the US, and colleagues recently conducted a study on the accuracy of practitioners when injecting lower hock joints in horses.

The results were presented at the 2015 American Association of Equine Practitioners’ Convention held in Las Vegas last December.

“Straight-anterior diagnostic anaesthesia and therapeutic injections are relied upon to help diagnose and treat osteoarthritis in the lower hock joints,” she said. “But the medication can only be effective if veterinarians are accurate, and the distal hock joints can be a very challenging area to inject, especially if the horse already has osteoarthritis present.”

Dr Seabaugh and her team evaluated a group of six equine surgeons and surgery residents at the college.

Each injected two distal intertarsal (DIT) joints and two tarsometatarsal (TMT) joints with a contrast medium. The team then took radiographs to determine where the contrast medium was located within the joint.

The researchers found that the group successfully injected 23 of 24 TMT joints, for a success rate of 96%; but were less successful at injecting DIT joints, achieving a success rate of only 42% (10 out of 24). They also noted that experience did not appear to significantly improve injection accuracy.

Dr Seabaugh recommended that veterinarians use radiographs to ensure proper needle placement before injecting the DIT joint. “They might not be required for every injection but they could help improve injection confidence and improve technique and they can be very helpful when injecting horses with osteoarthritis. Horses with OA often have narrowed joint spaces or proliferative bone, making getting the needle into these joints even more challenging,” she said.

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