Clinical examination of the dog with thoracic limb lameness

Examination of the patient

Examination of the patient with musculoskeletal disease should start with a general physical examination. Particular attention should be paid to areas of inflammation, contusion, deformity, malfunction/disuse, atrophy/hypertrophy, increased/decreased range of motion, disarticulation or fracture.

Patient type (or signalment) may give important clues to the diagnosis. In many cases the breed, age, sex and use of the animal will narrow the differential list considerably.

History

The patient's history should be documented in chronological order. Important general questions relate to the use of the animal (working/pet), diet, vaccinations, etc. The animal's level of exercise, episodes of previous illness or previous musculoskeletal disease may be relevant to the current situation. The animal's accommodation may be important (is it kept with other animals?) Greyhounds kept on hard and rough surfaces are prone to corns.

The present problem should be investigated with straightforward and simple questions. Owners often blame musculoskeletal disease on an episode of minor trauma so be careful in interpreting their responses. The rate of onset (acute/chronic) is often important and informative. Is the problem getting worse or better, or is it stable? Is it worse after rest or exercise? Has there been any response to previous treatment? Is the animal off colour, or suffered any weight loss? Does the owner know of siblings with similar problems?

There is increasing interest in the use of clinical metrology instruments (owner questionnaires) for musculoskeletal disease. Whilst such instruments cannot replace the well constructed consultation, they do serve to formalise collection of some basic data and also to "stage" the condition as seen by the owner. The scores generated by such instruments can be useful to track clinical progression and response to treatment.
Clinical examination

There are definite sections to a logical examination:
• Observation
• Palpation: muscle mass, pain, swelling, heat
• Manipulation: joints, muscles, tendons, spine
• Neurological function

Observation
Locomotion can be divided into phases. These are "swing" and "stance" and are detailed in Table 1-1

<table>
<thead>
<tr>
<th>Phase</th>
<th>Motion</th>
<th>Swing</th>
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<tr>
<td></td>
<td>Flexion</td>
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<td>Early extension</td>
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<td>Stance</td>
<td>Beginning weight-bearing</td>
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<td>Propulsion (active extension)</td>
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Figure 1: Stages of the stance phase (right thoracic limb): paw strike, deceleration, propulsion, toe-off

There are several types of gait in the dog:
• Walk
• Trot (opposite limbs in-phase): Most dogs
• Pace (adjacent limbs in-phase): Cats, some dogs
• Canter
• Gallop

Observation with the dog at rest allows assessment of conformation, deformity, Distribution of bodyweight - uneven distribution points to discomfort. Ask yourself the following questions:
• Is weight distributed forward?
• Is weight distributed backwards?
• Is weight distribution asymmetric?
• Is weight shifting?

Palpation and manipulation
It is important to remember that thoracic limb lameness can also be caused by Cervicothoracic diseases such as caudal cervical disc disease and brachial plexus disease.
Cervical vertebrae
- Ventra- and dorsiflexion, lateral movement
- Palpation of lateral processes

The thoracic limb
For larger dogs, it is often easier to have the dog sitting on the floor in front of the owner; the owner can then steady the dog’s head. One should work logically from proximal to distal and then back to proximal. The author feels for asymmetry and effusions when working distally. I then flex, extend and rotate all the joints and palpate the long bones in a distal to proximal direction.

Manus
With the claws and pads look for uneven wear or fraying. Cuts, lacerations and entry wounds are common. The digits should be flexed and extended. The palmar sesamoids are a site of pathology in breeds such as Greyhounds, Rottweilers and Labradors. They can be palpated at the metacarpophalangeal joints.

Carpus
The carpus should be palpated for swelling and manipulated to the extremes of motion. A normal carpus should flex so that the toes touch the antebrachium. In extension the carpus should go to 10° beyond straight- hyperextension is common caused by palmar ligament injury. Collateral ligament stability should be assessed.

Elbow
The elbow is a very common site of pathology especially in larger dogs. Effusion may be palpated caudilaterally as a fluctuant swelling. Pain is most often exhibited on full extension, with or without external rotation. Full flexion may also elicit pain, especially if combined with internal rotation (pronation). Medial joint line palpation is often tender in dogs with elbow dysplasia. Assess the range of motion, using a goniometer if necessary.

Figure 2: Effusion at the elbow joint is palpated caudilaterally
Shoulder

The shoulder is also a common site of disease. It should be moved through its full range of motion. Contracture of the spinatus musculature can cause inability to abduct the shoulder during extension. Check for crepitus or a decreased ROM.

![Figure 3: Examining the shoulder joint](Image)

One must be careful to avoid confusion with elbow pain when manipulating the shoulder; the elbow should be held in a neutral position when manipulating the shoulder joint. Integrity of the biceps tendon can be assessed by full flexion of the shoulder joint and observing the degree to which the elbow joint will extend; hyperextension indicates biceps tendon rupture.

![Figure 4: Hyperextension of the elbow joint (above) caused by bicipital tendon rupture; normal contralateral joint (below)](Image)
Pressure should be applied to the bicipital tendon in intertubercular groove although pain on this "test" is not specific for biceps tendon disease. One should not forget to palpate the scapula. Pain elicited on this test without an increased range of elbow extension is reasonably specific for cranial shoulder pathology.

Assessment of abduction angles of the shoulder needs to be performed in the sedated or anaesthetised dog; positioning of the dog is critical: the elbow and shoulder joints should be in full extension with no internal or external rotation at the shoulder joint. Increased angles may be consistent with medial shoulder disease although can also be caused by chronic muscle atrophy. Increased angles AND pain are reliable indicators of medial shoulder disease.

Figure 5: Assessing shoulder abduction angles
(photo courtesy Dr Jimi Cook, University of Missouri)

**Neurological function**
It is important to test neurological function, especially if there is any suspicion of brachial plexus or cervical spinal disease. Proprioception is tested using paw knuckling or paper-slide tests. Local myotatic reflexes should also be assessed including:
- Biceps brachii tendon of insertion
- Triceps brachii tendon of insertion
- Extensor carpi radialis tendon of origin
The panniculus reflex should also be assessed bilaterally.
Figure 6: Testing the panniculus reflex: the lateral thoracic nerve carries the motor supply to cutaneous trunci muscle and is from spinal segments C8/T1 and passes through the caudal brachial plexus

Acknowledgements

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