

# CONFORMATION DEFECTS IN DRAUGHT AND PACK EQUINES

G.J.R. Hovell

## Introduction

Clinical examination procedures in working animals at a clinic or in the field tend to be somewhat superficial. The more obvious abnormalities such as sores, tendon injuries and overgrown feet are identified and treated but other defects which should be recorded and which may be of even more significance to health and welfare are frequently over-looked.

In appropriate cases examination procedures could with advantage be extended to include tests to detect back strain and observations to recognise roachback and ilio-sacral subluxation. Similarly, assessment of the hind limbs to determine the alignment of hocks and stifle joints can identify cow and sickle hocks and the degree to which they may be abnormal. Feet should be inspected on the ventral aspect as well as from above. Dished feet may be apparent, but flat soles will only be revealed when the foot is lifted and cleaned. The position and extent of the bar is crucial to foot comfort and free movement, particularly in arid climates.

## Back Conditions

Roachback and sacro-iliac subluxation are usually suspected by observation alone as they affect the posture of the animal but back strain in the thoraco-lumbar region can only be diagnosed if a test for ventro-flexion is applied.

1. **Roachback** This defect is alternatively termed kyphosis and gives a hump backed appearance. It should be differentiated from prominent withers and a round backed posture which might be a symptom of a more general condition causing weakness. The significance of roachback, which is usually congenital in origin, is that it is always more difficult to fit a saddle in such a way that rubbing is prevented. In addition, it has been found that roachbacked animals are more prone to suffer back strain, judged by ventro-flexion testing than straight backed animals. Affected animals are less suited to draught work where a saddle is involved, than being ridden or working with collar and traces only.
2. **Sacro-iliac subluxation** This abnormality is sometimes known as Hunter's Bumps in horses and it is a partial dislocation between sacrum and pelvis which is acquired from traumatic causes such as a fall. In developing countries, especially in donkeys, it results from being ridden or carrying some other excessive load when the animal is still immature. Pressure on the lumbar region stretches and tears the ligamentous attachments between the sacrum and wings of the ilium. The resulting deformity, akin to a step in the vertebral column, is not reversible, but by reducing activity which stresses the vulnerable area, the injury may stabilise and cause less discomfort. This lesion provides a specific example of a permanent abnormality originating from overloading an animal which was too young.

3. **Back strain** Whether a back is strained or sprained depends on the degree of the injury. Certainly the longissimus dorsi muscles are affected and the supraspinous ligament may also be involved. It is a soft tissue injury but is usually chronic in nature in draught animals, typically centred on the thoraco-lumbar region. The lesion can be extensive, affecting muscles, tendinous attachments and ligaments.

Up to 80% of draught donkeys may suffer from this type of injury which can consequently be responsible for cases of hind leg lameness and abnormalities of gait. Donkeys drawing two-wheeled carts of poor design and with unsuitable harness are probably most affected. While rest and appropriate therapy are the immediate requirements, for a longer term solution attention must be directed to the cart, particularly its size and balance, and the harness and its attachments to the cart. More care in placing a load centrally on the cart above the pivotal point is also necessary. It has been known for a donkey to fall to the ground as the shafts of a cart were lowered and weight was taken on the saddle which was not quite correctly placed. Sometimes too, donkeys stumble and fall when descending even a slight incline, due to movement of the saddle which transferred pressure to an acutely sensitive part of the spine.

The ventro-flexion test should be applied for diagnosis of back strain in conjunction with other clinical methods. A positive result usually indicates that there is at least soft tissue damage. Slight pressure is applied manually to the middle and distal parts of the spine and an affected donkey will semi crouch, flexing at the knees and dipping its back three inches or more: clearly the stimulus is resented. If the response is merely a flickering of the skin or a slightly lowered back by an inch or so, this can be classified as negative or mild. Back strain does not necessarily affect posture but more often causes gait abnormality.

### **Hock and Stifle Joints**

Three abnormalities are included here: cow hocks, sickle hocks and stifle joints which are divergent.

1. **Cow hocks** This condition of the hind legs is a normal feature in some species, camels for example, but it is considered a definite abnormality in equines. Donkeys as a species tend to have mild cow hocks but when this is more severe due to inbreeding or random breeding of poor stock, and perhaps exacerbated by other factors, it is a bad characteristic leading to altered gait and poor work performance. Cow hocks are easily seen on inspection from behind the animal with the points of the hock inclined medially and the feet splayed apart.

This abnormality is usually so obvious that other related defects are overlooked. For instance, cow hocks are frequently associated with sickle hocks and, in addition, in extreme cases the stifle joints are found to be out of alignment, pointing more antero-laterally than is normal. A cow-hocked leg with excessive angulation of the hock joint (ie sickle-hocked) and a poorly aligned stifle will cause deviation from a normal gait. The animal cannot even bear a moderate load and will only perform to a low standard.

Cow hocks in horses are also known to predispose to bone spavin due to strain on the medial aspect of these joints.

2. **Sickle hocks** An assessment for sickle hocks should be made from a lateral view of the animal. The hocks are more acutely angled than is acceptable for normal conformation, with the toe of the hind foot placed almost directly in a perpendicular line below the stifle when the animal is standing square. This defect is commonly found in association with cow hocks. It counts as an unsoundness because the posterior aspect of the hock is under strain and from this may develop inflammation and enlargement of adjacent structures. Curb involves thickening of the plantar ligament at the level of the hock joint.
3. **Stifle joint** This has the largest articulation in the whole body; its correct alignment is important to normal gait and for power transmitted from the hindquarters. In normal movement the joints of the upper limb are first flexed and then carried forward more or less parallel with the main body axis. In a cow-hocked animal the stifle joints will be deviated laterally as a result of the hocks being inclined medially. This will be more noticeable when the animal is moving or when the legs are individually fully flexed passively.

In one of the heavy horse breeds, the Clydesdales, a characteristic feature is the closeness of the hocks posteriorly so that the lower legs and feet are rotated slightly outwards and the stifle joints are similarly wider angled antero-laterally than normal. This preferred trait allows good flexion of the hind legs and contributes to the springy stride of this breed; it has been achieved by selection without sacrificing the ability of the leg to absorb concussion. It should be noted that this type of conformation is not the same as cow hocks as the metatarsal bones and feet are not splayed out distal to the hocks. Neither are sickle hocks associated with the typical shape of the Clydesdale hind leg.

Stifle joints are usually divergent in animals with marked cow hocks, most notably donkeys and there is commonly also an association with sickle hocks, making the hind legs in these cases decidedly abnormal. Equines with such defects have a modified gait and as draught and pack animals cannot be rated highly. When cow hocks are noted attention should be directed to the more proximal configuration of the leg as well as distally to make a full assessment.

## **Feet**

Flat feet, which can be recognised in the standing position from the slope of the wall, constitute a conformation defect and are probably due to hereditary factors. Differential diagnosis should exclude cases of laminitis and sand crack at the lower periphery of the wall. If the walls have a dished appearance especially at the quarters, the sole and bars will also follow this form. These abnormalities are more prevalent in horses than donkeys and mules and prove a greater handicap in arid climates when the external structures of the hoof become extremely hard.

Lameness in equines more often affects the feet and lower limbs than the upper limbs, and more often in the fore legs than the hind. Conversely, abnormalities of gait as opposed to lameness are more often observed at the rear due to lesions at hock level or above, and particularly in the back. Donkeys are considered to be the most affected equine species in this respect, due to work related stresses and faulty conformation. In addition, hoof defects in horses can also be responsible for gait abnormality.

Lameness is generally more readily identified than abnormality of gait because only one leg is usually affected and a requirement for treatment is perceived. Gait abnormality, on the other hand, commonly affecting two legs or feet typically involves a shortened stride with a low flight path of the feet, and as a consequence it may be less dramatic and cause less concern. The site of an injury responsible for this may not even be in the leg or foot, but in the back.

1. **Hoof wall** Sand cracks and overgrowth of the wall which may result from chronic laminitis should be easily seen and dealt with in a conventional way. In horses, hooves with a tendency to dish require regular trimming to shape and will benefit from being shod. Shoes with a transverse bar to protect the foot and effectively to raise the heel from the ground would be an added advantage. If such hooves become even slightly overgrown the walls may crack at the outer edge and splay at the quarters. This leads to abnormal pressure on the flat sole which is then more liable to be injured. It is important to realise that a mare or stallion affected with flat feet will transmit this characteristic to a proportion of its offspring, perpetuating the abnormality and making for further difficulties with foot care.
2. **Sole and bars** The soles of the feet should be concave, but in flat feet which are hereditary in origin the soles are not only flat but lower than normal, ie nearer the ground. In consequence they are more prone to bruising. In arid climates where the soles and bars are dessicated and hardened there may be accumulation of tissue because little is shed. This is particularly so if the horse has little opportunity for exercise. In these circumstances, parts of the sole may even become convex. This should be corrected by judicious removal of sole tissue in conjunction with trimming the wall.

The bar in a flat footed animal slopes more laterally than in a concave footed one. In neglected overgrown feet it overlies the adjacent area of sole. This prevents sloughing of the sole epidermis and due to the harder structure of the bar it can also press up on the softer sole from ground contact. This may result in the formation of a corn. Bar overgrowth in hot and dry environments frequently leads to abnormalities of gait in horses.

Cases with bars extending at least half way across the angles at the heel or towards the quarters of the hoof are not unusual. Sometimes grit becomes trapped between the horn tubules of the bar and the sole tissues which can penetrate the sensitive matrix. Paring the bar tissue away from the underlying sole and removing embedded dirt commonly resolves abnormal gait and will reverse further deterioration. The bar should occupy a position virtually in a straight line from its junction with the wall at the heel, forwards and parallel with the corresponding edge of the frog.

## **Discussion**

Conformation is one of the factors which affects the welfare of working animals. With good conformation a horse or donkey for example, has one less handicap to compromise its performance. Conversely, abnormal conformation from either congenital or acquired causes such as trauma, can weaken an animal so that it is continually working under stress and is liable to further injury.

A study conducted in Sudan with draught donkeys and also horses showed that back defects which were mostly acquired and distinct from saddle galls, were commonest in donkeys. Together with congenital defects of the hind limbs and poor foot care especially in horses with hoof deformities, these were responsible in many instances for abnormal gait which was accentuated when loads were heavy. Recognition of conformation faults affecting backs, hind legs and feet enables advice to be given so that an affected animal can be put to more appropriate work, as treatment may be limited in effect. Replacement animals of normal conformation should be selected, thus avoiding recurrence of the same disability. In the longer term greater attention to breeding to achieve better conformation is required.

## **Summary**

Conditions commonly affecting draught and pack animals which can be classified as conformation defects have been discussed, as well as back strain which is associated with several of the examples described here. This list is by no means comprehensive but concentrates on areas which are often neglected, and the abnormalities are those which are of special relevance to working animals. Although a horse or donkey should not be condemned because it has a mild conformation defect, cases with moderate or severe forms of these conditions will benefit from informed advice which takes the disability into account and offers a solution to reduce further stress on the affected part.

## **Acknowledgements**

The data on which these observations are largely based was collected through the assistance given by many Sudanese animal owners and professional colleagues. Their collaboration is gratefully acknowledged.