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# Angular and flexural limb deformities in foals and yearlings. Part 2: Flexural limb deformities

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**ABSTRACT:** Foals can be born with limb deformities or they can be acquired. In this, the second of this series of articles, flexural limb deformities and their treatment are discussed.

## Introduction

Normal foals are born, like most mammals, with naïve musculature and often have slightly lax tendons and immature ligaments, giving the impression of being weak and slightly flaccid. This sometimes manifests itself as over-extension of the fetlocks, which, in dysmature foals, can be quite extreme. However, foals rapidly gain muscular strength and ligamentous stability after birth. Thus, within a few days, newborn foals begin to strengthen and straighten their limbs.

Flexural deformities can be congenital or acquired after birth. They can occur at specific times in a young horse's life. Acquired deformities typically involve the carpus, fetlock or distal limb and their cause is uncertain. Another specific type of flexural deformity involves the stifle and is caused by lateral luxation of the patella.

Acquired deformities typically involve the distal inter-phalangeal joint in suckling foals. Occasionally weanlings and yearlings acquire flexural deformities of the fetlock. Any painful lesion in a limb might result in some degree of flexural deformity.

## Carpal flexure

This is the classical, so-called "praying mantis" foal (**Figure 1**). In its most

extreme form, the foal *in utero* cannot assume the diving posture which is necessary for the normal birth process, and such cases usually end up requiring delivery by caesarean section. However, while mild carpal contracture is usually self-correcting, moderately affected foals require assistance.

In the first instance, the priority is always to ensure the foal is able to suckle from the mare to obtain the vital colostrum. The most useful method of achieving this, without having to lift or hold the foal, is to provide carpal extension splints. These can be proprietary splints such as "Dynasplints", or made of any light, inflexible material incorporated into a light bandage to support the affected carpus; the condition is usually bilateral.

The foals should have the splints removed intermittently to avoid pressure sores. It should be remembered that foal skin is particularly sensitive and that splints and casts can readily create pressure sores which can be as damaging as the original deformity.

Another very useful treatment is a single, intravenous injection of oxytetracycline (3 g in a thoroughbred foal), which frequently seems to relax contracted tendons, although the mechanism is unknown. Combining this treatment with active splinting gives the most effective and rapid improvement.



▲ **Figure 1.** Newborn foal with a moderate carpal flexural deformity



▲ **Figure 2.** Newborn foal with casts on both hind fetlocks because of a severe flexural deformity

As the foal's condition improves, it should be given controlled access to light exercise. These foals maintain carpal extension and weight bearing by contracting their forelimb musculature. If exercise is overdone they will rapidly tire and the muscles tremble with fatigue; this should be avoided.

While the surgical release of tendons attaching to the accessory carpal bones can be effective in a small number of cases, in the vast majority of affected foals, splinting and increasing maturity,

combined with gradually increasing controlled exercise, resolves the problem. In a small number of cases, the degree of contracture is so severe that surgical releasing procedures are completely ineffective. It is not possible to passively extend the carpus when these individuals are heavily sedated or under general anaesthesia; such foals should be euthanased.

### Distal limb flexure

This is a condition of newborn foals and typically involves both the fetlock and distal inter-phalangeal joint to varying degrees; both fore- and hindlimbs can be involved. In almost

all cases the deformity can be resolved by applying splints or, in more severe cases, a fibreglass cast (**Figure 2**).

The principle is that supporting the distal limb of a young foal results in laxity of the tendons and ligaments and limb straightening (**Figure 3**). In fact, the aetiology of congenital flexural deformities involving the carpus or distal limbs is very poorly understood. As with the carpus, injecting oxytetracycline also usually has a dramatic effect on the condition. Surgical treatment is virtually never used for these



▲ **Figure 3.** The same foal after nine days, when two sets of casts had been replaced and finally removed

cases, because of the effectiveness of splinting.

### Active extension splinting

Recently, an active extension splinting technique has been employed for distal forelimb contracture. A dorsal splint is created by using fibreglass casting strips conformed to the limb and, once cured, these are trimmed and any rough edges smoothed or covered with tape, the splint is wired to the toe and bandaged to the limb in maximum extension. This has proved a simple and inexpensive way of managing these deformities.

### Distal inter-phalangeal joint contracture (so-called club foot)

“Club foot” is an acquired flexural deformity which most commonly occurs in foals between six weeks and six months of age. Typically, foals will start to stand on tiptoe, and a colloquial name for this is the “ballerina syndrome”. The condition seems to be associated with orthopaedic pain in some foals and the use of a low dose of non-steroidal anti-inflammatory (NSAID) medication, with or without oxytetracycline and rest, will often resolve the problem. However, in some cases the condition continues to progress and the lack of heel contact results in excessive heel growth and a boxy, club foot (**Figure 4**).

Foals with a club foot require proactive treatment and several different approaches to the problem have proved effective.

One approach is to trim the heels and shoe the foal with an elevated heel, which is then gradually lowered. This, combined with NSAID medication and rest, can



Figure 4. Club foot in a weanling

resolve the problem without the need for more radical interference.

Another approach is to use a toe extension. This is usually an aluminium strip, which is attached to the solar surface of the foot with synthetic hoof material and extended dorsally to discourage premature break-over of the foot.

For the most severely affected club foot, robust heel trimming is combined with resection of the carpal head of the deep digital flexor tendon (inferior check ligament) under a general anaesthetic (Figure 5). With judicious use of NSAIDs and controlled exercise on a firm surface, this almost invariably resolves the problem (Figure 6).

#### Fetlock joint contracture

Less common than other contractures, the condition typically affects horses of 12–24 months of age. The animal usually stands with its foot flat on the ground, which differentiates it from the more



Figure 6. The same foot 48 h after surgery and trimming of the excessive heel

common distal limb contracture, which is seen in young foals. The condition usually presents with both forelimbs appearing straighter through the fetlock and usually progresses quite rapidly, resulting in the horse knuckling over at the fetlock. Although the condition can affect only one forelimb it is typically bilateral, with each limb affected to differing degrees.

As with other contractures the cause is uncertain, although it develops during a rapid growth spurt. Both superficial and deep flexor tendons are often involved and severely affected animals are usually quite disabled by the condition. The response to treatment can be disappointing and treatment should be instigated as soon as the condition is identified.

Surgical release of the radial head of the superficial flexor tendon (superior check ligament) can be achieved via a tenoscopic approach and sectioning of the carpal head of the deep digital flexor tendon.



Figure 5. Section of carpal heads of deep digital flexor tendon

The use of NSAID medication and continued exercise is essential to encourage stretching of the affected limb(s). Despite prompt surgical intervention, the response is usually slow and poor. In some severe cases, surgical release can be combined with splinting or even the use of a fetlock brace, which attempts to hold the fetlock in a more palmar position.

Affected animals seldom recover fully and most are left with a straight fetlock and upright forelimb conformation. While resection of the flexor tendons themselves will usually resolve the contracture in the short term, such animals are unlikely to be useful for any athletic activity and recurrence of the contracture is not uncommon after some months.

#### Lateral luxation of the patella

This is a condition typically of miniature horses, but has been recorded in horses of many breeds, including thoroughbreds. It appears in newborn foals and the typical case involves both stifles. Although the *quadriceps patella* unit is a major extension apparatus, lateral luxation of the patella converts its action to flexion. Thus a bilaterally affected foal stands, if it can, with a crouching appearance with both stifles in flexion. More often it is unable to stand effectively and has to be held up to the mare to suckle, which is the first priority in this situation. Unilaterally affected animals tend to be less severely disabled.

Clinical examination of the stifle typically reveals marked femoro-patellar joint effusion and routine radiographic views reveal the patella to be markedly displaced laterally. The only effective treatment for the condition is to imbricate (fold over and suture securely in place) the medial aspect of the femoro-patellar joint capsule and, if necessary, to deepen the distal femoral trochlea. Usually, the chronic displacement of the patella results in a contraction of the lateral aspect of the femoro-patellar joint capsule, and releasing incisions and even lateral patellar ligament desmotomy may have to be made in some foals.

While this type of surgical procedure can relocate the displaced patella to a stable position within the trochlea of the distal femur, hypoplasia of the lateral trochlear ridge often causes permanent instability and failure of the procedure.

#### Conclusion

Limb deformities in the foal can be a challenge to correct and manage, with many requiring supportive nursing care in the form of wound management and bandaging. It is important to work closely with the veterinary surgeon, as some aspects of the foal's care can be complex, requiring efficiency and teamwork.