

Limb Deformities of the Foal
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Introduction

Angular limb deformities are very common in the newborn and developing foal. In addition, congenital flexural and extensor deformities are very common in the newborn foal. The fetlocks, carpus, and tarsus are the primary joints involved. The purpose of this paper is to describe the deformities most commonly seen in our practice and the manner in which they are handled. Treatments vary and range from conservative therapy to surgical intervention. The type of treatment indicated depends upon the location and severity of the deformity.

In my practice, the amount of valgus or varus deformity is given a subjective score. Foals are graded from 0 to 3 with 0 being straight. For foals with a slight deformity, a score of 1/2 is used. In addition to angular limb deformities, many foals will have sickle hock conformation or rotational deformities that need to be monitored. Most foals will improve without treatment within the first 30 days of life. Therefore one should let the foal improve on its own and initiate specific therapy only when the foal has stopped improving, the rate of improvement has slowed, or a drastic change in the conformation has occurred. If you do not record a grade, it is impossible to remember if the foal is improving or worsening. Most significant conformational abnormalities are monitored on a monthly basis to observe the conformational trend. On many farms, all foals are evaluated every 4 to 6 weeks. Often a dramatic change in the conformational trend can occur in two weeks, especially in foals with very good conformational scores as neonates.

Examination

During the initial newborn examination, the foal should be evaluated for conformational abnormalities. Most deformities change dramatically within the first few days of life, however; some require early intervention. Many flexural or extensor abnormalities will need immediate attention if severe. By performing a brief conformational examination one can monitor the progress of the foal.

The “30 day” conformational examination has become a popular procedure. This is an important time in the developing foal’s life, especially with regards to fetlock conformation, because the distal metacarpal and metatarsal physes lose 50% of their growth every 30 days. I have found the 30-day examination most important in cases of fetlock varus when more aggressive treatments need to be considered. It is important to watch the foal walk as many early conformational abnormalities can be detected by the way the foal “tracks”. This is important when evaluating their response to corrective trimming. The time of the examination is also important relative to trimming. If a foal has been recently trimmed and corrected and still has an obvious conformational abnormality (especially varus fetlocks) a more aggressive treatment, i.e. PT, may be indicated. Periosteal transection is a controversial procedure in the developing foal; however, when used properly and with discrimination, we have found it to be a useful adjunct to corrective trimming.

Carpal Valgus / Varus Conformation

Most foals with carpal valgus will improve dramatically within the first few weeks of life. These foals are monitored for improvement for up to 60 days. If the angulation has not corrected by that time, a periosteal transection is performed. When a foal is found to have a grade 2-3 valgus deformity, the affected limb(s) are radiographed to evaluate the cuboidal bones. The grade 2-3 valgus foals without bony abnormalities will have very limited turnout to allow for the soft tissues to strengthen. Unlimited turnout in these foals could result in ligamentous stretch, damage to the physis, or damage to the cuboidal bones. Improvement usually occurs with a week of stall rest, and a gradual increase in exercise can be initiated in a round pen or temporary small pen. These foals are candidates for periosteal transection at 2 weeks of age if they are not improving. Occasionally, a second PT is required at a later date, or if severe enough, transphyseal bridging may be performed. Improvement with time is the key parameter to monitor. Foals with delayed ossification of cuboidal bones are stall confined, and radiographs are taken weekly until the bones totally mature. Occasionally, these foals will require splinting.

Carpal varus is not as common. Usually this deformity is associated with a windswept conformation and will be discussed later. Foals that were normal and suddenly become varus should be radiographed.

Fetlock Valgus / Varus Conformation

Fetlock (metacarpal/metatarsal) valgus usually improves dramatically as the foal grows. This type of deformity must be severe to require any special attention. This is in contrast to fetlock varus, which is frequently familial and requires more aggressive treatment. The blacksmith, at 3-4 days of age trims the foal's hooves, applying only slight correction for a toe-in (lowering the inside wall) and removing the points on the toes. This foal is usually trimmed on a 2-wk schedule. With foals that wear their foot excessively despite trimming, equiox (cyclohexyl methacrylate - manufactured by Equiox International, 110 NE 2nd Street, Pine Island, MN 55963, 800-551-4394) can be used. One must carefully monitor equiox used for long periods of time (> 30 days) because a foal's hoof grows very fast and misshapened or deformed hooves can result from overuse. If equiox is used for long periods of time, one should use it intermittently to allow the foot to grow normally.

Most improve dramatically by thirty days of age, but for full correction, many will require a PT on the medial side of the metacarpus/tarsus for fetlock varus. Because of the rapid closure of the metacarpal and metatarsal physes, a PT should be performed before 60 days of age. In severe cases, transphyseal bridging of the fetlock has been successful. If done early (before 60 days) and bandaged appropriately, the cosmetic effects are very good. However, this procedure is reserved for severe fetlock varus that has not responded to trimming or PT. One will observe that, after thirty days of therapy (trimming or PT), no change in the varus deformity has occurred, with the foal's fetlock and knees moving laterally when the foal walks. Also, these foals often have offset knees that give the foal a "bow-legged" appearance. In the most severe cases, crushing of the medial aspect of the metacarpal physis may occur, resulting in an extreme toe-in conformation and ultimately, affecting future soundness. Many times, this condition is associated with severe physitis. It is not uncommon for farm personnel or blacksmiths to report an acute and sudden change in a relatively normal foal. Once crushing of the medial epiphysis has occurred, most treatments, including surgery and corrective

trimming are unrewarding. Therefore, all means available are employed to correct a varus fetlock in the presence of offset knees.

Windswept Foals

“Windswept” foals have a conformational abnormality in which the limbs are slanted in one direction with a valgus deformity in one limb and a varus deformity in the other. This conformation is thought to occur secondary to fetal positioning during the last few weeks of gestation. Affected foals require stall rest until their conformation improves enough to walk to a small pen or paddock. They should be examined for severe abnormalities such as curvature of their long bones and spinal deformities. Although surgical intervention such as a PT or transphseal bridging may be required in some cases, many foals will correct without specific therapy during the first month of life. The site normally requiring the most careful monitoring is the cannon bone of the varus limb. Although the valgus limb is often more dramatic, it is usually centered higher in the limb where there is more time for correction to occur.

Tarsal Conformation

At birth, many foals have a valgus deformity of the tarsus (“cow-hocked”) or have a “sickle hock” conformation. These angular limb deformities usually correct within the first 30 days of the foal’s life. Many premature foals have delayed ossification of cuboidal bones along with abnormal hock conformation. Even in term foals, crushing of the tarsal bones can be predisposed by conformational defects. In either case, radiographs should be taken to evaluate the cuboidal bones in all foals that are at risk. Foals with severe conformational defects or delayed ossification of their cuboidal bones are stall confined and radiographs are taken weekly until cuboidal bone mineralization has occurred. After complete mineralization, foals undergo a gradual increase in turnout. Usually a small pen or round pen is used initially. After a few days the foals are introduced to a small paddock. Splinting may be required in the occasional severe case, especially with concurrent soft tissue laxity; however, it should be avoided if possible. Most foals will correct with normal growth. Occasionally, in more severe cases of tarsal valgus a PT is performed. This procedure is usually performed after 60 days when it has become obvious that the foal has not continued to improve or has worsened.

Tarsal varus is not common and is usually associated with a “windswept” conformation. Unless severe, tarsal varus rarely requires surgical intervention. Non-responsive varus always requires a closer examination.

These deformities improve a great deal as the foal strengthens with exercise. Hock conformation generally continues to improve for many months and only a few would require a PT.

Flexor and Extensor Abnormalities

The most common flexural weaknesses are “back at the knees” and weak pasterns. Both of these conditions improve the first few weeks of life. As the supporting soft tissues strengthen, many moderately affected foals with carpal over extension will gradually improve to normal, thus a “back at the knee” conformed neonate is not an indication of the adult conformation. In severe cases, the amount of turnout is restricted until the conformation improves.

Weak pasterns (fetlocks) are a very common finding. Most foals improve in a few days and require very little special attention. In mild cases simply trimming the heels

slightly will rid the foot of the rocking motion and keep the foot on the ground. In cases where the foal rocks back on its pasterns to the fetlock and the hoof is seen to extend dorsally, special shoes, glued or taped on, with a heel extension can be used for support for up to two weeks. Occasionally these shoes will need to be reset for an additional one to two weeks. I prefer to make aluminum shoes, which are applied to the foot with equiloxy, however commercially available glue on shoes is also adequate. A small bandage with extra padding behind the heel bulbs can serve as adequate protection until the foal strengthens or until shoes can be applied. Without protection, heel bulb and pastern lacerations are common in these foals, which can lead to a severe ascending cellulitis. Foals should be confined to the stall until the shoes are applied. Usually a round pen or small temporary pen works well for initial turnout.

The most common flexural deformities involve the carpus, fetlock, or pedal joints. In my experience the biggest mistake made when treating flexural deformities of the neonate is a lack of aggressiveness with non-responsive cases. Many times foals are merely bandaged, given tetracycline and turned out even though they are not responding. Aggressive splinting is required. By the time appropriate splinting is used, many foals will have pressure sores so severe as to become life threatening. In general, a flexural deformity of the fetlock or pedal bone should be corrected in three days of routine splinting. No more than 5% of these foals will take longer than three days of steady splint pressure on the short flexor tendons to obtain normal limb position. Oxytetracycline given at 3 grams IV diluted in saline as needed, for three consecutive days will relax most flexor tendon contractions in neonates¹.

If a foal with fetlock flexural deformity cannot walk without the fetlock-flexing forward, a splint is applied. I use an aluminum splint manufactured by a blacksmith, who is easily applied, shaped as necessary, and lightweight. PVC pipe is also very useful and can be cut or shaped into the correct size. Selective pressure should be applied to the back of the foot by applying extra padding to the bottom of the splint. The splint is applied and the foal is given 2 grams tetracycline IV and 1 mg/kg flunixin meglumine. The foal is not turned out until the splinting is no longer needed. Most fetlock contractions take two to three days to correct.

Flexural deformity of the pedal bone is less common and is a challenge. Again, one cannot stress the importance of aggressive treatment in these cases. I have had the most success by applying the splint on the anterior surface of the leg, drilling two holes in the anterior hoof wall and connecting it to the bottom of the splint. A fulcrum is placed on the front of the bandage and the splint is applied to the bandage. Because of the force placed on the deep flexor tendon and foals can become painful. Therefore, this splint will need to be removed at 12-hour intervals. In addition, 1 mg/kg Flunixin Meglumine and 2 grams of tetracycline are used for up to three days. Flexural deformity of the carpus (over at the knees) is very common with a large variation in severity. Most improve with normal exercise. In cases where the foal has difficulty standing, the legs are bandaged from the elbow to the foot or a splint cast is used. I have not had much success with surgery, casting or tetracycline in severe carpal flexural deformity. Even some of the more severe cases will improve in a couple months with paddock exercise. In most cases, an intermittent turnout schedule is used. The foal is allowed to exercise in a small paddock with its mother and when the foal becomes fatigued, which is characterized by trembling of the legs, the mare and foal are returned to their stall. Usually this is no more than 30 minutes per turnout and can be repeated four times daily. If these foals do not become painful, improvement is usually seen within a few days. A 0.5 mg/kg dose

flunixin meglumine is used to eliminate pain. Patience is the most successful, non-stressful method of treating flexural deformity of the carpus in the foal.

¹ Kasper CA, et al, Effects of high doses of oxytetracycline on metacarpophalangeal joint kinematics in neonatal foals, JAVMA 1995 Jul 1; 207 (1): 71-73.

- References on surgical options: **Equine Surgery**, JA Auer, WB Saunders Co, 1992 and **Current Techniques in Equine Surgery and Lameness**, N. White and J Moore, 2nd Edition, WB Saunders Co, 1998.



Grade 0 to 0.5 valgus



Grade 1 valgus



Grade 2 valgus



Grade 3 valgus