Hoof Care for Angular Deformities

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Little has been written about hoof trimming for angular deformities. Most writers have avoided the subject and with good reason. Every situation is different, and nothing could be written that would work every time. The professional in the field must be willing to pay close attention to detail, adapt and switch tactics; following a rigid protocol of any kind will be detrimental to some cases. That said, I'll lay out my basic protocols and the way I approach the hooves on crooked limbs. Somebody has to do it.

This article is clearly written from a standpoint of "my opinion" and experience, because that is honestly all I have on the subject. To my knowledge there is no research to deliver. **Almost every imbalanced hoof is being caused by an issue somewhere above the hairline, so every imbalanced hoof you see should send you on a 'detective mission', trying to determine what is wrong in the body and what can be done about it.**

Foals vs. Adults

From a trimming standpoint I approach foals and adults the same. The big differences between the two come in "Importance" and "What to expect". With a foal, you are faced with rapidly closing window of opportunity to effect permanent correction to the limbs. By the time the foal is one year old (or less), the changes you can make to the joints are much more limited. When a foal fails to become straight limbed in one to two weeks of life, it is time for immediate action.

I view the veterinary role as offensive and the farrier role as defensive (I'll explain later). Farriers should not approach these cases alone. Blood work and/or forage testing needs to be done to test for nutritional problems. Most angular deformities in foals have mineral imbalance, dietary excess, inadequate nutrition and/or disease as the primary cause. If this is the case, you will not trim or shoe your way out of the problem. Also vet turf: There is a time to "wait and see", a time to splint, a time for surgery... All on a quickly evolving time schedule. If you wait until you have already failed and the horse is a year old, there will be very little the best equine vet can do for the horse.

With proper hoof care and movement, even adult limbs/joints can become straighter over time, but it should not be something we push for or dwell on. For the most part we should accept a crooked-limbed horse over two years old as is, set up the hooves accordingly and then "wait and see". Cutting a straight hoof onto a crooked limb is just as harmful as cutting a crooked hoof onto a straight limb.

Balance in General

Before we get into imbalance, I have to discuss balance.

No one can balance a foot. If you show me a "perfectly balanced foot, I'll lead the horse through a slight turn, and we'll watch together as one heel hits the ground before its partner. So what is medial/lateral hoof balance? The horse needs both heels to hit the ground simultaneously as often as possible. Therefore terrain, movement, type of work, body issues and limb conformation all create variables to "proper" balance. This sounds complicated, but in reality it's quite simple, because the lateral cartilages (the foundation for the back of the foot; similar in function to the coffin bone, but with much greater flexibility) adjust their 'pre-load' position for the most common way the foot hits the ground. Then they can flex and twist to accommodate other types of impacts (uneven terrain, turns). I've seen countless complicated balance situations, but have never seen a horse that needed more "skin" (sole, wall, bars) covering one lateral cartilage than the other on the same foot. So at least this little part is easy. *[Well, I do remember one exception: The coffin bone had matured in a distorted hoof capsule and was actually twice as "tall" on one side than the other. None of this can be "put in a box". Again the professional in the field must be willing to adapt and able to think.]*

The distance from the bottom of the collateral groove (Read the 'sole' articles on this site for deep explanation) to the lateral cartilage is consistent on each side of the foot, so you can balance the amount of material attached to each lateral cartilage by balancing the distance from the collateral groove depth (at the deepest point just forward of the heels) to heel; or put another way balance the collateral groove height off the ground on each side of the foot.

This is far more accurate than looking at hairline to heel distance. The hairline is highly dynamic; always moving, so it is **never** an accurate place to measure from. Excess stress on one heel often moves the hairline upward, relative to the lateral cartilages over time. The callused sole plane is the 'next most accurate' guide to the amount of material covering the lateral cartilages, but in some cases of severe imbalance, uneven wear can create a thicker sole on one side. The collateral groove balance doesn't lie (except in very rare cases of subsolar abscessing under one side) so that is my primary means of ensuring that both lateral cartilages on a given foot are covered by the same amount of material: My view of 'perfect' medial/lateral balance; *if there is such a thing.*

Furthermore, I see no reason why heel balance and toe balance should relate to each other; specifically I see no reason why the heel plane and toe plane should be parallel with each other. Heel balance should reflect the way the heels impact with the limb extended. Toe balance should reflect the way the foot leaves the ground with the limb in the 'back' position. These limb positions are six feet away

from each other from the horse's perspective and may not need to be exactly parallel.

Defensive Trimming

When faced with angular limb deformities, I view the farrier's role as critically important but completely defensive; not offensive. Attempts to "push" a limb straight by cutting exaggerated, crooked hooves tend to adversely effect the coffin joint while having either 'no effect' or sometimes an adverse effect to the 'offending' joint (fetlock, knee, etc.). **Of particular concern is causing sensitivity at the crooked joint and causing the horse to "lean away" from the pain, making the problem worse.** I do not think properly applied "lateral extensions" are particularly 'bad', except that in the real world their presence tends to lead to infrequent trimming, creating a very important negative. I always stand ready to use one if a horse can't "stand up onto his foot" at all, but rarely see that need.

With an angular deformity in a foal, it is critical that we not "put something on and walk away". The hooves will need constant attention.

The best way to explain my view on this is to get more specific. Any angular deformity effects and is effected by the hooves the same way, but I'll discuss the "pigeon toe" (fetlock varus) in which the fetlock joint turns or deviates inward. These horses tend to primarily load the outside wall/heel (though some will load the inside heel and outside toe if the coffin joint is valgus or deviated outward). These horses can often be corrected quickly in a foal or in an adult- over the course of many years. **Either way "the fix" is 'miles and miles' of straight-line movement.** The challenge or "catch" to this comes with the fact the imbalanced limb usually creates a crooked hoof in less than a week; then all the movement in the world will only hold the joint in a crooked position.

These horses will usually carry most of the load on the outside wall. The horse grows enough extra hoof wall everywhere to accommodate the extra load/wear to the outside wall. This translates to constant excess growing at the inside wall that can't wear away because it isn't used. This crooked hoof that can develop overnight locks the limb in the incorrect position and also increases wear to the outside wall/heel even more; a snowball effect. So the farrier's job is simply to keep the inside wall from overgrowing. This is easier said than done, but I can give you some real-world tips that help.

A secondary role we need to be prepared to fill, is coping with excess wear to the outside wall/sole. This is extremely rare IF the inside wall is not allowed to overgrow, but when the sole is worn too thin, I build it back with Equethane Superfast and carry on as usual. I've never had to do it twice to the same horse, because again, the true cause of the excess wear is usually excess wall that was previously allowed to exist on the other side.

Battling the excess growth at the inside wall on a "pigeon-toed" horse is best done with weekly trims ($$$ Sad but true). If this isn't done, constant imbalance and flaring of the inside wall will probably persist to some degree. This can get expensive, but most horse owners who know or care nothing about hoof trimming can easily learn to carry the bulk of that load, because they have a built-in guide. I usually show them very specifically where the foot overgrows, and have them lightly rasp that spot to match the other side of the foot exactly (based on the height above the sole plane). I have them do this once a week, and then I come along at 4-6 weeks to address the rest of the foot and critique or change their work. It works wonders, and any owner that can pick a foot can be trained to do it. Avoiding paying the farrier for weekly visits provides excellent motivation.

The bottom line is: To maximize success, we need many miles of straight-line movement and the hooves must stay balanced 24/7, rather than having their balance "corrected" at each trim.

Heel First Impact

Above all, prioritize heel first impact. A flat impact at the walk is okay, but at any faster gait (including a fast walk) the hooves should obviously land heel first. One of the biggest reasons I mention this here, is that very often these (pigeon-toed or fetlock varus) horses will have an outside heel that is "windswept" or caved underneath the horse with bent horn tubules, or they may be severely under-run. Rasping away these bent tubules is a "counterproductive addiction". Every rasp stroke delightfully pulls the heel back farther under the horse, and it is hard to stop. But if that "one more stroke" causes sensitivity and a toe first impact you **will not** make progress; period. It is better to primarily focus on the constantly overgrowing inside wall and prioritize heel first impact over everything else, even when that means leaving an "ugly" folded under heel.

Almost any type of heel contraction, including this one will be accompanied with a lack of digital cushion and lateral cartilage development (Robert Bowker VMD, PhD) thus sensitivity in the back of the foot. If the horse lands toe-first the foot cannot develop, so fit the horse in boots with thick, padded insoles for exercise. You cannot cut a healthy foot onto a horse. It must be forged by natural movement. A pea gravel 'loafing area' will also work wonders for developing these horses.

Slowing Down Wall Growth

The hoof is constantly "wondering" how much to grow, and it figures your trim into the equation. Therefore it is very important not to speed growth in these horses with excess trimming. How do you apply this? Try to avoid trimming the parts of the wall that don't need it. I believe that if you routinely trim ¼ inch of wall/heel from the outside wall on a pigeon-toed horse, you speed up the growth of the whole foot by that same amount (probably more actually, because any of the outside wall you remove will be callused or compacted horn). So if you try to leave the outside wall alone, you

can dramatically slow down the growth of the offending inside wall. Use common sense with this. I don't mean blatant neglect, but if the inside wall only 'needs' 1/8th inch rasped away, try leaving it. Most of the time you will come back at the next trim to find the wall "hasn't grown" or more accurately, the growth rate has slowed down to match the wear rate (stopped calculating for your trim). This was the most important paragraph in this article!

Thinning the Walls?

I considered leaving this one out, but it is a very good tool if used correctly. It's just a little dangerous, so use caution.

You can thin the walls in specific areas that overgrow, and cause them to wear faster; thus making the balance of your trim last longer. If done to excess, this can bite you by speeding up wall growth. Also, if the wall is over-thinned, bruising of the dermal laminae becomes more likely. A good rule of thumb is to keep any 'outer wall rasping' in the lower 1/3 of the hoof capsule and stop when the unpigmented wall (or water line) starts to show at ground level. Be sure to do this only in the specific spots that tend to overgrow or it will be counterproductive, by speeding up the wall growth.

Mustang Roll Angles

When faced with an imbalanced hoof I vary the angles of the 'mustang roll' or bevel to the outer wall. In the specific case we're discussing, for instance (fetlock varus, flared inside wall) I'll trim a very flat bevel on the outside wall or just a soft roll. On the flared inside wall I trim a very steep or exaggerated bevel on the outer wall including the heel. I feel that the mustang roll seeks balanced angles at ground level and that this little trick helps me 'push' a foot under the horse. This could just be in my head; maybe the flatter roll on the outside wall just doesn't contribute to contraction, and the steep bevel on the inside wall helps grow out the flare. Either way, it works. I'm just not positive about the "why?"

I've used the one example of the pigeon-toed horse because it is the most common, but I use the exact same thoughts and principles for any medial/lateral limb imbalance. Basically, I use constant defensive prevention of hoof imbalance that enables the horse to walk out of the problem when/if we will. I focus on removing the constant excess, and occasionally build areas of excess wear. If wall flare persists in the areas of less wear, you should automatically know that more could be done to maintain constant balance. The wall flare is the horse's defense mechanism for excess wall growth.

From a 'hoof care standpoint', I'm convinced that the best we can do is constantly keep the coffin bone and lateral cartilages balanced with the ground plane, then keep the horse comfortable and constantly moving. I've "been there; done that" with more aggressive approaches. This way isn't always a "magic wand" but it works better and more often than anything else I've done, seen or studied.

Diet

Don't forget the nutrition. I must stress again that improper diet and mineral imbalance in the mare and foal are at the heart and soul of most cases of angular deformity in foals. Often this means inadequate nutrition, but excess carbohydrate and/or excesses of certain minerals can be worse than inadequate amounts! The most common example is probably excess calcium. Calcium and phosphorus are utilized by the same receptor. Excess calcium can create an effective depletion of phosphorus, even if plenty is available. It is the ratio that is important. Timothy hay usually has over 5 times as much calcium as phosphorus. Alfalfa usually has at least 7 times more calcium. The body tries to balance the situation by robbing phosphorus from the bones; contributing to bone loss in mature horses and angular deformities in foals.

Some breeders cause these problems by adding more, more, more; effectively "loving their horses to death". The only way to know is to test. So a sharp equine vet and/or equine nutritionist are worth their weight in gold in these cases. If you forget that part early-on, you may stick yourself with a permanent deformity that could have been easily fixed or prevented.

Early Trimming and Movement

Remember that all foals are "born crooked"; they've spent their whole life wrapped up in a ball! Movement is essential for straightening them out. Unless directed by a veterinarian for a specific injury or reason, do not confine foals in stalls. Every aspect of their proper development requires movement. I also firmly believe that if every foal received routine competent hoof trimming from the very beginning, angular limb deformities in adult horses would virtually disappear from the horse world; I've seen this with my own eyes in my own clientele. Birth defects do happen but they are far more rare than most people think. Instead, what is very common is that foals get off to a slightly wrong start, this skews the hoof balance and then their joints, ligaments, tendons and muscles are allowed to grow and form on the imbalanced, neglected hooves. Eventually the horse matures and the conditions are effectively permanent.

Most people think that hoof trimming for adult horses is a necessity and foal trimming is a luxury. If anything it should be the other way around. If I financially had to pick out two years to neglect the hooves on MY horse, I'd choose the last two or maybe a period in the middle; absolutely not the first two years! There was never a truer statement said than, "An ounce of prevention is worth a pound of cure." With angular deformities, that's actually an understatement.