Hoof Wall Cracks

Part 1

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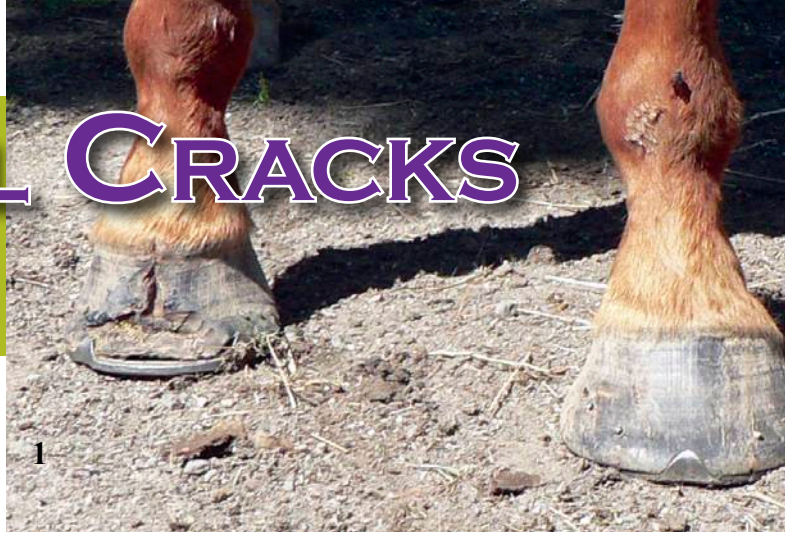
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All cracks in the hoof wall have the potential to progress to catastrophic breakdown of the entire capsule, which is why they should be dealt with as soon as they appear.

Strength for the equine hoof comes through unity; not only with a very tight lamellar bond between the wall and sole, but also unity in the wall itself which is in effect an arch, one of the architecturally strongest forms known to man. A good analogy for comparison would be a stone arch bridge that is a pile of rocks spatially arranged so the individual parts can act in unity with great strength. Without unity it is just a pile of rocks!

So it is with the hoof wall, an arch that remains incredibly strong so long as it remains complete, continuous and unbroken.

However, any breakage in the continuity of the hoof wall arch results in a great weakness, which is why all cracks in the hoof wall have the potential to progress to the point of catastrophic breakdown of the entire hoof capsule. They should be dealt with as soon as they appear. Remember grandma's old saying about a stitch in time saving nine? (Photo 1)

All hoof cracks have a reason for existing. They are symptomatic. Success with growing them out of the hoof capsule therefore relies on treating the underlying cause.

Hoof cracks are best studied individually according to what is causing them. Part one of this article series addresses sand cracks which are possibly the most common hoof wall defect.

Sand Cracks

Sand cracks begin as those innocuous little vertical hairline splits which appear mid way up the hoof wall (Photo 2). They are barely noticeable at first, but are progressive and work their way both down and up and also inward (Photo 3).

If left untreated, not only can they penetrate beyond the inner wall to the living corium (giving 'bugs' unrestricted access to inner layers of tissue, resulting in abscess formation) (Photo 4), but they can very quickly complete their journey to the ground surface and – more sinisterly – to the coronet band which can be easily transversed by the running crack and permanently broken (Photo 5). What starts as a minor blemish can soon become a permanent defect.


2

Sand cracks begin as inocuous vertical hairline splits and work their way up, down, and inward


3


4

Untreated, cracks can penetrate the inner hoof wall to the living corium and travel up to the coronet


5

Sand cracks are mostly located around the toe and quarters, but they can appear anywhere around the hoof capsule. To make matters worse, sand cracks can infest a hoof in large numbers, nullifying any remaining strength in the hoof capsule.

What causes sand cracks?

With sand cracks it is important to differentiate between factors that are only pre-disposing and the actual fundamental cause.

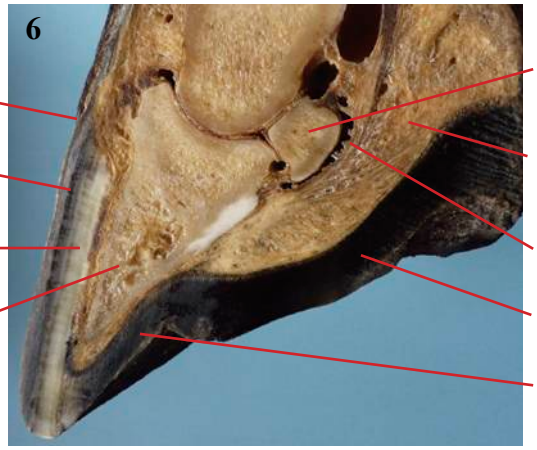
And hasn't this season been full of predisposing factors!

It has been too wet, then it has dried right out and then it has been too wet again (several times). Throughout Eastern Australia there has been way too much fluctuation between environmental extremes, including nutritional fluctuations, often with periodic bouts of low grade laminitis thrown in for good measure. It has been a lot to expect equine hooves to cope with and many hooves have existed in a weakened state.

As to the underlying cause, sand cracks arise from simple mechanical failure; the inability of the outer hoof wall to expand sideways under pressure.

The outer wall grows in fibres that run parallel and are 'glued' together in a keratin matrix. The individual fibres are very strong along their vertical length, but the horizontal bond between fibres is quite easily broken, especially if softened by excessive moisture.

Bond breaking excessive pressure stems from incorrect weightbearing.



> *The underlying cause of sand cracks is simple mechanical failure; the inability of the outer hoof wall to expand sideways under pressure.*

Put simply, the ground surface of the equine hoof is not meant to be flat and there are in fact two areas that must be non weightbearing.

Firstly, the outer wall acts as armor plating and is hard to the point of being brittle. It is not designed to carry weight.

The hoof wall consists of two distinct parts – the outer wall which grows downwards from the corium inside the coronary band and the inner wall which grows both outwards and downwards from the corium surrounding the pedal bone. The inner wall is more malleable and much better suited to the task of weightbearing. Photo 6 shows a clear distinction between the dark colored outer wall and the vividly white inner wall (Photo 6).

Secondly, a functionally correct hoof has a consistent height of wall above the plane of sole which simply reflects the contour of the pedal bone within. The sole plane dips downwards as it enters the quarters and the ground surface of the hoof wall needs to reflect this. The hoof wall in the quarters should not be weightbearing.

Any hoof that is weightbearing through the outer wall or quarters has incorrect weightbearing and is prone to sand crack development.

Mechanical stress is magnified if a hoof is flared or run out at the toe, especially with a club foot as shown in photo 7.

Treatment

Treatment for sand cracks is fairly straightforward but patience is required.

In all cases the correct weightbearing needs to be restored to the ground surface of the hoof, with particular attention being paid to removing the outer wall and the quarters (this is virtually impossible with shoes on) (Photo 8).

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Any raised corners and causative flaring needs to be removed, although this may need to be done in stages if the flaring is excessive (Photo 9).

The real secret to regrowing a healthy hoof capsule is to maintain the correct weightbearing surface with touch up rasping no more than two weeks apart.

If there is any invading infection, mostly seen as crumbly, 'cheesy' or 'stringy' material, it needs to be opened to the outside world and topically treated with an antifungal and antibacterial agent such as tea tree oil (refer to the seedy toe article in March issue of Horses and People or visit the article's archive at www.horsesandpeople.com.au). (Photos 10,11,12)

Invading infection should be opened and topically treated with an antifungal and antibacterial agent

In serious cases when a major crack has destroyed the integrity of the capsule, a patch may need to be applied for restoring mechanical strength (Photo 13).

Focus on prevention

As with all hoof capsule problems, prevention seems to be the best path to walk.

Healthy, functioning, well nourished hooves seem to be able to withstand the environmental variation that otherwise weakens the outer wall and encourages sand cracks.

Such hooves are those that are regularly maintained in a physiologically correct framework, trimmed a consistent height above sole plane (with the quarters 'relieved') and the outer wall non weight bearing. Regular maintenance by their owners – even just a basic 'tweak' with a rasp every couple of weeks – is undoubtedly the best hoofcare for your horse.

With any serious hoof problems, horse owners should consult a suitably trained equine hoofcare professional (for information visit www.equinepodiotherapy.com.au).