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## **1.0 Introduction**

In conventional veterinary medicine Navicular Disease is thought incurable. This case study attempted to test if this belief is valid or not, by taking a horse already diagnosed with the disease and by applying an alternative methodology record the results. The case study of Don Panache is one of other case studies contributing to a Masters of Philosophy, researching hoof form and function in the domesticated horse.

Don Panache a 16.2hh black Oldenberg warmblood began a long history of right front (RF) navicular heel pain lameness at the age of 7years, ending his 3DE career in May 2008 aged 10. Whilst representing Australia in the pre-selection for the Beijing Olympics CCI\*\*\* 3DE event at Samaur, France and laying 10th after the cross-country, ridden by Australian Olympic gold medallist Stuart Tinney, Don Panache vetted out lame. Further inspection at the Ranwick Equine Centre, Sydney concluded navicular disease, recommending Don Panache be retired.

As a case study Don Panache was of particular interest for several reasons, this elite competition horse had been given the best of conventional veterinary care, providing explicit historical records. The severity of his lameness, as well as the extreme distortions of the hoof capsules and the compensatory insults of the left front (LF) all gave a challenging opportunity to test the alternative Holistic Horse and Hoofcare correctional methodology.

## **2.0 Reasons for performing the case study**

Navicular disease remains one of the most prolific causes of lameness's in the domesticated horse. Adams<sup>1</sup> estimates the disease is responsible for one third of all chronic forelimb lameness's in horses. Developing alternative treatments to current best practice is much needed.

## **3.0 Objectives**

The objective of this case study was to test the current belief that the pain from navicular disease is sourced in the navicular bone and is irreversible, comparing with another theory that pain is caused by incorrect heel angles pushing the harder bar horn into the softer internal hoof, pinching both the frog and solar corium and that this pinching of the sensitive structures is the cause of pain, which can be reversed by a regime of accurate trimming and hoofcare management.

## **4.0 Methodology**

Don Panache was brought to the Gilgandra Rehabilitation Centre where conventional medication was discontinued and a natural lifestyle<sup>2</sup> commenced, aiming to provide the best environment for healing. Orthopaedic shoes were removed. Hooves and gait were assessed under veterinary supervision including radiographs and photographs, an Obel lameness score was given before trimming of the hooves began. A daily regime promoting holistic care was established of hydrating hooves, 2-4 walks on a rubber track, with further movement in the paddock and riding 5days a week in the latter stages, adequate protein was fed to fuel the healing process and natural

medication was administered as required, including body therapies. Frequent trimming of between 2-21 days was dependent on the required hoof reform and hoof growth. Video, photographs, radiographs and measurements were regularly taken of the hoof and gait for comparative analysis. Trimming protocol used the following criteria:

- a) to bring the distal phalanx to a ground parallel position, palmar angle (PA) =  $0^{\circ}$ , as quickly as possible to support natural bone alignment, with a  $45^{\circ}$  dorsal wall for front hooves and a  $30^{\circ}$  hairline,
- b) scoop the hoof wall quarters to enable expansion of the hoof on weightbearing, allowing blood to circulate around the entire hoof to support a healthy metabolic process,
- c) trim the sole for concavity, aligning the deepest part of the concave sole with the deepest part of the concave distal phalanx on its volar surface,
- d) trim the collateral groove to an equal depth along the entire length,
- e) trim the bar horn to prevent them being weightbearing and to facilitate the lowering of the over high collateral groove in the caudal section,
- f) trim the heels to reverse longitudinal and lateral heel contraction aiming to gain a diverging cone hoof capsule shape, with heel angle of not less than  $45^{\circ}$ .

The desired outcome of using the trimming criteria was to reform hoof distortions so that the external hoof capsule could maintain a geometric relationship with each component part of the internal hoof; where each anatomical structure, whilst clearly interconnected, was still able to preserve its own shape and form, enabling the external hoof capsule and the internal hoof structures to co-exist without interrupting the full functionality of one another and in so doing promote pain free hooves.

## 5.0 Results

In Oct 2008 Don Panache presented with excessively steep lower limb bone alignment and extreme hoof distortions, the front hoof heels were excessively underrun, with a too steep dorsal wall resulting in a converging hoof capsule on weightbearing, Figure 1. Internally the underrun heels resulted in an excessively high collateral groove, Figure 2., pushed up by the bar impacting the internal hoof from the pushing force of the heels. Eight years of normal and orthopaedic shoeing had prevented healthy hoof function, shown in Figure 3, by the severe level of lateral contraction. RF lameness with shoes was 2-5. With shoes removed veterinary assessment revealed a 2/3-5 lameness in the RF. Radiographs showed a PA of  $+7^{\circ}$  on both front hooves, the LF showed arthritic changes on the fetlock. Veterinary palpation of the RF pastern suggested a neuroma had developed from the previous neurectomy (2005), however as trimming of the bars progressed the positive reaction disappeared. Following the removal of the orthopaedic shoes and just 5 days after the first trim there was a significant lateral de-contraction response, see Figure 4. Lower limb bone alignment improvements, including reforming the hoof capsule to a desirable diverging hoof shape, see in Figures 5. and 6. By Jan 2009 lameness had decreased to 0.5-5 on soft ground, with residual lameness believed to be caused by bar horn trapped under the frog and by bars continuing to be pushed into the hoof via their persisting steep angle from residual underrun heels. It took a challenging 10 months for all of the bar horn to be trimmed from under the frog. The collateral groove in the caudal hoof also remained too steep, see Figure 7., requiring ongoing trimming of the underrun heels and the bars to correct.

Significant improvements in PA from  $7^{\circ}$  to  $0^{\circ}$  and longitudinal de-contraction of 18mm (Table 1.) resulted in a diverging hoof capsule, removing the pushing force of the

heel to the bar causing the internal hoof pain. Lateral de-contraction was restricted to 5mm due to palmar process bone loss, however this did not prevent soundness improvements.

Date	PA°	Hairline °	Toe angle°	Heel angle°	Hoof length mm	Heel width mm
24.10.08	7	21	60	30	134	44
10.11.08	-	24	54	38	140	45
15.01.09	-	30	48	40	144	49
10.3.09	2	30	47	40	145	49
08.09.09	0	30	47	40	145	49
14.12.09	0	30	46	40	150	49
27.06.10	0	30	46	40	152	49

Table 1. Chronological list of RF external and internal hoof angles and measurements from Oct 2008 – Jun 2010, 21months.

Results show a positive reduction in the presenting lameness in the RF, confirmed by a further veterinary assessment in Dec 2009. A flexion test revealed a compensatory LF fetlock lameness of 2-5 on hard ground, reducing to negligible lameness on softer ground, there was no lameness in the RF hoof, resulting in there being no welfare issue in Don Panache being ridden.

## 6.0 Discussion

Despite being presented with such a challenging case the significant and ongoing soundness improvements appeared to have been primarily achieved by the frequent and accurate trimming of the underrun heels and the bars and maintaining the above mentioned hoof parameters. Frequent movement allowed de-contraction of hooves and was a major contributor to hoof reform. With careful management including daily leg and body stretching it is expected current levels of soundness will continue. Further horses will be sought to repeat this trimming methodology in order to determine if it is repeatable, aiming to compare like with like.

## 7.0 Take home message

1. Hoof capsule distortions can be corrected and therefore lameness reversed.
2. Navicular disease is reversible.

## References

- 1 Stashak T.E. , 'Navicular Syndrome (Navicular Disease or Navicular Region Pain)', Part 1: The Foot, Ch 8, Adams Lameness in Horses, 5th Ed. 2002; p664.
- 2 Strasser Dr H., 'A Lifetime of Soundness', 2000; p4.



Figure 1. RF converging hoof wall indicating underrun heels Sept 2008



Figure 2. RF collateral groove pushed unnaturally high by impacted bars May 2008 (Hall & Lawrence, UK)



Figure 3. Excessive bulb and heel contraction Sept 2008



Figure 4. RF 5 days after shoe off shows significant lateral de-contraction Nov 2008



Figure 5. LF Front limb bone alignment too steep Sept 2008



Figure 6. LF diverging hoof capsule with more natural lower limb bone alignment Mar 2009



Figure 7. Collateral groove still too deep in caudal half Dec 2009