

Explaining Laminitis and its Prevention



Robert A Eustace BVSc Cert EO Cert EP FRCVS

The Laminitis Clinic, Mead House, Dauntsey, Chippenham, Wilts. SN15 4JA. England

Chapter 8 - Prognosis (What are the chances of recovery?)

What factors affect the prognosis

A study was carried out at the Laminitis Clinic to try and discover which factors were important in determining the outcome of a case of laminitis, founder or sinking. On admission to the Clinic each animal was allocated to one of four Groups. They were allocated to a Group just by clinical examination, i.e., without the use of special techniques like blood samples or X-rays. The animals were described as (1) Laminitic (2) Acutely Founder (3) Sinkers or (4) Chronic Founder cases. Some cases were put down without treatment being attempted because they were either too severely lame or the owners were not prepared or able to cope with their management. The remainder were all treated at the Clinic and then after a period of at least 6 months their progress was recorded and they were categorised. Category 1 cases were either dead or unrideable (failures of treatment) and Category 2 cases were back doing their normal work, rideable and sound without any painkillers (successfully treated cases). The following Table shows how the animals were grouped and categorised.

Results of treatment in Categories and Groups

| Group | Totals | Sinkers | Acute Founder | Laminitic | Chronic Founder |
|--|-----------|---------|---------------|-----------|-----------------|
| Totals | 140 | 13 (9%) | 49 (35%) | 18 (13%) | 60 (43%) |
| Category 1 (Dead/Unrideable) | 40 (29%) | 12 (9%) | 9 (6%) | 1 (1%) | 18 (13%) |
| Category 2 (Alive & Sound) | 100 (71%) | 1 (1%) | 40 (29%) | 17 (12%) | 42 (30%) |

Percentage figures are in relation to the total of 140 animals (recorded to the largest integer).

In order to discover which factors were the most useful in determining the outcome of the case, information regarding both the animal's physical characteristics and measurements taken from X-rays of the feet were gathered. Horse height, Number of feet involved, Size of foot, Presence of solar prolapse, Angle S (Figs. 52-54), Angle T, Angle U, Angle H, Angle R, Wall thickness WT, Founder distance D, Category and finally the Group to which the animal had been ascribed on admission were recorded. The 'worst' or most abnormal value was taken for each animal (thus allowing for the fact that not all feet were similarly affected). These data were subjected to statistical analysis in order to find the most valuable prognostic parameters. Of all these parameters studied, the analysis determined the parameter Group as the most useful thing to know about a case in order to predict outcome. This means that each of the Groups carries a statistically significantly different prognosis. If Group was excluded from the analysis, the most significant parameter was founder distance D.

Therefore, it is important to be able to recognise which of the four groups your animal fits into in order to evaluate its chances of recovering. This presupposes that the animals were all treated according to the same principles as we use at the Laminitis Clinic. Other treatments may give different results. The treatment regime of the Clinic is the only one for which the results of treatment have been published. The next most important thing to examine having found out which group the animal belongs to is to X-ray its feet using the technique described earlier. This will allow accurate measurement of the founder distance. Although at present it is not possible to say that beyond a certain founder distance the horse will definitely not become sound again, it is possible to give a percentage probability. For instance with a founder distance of 15 mm the horse has about a 37 % chance of returning to soundness after treatment (Fig 55).

Explaining Laminitis and its Prevention

©

Robert A Eustace BVSc Cert EO Cert EP FRCVS

The Laminitis Clinic, Mead House, Dauntsey, Chippenham, Wilts. SN15 4JA. England

The factors which have been used to decide on prognosis in the past are uncontrollable pain, presence of solar prolapse, and an angle of rotation, Angle H, greater than 11.5 degrees. Certainly the first factor must be considered on humane grounds; in my experience there are few animals which cannot be made relatively comfortable by drug and foot treatments. In addition some laminitis cases showed severe pain but had an excellent recovery rate. The presence of solar prolapse was shown to be unrelated to outcome, in the Clinic study. There were more horses showing solar prolapse which fully recovered than those which died (Figs 56 & 57). The measurement of Angle H (often referred to as an angle of rotation) was shown to be unrelated to outcome, in other words one may as well measure the length of the horse's ears as measure Angle H if you want to predict outcome.

There are several general factors which may indirectly affect the prognosis. Large, flat, wide feet tend to be inherently weaker structures than narrower more upright pony type feet. I would far rather deal with a pony type foot than a Thoroughbred foot. Wide, flat feet seem to have a 'narrower safety margin' following founder before they become beyond help. I feel that this is why foundered draught horses have such a bad survival rate. It is not necessarily the great weight of these animals which worsens the prognosis but the shape of their feet.

I regard attention to prognosis as important. By making use of the grouping system and by measuring founder distance it is possible to prevent unnecessary suffering of cases which have such a very slim chance of recovery. Similarly it is now possible to prevent the unnecessary destruction of animals which are very likely to make a full recovery given the correct treatment and a period of recuperation.

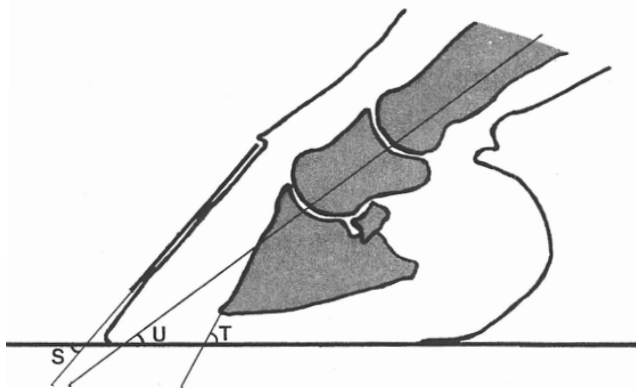


Figure 52. This diagram shows how the three angles S, U and T were measured from X-rays of the feet when the horse was first presented at the Clinic. From these, two more angles H and R were calculated;

Angle T minus Angle S = Angle H

Angle T minus Angle U = Angle R

When people say an animal has x degrees of pedal bone rotation they usually mean he has an Angle H of x degrees.

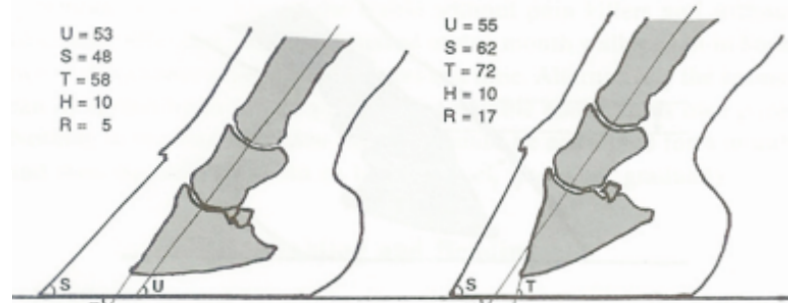


Figure 53. To illustrate how meaningless consideration of one angle is in terms of describing and making prognostic statements about laminitis cases consider the above figure. The angles in the two diagrams are listed beside them. I have purposely drawn them so that Angle H is the same in both; 10 degrees. I think you will see that in the figure on the left the phalangeal axis is straight whereas on the right there is true pedal bone rotation in relation both to the proximal phalanges and to the ground. This is reflected by different Angle R's. Assuming these were acute or old founder cases the one on the left may only need a foot dressing whilst that on the right may need the deep flexor tendon cutting; very different treatments and prognoses for the same angle of rotation!

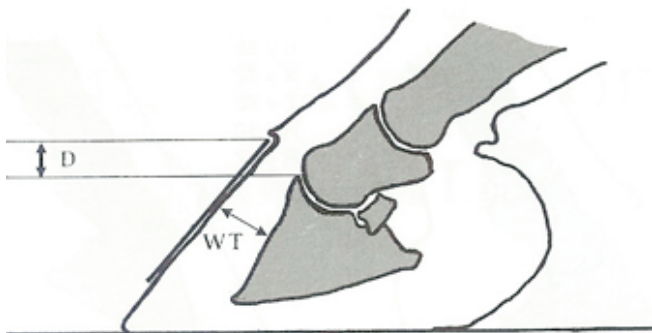


Figure 54. In addition to the three angles S, U and T; two distances were also measured from the X-rays of each foot on admission to the Laminitis Clinic. WT or wall thickness is the distance from the wire marker taped to the front of the hoof wall to the front surface of the pedal bone. The distance being measured half way up the front and at right angles to the front surface of the pedal bone. D the founder distance was the vertical distance between the top of the wire (placed where the horn changes from hard to soft) and the top of the extensor process.

Explaining Laminitis and its Prevention

©

Robert A Eustace BVSc Cert EO Cert EP FRCVS

The Laminitis Clinic, Mead House, Dauntsey, Chippenham, Wilts. SN15 4JA. England

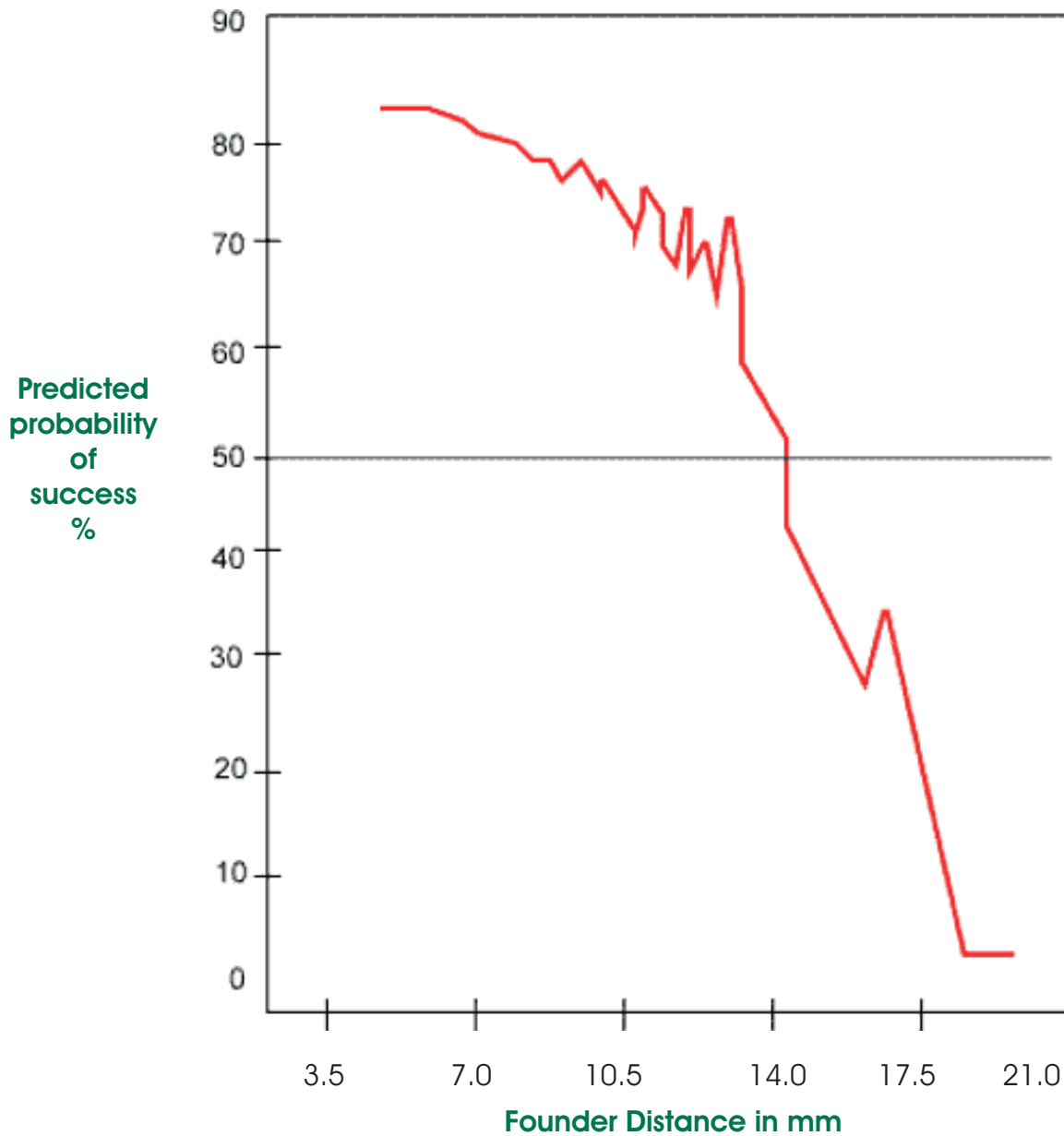


Figure 55. From the data entered during the study on prognostic indicators, the statistical analyses predicted the probability of an acute founder or sinker case recovering for a given founder distance D; shown above in line graphical format. Although the conclusions which can be drawn from these data should not be regarded as being cast in tablets of stone, the recognition of Group, and measurement of founder distance represents a more scientific basis on which to make decisions on the life or death of foundered horses.



Figure 56. This cob stallion suffered solar prolapse on both front feet. The piece of horny frog and sole covering the tip of the pedal bone protruded 35 mm (1.25 inches) through the horny sole. Measured from the point of the prolapsed tissue to the bottom of the hoof wall at the toe quarters. The founder distance D was only 13.5 mm, the discrepancy being due to gross swelling of the solar corium.



Figure 57. The same foot as shown in Figure 56 six months later. Following careful management, use of Eustace shoes and bilateral deep flexor tenotomies this horse is now sound.