TREATMENT OF ANGULAR LIMB DEFORMITIES USING RADIAL EXTRACORPOREAL SHOCKWAVE THERAPY: A PROSPECTIVE CLINICAL TRIAL

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Introduction

Angular limb deformities (ALD) are a common problem in foals, and many cases respond to conservative treatment. However, a significant number require surgery, with the associated costs, risks to the patient and adverse cosmetic effects. Experimental work in neonatal rats had suggested that extracorporeal shockwave therapy (ESWT) may have a growth retardation effect on the physis1. Pilot studies had shown an effect on angular limb deformities in three experimental animals (Boening, unpublished observations, 2002). Our hypothesis was that ESWT would modulate physeal function sufficiently to be a useful non-invasive method of treating ALD.

Materials and methods

Seventeen Thoroughbred foals from Newmarket stud farms were selected for treatment on the basis of radiologically confirmed ALD which was failing to respond to initial conservative management. Treatments were performed at approximately weekly intervals on sedated foals using a radial shockwave generator at 3 bar, 15 Hertz and 2000 cycles with a 15 mm applicator. Treatments were applied to the region of the physis on the convex side of the deformity, aiming to slow growth on that side, after wetting of the coat and application of ultrasound gel. Younger foals were treated in recumbency and older foals were treated standing.

The foals were clinically monitored on a weekly basis and treatment was stopped when the limb angles were deemed satisfactory (<4∞). Digital photographs were obtained at each treatment and radiographs were taken as clinically indicated. Other treatments, such as restricted exercise and corrective farriery, were performed routinely, so that the only difference from our normal non-surgical management of these foals was the use of shockwave therapy.

Results

There were 10 colts and 7 fillies in the treatment group. The age at start of treatment ranged from 7-120 days, with a median of 24 days. There were 12 unilateral cases of carpal valgus (8 left, 4 right) and one bilateral; two cases of unilateral carpal varus (1 left, 1 right); one unilateral (right) case of fetlock varus and 3 unilateral cases of fetlock valgus (2 left, 1 right). Two of the latter cases also had carpal valgus. Five foals were graded as mild (5-6∞ deformity), four as moderate (7-8∞ deformity) and 8 as severe (≥ 9∞). At the time of commencing treatment we would predict that 6 foals would normally have progressed to have required a periosteal strip and 4 would have had transphyseal bridging.

The number of treatments ranged from 2-5, with a median of 3. The time until satisfactory straightening ranged from 15-76 days, with a median of 25. 15/17 cases (88%) were deemed clinically successful. Two cases went for surgery: one periosteal strip for a carpal valgus and one transphyseal bridge for a carpal varus. Two foals had transient lameness after the first treatment only. One foal was very lame after each of two treatments, as it had significant skin excoriation and soft tissue swelling at the treatment sites due to the severity of its carpal valgus, so no further treatments were performed. One foal showed radiological signs of physitis before treatment, and this did not change during the treatment period. Three foals developed very mild radiological signs of periosteal reaction in the treatment site, but this was also evident in one severely affected foal before treatment. There were no adverse cosmetic effects on the limbs.

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Discussion

The results of this study seem to show a positive effect with the use of ESWT for the treatment of ALD in foals. Given the difficulty is assessing treatment response in a condition which will often spontaneously improve, a controlled trial is planned to validate these results. There have been no controlled trials published of the commonly used surgical treatments performed on clinical cases of ALD.

Our clinical impression, and that of the stud managers, was that there was a more rapid improvement in the degree of the deformities than normal. This is beneficial in that it allows a more rapid return to normal management and exercise. The lack of any cosmetic blemish is beneficial from a sales point of view. It was significantly cheaper to the client than surgical treatment.

Some severe deformities which almost certainly would have been treated surgically were successfully managed with shockwave therapy. The non-invasive nature of this treatment means that it can safely be applied early, and if there is a lack of satisfactory response then a transphyseal bridge can be performed at a later date. An experimental study showed hemi-circumferential periosteal transection and elevation to have no effect on carpal valgus induced by a temporary transphyseal bridge2, and the clinical utilization and belief in the beneficial effects of this procedure seem to be diminishing.

In the 2005 breeding season it is to be the first choice treatment for ALD in foals under our care, and 20 foals have so far been treated. Ongoing case evaluation will allow further evaluation of the response to ESWT. Corrective farriery and controlled exercise will be continued in standard fashion. In conclusion, ESWT currently seems to offer a practical treatment option to the practitioner in the field.

References

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