ESVOT CONGRESS 2006

PROCEEDINGS

MUNICH, Germany
7th-10th September

“The Cutting Edge in Veterinary Orthopaedics”

European Society of Veterinary Orthopaedics and Traumatology
Assessment and treatment of choice for correction of angular limb deformities in the foal

A.R. Adkins
Scone Veterinary Hospital, Scone, NSW 2337, Australia

INTRODUCTION
Techniques for assessment and treatment of angular limb deformities (ALD’s) are well reported in the literature.1 The need and effectiveness of this treatment is often questioned.2 There is limited information on the effect of conformation on athletic soundness although there is often a strong desire for straight conformation, particularly in the thoroughbred racing industry.3-4 The majority of cases I assess and treat are racing thoroughbreds and this discussion will pertain to this population.

ASSESSMENT OF CONFORMATION
Prior to assessing limb conformation the foal’s sire, dam, age and maturity are recorded. I then observe the foal at rest, and when walking unassisted next to its dam, on a firm flat surface. A 3 x 20 m concrete alleyway is ideal to encourage the foal to walk in a straight line. The foal’s body type and weight are recorded. Fore and hind limb conformation are assessed when viewing the foal from in front and behind. I assess conformation as angular (varus or valgus), rotational (outwards or inwards) or axial (offset). A subjective numerical grade1-4 is assigned to each specific anatomical area (i.e. fetlock, carpus etc) to allow future comparison. Objective radiographic measurement of deviations is not performed as it is difficult to achieve and (in my opinion) prone to misinterpretation. I assess the foal’s foot shape and enquire if corrective farriery has been performed. Assessment of the mare’s conformation is also made at the time of initial examination. If possible the first examination is made at two weeks of age unless the foal has severe limb deformities. The foal is then examined on a one or two week basis, with the frequency depending on the findings of the initial assessment. In determining treatment I take into consideration all information noted above, and very importantly, the change in conformation over serial assessments and after treatment. Other factors taken into consideration are the level of confinement and extent of recent exercise, farm management, accompanying problems such as lameness, intended use and conformation of the mare’s previous offspring.

TREATMENT
In treating ALD’s I utilise variable degrees of confinement, hoof trimming, shoeing, periosteal elevation and temporary transphyseal bridging (TTB). When utilising these forms of treatment I have recognised a number of failings. These include: the reluctance to advise prolonged stall confinement for risk of inducing other types of developmental orthopedic disease, aggressive or prolonged trimming/shoeing causing permanent deformity of the foot, periosteal elevation having variable effect, and traditional TTB techniques with screws and wire being prone to complications and cosmetic blemishes. I have been using a single screw (SS) technique for TTB of the distal radius in yearlings for some years. It is my experience, and recently reported by others, that the cosmetic results and effectiveness of this surgery are excellent.5 The technique was modified for use at the distal canin and a comparative prospective study of this technique with a two screw and wire (TSW) technique has been undertaken at Scone Veterinary Hospital. The surgical technique and results of this study are described below.

MATERIALS AND METHODS
In 2004, at one thoroughbred stud farm, 73 TTB’s were performed on the distal lateral metacarpus for correction of varus deviations in 40 foals. Of these, 54 were SS and 19 TSW. Prior to surgery all foals had been assessed as described above. Foals were considered a candidate for surgery if they had at least a grade 2 varus deviation after 6 weeks of age. Surgery was performed under general anaesthesia in dorsal recumbency. A 10 mm incision was made through the skin, subcutis and periosteum 1.5 cm proximal to the physis of the distal metacarpus. The periosteum was elevated and a 5 mm x 5.5 mm drill hole was made in the lateral cortex, parallel to the physis. A sharp periosteal elevator was used to remove the proximal rim of this hole to allow screw placement without bending of the screw head. A 2.5 mm hole was made at a 70° angle to the physis using the 5.5 mm hole to seat the drill guide. The hole was measured, taped and a 32-36 mm x 3.5 mm cortical screw inserted. The periosteum and skin were closed and the limb bandaged. Surgery time was approximately five minutes. The limbs were bandaged for 16 days following surgery and the foal stall rested for two weeks.
For the TSW technique, stab incisions were made on either side of the physis to allow placement of two 34-36 mm x 3.5 mm cortical screws and a single 18G figure of eight wire. Surgery time was approximately 15 minutes. The limbs were bandaged until TTB removal and foals were stall rested for three to four weeks.

In both groups of foals the TTB’s were removed under general anaesthesia via stab incisions once the limb was either straight or the foal was at least 22 weeks old.

All foals were reassessed at least six weeks after TTB removal to grade their conformation and surgical site swelling. The swellings were graded on a scale from 0-3, 0 being absent and 3 being severe (> 2 cm in diameter or protruding > 1 cm).

RESULTS

The surgery was performed on foals aged from 3-21 weeks of age. The age at surgery was less for the TSW than the SS foals (90.3 compared to 111.6 days) and the ALD grade was similar (2.2 compared to 2.1) for both techniques. The SS resulted in an overall improvement of the ALD grade of 1.93, compared to 1.81 for the TSW. The SS average bridge period was 31 days, and the TSW was 43 days. Despite being placed earlier, and being left in longer, the final ALD grade was worse for the TSW than the SS technique (0.42 compared to 0.19).

The cosmetic appearance was better using the SS technique. A graded average of 1.4 in swelling severity was recorded for the SS and 1.54 for the TSW.

Although there was no screw breakage in this study, difficulty in screw removal was experienced at times due to bone growth over the screw head, making it difficult to find and remove the screw.

CONCLUSIONS

The results confirm the SS technique is not only an effective technique for TTB of the distal metacarpus, but it causes a more rapid improvement in the ALD. The SS required less time to improve the ALD even though it was placed later in life when growth had slowed. This may be explained by the single screw causing immediate growth retardation compared to the dependence on an appropriately tightened wire for the TSW technique. Improvement in ALD severity was seen in foals undergoing surgery up to 21 weeks of age and over-correction was not observed after screw removal. The SS technique is an easier and faster technique to perform than the TSW technique. The post-operative cosmetic appearance is better, despite less stall-rest and bandaging time.

REFERENCES