

*Racetrack practice has become a very specialized field in equine veterinary medicine. This type of practice encompasses many aspects of sports medicine, not only that of the musculoskeletal system, but also of the respiratory and cardiovascular systems.*

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## Fracture repair at the racetrack

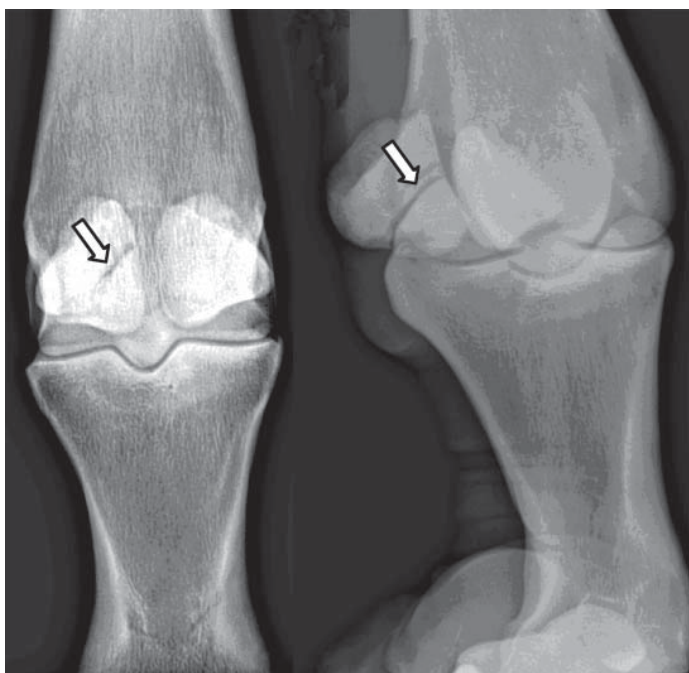
As discussed in previous AO VET articles in AO Dialogue magazine, the issues relating to the poor performance of the equine athlete have many faces. Because there is often a significant financial investment involved with these horses, racetrack veterinarians are frequently presented with very difficult scenarios as to the care and treatment of their patients. Often the owner/trainer desire a swift solution to a problem in order to participate in an important race, but they may not have the knowledge base or the presence of mind to take into account that the consequences of the swift solution may in fact be detrimental in the long run for the patient.

Fortunately, the positive aspects of the economic factor allow for an eye on the future when dealing with an injury in a valuable racehorse. In these cases, the owner, trainer, and veterinarian can work together to devise a reasonable plan of action that may involve surgery and/or rest and will allow for a return to athletic activity at the horse's previous level of racing. The important point is that the advances made in equine surgery have allowed for the luxury of having options, and have provided today's racetrack veterinarian with multiple choices that may encourage an investment by the owner in a course of action that ultimately benefits the patient.

### **Orthopedic cases dominate racetrack practice**

Typically, orthopedic cases dominate in a racetrack referral surgical practice. This will include arthroscopic surgery for chip fracture removal, and tendon and ligament surgeries. In the author's experience, condylar fractures comprise the overwhelming majority of the cases referred for internal fixation (2008:63) in a racetrack practice. This is followed by slab fractures of the carpus (2008:25), and sagittal fractures of the first phalanx (2008:15). In most of these cases, some form of an athletic career is desired and this is the impetus for repair.

In the author's practice, Thoroughbred and Standardbred racehorses predominate. This is somewhat unusual, as most surgeons working in the racetrack referral setting deal primarily with only one of these breeds, or with racing Quarter Horses. Specializing in both of the racing breeds allows for the opportunity to repair a larger number of the specific fractures listed previously compared to most other equine surgical practices. The observations noted here are based upon personal experience and are a reflection of the specific caseload seen in this author's practice.



**Fig 1a–b** Preoperative digital x-rays (DP view at left, oblique view at right) of the right hind fetlock of a three-year-old Thoroughbred gelding (castrated stallion). This horse had sustained an unusual displaced fracture of the distal axial portion of the lateral sesamoid bone (arrows). The fracture was successfully repaired with two cortex screws in lag fashion using arthroscopic technique to super-vise anatomic reduction.



**Fig 2a–b** Digital x-rays of the right hind fetlock of the same horse as in Fig 1. The fracture healed with excellent anatomic alignment. After a rehabilitation period of eight months the horse successfully returned to racing.

### Evolving objectives in fracture repair

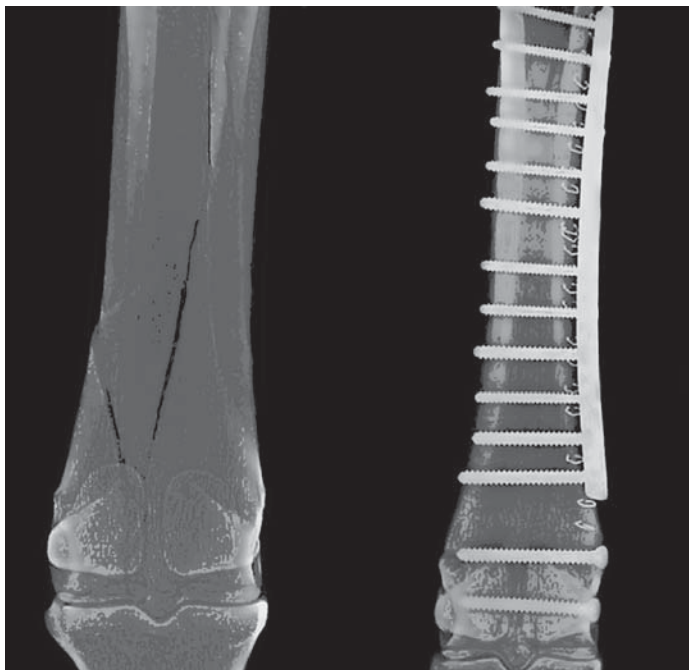
Few advances in equine veterinary medicine have made as much of a clinical impact in recent years as those achieved in fracture repair. Surgical repair of fractures in horses has evolved over the past 30 years from one with purely a “salvage” objective to that of a “return to athletic performance,” and now in many cases, a “return to previous athletic form.” Combined with improvements in both general anesthesia and anesthetic recovery methods, the world of equine fracture repair has enjoyed remarkable growth and success in a relatively brief period of time.

The overwhelming majority of fractures that occur in the Thoroughbred or Standardbred racehorse involve an articulation (**Fig 1a–b**). Since the introduction of arthroscopic surgery in the early 1970s, arthroscopic technique has become the standard of care for joint surgery in the horse. This in turn has led to the development of arthroscopically-assisted fracture repair techniques, which has contributed greatly to the increased success in returning horses to an athletic career following injury.

Continued advances in imaging technology have also provided tremendous advantages in the form of computed tomography and digital radiography, and direct digital radiography, thereby reducing operative time and surgical error. Fractures that were once considered too delicate to be repaired adequately using conventional open techniques can now be repaired using arthroscopically-assisted, minimally-invasive techniques that not only preserve joint function but also ensure a perfect articular reduction (**Fig 2a–b**).

### From euthanasia to a return to racing form

The most common fractures seen in the racehorse involve the bones of the fore fetlock joint. Condylar fractures, involving the distal end of the cannon bone, are relatively frequent. These fractures occur in various forms and with differing degrees of severity. As recently as 15 years ago, a spiraling condylar fracture that extended the length of the cannon bone was considered a certain candidate for euthanasia, as repair and recovery was considered to be too risky. With the advent of better implants, such as the locking compression plate (LCP), improved anesthetic recovery methods, and refined surgical techniques,



**Fig 3a–b** Pre- and postoperative xero x-rays of the right hind fetlock and cannon bone of a two-year-old Thoroughbred racehorse. There is a medial condylar fracture that propagated proximally the entire length of the third metatarsal bone (MtIII). This fracture was repaired successfully and the horse returned to its previous level of performance, until incurring an almost identical spiral condylar fracture in the left fore fetlock one year later. That fracture was then repaired using the same technique and the horse again returned to racing and remained competitive for 4 more years.

horses with these fractures now carry a very acceptable degree of risk for repair with the assumption that a return to racing is an attainable goal (**Fig 3**).

Even the most severe of orthopedic injuries in the racehorse have benefited from just the advances achieved in implant development alone. The increased strength and stability provided by the advent of the 5.5 mm cortical screw has been a major contributor to the improvement in success rates noted in equine fracture repair. And more recently, the introduction of the LCP has already made a positive impact on the surgical treatment of breakdown injuries, providing a stronger construct for arthrodesis techniques.

### A promising future

It is very exciting to consider what the future may hold for equine fracture repair. The emphasis will certainly be on the continued development of stronger, more effective implants and on the expansion of minimally-invasive fixation techniques. Additionally, it appears that progressive research in the field of

osteosynthesis will likely provide adjunctive measures in the form of gene therapy and mesenchymal stem cells that will continue to expand our horizons and abilities to accelerate and strengthen bone healing.



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