A Review of Central and Third Tarsal Bone Slab Fractures in 57 Horses

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Conservative management of horses with third and central tarsal bone slab fractures can be effective in returning these horses to athletic function. Author's Addresses: New Bolton Center, University of Pennsylvania, 382 West Street Road, Kennett Square, PA, 19348. © 2001 AAEP.

1. Introduction
Both surgical and conservative management of horses with central and third tarsal slab fractures have been advocated. However, the few horses in these studies, and conflicting views on the success of conservative management in returning horses to athletic function, leads to a lack of consensus on an optimal management plan for horses with these fractures. For instance, Murphey et al. reported good prognosis after conservative management, but Winberg et al. and Lindsay et al. made recommendations for surgical management. The purpose of this study was to report the results of a retrospective review of central and third tarsal bone slab fractures in 57 horses.

2. Materials and Methods
Medical records from 1990 to 2000 of 57 horses with a diagnosis of central or third tarsal bone fracture were examined and information retrieved. The information included: signalment, history, physical examination findings, lameness examination results, scintigraphic findings, radiographs, and treatment. Scintigraphic scans were examined for uptake in the area of the tarsal bones. Radiographs were examined for the presence of a slab fracture, the size of the fracture fragment, the displacement of the fracture fragment, and presence or absence of degenerative changes. Lifetime race records for racehorses were reviewed and data derived included number of starts before and after injury, and the time from injury diagnosis to first race.

3. Results
There were 24 horses with central tarsal bone slab fractures. Bilateral fractures were seen in 1 horse. In this group there were 5 Thoroughbreds, 18 Standardbreds, and 1 Quarter Horse. The mean age was 3.1 y (median 2 y), and there were 3 geldings, 8 stallions, and 13 mares. Of the 24 horses, there were 13 with right, and 12 with left central tarsal bone fractures. The average fracture fragment size (dorsal to planter width), as measured on the dorsolateral to plantaromedial oblique radiograph, was 8.2 mm (median 8, range 4–14 mm). Fracture gap was measured at a mean displacement of 0.5 mm (median 0, range 0–1.5). Eighty percent of the Standardbreds (8/10) raced after injury, and a mean time between diag-
nosis and first race was 323 days (range 188–803 days, median 236). Mean starts before injury were 9.4 (median 3, range 1–70) and mean starts after injury were 53.7 (median 45.5, range 8–196).

There were 25 horses with unilateral and 3 horses with bilateral third tarsal bone slab fractures. In this group there were 11 Thoroughbreds, 16 Standardbreds and 1 Quarter Horse. The mean age was 3.5 years (median 3) and there were 8 geldings, 6 stallions, and 14 mares. There were 14 left and 17 right third tarsal bone fractures. Mean fracture fragment size, as measured on the dorsomedial-plantarolateral radiograph, was 9.0 mm (median 8.5, range 4–16). Ninety-two percent of the Standardbreds (12/13) and 71% of Thoroughbreds (5/7) raced after injury. Mean starts before injury were 12 (median 11, range 1–30) and mean starts after injury were 25.8 (median 16.5, range 1–72). The mean time between diagnosis of the injury and the first race was 243 days (median 256, range 107–333). Rehabilitation times did not differ between breeds.

During the same time period 5 horses had surgical correction of tarsal bone fractures. There were 4 horses with third tarsal bone fractures and 1 horse with a central tarsal bone fracture. All horses were Standardbreds and there were 2 mares, 2 stallions, and 1 gelding. There were 2 right and 2 left third tarsal bone fractures and 1 central tarsal bone slab fracture. The mean age was 2.8 years (median 3, range 2–3 y) for the third tarsal bone fracture horses and the central tarsal bone fractures occurred in a yearling. The fracture fragment size of the third tarsal bone fractures was a mean of 8 mm and a range of 8–14 mm. Fracture gap ranged from 1.5–2 mm with a mean of 1.6 mm (median 1.5 mm). The central tarsal bone fragment was 8 mm with a 2-mm fracture gap. Of the 5 horses only 3 returned to race successfully after surgery.

4. Discussion
Conservative management was effective in returning horses with both central and third tarsal bone slab fractures to racing. During the same time period only 5 horses out of 57 total had surgery. These were mainly chosen for internal fixation based on surgeons’ preference, owner compliance, and increased displacement of the fracture fragment (the one central tarsal bone fragment was displaced by 2 mm and the third tarsal bone fragments were displaced by 1.5 mm). Of these horses only 3 returned to racing.

We did not find a side predilection for the fractures. Both third and central tarsal bone fractures were equally distributed between hindlimbs. Previous review articles had been suggestive of an increased occurrence in the left hindlimb.1–2

In the studies published previously there has not been a consensus as to the effectiveness of conservative management.1–4 We feel that the number of horses in this study confirms a previous report by Murphey et al.1 that conservative management with appropriate rest can be effective in returning these horses to racing careers. In that article 64% of horses had a successful outcome with conservative management. Ten of 14 Standardbreds returned to racing as did 2 of 6 Thoroughbreds.1 In our review, 80% of Standardbreds with central tarsal bone fractures and 92% with third tarsal bone fractures returned to race successfully with conservative management. Also, 71% of Thoroughbreds with third tarsal bone fractures returned to a racing career after injury. Appropriate rest in our retrospective study averaged 8 mo for third tarsal bone fractures and 10 mo for central tarsal bone fractures. In the review by Murphey et al. reporting success in returning horses to racing with conservative management, the average rest period was also approximately 8 mo.1 Conservative management varied based on the clinical examination of the horses during rehabilitation but consisted of 2 mo of stall rest followed by 2 mo in a small paddock and re-evaluation for lameness at the end of that time. A total of 4–6 mo of rest was commonly required prior to a controlled and slow return to exercise for the remaining 2 mo.

Surgical management of severely displaced or comminuted fractures would be advocated, but conservative treatment of horses with minimally displaced central and third tarsal bone slab fractures can be successful in returning horses to athletic function. The previous report by Winberg et al. of surgical management reported a success rate of 72% returning to race after surgery in a case series of 20 horses.2 Articles by Tulamo et al. and Lindsay et al. compare results obtained from surgical versus conservative management.3,4 Tulamo et al. had 1 horse that returned to racing after surgery and 7 horses who did not return to racing after injury and were managed with rest alone; 3 horses were euthanized.3 Lindsay et al. had 3 horses treated with conservative management who did not return to training due to persistent lameness and 2 horses treated surgically who returned to training after surgery.4 In our review surgery was only performed in 5 horses, of which 3 returned to racing careers.

In our review of 57 horses, we recommended conservative management in 52 of the 57 horses. Appropriate rest was sufficient to return the majority of these horses with central and third tarsal bone fractures to their athletic function. This method of management remains the treatment of choice for most slab fractures of the central and third tarsal bones.

References
1. Murphey AD, Schneider RK, Adams SB, et al. Long-term outcome of horses with a slab fracture of the central or third...

