Results of Plate Fixation of Third Metacarpal and Metatarsal Diaphyseal Fractures

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Internal fixation of closed MCIII/MTIII diaphyseal fractures is a highly successful method of treatment. Authors' addresses: Cornell University Hospital for Animals, Box 25, College of Veterinary Medicine, Ithaca, NY 14850 (Beinlich); Rood and Riddle Equine Hospital, P.O. Box 12070, Lexington, KY 40511 (Bramlage). © 2002 AAEP.

1. Introduction
Diaphyseal fractures of the third metacarpal (MCIII) or metatarsal (MTIII) bones are not common in horses, although they are seen regularly in equine athletes. These fractures are as many as one third of all long-bone fractures in the horse.1 Treatment options for MCIII/MTIII fractures include internal fixation, external coaptation, and a combination of the two. The most stable treatment method is internal fixation. The quality of recovery and the possibility of return to athletic use are enhanced by stability, which keeps the limb functional during healing. Internal fixation increases the likelihood of infection because of the surgical exposure to insert the implants and the presence of the implants. One study showed the prognosis for healing was 67% using several treatment methods including internal fixation, transfixation pin casting and casting alone.1 The purpose of this study is to provide additional information on the success of internal fixation, using dynamic compression plating, of MCIII or MTIII diaphyseal fractures, and to determine the factors that contribute to success or failure.

2. Materials and Methods
Case records from The Ohio State University treated by the second author (1970–1989) and from the Rood and Riddle Equine Hospital (1990–2000) that underwent plate fixation of MCIII or MTIII diaphyseal fractures were assessed. Sixty-three horses with usable information were examined for signalment, type of fracture and cause when available, treatment method, type and number of implants, length of hospital stay, complications if any, and outcome. Racehorses also had their racing records examined to compare starts before and after surgery. Successful treatment was defined as sufficient clinical and radiographic healing that the patient was discharged from the hospital and finished convalescence at home.

3. Results
Forty-two of the 63 horses (67%) had axially unstable diaphyseal fractures; 21 of the 63 (33%) had axially stable fractures of the diaphysis that originated in the condyles. Thirty-three of the 63 horses (52%) were treated with one plate and 30 of the 63 (48%) were treated with two plates. Twenty-four of the 63 (38%) were also placed in a cast. Twenty-
eight of the 63 horses (44%) developed complications; the most frequent were incisonal infection (18%), and osteomyelitis (18%). Fifteen, all axially unstable, of the 63 fractures (24%) were open fractures. Thirty-one of the 63 (49%) were fillies (<4 yr), 23 (37%) were colts (<3 yr), 4 (6%) were geldings, 3 (4%) were stallions (≥10 yr) and 2 (3%) were unknown. Forty of the 63 (63%) had MC III fractures and 23 (37%) had MTIII fractures. The average hospital stay was 31.05 d and the average age of the horses was 2.3 yr. Fifty-three of the 63 horses (84%) were successfully treated, 76% with axially unstable fractures, and 100% of the axially stable diaphyseal fractures. Nine of the 15 horses with open fractures (60%) and 44 of the 47 horses (94%) with closed fractures were successfully treated. In one horse it was unknown whether the fracture was open or closed. Six of the 8 stallions (75%), 26 of the 31 fillies (84%), 15 of the 18 colts (83%), and 4 of the 4 geldings (100%) were successfully treated. In two of the horses that were successfully treated the sex was unknown. Twenty-nine of the 36 horses (81%) 1 yr of age or less, all 7 (100%) of the 2-yr-olds, all 11 (100%) of the 3-yr-olds, and 4 of the 7 (57.1%) older horses (≥4) were successfully treated. The age of 2 of the horses that were discharged was unknown. Ten of 19 (53%) of the axially stable diaphyseal fractures raced: 60% of the colts and 25% of the fillies. Nine of 16 (56%) horses with axially stable MCIII fractures and 1 of 5 (20%) with axially stable MTIII fractures returned to racing.

4. Discussion
MCIII/MTIII fractures can be successfully treated by using dynamic compression plating. The prognosis for healing of horses with axially stable diaphyseal fractures using internal fixation is excellent (100%); however, the prognosis for their return to athletic competition is 53% overall. The prognosis for survival for horses with axially unstable MCIII/MTIII fractures is good (76%). The overall success rate (84%) is higher than a previously reported case report1 in which a 67% success rate was achieved. Therefore, most of these serious injuries have a good prognosis, although return to athleticism is guarded. Factors in this study that decreased prognosis were, if the fracture was open, an increased age (>4), and being an intact male.

Reference