



Case Study: Mid-shaft fractures of right metacarpals 3 and 4

Patient: 'Copper' Laughbon, an 5-year-old MC Boxer/Doberman mix

ASOC Surgeon: Alexander Z. Aguila, DVM, DACVS

Referred by: Olympic Veterinary Clinic

Presented:

Presented as a referral from Olympic Veterinary Clinic for mid-shaft fractures of right metacarpals 3 and 4 after having been hit by a car. He was referred to the Animal Surgical & Orthopedic Center for surgical consultation after having been hemodynamically stabilized.

Diagnostics:

Referral radiographs revealed fractures of metacarpals 3 and 4. Bloodwork was found to be largely within normal limits aside from mild elevation in alkaline phosphatase, attributed to the trauma. (See Figure 1)



Copper - Pre-op radiograph



Copper- Pre-op radiograph

Diagnosis:

Mid-shaft fractures of Right metacarpals 3 and 4

Treatment:

Fracture stabilization with intramedullary pinning of right metacarpals 3 and 4 was pursued, with adjunctive post-operative splint management. (See Figure 2)



Outcome:

After 10 weeks of post-operative splint management (splint changes every 1-2 weeks), appropriate bony healing as confirmed on recheck radiographs, and the pins were removed. Copper was transitioned to a soft padded bandage for an additional 2 weeks prior to removal altogether, and is reported to be doing very well now, with complete resolution of lameness. (See Figure 3)



Image 1



Image 2

Case Takeaway:

Whether to treat metacarpal and digital fractures with surgical stabilization or conservative splint management can be a challenging decision. Traditionally, **surgically repairing**

metabone fractures in the dog and cat have been advocated if

1. More than two metacarpal or metatarsal fractures are present in the same manus
2. The fractures involved both of the primary weight-bearing bones (metacarpals or metatarsals III and IV)
3. The fractures are articular fractures
4. The fracture fragment segments are displaced by >50%
5. The fracture involves the base of the metacarpal/metatarsal II or V
6. And the dog is a large-breed, athletic working or show dog.

However, there is no evidence to support the accuracy of these guidelines, assuming the outcome measurement is fracture healing without lameness. **Repair of digital fractures** is rarely considered, and only in large-breed, athletic working or show dogs; more often, amputation is the preferred surgical consideration for digital fractures, to be weighed against conservative splint management.

The clinician must rely on their intuition, as specifically applied to the patient's circumstances, and the management of client expectations, that defines whether to pursue surgical stabilization vs. conservative splint management alone. Clients need to be prepared for several weeks of restrictions, splint management and complication expectations, including the eventual need for pin removal, if elected as the stabilization choice. **Still, other clients know their pet will not tolerate splint management and restrictions, and will wish to have the option to amputate the digit from the outset,** as this is the salvage procedure of choice, should initial management choices fail. Although it is less desirable to amputate digits III and/or IV, it can be done with appropriate client education and management of expectations.

Whereas most stabilized fractures should be healed in 8 weeks (4-6 weeks in juvenile dogs), unstabilized fractures (i.e. conservative management cases) are not expected to complete healing until after 10-12 weeks; these expectations may govern the clinician's choices in timing recheck radiographs. **In conservative management cases, a radiographic assessment of 'delayed union' is expected for recheck radiographs obtained prior to 10-12 weeks, making their usefulness questionable.** Many pets will not tolerate splint management beyond 6-8 weeks, due to bandage sores and other complications, so splint management often needs to be abandoned sooner than completion of healing. Activity restrictions are enforced until completion of fracture healing can be verified; however, for conservative management cases, final recheck radiographs may be considered academic exercises, as surgical revisions or amputation would only be considered if clinical lameness or pain persists beyond expected healing times. If radiographs reveal delayed or fibrous non-unions, but the pet is ambulating without lameness or discomfort, no additional surgical interventions would be advocated

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