

GREYHOUND SURGICAL CASE STUDIES

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1. CAUDO-MEDIAL INTRA-ARTICULAR DISTAL TIBIAL FRACTURES

Fractures of the hock joint in the racing greyhound have been well documented, with the central and fourth tarsal bones of almost exclusively the right hind leg being affected most commonly. Fractures of the third tarsal, fibular tarsal, and tibial tarsal bones are also noted to occur. Very occasionally fractures of the medial malleolus of the tibia or the fibular malleolus may be identified, usually after some off-track traumatic incident. Over recent years there has been the emergence of a distal tibial intra-articular fracture located on the caudal or caudomedial aspect of the tibia.

Case No.1:

A 24-month old greyhound bitch was presented with a subtle RH lameness. The dog had raced 5 days prior and had become lame upon cooling down. There was pain on flexion and delayed return to weight-bearing following hock flexion as well as sensitivity to digital pressure and subtle oedema over the caudolateral aspect of the tibiotarsal joint. Radiographs revealed an intra-articular triangular slab fracture off the caudal aspect of the distal tibia measuring 17mm axially and involving approximately 7mm of the articular surface. Surgery was indicated and a caudomedial approach to the distal tibia used to identify the fracture fragment and to place two 2.0mm diam cortical lag screws through the fragment into the distal tibia. The dog was given peri-operative analgesia and antibiotics and the limb was placed in a padded bandage for a total of 3 weeks post-operatively. The greyhound's recovery through to free running at 6 weeks post-operative was uneventful with no loss of hock flexion or lameness but the owners of the dog declined a return to competitive performance.

Case No.2:

A 33-month old male greyhound presented with a left hind lameness after racing the previous night. Physical examination revealed a significant weight bearing left hindleg lameness, oedema around the caudal aspect of the hock & pain on hock flexion. The dog had also sustained ruptures of the medial collateral ligament of the LFD3P1-2 joint and the lateral collateral ligament of the LFD5P1-2 joint. Radiographic examination of the left hock joint revealed a triangular intra-articular fracture of the caudal aspect of the distal tibia, with the fracture line extending 13mm proximally and involving 5mm of articular surface. Surgical intervention was elected and a caudomedial arthrotomy was performed in order to identify the fracture line prior to the placement of one 2.7mm diam cortical lag screw through the fragment cranioproximally into the distal tibia. The ruptures of the collateral ligaments were repaired surgically. The dog received peri-operative antibiotics and analgesics and both legs were externally supported in padded bandages for 3 weeks. The lameness had resolved by 10 days post-operatively walking was resumed at 3 weeks post-operative. Examination at 48 days post-operative revealed no lameness, no peri-articular swelling and no loss of hock flexion and a radiograph showed no periosteal reactivity but the presence of a radiolucent line at the fracture site consistent with incomplete mineralisation/ incomplete healing at that time. At time of writing (02/07) the patient is about to return to training.

The two cases reported here involve fracture of the caudal prominence of the medial malleolus of the tibia. This type of fracture appears to be significantly less common than those that have been described previously in the greyhound literature. The author is aware of only one other case of a similar fracture which was repaired similarly interstate, utilising one screw, just prior to the presentation of Case no.1 to Keysborough Veterinary Practice. The degree of lameness that occurs with this injury is similar to that found with fractures of the 3rd tarsal bone and clinical signs of pain on hock flexion and delayed return to weight bearing following hock flexion are present but not diagnostic as these signs are common with most if not all hock injuries. Radiography, specifically the lateromedial projection is usually diagnostic. Surgical intervention is indicated and provided good reduction and rigid fixation is achieved, a very good to excellent prognosis for a satisfactory return to racing should be expected.

2. 2nd TARSAL BONE FRACTURE & TARSO-METATARSAL DISLOCATION

A 5yo retired greyhound bitch running around in a galloping paddock the night prior to presentation had been heard to cry out and had been found holding the left hindleg off the ground. At examination the left hock, metatarsus and paw were significantly swollen with palpable tarso-metatarsal instability laterally. Radiographs taken revealed fracture and displacement of the second tarsal bone together with dislocation of the 4th tarso-metatarsal joints, avulsion of the collateral ligament from the head of the fifth metatarsal and subluxation of the 3rd tarso-metatarsal joint. Surgery was agreed to and the dog anaesthetised for surgery. The displaced medial fragment of the second tarsal bone was reduced via a medial approach directly over the bone and a 2.0mm diam lag screw placed through the second tarsal bone into the third tarsal bone. A lateral approach was made to the 4th tarso-MTV joint and 0.6mm diam wire used as a wire snare to secure the avulsed bone fragment and associated ligament back to the metatarsal. This repair was then strengthened by the placement of a 0.8mm wire through the distal body of the 4th tarsal bone and the proximal shaft of RMTV. The dog received fluid therapy during surgery into post-operative recovery together with peri-operative antibiotics and analgesics. The repair was externally supported by the use of a hock splint for a period of five weeks and recovery was uneventful except for the exposure of the wire twist of the 0.6mm wire at three weeks post-operative, this being treated medically through to seven weeks post-operatively at which time it was deemed that sufficient healing had occurred to permit its removal. The dog continues to walk and free run on the property without lameness.

Except for toe and sesamoid injuries, traumatic/exercise induced dislocations in greyhounds are not very common. Rupture of the plantar fibro-cartilagenous ligament is occasionally encountered, resulting in tarso-metatarsal luxation, and more rarely subluxation of the elbow joint secondary to rupture (or more commonly avulsion) of the radial collateral ligament. Surgical intervention is indicated to restabilise such luxations to provide the patient with any reasonable prognosis for a return to racing. Fibular tarso-metatarsal luxations require either plate or pin and tension band wire stabilisation with arthrodesis of the affected joint to permit elimination of the plantigrade stance and a return to normal weight bearing, but this injury almost always ends a dog's competitive career. It is highly likely that the injury sustained by the greyhound in this case (had it occurred in a race age greyhound) would likewise end the animal's competitive career. Dorsal inter-tarsal ligament injury does occur, but this injury carries a good to very good prognosis for return to racing, given that the dorsal surface of the tarsus is usually under compression during weight bearing and propulsion so the fibrosis that results in

stability is rarely if ever placed under significant stress. Subluxation of the elbow secondary to radial collateral avulsion responds very well to surgical reattachment of the avulsed ligament (usually avulsing from the medial epicondylar area of the humerus).

3. COMMINUTED OPEN RADIAL AND ULNAR FRACTURE

An 18-month old male greyhound was presented after trialling that morning and colliding with the lure arm, resulting in a compound (open) fracture of the left radius and ulna. The greyhound was non-weight bearing on a grossly swollen left foreleg with a small skin wound over the craniomedial aspect of the forearm. The greyhound was provided with narcotic analgesia and sedation upon presentation to permit radiography which revealed an overridden short 'V' shaped fracture through the distal third of the radius with multiple fissure fractures extending proximally to within 4cm of the elbow joint, and a single short oblique fracture of the ulna. The greyhound was anaesthetised and the radius repaired by the placement of five 2.7mm lag screws and a 12-hole 3.5mm DCP. The ulnar fracture interdigitated well and appeared quite stable following repair of the radius and was not treated surgically. The dog was placed on peri-operative antibiotics and analgesics and the leg was placed in a padded bandage for 2 weeks post-operatively. Lameness resolved over 3 weeks and by nine weeks post-operatively there was minimal loss of carpal flexion with a radiograph revealing that healing was well advanced. The implants were removed eleven weeks post operatively and the dog returned satisfactorily to competitive racing a further eight weeks later.

The use of implants to repair even complicated fractures in domestic pets is not a recent innovation, nor is their use in performance greyhounds. The adherence to the principles of internal fixation will commonly result in a satisfactory outcome. Eaton Wells and other authors have previously detailed the results of in-house data demonstrating that a reasonable percentage of greyhounds that sustain long bone fractures can return to satisfactory racing if the fracture is adequately repaired. This fact is commonly overlooked by trainers and owners of greyhounds when confronted by the quite grotesque appearance of a closed or open long bone fracture. It is worth race track veterinarians being aware of the potential for these fractures to be satisfactorily repaired for return to athletic performance and to provide owners and trainers with the option of supportive first-aid and fracture immobilisation and repair or referral for repair in these circumstances.

4. INTRAMEDULLARY REPAIR OF PHALANGEAL FRACTURE

A 7-month old male greyhound pup was presented with left hindleg lameness. The outer central toe (LHD4) was swollen and angularly deformed with palpable crepitus over the proximal phalanx (P1). Radiography revealed a transverse fracture of the distal diaphysis of P1. Due to the unstable nature of the fracture surgery was recommended and a dorsal approach made to the fracture site. A 2.0mm diam K-wire was introduced into the medullary cavity of the distal fragment and the depth to which it could comfortably be placed was measured. The K-wire was then introduced into the medullary cavity of the proximal fragment and inserted until firmly seated. The K-wire was then cut, leaving exposed a length of pin equal to the depth to which the pin could be inserted into the distal fragment. Traction was then applied to the distal fragment so as to permit distracted alignment of the pin relative to the proximal end of the medullary canal of the distal fragment. Release of the traction permitted alignment of the fracture fragments with minimal

fracture gap. The surgical site was closed routinely and the foot placed in a padded support bandage for a total of 4 weeks. Lameness was not evident by day 5 post-operatively and the bandages were changed weekly. The pup was confined to a race kennel for 4 weeks and has since returned to competitive free running with his peers in a 20m x 20m galloping enclosure.

Phalangeal fractures are common in young greyhound pups and may range from simple long oblique fractures with minimal displacement through to highly comminuted diaphyseal fractures or growth plate separations (Salter Harris type I or type II fractures). Intra-articular phalangeal fractures are more common in young adult and adult racing greyhounds. There are many methods for repair of phalangeal fractures. Non-displaced or minimally displaced fractures can commonly be treated with conservative treatment involving bandaging with or without splintage. Comminuted fractures likewise are best treated conservatively. Long oblique fractures can be cerclage or hemi-cerclage wired to minimise overriding of the fracture fragments, this being of significant importance in oblique fractures of the second phalanx where conservative treatment often results in overriding and osseous spur formation which commonly causes pad or webbing irritation where the spur contacts the ground resulting in lameness. Removal of the spur with bone rongeurs in such cases is usually curative.

The method of repair described in this case eliminated the necessity to enter the joint at either end of the fractured phalanx- the common method of repair being to place an intramedullary pin down the diaphysis into the metaphysis and through the epiphysis into the joint followed by reduction and retrograde placement of the pin into the other fragment with the pin being cut off flush with the articular cartilage and then being seated below the cartilage by tapping with an orthopaedic mallet. Alternatively a double rush pinning technique could be employed but getting large enough pins to provide strength and stability without damaging the soft metaphyseal bone often is a problem. The technique used in this case resulted in very good alignment of the fracture fragments, provided significant strength due to the fact that a large K-wire, one that could occupy the entire medullary canal could be used, and no articular cartilage injury was inflicted to achieve the repair. Rotational stability was a concern but supportive bandaging resulted in continued stability and the tension in the extensor and flexor tendons maintained excellent reduction of the fracture site. Additional rotational stability could have been provided with the use of a hemicerclage wire. The technique is truly only suitable for distal or proximal diaphyseal fractures – mid shaft fractures would not be able to be distracted sufficiently to place the pin if the pin was to occupy most of the medullary cavity of both fragments. Placing only a small amount of pin into either the proximal or distal portion of a mid diaphyseal fracture would permit excessive bending moment forces to exist at the fracture site which might result in failure of the repair.

A range of repair options usually exist for phalangeal fractures and it is worthwhile reviewing the various forces that are likely to exist at the fracture as well as the fracture type before entering into the surgery.