The nature, incidence and response to treatment of injuries to the distal limbs in the racing Greyhound

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Objectives: To determine the nature, incidence and response to treatment of injuries to the distal limbs of racing Greyhounds.

Methods: All Greyhounds treated by the author for distal limb lameness were included in a five year prospective study. Additional cases were taken from a five year retrospective study.

Selected injuries: Conditions discussed are either previously unreported; a novel method of treatment; add further to the understanding of the injury; or give a prognosis for a return to successful racing.

Outcome measurement was mainly by reference to pre and post-injury racing results on the GBGB website.

Results: There were a total of 387 injuries of which 229 were fractures (59%). The distribution was 160 injuries in the thoracic limb and 227 in the pelvic limb. The most common site of injury was the tarsus (35%) of which 88% were fractures.

CARPUS

Accessory carpal bone fracture

Classification of accessory carpal bone fractures (Johnson and others 1988).

36 cases of ACB fractures were recorded of which 32 were in the right carpus. 31 cases were classified as type I. Type I fractures were further classified into:

- Type IA: on the disto-lateral aspect at the attachment of the accessorio-ulnar carpal ligament.
Type IB: on the disto-medial aspect at the attachment of the accessorio-quartal ligament.
Type IC: on the medial aspect at the attachment of the accessorio-radial carpal ligament.

Combinations and numbers of these types are:
- Type IA: n=2
- Type IB: n=18
- Type IC: n=2
- Type IA and IB: n=12.

The majority of cases (n=28) were retired. Prognosis for the different types and treatments could not be determined. Screw fixation was attempted in 3 cases. Accurate reconstruction was successful in only 1 case (type IB) and the dog then completed over 80 races. Both type IC cases were rested and returned to racing.

**Extensor carpi ulnaris tendon tear**

The tendon of the ECU muscle inserts on the lateral aspect of the ACB. Diagnosis is by palpation of the tear with focal swelling. One acute case was treated by surgical repair and the other was a chronic tear in a newly acquired dog. Both dogs raced successfully.

**THE TARSUS**

**Distal crural fractures**

Fractures of the caudal distal tibial margin have been reported as single fractures or concomitant to malleolar fractures (Montovan and others 1993). In this series 8 cases were recorded with one concomitant medial malleolar fracture. The left hock was over-represented (n=7).

Lag screw fixation was successful (n=6) in single CDTM fractures. The failure (n=1) was due to poor screw placement.
Sprain of the lateral ligament complex of the talocrural joint.

Cases (n=3) presented with mild lateral hock swelling and lameness. All cases were in the left hock. A dorsoplantar radiograph showed a small avulsion fracture from the lateral malleolus. Hock instability could be elicited by a manoeuvre involving flexion, rotation and tilting of the hock under general anaesthesia.

With the hock extended stability is maintained by the malleoli. Treatment was kennel rest for 8 weeks. All dogs raced again successfully.

Central tarsal bone fractures

81 cases of CTB fractures were recorded of which 69 were classified as types IV (n=23) and V (n=46). 70% had concomitant fractures in other tarsal bones: calcaneus (n=19), fourth tarsal bone (n=30), MT5 (n=11), T2 (n=1) and in multiple bones (n=12).

Tarsal reconstruction was by screw fixation and of 11 cases that returned to racing 7 competed at the pre-injury grade, 4 of these cases having concomitant fractures. The aim of the surgery was to achieve tarsal alignment often without accurate reconstruction, healing was by intertarsal bone fusion.

Delayed onset septic arthritis with osteomyelitis was diagnosed in the proximal intertarsal joint (n=1) and the tarsometatarsal joint (n=1) when the dogs returned to training. Staph intermedium was isolated in both cases and responded to Synulox therapy. No lysis was present around the implants which were not removed. Both dogs raced again.

Calcaneal fractures

20 cases were recorded of which 19 had concomitant CTB fractures. 6 cases had comminuted calcaneal fractures with collapse treated by a lateral plate and tension band wires (n=2) or pin and tension band wires (n=4). The latter
technique was considered the simpler. Persistent lameness resolved after wire removal (n=3). No dog with these comminuted fractures returned to racing.

Third tarsal bone fractures (Guilliard 2011)

23 cases were recorded. 8 cases were presented as chronic lameness (1 to 6 months duration). Concomitant T2 fracture occurred in 5 cases. Lag screw fixation (n=14) was successful (n=8), 3 cases failed to race due to lameness and 3 cases were lost to follow-up. The failed cases had a degree of dorsal tarsal collapse probably due to undetected fracture comminution.

Dorsal proximal intertarsal joint instability

There were 2 cases affecting the right tarsus both having dorsal and lateral instability. The case stabilised with temporary screws and wire tension bands returned to racing. The case stabilised with an external fixator remained lame.
METACARPUS and METATARSUS

Metatarsal bone III fractures

18 cases of MT3 fractures were seen in the right metatarsus. Radiographic changes varied from sclerosis to multiple fissure lines with or without fragment displacement.

Treatments varied chronologically from dorsal plating, lag screw reconstruction, external fixation, external coaptation to kennel rest with no support dressings. Given adequate time (and implant removal) all cases returned to racing.

Metacarpal and metatarsal bone fractures

Metacarpal bone (n=16) and metatarsal bone (n=23) fractures were treated successfully using the same techniques as for MT3 fractures.

The author’s present recommendation is minimal surgical interference with the exception of over-riding fractures (see below). Alignment was achieved with a temporary IM pin allowing the placement of an external fixator. The pin is then withdrawn through the distal joint.

THE FOOT

Metacarpophalangeal and metatarsophalangeal joint instability

29 cases of instability were recorded (MCP=3, MTP=26). MTP abaxial (lateral) instability was either rotational (n=3) or P1 luxation with (n=3) or without (n=1) the sesamoid bones. All were in digit 5 of the left hind foot. Treatment was by reduction and temporary fixation with a transarticular fixator with 100% success.

Metatarsal bone 5 torsion and axial instability

17 cases were recorded of axial rotation of digit 2 (n=3) and digit 5 (n=14). Digit 5 instability was associated with an axial torsion of the distal MT5 bone in all cases. There was no limb bias and the MT5 bone in the contralateral foot had the same degree of deformity. Treatment was rest (n=10),
amputation (n=1), and an external fixator (n=7). 1 fixator case resubluxated. All cases returned to racing. The conclusion is that there is no advantage to surgical repair of this injury.

Proximal interphalangeal joint instability (P1/P2)

18 cases were recorded with no limb or digit bias. The instability varied from relatively stable to complete luxation (n=1). 2 dogs had subluxation of both digit 3 and digit 4 in a hind foot. Treatment was by a transarticular external fixation (ESF) alone or in combination with permanent nail removal (ungual crest ostectomy, UCO). All dogs returned to racing with stable congruent joints.

Distal interphalangeal joint (P2/P3)

9 cases were recorded of which 2 had a chronic luxation of more than 2 months duration. Treatment was by UCO alone (n=5) or for very unstable joints, by UCO with a mattress suture through the damaged collateral tissues (n=4). All dogs returned to racing with stable joints.

Osteomyelitis of P3

4 cases were recorded. Treatment was by distal digital amputation (n=2) or UCO with antibiotic (Synulox) treatment. All returned to racing.

Split foot

15 cases were recorded with an over-representation of the skin over digit 3 in the right hind foot (n=9). Treatment in all cases was by an incisional resection of the abaxial web. Recurrence (n=2) was treated by the additional resection of the central web. All cases returned to racing with no further recurrence. No subsequent injury to the adjacent digits was recorded.

Corns

These results are from a previous study (Guilliard and others 2010).
40 corns were recorded in 30 dogs. The breeds were Greyhounds, Lurchers and Whippets. 85% occurred in the pads of the central digits of the fore feet. 40% of corns were associated with some form of anatomical abnormality of the foot (DDFT rupture, carpal hyperextension, P2/3 subluxation). Treatment was by surgical excision and at one year there was 25% recurrence and at 5 years there was more than a 50% recurrence. This was higher in dogs with anatomical abnormalities. The aetiology was considered to be mechanical as in man.