

SUMMARY

Incomplete sagittal proximal fracture of the first phalanx is a common fracture in racehorses

Post-operative race records were evaluated in 126 Thoroughbreds that had an incomplete sagittal proximal fracture of the first phalanx repaired under general anaesthesia using cortical screws applied in lag fashion

83% of horses raced post-operatively; of these 63% won a race, 82% won money, 78% raced at the same or a better level than pre-operatively

INTRODUCTION

- Incomplete sagittal proximal fracture (ISPF) of the first phalanx accounts for up to 10.4% of fractures seen in racing Thoroughbreds¹.
- These fractures can be treated conservatively or by lag screw internal fixation; the latter method optimises post-operative prognosis, maintains joint surface congruity and helps to prevent distal propagation^{2,3}.
- Most studies that have examined prognosis following these fractures focus on American Standardbreds, and include surgical and conservative treatment^{2,4,5,6}.
- There are a lack of recent data from the United Kingdom reporting post-operative outcome and racing performance in Thoroughbred racehorses.

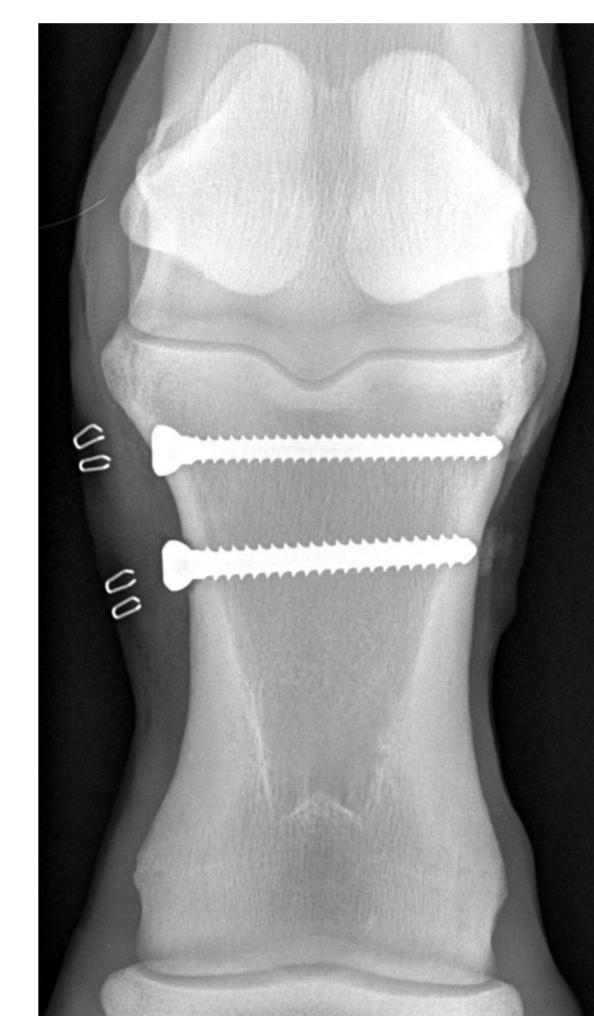
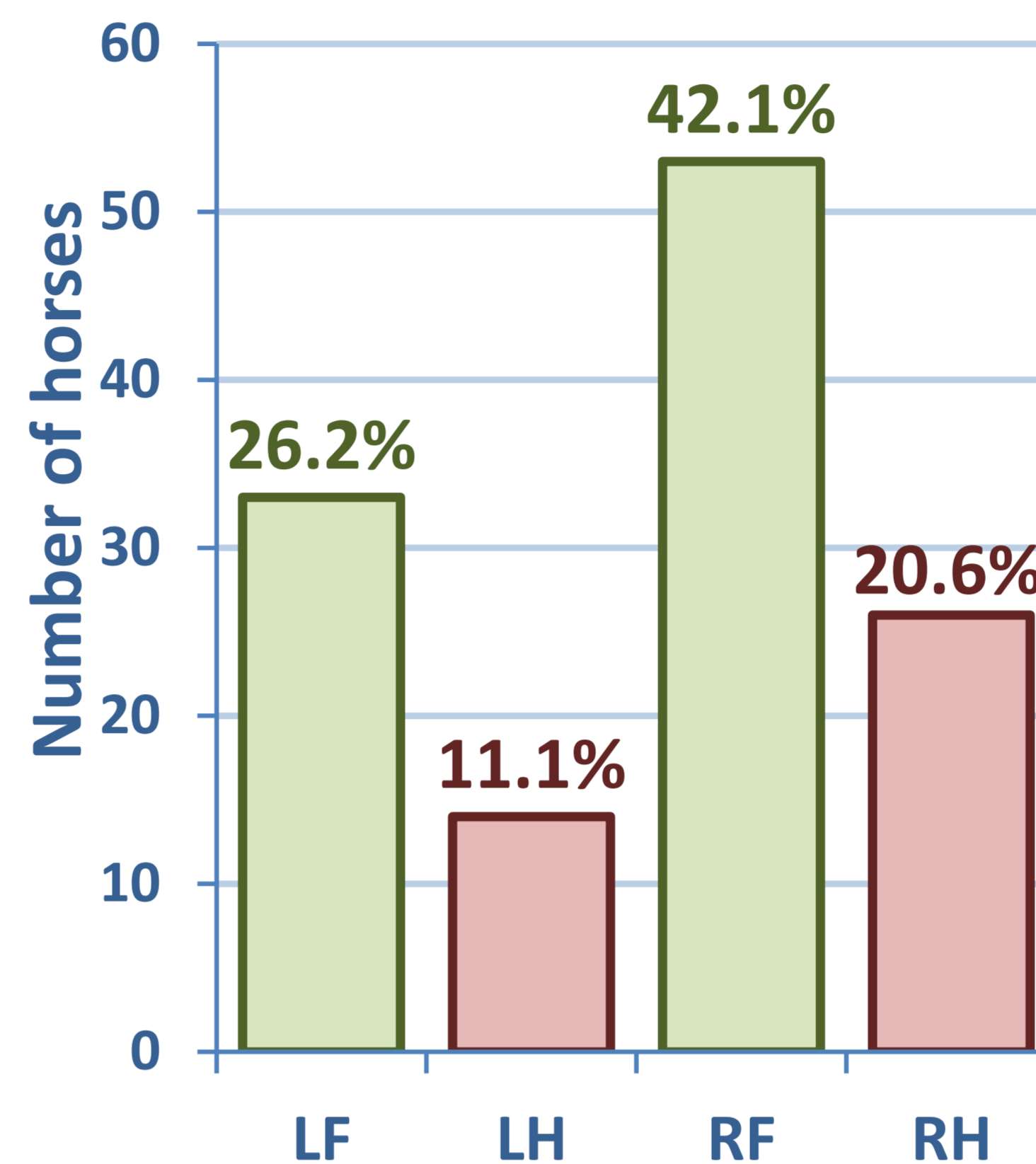


Figure 1
Lag screw fixation of a ISPF in the first phalanx

Figure 2

Distribution of fracture frequency by limb



RESULTS

- 126 horses satisfied the inclusion criteria, with either a short (≤ 30 mm; $n = 17$) or long (> 30 mm; $n = 109$) ISPF of the first phalanx.
- Fractures occurred significantly more frequently in the fore limbs ($n = 86$; 66%; $P = 0.005$) than in hind limbs ($n = 40$; 34%), and occurred most commonly in the right forelimb ($n = 53$; 42%; $P = 0.05$) (Fig. 2).
- Post-operative racing records were available for 108 horses; 83% ($n = 90$; 95% C.I. 76.3%, 90.4%) of these returned to racing.
- 88% of horses sustaining short and 68% sustaining long sagittal fractures raced following surgery ($P = 0.73$) (Fig. 3).
- Mean time from operation to return to racing was 270 ± 77 (SD) days for short ISPF and 337 ± 171 days for long ISPF (Fig. 4).
- Horses sustaining fore limb fractures took an average of 48 (mean) more days to return to racing than horses sustaining hind limb fractures, although this difference was not significant ($P = 0.17$).
- 82% of horses that raced post-operatively won money, 63% won a race.
- Out of 50 horses that had raced pre-operatively, 39 (78%; 95% C.I. 66.5%, 89.5%) raced at the same or a better level post-operatively (Fig. 5).

MATERIALS AND METHODS

- Fractures of the first phalanx were repaired under general anaesthesia using cortical screws applied in lag fashion (Fig. 1).
- Inclusion criteria:** Racing Thoroughbreds that survived to discharge following ISPF repair, between 1991 and 2010 at RosSDales Equine Hospital.
- Exclusion criteria:** Concurrent orthopaedic diagnosis at time of surgery.
- Medical records were examined and racing performance data retrieved from the Racing Post website.
- Statistical analyses were performed in R⁷ and Microsoft Excel⁸.

Figure 3
Horses with each fracture type that raced postoperatively

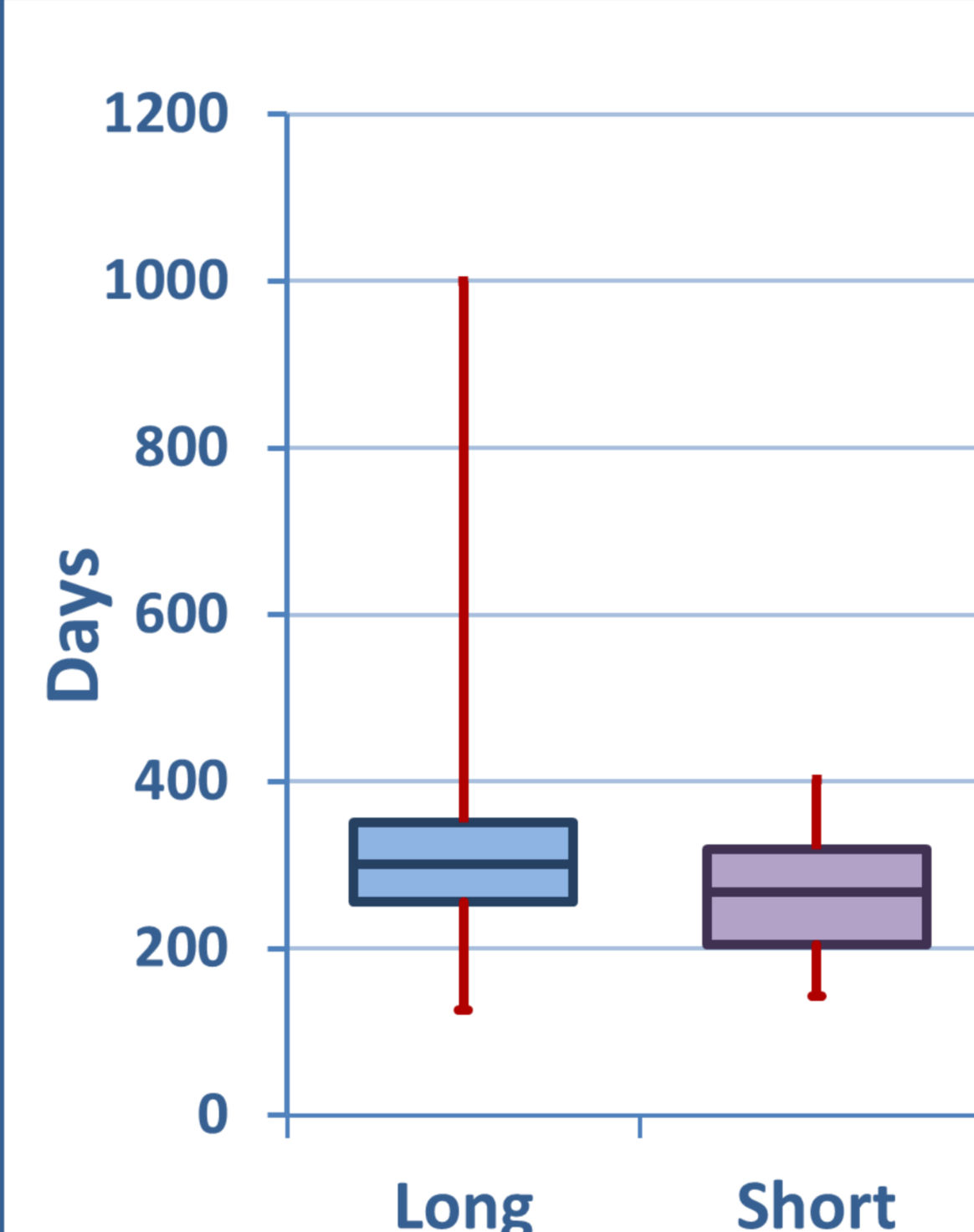
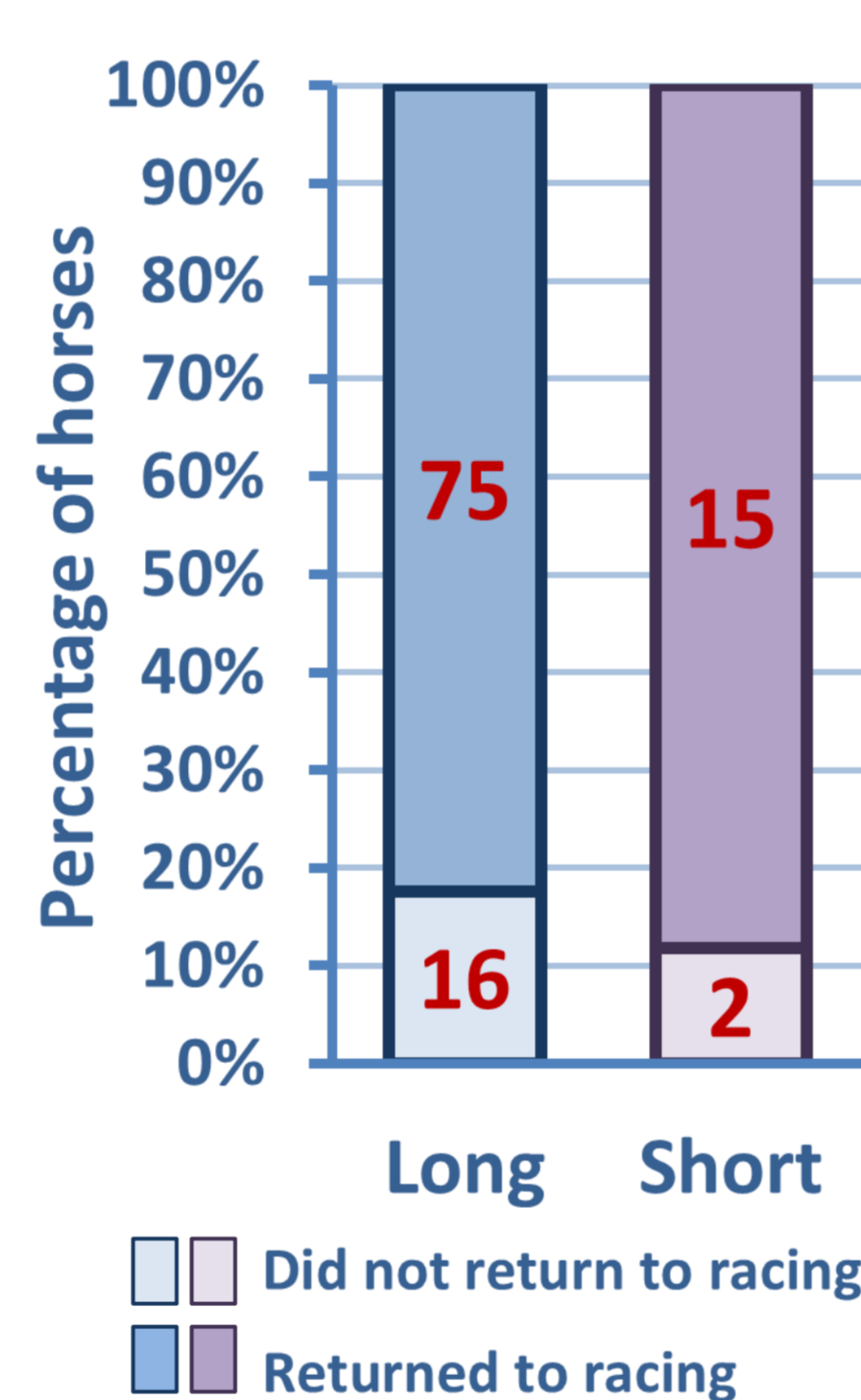
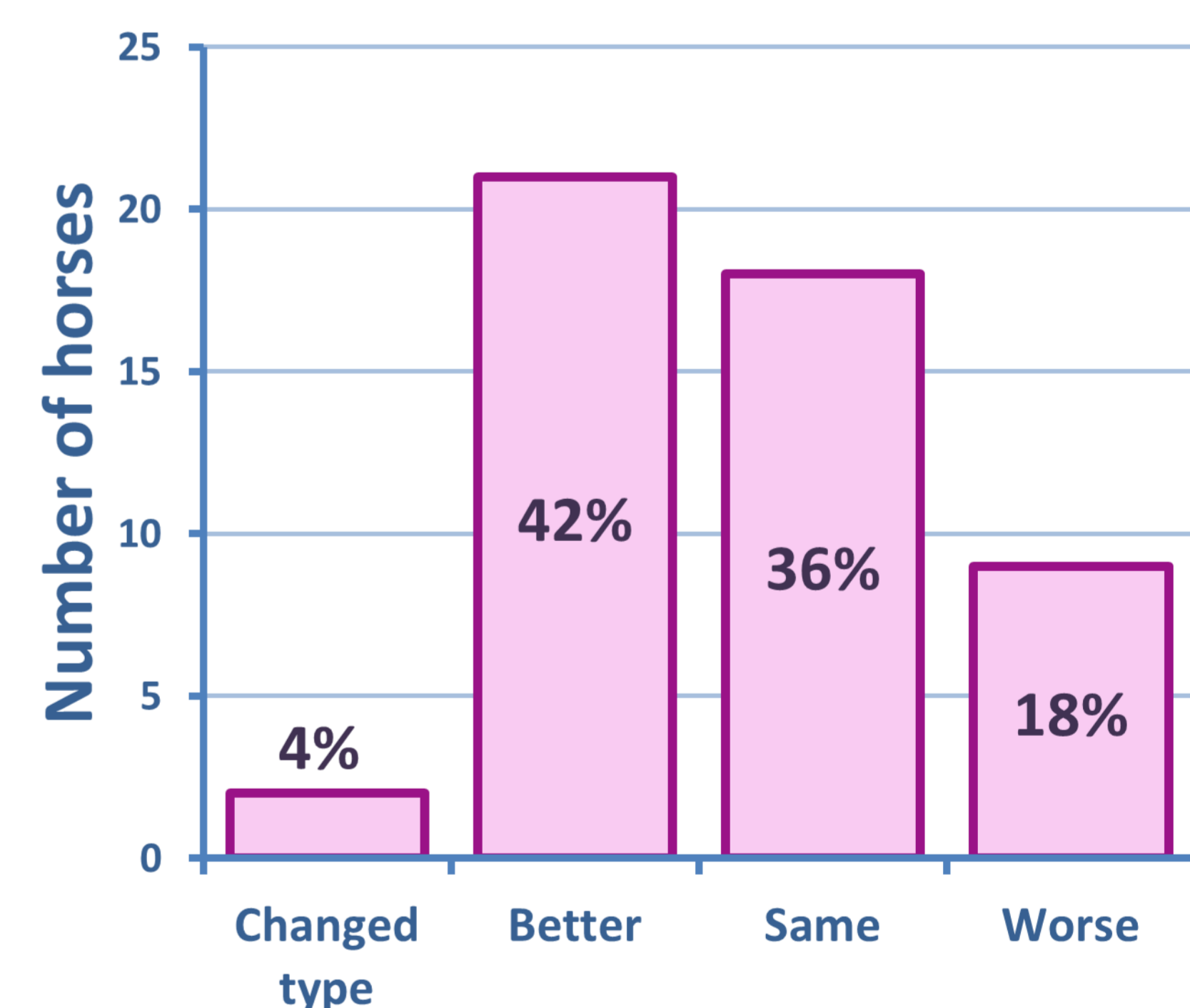


Figure 4
Time between operation and first race for each fracture type

Figure 5
Class of race performed in post-operatively compared to pre-operatively



| Table 1 | Percentage of horses that returned to racing | | Breed | Type of treatment |
|-------------------------------------|--|--|---|---------------------------|
| | Short ISPF | Long ISPF | | |
| Present study | 88 % | 68 % | Thoroughbreds | Surgical |
| Tetens <i>et al.</i> ⁶ | 89 % (all fracture lengths grouped) | | Standardbreds | Surgical and conservative |
| Holcombe <i>et al.</i> ⁵ | 71 % | 66 % | Standardbreds (86%) and Thoroughbreds (14%) | Surgical |
| Ellis <i>et al.</i> ² | 61 % | 61 % | Thoroughbreds | Surgical and conservative |
| Markel and Richardson ⁴ | 36 % (conservative treatment) | 86 % (surgical and conservative treatment) | Standardbreds and Thoroughbreds | Surgical and conservative |

DISCUSSION

- Results from this study demonstrate that horses have a good chance of returning to racing, and of either winning a race or money, following internal fixation of long and short ISPF of the first phalanx.
- A better prognosis for return to racing is offered for short compared to long fractures, consistent with the results of other studies (Table 1).
- Previous comparisons between Thoroughbred and Standardbreds have had conflicting results. Markel and Richardson⁴ reported a poorer prognosis for Thoroughbreds, with frequency of return to racing at 52%, compared to 77% for Standardbreds. However Holcombe *et al.*⁵ reported a higher percentage of Thoroughbreds (75%) returning to the racetrack compared to Standardbreds (61%).
- 83% of horses for whom follow-up racing data were available for in this study raced, providing evidence for a good prognosis following surgical repair of this fracture configuration in racing Thoroughbreds.
- Earlier studies have shown differing outcomes with respect to post-operative performance. Tetens *et al.*⁶ found a negative effect on post-operative performance, whereas other studies have not shown a difference between pre- and post-operative performance^{4,5}.
- In this study, surgical repair did not appear to affect racing performance negatively for those horses that had raced pre-operatively.
- These results should provide a prognostic guide for trainers, owners and clinicians evaluating the benefits of surgical correction of proximal first phalangeal fractures in the racing Thoroughbred.

ACKNOWLEDGEMENTS

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REFERENCES

1. Verheyen and Wood (2004) *EVJ* 36 167-173; 2. Ellis *et al.* (1987) *EVJ* 19 43-49; 3. Kuemmerle *et al.*, (2008) *Vet Surg* 37 193 – 200; 4. Markel and Richardson (1985) *JAVMA* 186; 573-579; 5. Holcombe *et al.*, (1995) *JAVMA* 206 1195-1199; 6. Tetens *et al.*, (1997) *JAVMA* 210 82-86; 7. R (2011) <http://www.R-project.org>; 8. Excel (2010) Microsoft.