



Comparison of treatment outcomes for superficial digital flexor tendonitis in National Hunt racehorses



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ABSTRACT

Superficial digital flexor (SDF) tendonitis is a common injury in Thoroughbred racehorses. Injuries require prolonged rehabilitation, with unpredictable outcomes and a high incidence of re-injury. This observational case–control study aimed to compare race outcomes after commonly advocated treatments for tendon healing. Clinical and racing records were evaluated for 127 National Hunt racehorses treated between 2007 and 2011 for an SDF tendon injury. Two age- and sex-matched control horses were selected for each case horse to analyse the effect on post-injury racing outcomes of pre-injury data, lesion severity and treatment group [controlled exercise alone, bar firing, intralesional platelet-rich plasma (PRP), tendon splitting, tendon splitting combined with bar firing]. Control horses raced more often than case horses, with higher maximum racing post rating (RPR_{max}) and longer racing distances. Pre-injury racing performance was not associated with treatment group. Rate of return to racing was not associated with lesion severity or treatment group. Number of races, total distance raced post-injury and RPR_{max} were not associated with lesion severity or treatment group. Controlled exercise alone offered similar post-injury racing outcomes in National Hunt racehorses with SDF tendonitis to the other treatment options examined. Bar firing, either alone or in conjunction with tendon splitting, provided no additional benefit in rate of return to racing and race performance.

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Introduction

Superficial digital flexor (SDF) tendonitis is the most common cause of lameness in National Hunt racehorses, with prevalences as high as 24% (Lam et al., 2007; Avella et al., 2009; Dyson et al., 2011), or 1.71 per 100 horse months in training (Ely et al., 2009). SDF injuries require prolonged rehabilitation, with unpredictable outcomes and high incidences of re-injury (Marr et al., 1993; O'Meara et al., 2010). SDF tendonitis is often career ending (Marr et al., 1993; Lam et al., 2007; Dyson et al., 2011).

Immediate treatment of SDF tendonitis targets a reduction in inflammation (Ross et al., 2011; Avella and Smith, 2012), and thereafter various interventions are advocated to improve tendon healing. Tendon firing and blistering were believed to promote repair but positive clinical evidence is lacking and these treatments are widely considered unethical¹ (Silver et al., 1983; Marr and Bowen, 2012).

Tendon splitting to release the pressure of haemorrhage and promote vascularisation in the injured area has yielded mixed results (Stromberg et al., 1974; Henninger et al., 1990; Ross et al., 2011). Desmotomy of the accessory ligament of the superficial digital flexor tendon produced favourable rates of return to racing and number of races completed but resulted in increased suspensory ligament strain experimentally and higher incidence of suspensory ligament desmitis clinically (Bramlage, 1986, 2012). Intralesional β-aminopropionitrile fumarate, polysulfated glycosaminoglycans and sodium hyaluronate (Dowling et al., 2000) have been superseded by regenerative therapies. Isolated exogenous growth factors such as insulin-like growth factor 1 and transforming growth factor-β can be administered intra-lesionally (Dowling et al., 2000; Witte et al., 2011); however, more recently mixed endogenous cytokines have been delivered in the form of platelet rich plasma (PRP; Schnabel et al., 2007; Arguelles et al., 2008; Bosch et al., 2010; McIlwraith, 2012) or stem cells (Smith et al., 2003; Smith and Webbon, 2005). Intra-lesional mesenchymal stem cell therapy yielded reduced re-injury rates in National Hunt racehorses (Godwin et al., 2012) and foetal-derived embryonic and induced pluripotent stem cells show similar promise (Watts et al., 2011; McIlwraith, 2012; Smith et al., 2014).

In spite of the evolution of tendon therapies, controlled exercise remains fundamental to the rehabilitation of SDF injuries. A

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¹ See: Firing of horses: RCVS position unchanged on this unethical procedure. In: RCVS News. <https://www.rcvs.org.uk/publications/rcvs-news-november-2011/> (accessed 8 August 2016).

standard 48-week rehabilitation program, with progress monitored ultrasonographically at 3-month intervals, has been advocated (Avella and Smith, 2012; Smith and McIlwraith, 2012).

Measures to quantify racehorse performance include race starts (Parente et al., 2008), races placed (Weller et al., 2006), race earnings (Cheetham et al., 2008; Parente et al., 2008), 2 years post-injury racing rate (Dyson, 2004; Smith and McIlwraith, 2012), rate of completion of greater than one race (Parente et al., 2008; Smith and McIlwraith, 2012), racing post rating (RPR; Weller et al., 2006; O'Meara et al., 2010), official rating (Weller et al., 2006), and top speed rating (Weller et al., 2006). Combinations of these parameters have been used to calculate performance indices (Woodie et al., 2005; Reardon et al., 2012). Completion of five post-injury races is considered an adequate measure of success (O'Meara et al., 2010; Smith and McIlwraith, 2012).

Racing outcomes have been evaluated for individual treatments, but never across multiple treatments within a population of horses from the same breed engaged in the same athletic pursuit. Randomised, masked controlled trials represent the best form of evidence for clinical decision-making, but are lacking for tendon treatments. Observational studies or single treatment prospective studies therefore currently represent the best available evidence. This observational case-control study compared racing outcomes in a population of National Hunt racehorses in the Republic of Ireland. Outcomes were compared between injured horses and control horses, and between treatments, for a range of contemporary and

more traditional therapies including thermocautery, which is still widely practised in spite of the ethical considerations. We hypothesised that lesion severity would be correlated with racing performance post-injury; that horses treated with PRP would more frequently return to racing, and at a higher standard than horses treated by bar firing, controlled exercise, tendon splitting or bar firing combined with tendon splitting; and that bar firing alone or in conjunction with tendon splitting would provide no additional benefit for racing performance post-injury.

Materials and methods

Horses

All National Hunt racehorses that had competed over jumps under rules and were presented to a single clinic between June 2007 and July 2011 for evaluation of an SDF tendon injury were identified (Fig. 1). Two age- and sex-matched horses were selected using a random number generator from the starters of the last race prior to presentation for each injured horse, to act as controls. Where identical matches were not available, the closest matches were selected. If the treated horse had not yet raced, control horses were selected from the first race after treatment.

Age, sex, horse origin (ex-store, ex-flat or point-to-point), lesion severity and treatment were taken from hospital records. Lesions were defined ultrasonographically as mild, moderate or severe (<10%, 10–40% or >40% of tendon cross-sectional area affected at the zone of maximum injury; Smith and McIlwraith, 2012).

In the acute stage, when heat, pain or swelling was evident (Smith and McIlwraith, 2012), horses were box-rested and treated with non-steroidal anti-inflammatory drugs, ice and bandaging. Horses were re-evaluated during the sub-acute phase (2–3 weeks post-injury), treated as described below and/or issued a standard rehabilitation

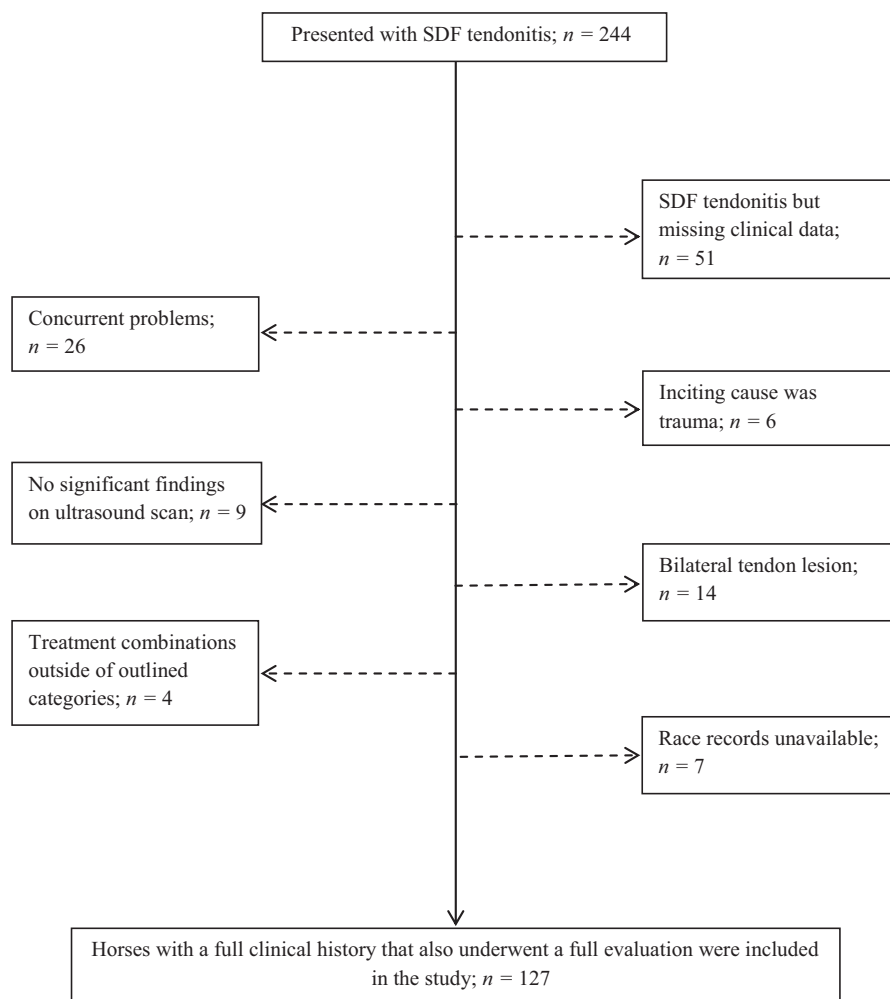


Fig. 1. Inclusion criteria for a retrospective study of outcomes of superficial digital flexor tendon injuries in National Hunt racehorses.

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