

Transcendence of musculoskeletal injury in athletes with disability during major competition

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Summary

Hamstring injuries are common in jumping and sprinting athletes. This case series documents acute grade I - II hamstring injuries in two Paralympic athletes. These athletes were able to transcend their injuries to compete 4 and 6 days after injury to attain personal best achievements.

Introduction

Hamstring muscle injuries are one of the most common injuries sustained by jumping and sprinting athletes, and remain a challenge for both athlete and clinician due to slow healing, persistent symptoms and high rate of recurrence.^{1,2} These injuries can usually result in significant consequences on performance due to time loss from training and competition.³⁻⁵

Although there is a relative paucity of published literature on musculoskeletal injuries in athletes with disabilities, it is evident that overall injury rates are the same for athletes with and without physical disability.⁶ Yet, the one group of disabled athletes that may be at higher risk for musculoskeletal injury are the amputees as they often experience muscle imbalances and have biomechanical compensation.⁶

Athletes with disability who have attained a high level of performance in sport, for example those that represent their country at the Paralympic Games, have demonstrated an ability to overcome adversity and achieve accomplishment in physical performance despite physiological challenge. This case series documents the musculoskeletal injury in two Paralympic athletes. Both athletes provided consent for the publication of their clinical material.

Case 1

History

A 23-year-old acquired single below-knee amputee (T44) sprinter, presented 3 days before competition at the 2008 Paralympic Games with acute posterior thigh pain (in the amputee leg) during sprint start training. A previous injury to this area had occurred 3 weeks prior to this incident.

Physical examination and special investigations

Clinical examination revealed acute tenderness on palpation of the hamstring muscle belly with inability of resisted muscle contraction. MRI scanning (Figs 1 and 2) revealed a grade I - II (94 x 19mm) acute upon chronic tear of the belly of the semimembranosus muscle.

Management

Management included initial immobilisation, cryotherapy, compression and rest with early physiotherapy. Non-steroidal anti-inflammatory medication was administered 24 hours after the injury. Advice regarding expectations with respect to further participation at the

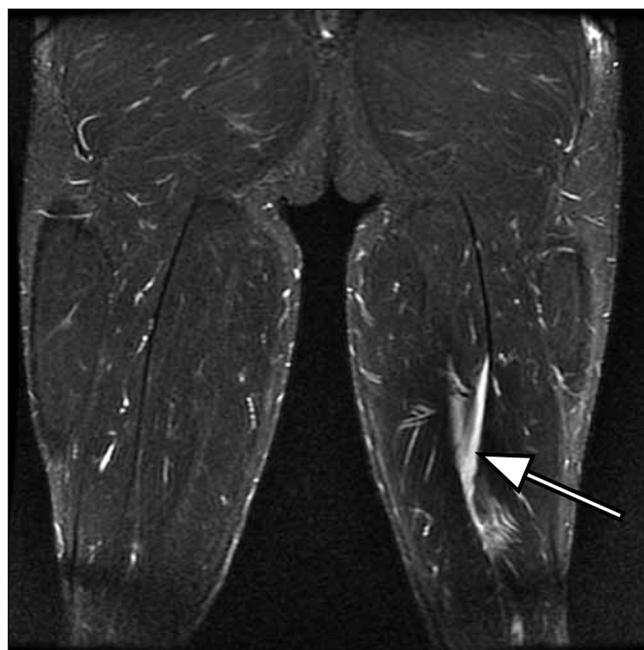


Fig. 1. MRI of hamstrings. Coronal STIR. Grade I - II muscle tear (measuring 94 mm X 19 mm). Note hyperintense signal in the left semimembranosus muscle belly at the musculotendinous junction.

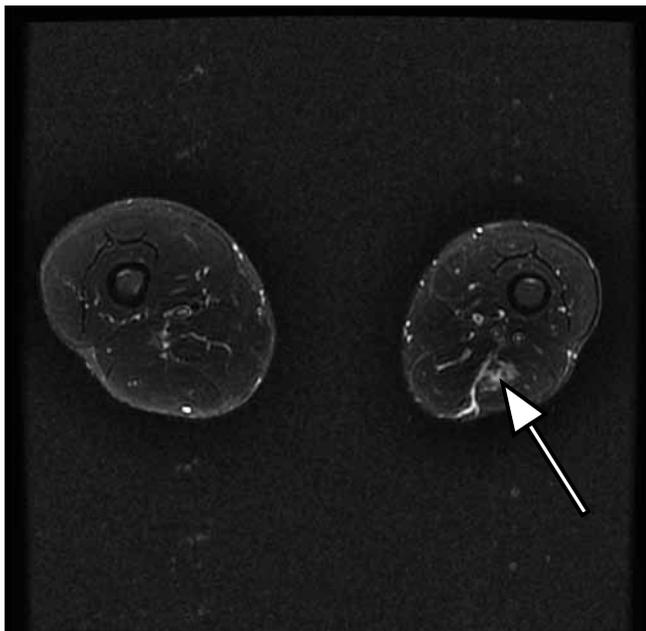


Fig. 2. MRI hamstrings. Axial STIR sequence. Grade I - II muscle tear. Note hyperintense signal in the left semimembranosus muscle belly at the musculotendinous junction.

competition was provided to the athlete, with the option of withdrawal from the competition being considered.

Three days later the athlete competed in the semifinal heat of the Paralympic 100 m (T44) and recorded a qualifying time 12.05 seconds. The following day the athlete completed the final of the 100 m (T44) race, recording a personal best time of 11.68 seconds, narrowly missing out on the bronze medal.

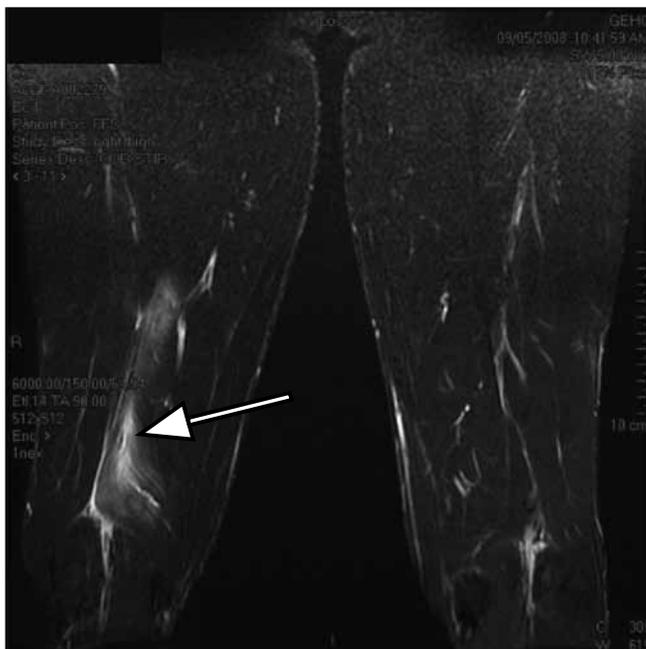


Fig. 3. MRI hamstring. Coronal STIR both hamstrings. Note feathery pattern in the right semimembranosus muscle at the musculotendinous junction. Features compatible with a grade I muscle strain.

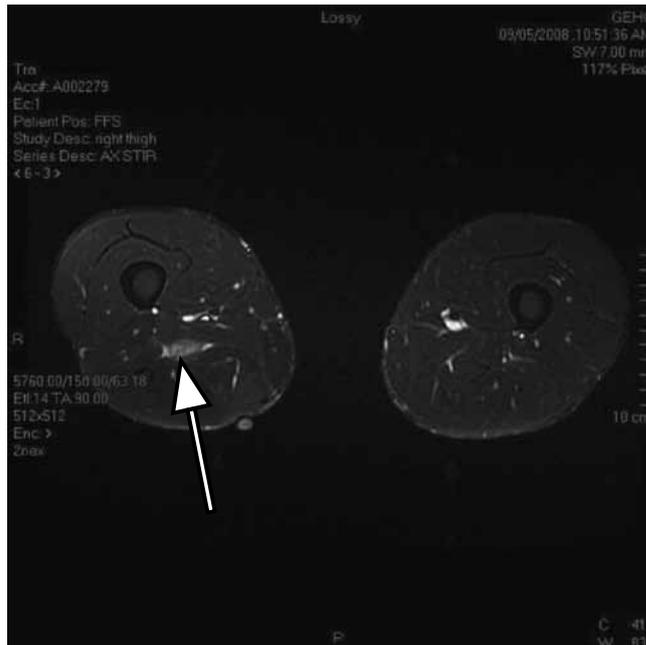


Fig. 4. MRI hamstring. Axial STIR both hamstrings. Note feathery pattern in the right semimembranosus muscle at the musculotendinous junction. Features compatible with a grade I muscle strain.



Fig. 5. MRI hamstring. Sagittal STIR sequence. Note feathery pattern in the right semimembranosus muscle at the musculotendinous junction. Features compatible with a grade I muscle strain.

Case 2

History

A 27-year-old congenital single below-elbow amputee (F46) long-jumper/sprinter presented 4 days prior to competition at the 2008 Paralympic Games with acute posterior thigh pain in the takeoff leg during long-jump training. A previous injury to this area had occurred 12 weeks prior to this incident.

Physical examination and special investigations

Clinical examination revealed acute tenderness over palpation of the hamstring muscle belly of the takeoff leg with inability of resisted muscle contraction. MRI scanning (Figs 3, 4 and 5) revealed a large grade I (110 x 25 mm) acute upon chronic muscle tear with fluid accumulation within the belly of the semimembranosus muscle.

Management

Management included initial immobilisation, cryotherapy, compression and rest with early physiotherapy intervention. Non-steroidal anti-inflammatory medication was administered 24 hours after the injury. Advice to withdraw from the 200 m sprint event (which preceded his main long-jump event) and expectations regarding further participation at the competition was provided to the athlete, with the option of withdrawal from the competition considered.

Four days later the athlete competed in the heat of the 200 m and 6 days following injury won the silver medal in the T46 long-jump final, recording a personal best distance of 6.64 m.

Discussion

Perhaps one of the most difficult aspects of the function of the team physician is the decision regarding ongoing participation following injury. Whilst there are many factors that are taken into account including the nature of the injury, risk of worsening or extension of the injury, the nature of the event/competition and the athlete's and coach's opinion, are all considered. Sometimes the decision to withdraw an athlete is clear, for example if there is threat to life or limb; at other times it is not quite clear, for instance in respect of less severe injury at a 'career pinnacle' competition like the Paralympic games.

Review of the literature reveals that in athletes with similar injuries return to sport occurs not before 13 - 48 days following acute injury.³⁻⁵ Indeed, the mean time to return to sport in athletes with muscle tears which are visible on MRI scanning is 27 days.⁴ The two athletes described in this series competed successfully without analgesia, 4 days and 6 days following injury, achieving personal best times and distances. While the response to injury and subjective experience of pain can vary from person to person, the events described above demonstrate human ability to transcend injury and compete at the highest level and achieve personal best results and in some instances medals.

Athletes with disability often demonstrate resilience and are accustomed to adversity.⁷ Indeed, athletes with disability report

more sport-related muscle pain compared with their able-bodied counterparts as their training increases and therefore they might be more accustomed to competing with pain.⁸ Yet factors governing performance following injury in athletes with disability are an under-researched area and therefore not fully understood.

It should be stressed that this case series is not intended to promote athlete participation in the presence of injury, and it is recognised that rest, recovery and rehabilitation in the injuries described above should be adhered to as recurrent injury is undesired and not in the best interest of the athlete and their future performances.^{9,10}

Following completion of the Paralympic Games both athletes were referred for ongoing physiotherapy and rehabilitation in their respective cities and this was completed successfully. Both athletes competed in, and achieved medals at, the 2011 IPC Track and Field World Champs in Christchurch, New Zealand.

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