

Hamstring return to play Protocol; Part three

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This article, the third in the series, attempts to give some insight and possible ideas of end stage rehabilitation for athletes with a hamstring injury. Of particular focus is how to progress from a controlled running environment to full field training and availability for competitive team selection.

Leading on from the previous article, at this stage the athlete should have completed the following and **all symptom free**;

- Repeated tempo running over a distance of between 50-70 m up to and including 90 % of maximal pace.
- Sub-maximal (60 % max) acceleration and deceleration running work
- Sub-maximal (60 % max) change of direction work

As stated previously all the above should have been progressive to allow you as a therapist or trainer to review any athlete reaction to any increase in training load or intensity and therefore be able to amend or progress accordingly. Exposure to a high training load at this stage could be detrimental and result in re-injury and/or delays in rehab progressions.

Additional conditioning away from the field must be carefully monitored. Excessive use of deep flexion loads via rowing/bike can be detrimental particularly with high hamstring injury.

I am not a great fan of static bike conditioning as a training modality for running sports. Predominately because such an exercise is vastly concentric in nature and promotes little eccentric muscle activity. Running on the other hand has a major eccentric component and thus all training should incorporate this as much as possible. Relating to hamstring injury, there is evidence to suggest that it is often an imbalance or timing dysfunction between concentric and eccentric transition which contributes to injury in the first place. Therefore, by exposing an athlete to a heavily concentric based activity may in fact increase such an imbalance, slowing recovery rate and increase the potential for re-injury in the future. In addition, field sports are played in a standing position, so spending excessive time in seated positions seems pretty non-sports specific.

Progression of eccentric exercise

Within the gym the final phase of hamstring rehabilitation involves a high emphasis on eccentric and ballistic type exercise.

With regards to improving eccentric control and strength Romanian deadlift (RDL) variations are an excellent choice. An emphasis must be placed on single leg exercise not only to prevent overcompensation from the unaffected limb but also to enable real time analysis of single leg lumbar, pelvic and lower limb control and muscle function. Modifications can then be made to rehab sessions as a result of such findings. Athletes with unilateral

dysfunction, be it quad dominance, glute medius weakness or a lack of core control, may not be clearly visible with double leg activity. The use of a video-camera can be a great tool to capture these dysfunctions.

Linking back to previous articles, if adductor magnus inefficiency was identified the use of sumo squats (progress from front to back grip variations) and sumo deadlifts (progress from double leg to split stance) are good choices to promote adductor magnus bias.

Ballistic exercise progression

A good quick test prior to the commencement of ballistic/power training is the ballistic active straight leg raise (BASLR). In a supine position, ensuring the knee is kept in a fully extended position, the athlete lifts their leg as quickly and as high as possible. The height reached should be within 5 deg of passive range of movement and should be totally pain-free. Failure in this test means the athlete is not ready for this type of training and rehab should not be progressed at this stage.

The explosive one legged bridge is a great ballistic exercise to use at this stage of the rehab program. The exercise promotes reciprocal hamstring control at both the hip and knee and develops the explosive transition between knee isometric to eccentric to concentric muscle activity.

Low threshold endurance

Mini exercise circuits are also useful to help develop low threshold endurance and could act as a good lower intensity workout which may act as a deload training session or training week and complement the muscle heavy eccentric and ballistic exercise sessions. A possible circuit could be as follows;

- Bodyweight single leg RDLs
- Supermans
- Single leg glute bridge
- Double leg gymball hamstring curls

If each of the above was completed for 30 seconds, completed each side for the unilateral exercises, the circuit will take 3 and half minutes. I would propose allowing 90 sec rest before completing the circuit between 4 and 6 times.

On field progressions

Ultimately each sport consists of different skill sets and in addition, different playing positions require different physical attributes. For this reason, I am not

going to go into great detail into actual on-field drills and exercises, rather give some pointers that I have found useful within my previous experiences. Over a period of time progressions of running distance/endurance and intensity must be employed. These progressions must become more chaotic and less predictable for the athlete, in other words, your on-field rehab should over time become more and more like a normal field training session.

Many athletes with hamstring injury are often apprehensive about high intensity or repeated field running and agility work. For many, this was the mechanism for their original injury. I think it is of massive importance to break down these psychological barriers prior to return to full training. If possible try and recreate the scenario or field session drill that the athlete was originally injured. By completing such a task without symptoms could act as a massive boost in confidence and allow you access to an athlete with a mindset of 'I feel good, whats up next?' rather than 'I'm not too sure about this drill, I'll take it steady.' The latter of these mindset is potentially very dangerous as athletes may not be completing tasks to the level and intensity you are requesting and could lead to further injury or a return to full training/match play below an optimum level of function.

Lastly, the site of injury may lead to you differentiate the drills you use with each athlete. The short head of the biceps femoris has a massive deceleration role and evidence has indicated that it is the most important hamstring with regards to speed development. Conversely, the medial hamstrings have more influence on medial knee control, and as a result are crucial for any activity requiring cutting, turning and movement stability. Thus, the site of injury may help you plan and progress rehab appropriately and specifically to each individual athlete.

I hope this series of articles has given a good insight into different ways to approach treatment and rehabilitation of hamstring injuries. It is no way an exhaustive protocol just a story of some of the aspects that have worked well in my previous experiences.

Thanks for reading.

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