

Recurring Hamstring Strain – Seeking Answers

Damien Howell MS, PT, OCS



The following case study demonstrates a problem solving approach in which the degree of use, condition of what is being used, and manner of use are examined to identify the potential causes of a recurring hamstring strain.

For two consecutive years, a middle-aged male veteran marathon runner developed hamstring pain/strain which prevented him from running and training. The most recent episode occurred with a relatively sudden onset in the final miles of a marathon. The patient had no history of previous traumatic injury to his hamstring muscle. When he was 14 years old he suffered a fracture of the left ankle. Prior to the onset of this occurrence of hamstring pain, in addition to training for the marathon, he had done a great deal of walking/hiking, and playing golf.

On examination, an active straight leg raise (stretch of the hamstring muscle) showed there was more motion (greater flexibility) on the injured side than there was on the non-injured side. The injured hamstring was visibly larger in size and girth than the un-injured hamstring. Palpation of the injured hamstring revealed some local tenderness in comparison to the un-injured hamstring. Range of motion (flexibility) of the left ankle was limited in comparison to the right ankle.

Patient was videotaped walking and running on a treadmill for slow motion analysis. When he was walking there was visible asymmetry of movement. When the heel came off the ground, the left heel came off the ground sooner than the right. After the foot came off the ground there was a greater degree of knee flexion on the injured side in comparison to the uninjured side. Interestingly, this asymmetry of movement was not as evident when he ran as it was when he walked.



Both pictures were taken when the heel first came off the ground. Notice that the left heel comes off the ground before the right foot reaches the ground. The right heel comes off the ground just as the left heel is reaching the ground. There is also a subtle difference in shape/size between the hamstring muscles (the left is larger).

The working diagnosis was that he had suffered a repetitive use injury of a hamstring strain (versus tendonopathy). This injury developed in response to increased amounts of walking on a relatively impaired left ankle, which, in turn, led to excessive compensatory use of the left hamstring muscle. When walking, the stiff left ankle resulted in the heel coming off the ground relatively early and the left hamstring picked the foot up early. If he could increase the motion in his ankle and learn to leave his left foot/heel on the ground longer when walking he could decrease the excessive stress to the left hamstring.

Treatment/Intervention

Because there was greater range of motion (length of the left hamstring), the subject was instructed to avoid stretching exercises for the left hamstring. Hamstring pain is not an indication that stretching exercise is the most appropriate treatment. (A short stiff hamstring should be treated with stretching exercises.) He was instructed in exercises designed to increase the amount of left ankle motion, and to consciously try leaving his heel on the ground a little longer

when walking. He was encouraged to run more than walk, since the asymmetrical movement fault was not as apparent running as it was walking.

Outcome

Six weeks post onset of the injury, the patient reported being a 100% recovered. Unfortunately, at the time of discharge, follow-up range of motion measurements of the ankle had not been completed to determine if ankle flexibility had increased.

This case study provides an example of how the condition of what is being used (stiff left ankle) can be a contributing factor to the repetitive use hamstring injury. The hamstring injury was on the left side. Walking and running are symmetrical activities; therefore it was unlikely that the injury was only a result of the degree of use (running/walking too much), since the amount of running was relatively consistent over time for this veteran marathon runner. The amount of hiking and golf, however, was relatively novel activity for this subject. The hypothesized reason for the movement asymmetry while walking is the asymmetrical structure (condition of what is being used) of a stiff left ankle. Therefore the intervention needs to correct, modify, or account for the structural asymmetry by increasing the flexibility of the ankle joint. By consciously striving to change the manner of use that is walking to strive for symmetry, by leaving the left heel on the ground longer when walking was an efficient way to achieve greater ankle flexibility.

This case provides an example of how three factors contribute to the development of repetitive use injuries: 1. the degree of use, 2. the condition of what is being used, and 3. the manner of use. If these three factors can be identified, appropriate diagnosis and intervention to solve the problem can then be applied.