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## Recurring Injuries – Seeking Answers

The following is a case study which demonstrates a problem solving approach which examines the degree of use, condition of what is being used, and the manner of use in a systematic way in order to identify potential causes of a repetitive use injury in a triathlete with recurring lateral knee pain.

For two consecutive triathlon seasons this female athlete developed right lateral knee pain after hard long bike rides or bike competitions. Once the pain developed she was able to continue biking with pain, but found it very difficult to run because of the pain.

Examination revealed normal bony alignment, ligamentous integrity, and good muscle develop of the knee. It did appear that the insertion of the right biceps femoris muscle (lateral hamstring) was thick and enlarged where it inserted on the lateral aspect of the knee. When assessing the length of right biceps femoris muscle (stretching it) it appeared shorter and mildly symptomatic.

Her physician had ordered radiographs and MRI the first season when she was injured, and the results failed to reveal tissue damage that would explain the source of the pain.

A working diagnosis was that there was either a tendonitis or tendonopathy of the right biceps femoris muscle. As is often the case forming a diagnosis of which tissue is injured is fairly straight forward. The challenge and sometimes the frustration are to identify why or how the right lateral hamstring under goes excessive repetitive stress leading to damage and injury. We did not succeed the first season, as the problem reoccurred the very next year.

Because we were unable to prevent recurrence of the injury from one season to the next we repeated analysis of her training history, injury history, musculoskeletal screening examination, and slow motion video analysis using a systematic review of three categories of factors which can contribute to repetitive uses was undertaken.

Questions asked included, did she train/race too hard, too fast, too soon. If she did train and race too much one would expect both the right and left hamstrings should be injured, and not just the right hamstring. After a careful review of her training and competitive history it appeared the progression of her training and competition was safe and appropriate.

Was there subtle weakness, impairment, or structural abnormality in the right lower extremity? Other than the current injury none could be found. There was no history of a prior trauma to the right knee. There was no history of congenital abnormality in the lower extremities. She had not worn corrective shoes or orthotic inserts in the past. She had suffered a significant left ankle sprain in the past, but this did not appear to correlate with the current recurring right lateral knee pain.

Was she swimming, biking, or running in a manner which places greater stress on the right lateral hamstring? A slow motion video analysis of her running form demonstrated minor faults including over striding, and visible asymmetry of the size of her calf muscles with the left calf being smaller than the right. There was no obvious abnormality in her running form which seemed too correlated with her right lateral hamstring tenodopathy.

On further questioning it was determined that when dismounting her bicycle she routinely unclipped her right foot first, and often depending on the maneuver, there was a much greater frequency of unclipping the right foot from the bike pedal than the left. This was thought to be the missing piece to the puzzle.

The new working hypothesis was that in order to prevent the lateral knee pain from reoccurring she needed to learn to become comfortable and skilled at unclipping the left foot from the bike pedal first at least half of the time.

This is an active case so the proof or disproof of the hypothesis will be determined next triathlon season.

This case provides an example of how by eliminating the degree of use, and the condition of what is being used as contributing to this knee injury the manner of use was implicated as contributing to the recurring injury.