

Partial pcl tear diagnosis using mri

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Medical Diagnosis

In this particular case study, a 21-year-old Caucasian female who happened to play collegiate basketball was injured (Doberstein & Schrodt, 1997). The injury occurred during a full-court dribbling drill, when the individual in question accidentally tripped and fell down. When the girl tripped, she fell directly onto the anterior part of her left knee, while her ankle was plantar flexed. The girl's left knee was sore after tripping, but she continued with practice regardless.

After practice completed, the athlete chose to be physically examined by her team's athletic training staff. It was noted that she had mild-to moderate swelling, and her active and passive knee flexion was 110 degrees (normative value being 135 degrees). Flexion of the knee was determined to be painful and graded a 4 out of 5. Furthermore, the posterior sag test and posterior drawer test resulted positive. Tenderness upon palpation over the tibial tuberosity occurred. Based on these symptoms from manual testing, it was determined that the individual in question had a grade II posterior collateral ligament sprain (Doberstein & Schrodt, 1997).

According to the athletic training staff, reasons for a grade II PCL sprain include a positive posterior sag and drawer test (Doberstein & Schrodt, 1997). Additionally, swelling can be an additional indicator, along with limited range of motion and difficulty in walking. A posterior sag test is determined positive when a knee is flexed at 90 degrees, and an examiner sees "sagging" of the tibia from the femur (Feltham & Albright, 2001). Thus, the posterior sag test can help determine whether or not the PCL has been

injured or not. Additionally, the posterior drawer test is used to diagnose PCL injuries. For this test, the tibia is placed at 15 degrees external rotation, the knee is flexed to 90 degrees, and the hip is flexed to 45 degrees (Feltham & Albright, 2001). A physical therapist/examiner pushes the tibia posteriorly; if the examiner feels an abnormal end feel, then it can be determined that there is a PCL injury (Feltham & Albright, 2001). About ten-millimeter displacement of the tibia indicates a grade one or two severity sprain of the PCL (Feltham & Albright, 2001).

Medical Imaging

The type of imaging technique used in this case to determine the PCL injury was an MRI. Since MRI scans show all the tissues within the body, they are very relevant for a physical therapist's career. According to Sports injury clinic (2018), sports injuries such as ACL tears, meniscus tears, and PCL tears are often used to confirm prior diagnoses, hence MRIs are quite useful for the practicing physical therapist. Furthermore, MRIs are used over other imaging options because they offer superior soft tissue contrast resolution, multiplanar imaging capabilities, and high-resolution imaging (Eric, Chou, & Carrino, 2007). Thus, MRIs are relevant to the occupation of physical therapy because of their ability to identify ligament, muscle, cartilage, or bone injuries (Deyle, 2011). After detection of injury, the physical therapist can determine the best plan of action for rehabbing and healing their patients.

According to the American College of Radiology Appropriateness Criteria, an individual presenting with acute trauma to the knee, with focal tenderness, effusion, and who is able to walk, should first get an X-ray on the knee (given a 9 rating). Following that, the individual should get an MRI on the knee

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without IV contrast (given a 5 rating). The patient in this case study should have had X-ray imaging performed on her knee first, as opposed to an MRI, in order to get an initial diagnosis that could be related to bone fractures. Are there risks associated with an MRI procedure? There really are no known risk with magnets in an MRI. No radiation or contrast is used, so tissue can't be damaged. However, metal objects should not be worn or taken into the MRI machine, since there are magnets being used. The case study paper did not explain how the patient was protected from this risk, but I'm sure those in control of the machines instructed the individual with the knee injury to remove all metal objects from her person.

There are a few limitations in regard to using an MRI for medical imaging and the errors involved. A few limitations first. To accurately get images in an MRI, patients must remain completely still the whole time, or else images will not be accurately obtained (Deyle, 2011). As a result of this, some patients with severe illnesses or injuries are not able to get MRIs taken, because they are too uncomfortable to remain still the whole time (MRIs can take 10 minutes to an hour to complete). Different types of errors can occur all the time when looking at MRI images. First clinicians fail to correlate obtained images with previous images that have been taken (Vanhoenacker, et. al. 2016). Furthermore, clinicians fail to correlate the image findings with actual clinical findings (Vanhoenacker, et. al. 2016). Lastly, when clinicians find one problem in the MRI, they may be satisfied with what they have found, and they won't look anymore. This is a problem, as there could be more than one problem that the clinician won't find because are already satisfied (Vanhoenacker, et. al. 2016). All these errors that occur can negatively

impact individuals over the course of time, because they aren't being treated properly.

Patient's Progress

The individual in this case study received an MRI examination that revealed a partial PCL tear (Doberstein & Schrodt, 1997). The imaging technique did not alter the patient's care, because the clinicians had already completed a physical examination to determine what the individual's injury could be. They concluded that the injury was a PCL tear, so the individual who was hurt had already started rehabbing as if she had a PCL tear. The MRI revealed with more certainty however what her injury was. After rehab, the patient participated in basketball over the summer and played her entire senior season without any problems (Doberstein & Schrodt, 1997). Two years postinjury, the patient had no recurrence of any partial PCL tear symptoms (Doberstein & Schrodt, 1997).

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