Study Identifies Skiers Who Can Be Treated Without Surgery After ACL Tear

Roughly a quarter of recreational skiers who tear their anterior cruciate ligament (ACL) while hitting the slopes can be successfully treated without surgery, according to a new study. The study, conducted by researchers at Hospital for Special Surgery in New York City, appears online ahead of print in the journal *Knee Surgery Sports Traumatology Arthroscopy*.

"Some patients who tear their ACL while skiing can get away without surgery. Their ligament heals by itself, they will have stable knees, and they will be able to do whatever they want, including skiing," said Robert Marx, M.D., an orthopedic surgeon in the Sports Medicine and Shoulder Service at Hospital for Special Surgery (HSS), who led the study. "It is a huge deal to avoid surgery."

The study found that at six to twelve weeks post ACL tear, results from two tests that involve only the physical manipulation of a knee can identify skiers with a torn ACL who will recover without surgery. Oftentimes, ACL tears from skiing are less traumatic than ligament tears seen in sports that involve pivoting, such as soccer or football, explained Dr. Marx. This is the first study to demonstrate that patients with low-grade ACL injuries from skiing can heal without surgery.

"Patients who tear their ACL during recreational skiing should not rush to schedule surgery right after their injury," said Dr. Marx. "They should wait and be reevaluated at six to 12 weeks unless there is some other obvious reason to do surgery like a displaced meniscal tear or other ligament injuries. Most recreational skiers don't have those, and they may be able to avoid surgery if they wait and get reevaluated."

Dr. Marx conducted the study after noticing that some recreational skiers who came to his office with ACLs that were clearly torn on an MRI (magnetic resonance imaging) after a ski accident appeared to have healed ligaments at six to eight weeks.

To obtain hard data on the phenomenon, the researchers combed through the records of patients treated by Dr. Marx between 2003 and 2008 to identify recreational alpine skiers who were seen within six weeks of a first-time ACL tear. To be included, skiers had to have ACL rupture documented on an MRI after the injury and a minimum of two-years of followup. Patients were excluded if they had injured ligaments in both knees. They identified 63 acute, first-time skiing ACL tears and 29 of these patients did not undergo an ACL operation.

The researchers then separated these 29 patients into two groups, those that had low-grade Lachman scores and negative pivot shift tests, indicating a potentially healed ACL, and those that had Lachman scores of 2+ and a positive pivot shift test

indicating a damaged ACL. In the Lachman test, a physician uses his hands to try to pull the shin bone away from the thigh bone. If the ACL is intact, the bones won't move or will barely move, and the patient is deemed to have a score of 0-1. In a pivot shift test, a patient lies on his back while a physician lifts the patient's leg and uses his hands to place a rotational pressure on the knee. If the bones don't shift, the test is negative.

Six to 12 weeks after injury, 17 of the 29 skiers who did not have surgery had a Lachman score of 0 to 1 and a negative pivot shift test. Six of these patients were lost to followup, but 11 returned for a study-specific follow-up evaluation at more than two years post-injury. These patients completed questionnaires that gauged how well the knee was functioning, including the International Knee Documentation Committee subjective knee score and Tegner and Marx activity level scores. Patients provided information about how their ski accident had occurred. They also underwent Lachman and pivot shift tests as well as a KT-1000 test, a more objective test that uses an instrument to measure motions of the shin bone relative to the thigh bone.

Skiers described injuring their ACL in tumbles where the ski had rotated too far. Physical exams revealed that 10 of the 11 patients still had Lachman scores of 0-1 and negative pivot shifts tests, indicating a healed ACL, and only one patient's scores had deteriorated to a Lachman Grade 2+. None of the patients, however, complained about knee instability. Eight had returned to skiing without the use of a brace and three no longer skied. KT-1000 test results were also positive. "The mean difference was one millimeter, which is very close to perfect. Anything three millimeters or less is considered a successful result after surgery. In 10 of the 11 patients, their knees were rock solid, as good or better than surgery," said Dr. Marx.

Dr. Marx pointed out that the median age of the 11 patients was 43 and recovery from an ACL surgery at this age can sometimes be difficult. "For people who are 40 and over and who have less muscle mass, it takes a long time to recover, sometimes a year. Compare that to 12 weeks," said Dr. Marx. Identifying patients who can heal without surgery reduces medical costs and patient recovery time.

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