

Winter Sports Knee Injuries.

Mr Paul Sutton answers the FAQs...



INJURIES TO THE BONES AROUND THE KNEE

FRACTURES

In winter sports fractures usually occur with a direct impact either as a result of a collision or a fall but occasionally a fracture of the shaft of tibia (shin bone) can occur with a severe twisting injury. Skis act like giant levers on the end of the legs and are attached to the ski boots by a mechanism known as the ski bindings. Ski bindings are designed to release under a set pressure or load, and if a ski fails to release a huge amount of force is put through the lower leg or knee. As skiers wear rigid boots that usually protect the ankle, the force is usually transmitted through the bone above the ankle or the knee. Thankfully fractures of the tibial shaft are not common, but if they occur, they are associated with severe pain and an inability to bear weight on the injured leg. Usually the injured skier will be carried off the slopes by a medical rescue service and the injury is easily diagnosed by an x-ray. Provided a tibial fracture is not associated with a wound it is usually safe for the initial treatment to be immobilisation of the broken limb in a splint such as a plaster or resin cast. Often this will be a part splint passing down the back of the leg held in place with bandages, this is known as a 'backslab'. As a backslab doesn't enclose the whole circumference of the leg it will allow swelling that usually occurs with a tibial fracture, this is particularly important if the injured skier is planning to return by air to the UK. Under most circumstances it is not essential to undergo emergency or urgent surgical treatment for a tibial fracture and provided the fracture is splinted a safer option can be to return to the UK for definitive care. The exception to this is after what is known as an open fracture, sometimes called a 'compound fracture'. In these injuries the broken bone will break through the overlying soft tissue and skin. These injuries need urgent surgical treatment to clean the wound and protect the broken bones usually by fixing the broken bones together. If a skier or snowboarder sustains this type of injury, I would recommend the urgent treatment is performed in hospital near the site of injury before returning home.

Fractures can also occur directly into the knee joint itself. These are known as 'intra-articular fractures' they most commonly occur through the upper part of the tibia and are known as tibial plateau fractures. More rarely they involve the patella (kneecap) or the end of the thigh bone (femur). A fracture into the knee joint is usually associated with significant pain, rapid or immediate swelling of the knee and difficulty bearing weight on the injured leg. Following an injury with these symptoms it is important that an x-ray of the knee is taken. Interestingly an x-ray may not detect all fractures, but it will usually show serious or significant injuries. Even with hairline fractures that may not be directly evident there are often subtle signs that will lead an experienced doctor or surgeon to suspect an underlying fracture.

Most of these injuries do not need emergency treatment and can be safely managed by initially splinting the knee in a cast or a knee brace and using crutches to keep weight off the broken bone. It is perfectly safe to return to the UK for more definitive treatment, but this should be sought quickly on return. These injuries can be missed on a simple x-ray and the full extent of the fracture may only show properly after a CT (CAT) or MRI scan which is often needed to carefully plan treatment. If the broken bone into the knee joint is not properly aligned it may lead to permanent damage within the knee. A specialist should assess these injuries as they may need surgical treatment to restore the normal bone position and hold the fracture in place, most commonly with a plate and screws.

Rarely these injuries may be open fractures or associated with damage to blood vessels around the knee, in this situation emergency treatment is needed and it should be performed before return to the UK.

SOFT TISSUE INJURIES TO THE KNEE

MEDIAL LIGAMENT (MCL) INJURIES

The Medial ligament is properly called the Medial Collateral Ligament or MCL, it runs down the inner side of the knee from the little prominence felt on the inner lower end of the femur (thigh bone) to the upper part of the shin bone. This ligament is injured when the knee collapses inwards relative to foot. During skiing this can happen as part of a significant fall, but a more common mechanism is that the ski catches in snow or ice forcing the lower part of the leg outwards. This often happens at high speeds but can happen at low speeds if the ski binding fails to release. The injured skier may fall over but doesn't always. Pain is felt on the inner side of the knee that is made worse if the lower leg is pushed outwards, the initial pain can often worsen over hours later after the injury or even the day after. With this injury there is usually little, or no swelling. This ligament is stretched when the leg is put fully straight (extended) and the knee will usually be painful when it is put in this position.

Doctors usually like to grade the severity of this injury; a minor sprain is often called a grade 1 or 2 injury but in contrast a more serious injury to the ligament is called a grade 3 injury. A grade 3 injury is a complete snapping of the ligament and is usually associated with a sensation of instability. This can occur at the same time as a rupture of the ACL.

Grade 1 and 2 injuries usually heal spontaneously with time and need no surgical treatment, physiotherapy helps in the recovery of these injuries which typically takes 4-12 week depending on severity. The more serious Grade 3 injuries should be treated by a specialist, they will often heal well with a hinged knee brace which protects the ligament, but they do sometimes need surgical treatment.

There is no need for urgent or emergency surgical treatment of this injury and I would recommend return to the UK for definitive and on-going care. A temporary brace will make the knee more comfortable for travel.

KNEE CARTILAGE INJURIES (TEARS)

Inside the knee are two cartilages, one on the inner side of the knee and the other on the outer side. In medical terminology these are properly called the medial (inner) and lateral (outer) meniscus. The twisting nature of skiing and snowboarding can lead to tears in one or more rarely both. This can occur with a specific fall but in older people it a tear can happen because the meniscus is already a little degenerate (worn) and without a significant injury.

There are several types of meniscal tear. Small tears usually cause discomfort and swelling but no locking or mechanical symptoms. Unlike ligament injuries small meniscal tears often don't cause symptoms severe enough to prevent skiing or snowboarding. Larger tears will also cause pain and swelling but these can lock the knee, which means that it is impossible to fully straighten the leg. This is usually very disabling. The pain associated with a meniscal tear is usually localised to specific part of the knee, medial meniscal tears cause pain on the inner side or the back of the knee and lateral meniscal tears usually cause pain over the outer side of the knee. The symptoms of a small tear can often settle down over time without any treatment, but if discomfort continues and prevents normal activities knee arthroscopy (keyhole surgery) will often help. For minor meniscal injuries there is no need to seek urgent medical treatment.

If after a skiing injury it is impossible to fully straighten the knee this can be a sign that a torn piece of meniscus (cartilage) is lodged out of position. This is called a 'locked knee' it doesn't require emergency treatment, but it should be assessed quickly upon return from a skiing or snowboard trip. If this injury is considered an MRI scan is very accurate in confirming the diagnosis. In some people it may be possible to suture (stitch) the torn meniscus back into place using keyhole surgery, this can be technically demanding surgery and I would advise if you suspect this injury you should be assessed by a specialist knee surgeon as quickly as possible.

ANTERIOR CRUCIATE LIGAMENT INJURIES

In skiing and snowboarding rupture of the Anterior Cruciate Ligament or ACL is less common than injury to the MCL but is still a relatively common knee injury. For reasons that are not fully understood women are far more likely to injure their ACL and are therefore a high-risk group for this injury whilst skiing. The terminology can be confusing, but rupture of the ACL means that the ACL snaps or is torn. This is a serious injury and unfortunately it can very often be missed even by doctors and emergency medical staff.

Most patients who rupture their ACL report a very consistent experience associated with their injury. It is usually a twisting mechanism; with skiing it is often a low speed injury and the ski slowly twists outwards. The knee will usually give way or collapse, and the skier almost always falls over. Up to two thirds of patients who injure their ACL report a 'pop' or snapping sensation from the knee. The knee is initially very painful, but this immediate pain can settle so that the skier or snowboarder tries to get back up. Usually they are unable to continue skiing or boarding but sometimes they can carefully negotiate their way off the slopes but off the slopes experience difficulties walking on the injured leg. As the ACL has lots of blood vessels it causes bleeding into the knee joint when it snaps so most patients who rupture their ACL notice their knee swells up very quickly.

This injury description is so commonly associated with a rupture of the ACL that if you recognise these symptoms in a ski or boarding injury you should have a careful assessment by an experienced doctor, physiotherapist or knee surgeon.

I would advise that after any injury in which the knee swells immediately an x-ray should be taken as it is important to rule out a fracture. The ACL is not visible on an x-ray so this investigation will not confirm an injury to the ACL, but it can help by excluding a fracture and occasionally the ACL will be injured by pulling away from the joint with a small bone fragment. This can be seen on an x-ray and is known as an avulsion fracture. An experienced doctor or surgeon can usually detect a ruptured ACL by examining the knee joint but if the diagnosis is unclear an MRI scan is very accurate in confirming the diagnosis.

In some ski resorts there is a vogue to recommend urgent ACL surgery after injury and some patients may feel pressured into this treatment. There is very little scientific evidence to support this urgent treatment and there is evidence that operating on the ACL very early after injury is more likely to result in knee stiffness and difficulties regaining full knee movement. This can be permanently disabling. There is also very good scientific evidence that some people who rupture their ACL will not require an operation at all. This means that there is usually no need for an urgent or emergency treatment. If ACL injury is suspected I would recommend returning to the UK and seeking early advice from a specialist with expertise managing these injuries.

A private consultation with Mr Sutton at Claremont costs £200 if you don't have health insurance. For more information or to book an appointment, just call our Private Patient Team on 0114 263 2114.

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