

Diagnosis and immediate care of soft tissue knee injuries

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There is good evidence that the primary assessment of knee injuries is poor (Bollen and Scott, 1996). The knee is the most commonly injured joint in sport and exercise, and soccer and rugby carry the highest risk (Nicholl et al, 1991). A basic approach comprising a thorough history and a full examination, including 'look, feel, move and special tests', is usually all that is needed (Apley and Solomon, 1994).

The first examining doctor is often fortunate to assess a soft tissue knee injury in its acute stages and may be able to collect vital information. The history is fresh in the patient's mind and may be of considerable value in determining the diagnosis. Moreover, some signs and symptoms may be more easily gleaned before swelling, bruising and pain inhibition set in. This brief summary will outline the more common soft tissue knee injuries seen in the accident and emergency department and a plan for appropriate initial management (Figure 1).

CAUSES OF INJURY

Knee injuries can result from contact and non-contact mechanisms. Forty per cent of knee injuries are ligamentous (Myasaka et al, 1996). The resulting lesions may be isolated, combined, partial or complete, and may be associated with bony injuries. In every case, the assessment should include an examination of both knees as well as an assessment of the hip and ankle on the affected side. If the knee is very swollen, examination may be facilitated by aspiration under aseptic conditions, which can also be diagnostic

(haemarthrosis). A neurovascular assessment is mandatory. The examiner is almost always fortunate in having the contralateral limb for comparison.

COLLATERAL LIGAMENT INJURIES

The patient reports a history of twisting or wrenching the knee. The injury commonly occurs while the knee is flexed. Occasionally, a pop is heard or felt – this does not necessarily imply an anterior cruciate ligament (ACL) tear.

Medial collateral ligament (MCL) injuries are much more common. Look for bruising and feel for medial tenderness above or below the joint line. The knee should be stressed into valgus first with the knee extended, and then with the knee held in 30° of flexion. If the knee opens up in full extension, several ligaments have been injured, the extremity must be assessed for a vascular injury and immediate orthopaedic referral is required.

The lateral ligament complex (LLC) is more rarely injured. The knee joint opens up with varus stress. Always assess for associated injuries and look for a foot-drop, as the common peroneal nerve may be injured.

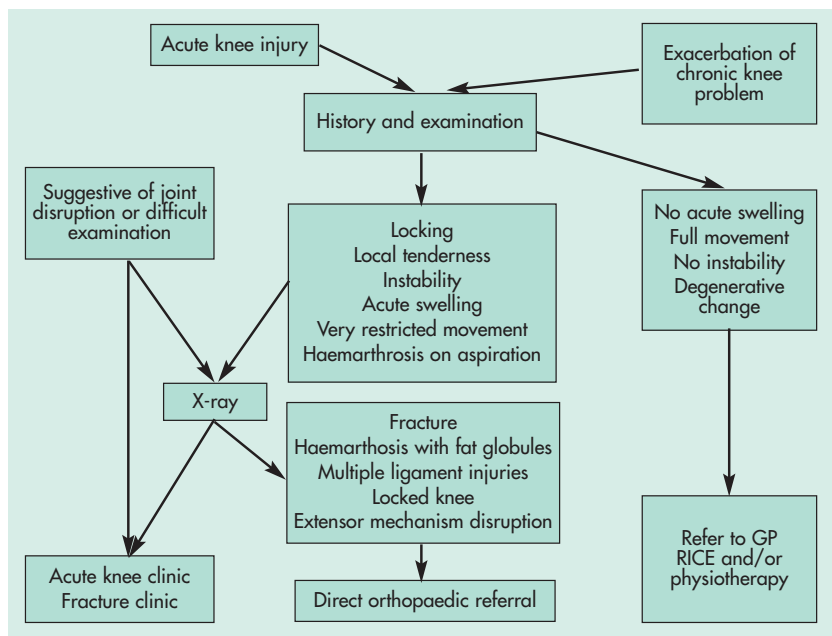
X-rays are mandatory to exclude bony injuries or avulsions. The knee should be splinted in extension in a brace or padded dressing and referred to the acute knee clinic or fracture clinic.

CRUCIATE LIGAMENT INJURIES

ACL injuries account for up to 50% of documented ligamentous knee injuries (Myasaka et al, 1996). Contrary to popular belief, ACL injuries are more commonly seen after non-contact rather than contact injuries. Patients often describe one of the following modes of injury:

Deceleration: These may be seen in basketball or football players who change direction. If the lower leg is

Figure 1. A guide to the management of acute knee injuries in accident and emergency. RICE = rest, ice, compression, elevation.



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internally rotated at the time, the ACL is at risk.

Flexion/valgus/external rotation: As the knee is bent and twisted out (e.g. if a football or rugby boot is stuck in the turf, or a ski binding does not release the boot in a twisting fall), the MCL is injured initially, and then the ACL gives way. These injuries are often associated with medial meniscal tears – the so-called unhappy triad of O'Donoghue.

Hyperextension: This may be seen in basketball and volleyball players who land awkwardly and in gymnasts during the dismount. It is the mechanism of injury in some footballers who cannot control their landing after going up for a header.

Direct impact: A direct blow to the knee or shin can also lead to an ACL tear. These injuries are usually associated with damage to other structures within the knee.

In over 50% of cases, the patient will hear a 'pop' or feel tearing within the knee. The patient is usually unable to continue playing sport and the knee swells rapidly. The swelling is the result of a haemarthrosis (bleeding into the joint), and 80% of patients attending accident and emergency with acute haemarthroses have sustained ACL injuries. Other causes of haemarthroses include osteochondral fractures (aspiration will reveal fat globules as well as blood) and peripheral meniscal tears.

Anteroposterior knee stability should be assessed at 20° and 90° flexion and compared with the other side. A positive pivot shift test is pathognomic. The patients should have their knee splinted for comfort, should be given advice regarding RICE (rest, ice, compression, elevation) and should be referred to the knee clinic.

Posterior cruciate ligament injuries require a greater force: these are more commonly direct blows to the anterior aspect of the knee or severe hyperextension injuries. The initial symptoms are similar to those for ACL injuries. Examination reveals a posterior sag when the knee is flexed to 90° in comparison with the uninjured side. The posterior drawer test

may be positive. Plain radiographs are required in order to exclude bony avulsions.

MENISCAL INJURIES

These injuries usually result from rotational stress being applied to a flexed, weight-bearing knee. Medial meniscus injuries are more common than lateral meniscus injuries; this is because the medial meniscus is less mobile because of its capsular attachments. Tears cause characteristic symptoms of pain, swelling, locking and giving way. On examination, there is often an effusion, and the patient is very tender on palpation of the joint line (not above or below) and cannot squat down fully. If the joint is rested, the symptoms usually subside, only to return with twisting or trivial straining of the joint. The knee may also give way spontaneously.

Locking (the inability to straighten the knee) can occur in certain types of tears where the displaced meniscus blocks full extension of the joint. This becomes an urgent surgical problem, as the knee must not be left in a fixed flexed position. Patients with true locking are either admitted directly or referred urgently to the acute knee clinic.

PATELLAR DISLOCATION

Many patients are predisposed to this through anatomical variants and poor knee biomechanics. Patellar dislocation usually results from a sudden contraction of the quadriceps muscle, especially when the knee is in valgus and externally rotated, e.g. when running and dodging to one side. The patella dislocates laterally and can spontaneously reduce in some cases. The patient reports the knee as having gone 'out of joint' and is left with medial knee pain above and below the joint line indicative of a medial patellar retinaculum tear rather than a meniscal or MCL injury. If the patella remains dislocated, it can usually be easily reduced with distraction of the patient, analgesia and gentle knee extension, with a medial force being applied to the patella.

Radiographs are mandatory regardless of whether the patella has spontaneously relocated or not. Anteroposterior and lateral views of the knee and skyline views of the patella are required. Osteochondral fractures are managed with acute surgical intervention within a week. Most acute dislocations are splinted in extension for 3–4 weeks. Recurrent dislocators should be referred for physiotherapy and to a routine knee clinic for the assessment and management of the underlying cause.

EXTENSOR APPARATUS FAILURE

If the patient is unable to straight leg raise and does not have X-ray evidence of a patellar fracture, an injury to the quadriceps tendon or patellar tendon should be suspected. A gap in the affected tendon is often palpable. The mechanism of injury is usually related to a sudden deceleration of the lower leg relative to the rest of the body, such as a stumble on a wet or muddy surface. These patients must be referred to the inpatient team for tendon repair.

CONCLUSION

A large study from Scandinavia found that the most common cause of permanent disability following a sports injury was injury to the knee (Kujala et al, 1995). A careful assessment will almost always lead to appropriate early management. A diagnosis of 'knee sprain' is insufficient. Most significant knee injuries require subsequent outpatient physiotherapy or orthopaedic review. **HM**

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