

Identifying the knee injuries among the Sudanese top league football players, season (2012).

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Abstract:

The study aimed at identifying the knee injuries among the Sudanese top league football players, season (2012).

The researcher used the descriptive method and the subjects were the Sudanese top league football players, season (2012), whose total number is 12 players.

Important results include that:

There were injuries related to the knee joint and its ligaments, the menisci and the patella.

Important recommendations include:

- More care and attention should be taken to the good, suitable exercises and training.
- Making proper, standard fields.
- Avoiding violence, careless, or unfair play.

Introduction:

Normal Anatomy:

- The knee is a complex hinge joint that allows flexion, extension and rotational movement, depending on ligaments and quadriceps muscle strength for stability. It has four main ligaments: the medial collateral ligament, lateral collateral ligament, the anterior cruciate ligament and the posterior cruciate ligament. It has a synovial capsule that extends under the quadriceps (the suprapatellar pouch), reaching about 5 cm above the superior edge of the patella. The joint is largely subcutaneous, allowing easy palpation of the patella, tibial tuberosity, patellar tendon, tibial plateau margin and femoral condyles. Another important knee structure are the menisci, they act as shock absorbers and assist in reducing friction Flexion is produced by the hamstring muscles. Extension requires the quadriceps muscles, quadriceps tendon, patella, patellar tendon and tibial tuberosity. Any disruption of this 'extensor apparatus' causes inability to straight leg-raise or an extensor lag (a difference between active and passive ranges of extension).
- The medial collateral ligament resists valgus stress. The lateral collateral ligament resists varus stress. The anterior cruciate ligament prevents anterior subluxation of the tibia on the femur, and the posterior cruciate ligament resists posterior translation. The medial and lateral menisci are crescentic fibrocartilaginous structures that lie between the tibial plateaux and the femoral condyles.
- There are several important bursae around the knee:
 - A. anteriorly: the suprapatellar, prepatellar (between the patella and the overlying skin) and infrapatellar bursae (between the skin and the tibial tuberosity/patellar ligament)
 - B. posteriorly: several bursae lie in the popliteal fossa

It is frequently injured, particularly during sports. Trauma or overuse of the knee leads to a variety of peri- and intra-articular problems.

Research methodology:

The method:

Descriptive methodology was used.

The sample:

The subjects were the Sudanese top league football players, season (2012) who have knee injuries, and they were 12 players.

the data collection tools:

1. References.
2. Case surveys.

The problem to be solved:

- Knee injuries are one of the most common injuries in football affecting the whole world, including Sudan. Our Sudanese fields are now also suffering from it, so this research tried to focus on the types, the mechanism of occurrence, the presentations and signs, diagnosis, proper treatment and rehabilitation of knee injuries.
- In order to prevent knee injuries the following is to be done:
 - a) Proper, good exercise.
 - b) Fair play.
 - c) Proper, official fields.

The subjects:

Were the Sudanese top league football players, season (2012), and they were 12 players.

Data analysis:

Was by SPSS.

The research goal:

To identify the knee injuries among the Sudanese top league football players, season (2012).

Sport related knee injuries:

1. Peri articular knee lesions:

- a) Medial or lateral ligament strain (medial knee pain, worsened by standing or stressing the affected ligament).
- b) Enthesitis may occur at the patellar end of the tendon (jumper's knee), present with anterior knee pain.
- c) Osgood-Schlatter disease causes pain and swelling over the tibial tubercle. It is a traction apophysitis of the patellar tendon and occurs in enthusiastic teenage sports players, also presents as anterior knee pain.
- d) Rupture of the quadriceps tendon.
- e) Acute injuries to the extensor apparatus and the patella.

2. Intra-articular traumatic lesions of the knee:

- a) Acute knee ligament injuries.
- b) Rupture of the patellar ligament.
- c) Tears and Lesions of the menisci.
- d) Dislocation and recurrent dislocation of the patella.
- e) Chronic ligament instability.

1. Acute knee ligament injury:-

- Most ligament injuries occur while the knee is bent, i.e. when the capsule and ligaments are relaxed and the femur is allowed to rotate on the tibia.
- The dam-aging force may be a straight thrust (e.g. a dashboard injury forcing the tibia backwards) or, more commonly, a combined rotation and thrust as in a football tackle.
- They can be single or multiple ligament injuries.
- Twisting force in a weight bearing knee often tears the medial meniscus, causing the well-recognized triad of MCL, ACL and medial meniscal injury described by O'Donoghue.

a) Anterior cruciate ligament injuries:

- Are the most common knee ligament injury seen in all sports, specifically footballers.
- Main mechanism of injury is by internal rotation and anterior translation of tibia.
- Cruciate ligament injuries occur in isolation or in combination with damage to other structures. Solitary cruciate ligament injuries result in instability in the sagittal plane, i.e. the tibia can be pushed backwards or pulled forwards in relation to the femoral condyles. If there is accompanying damage to a collateral ligament or the capsule, then the direction of instability is often oblique and there may be a problem in controlling rotation. These oblique plane and rotatory instabilities are complex; in essence, one of the cruciate ligaments is ruptured and there is also laxity in one part of the capsule – this causes movement of the tibia on the femur, usually around an axis of the remaining intact capsule or other supporting ligament.
- Injury involves a twist in addition to a valgus.

b) Posterior cruciate ligament injuries:

- Are less common.
- Result from a direct blow to the tibia.

c) Medial collateral ligament injuries:

Due to lateral(valgus) force is applied on the knee this ligament is susceptible to damage particularly at the femoral insertion resulting in pain and valgus instability.

- Grade 1 and grade 2 tears are partial.
- Grade 3 injuries have more than 1cm of joint opening.
- Others are associated with ligament injuries.

d) lateral collateral ligament injuries:

- Due to medial (varus) force applied to the knee.
- Often associated with more extensive disruption of the posterolateral corner, more severe injury needs surgery.

Clinical features of acute ligament injuries:

- 1) The patient gives a history of a twisting or wrenching injury and may even claim to have heard a 'pop' as the tissues snapped.
- 2) The knee is painful and (usually) swollen – and, in contrast to meniscal injury, the swelling appears almost immediately, the knee may be too painful to permit deep palpation or much movement. For all the apparent consistency, the findings can be somewhat perverse: thus, with a complete tear the patient may

have little or no pain, whereas with a partial tear the knee is painful, Swelling also is worse with partial tears, because hemorrhage remains confined within the joint; with complete tears the ruptured capsule permits leakage and diffusion.

The signs on examination:

- 1) Tenderness is most acute over the torn ligament, and stressing one or other side of the joint may produce excruciating pain.
- 2) With a partial tear attempted movement is always painful; the abnormal movement of a complete tear is often painless or prevented by spasm.
- 3) Abrasions suggest the site of impact, but bruising is more important and indicates the site of damage.
- 4) The doughy feel of a haemarthrosis distinguishes ligament injuries from the fluctuant feel of the synovial effusion of a meniscus injury
- 5) Tenderness localizes the lesion but the sharply defined tender spot of a partial tear (usually medial and 2.5 cm above the joint line) contrasts with the diffuse tenderness of a complete one.
- 6) The entire limb should be examined for other injuries and for vascular or nerve damage.
- 7) The most important aspect of the examination is to test for joint stability. Partial tears permit no abnormal movement, but the attempt causes pain. Complete tears permit abnormal movement, which sometimes is almost painless. To distinguish between the two is critical because their treatment is different; if there is doubt, examination under anesthesia is mandatory.
- 8) Sideways tilting (varus/valgus) is examined, first with the knee at 30 degree of flexion and then with the knee straight. Movement is compared with the normal side. If the knee angulates only in slight flex-ion, there is probably an isolated tear of the collateral ligaments; if it angulates in full extension, there is almost certainly rupture of the capsule and cruciate ligaments as well.
- 9) Anteroposterior stability is assessed first by placing the knees at 90 degrees with the feet resting on the couch and looking from the side for posterior sag of the proximal tibia; when present, this is a reliable sign of posterior cruciate damage.
- 10) Next, the drawer test is carried out in the usual way; a positive drawer sign is diagnostic of a tear, but a negative test does not exclude one.
- 11) The Lachman test is more reliable; Anteroposterior glide is tested with the knee flexed 15–20 degrees. Rotational stability arising from acute injuries can usually be tested only under anesthesia.

Acute ligament injury diagnosis:

1. Imaging Plain x-rays may show that the ligament has avulsed a small piece of bone:

from the medial edge of the femur by the medial ligament, from the fibula by the lateral ligament, from the tip of the fibula, probably by a posterolateral corner injury, from the tibial spine by the anterior cruciate ligament, from the back of the upper tibia by the posterior cruciate, from the near edge of the lateral tibial condyles by the iliotibial tract or capsule (a Segond fracture, which is often associated with anterior cruciate ligament and meniscal injuries). Stress films (if necessary under anesthesia) show whether the joint hinges open on one side.

2. Magnetic resonance imaging (MRI) is helpful in distinguishing partial from complete ligament tears. This may also reveal 'bone bruising', a hitherto poorly recognized source of pain. Arthroscopy With severe tears of the collateral ligaments and capsule, arthroscopy should not be attempted; fluid extravasations will hamper diagnosis and may complicate further procedures. The main indication for arthroscopy, which is usually conducted after capsular healing has occurred and knee motion recovered, is for reconstruction of cruciate ligament tears in those individuals who would benefit, and to deal with other internal injuries such as meniscal tears.

Management:

▪ According to the severity:

1. **SPRAINS AND PARTIAL TEARS:** The intact fibers splint the torn ones and spontaneous healing will occur. The hazard is adhesions, so active exercise is prescribed from the start, facilitated by aspirating a tense effusion, applying ice-packs to the knee and, sometimes, by injecting local anesthetic into the tender area. Weight bearing is permitted but the knee is protected from rotational or angulatory strain by a heavily padded bandage or a functional brace. A complete plaster cast is unnecessary and disadvantageous; it inhibits movement and prevents weekly reassessment – an important precaution if the occasional error is to be avoided. With a dedicated exercise programme, the patient can usually return to sports training by 6–8 weeks.

2. **COMPLETE TEARS:** Isolated tears of the MCL, i.e. where the knee is stable in full extension, usually heal well enough to permit near-normal function. Operative repair is unnecessary. A long cast-brace is worn for 6 weeks and thereafter graded exercises are encouraged. Isolated tears of the LCL are rare. If the diagnosis is certain, these can be treated conservatively as for MCL tears. If the fibular styloid is avulsed, the injury is probably more severe and involves part of the posterolateral capsule and arcuate complex. Examination for posterolateral instability should be done and, if confirmed, these injuries may benefit from repair. In contrast, a fibular head fracture indicates an avulsion of the LCL as a solitary injury. Isolated tears of the ACL should, in theory, be treated by early operative reconstruction. Indeed, such are the pressures on professional sports persons that this is often demanded. Operation may also be indicated for non-professionals if the tibial spine is avulsed; the bone fragment, with the attached ACL, is replaced and fixed under arthroscopic control and the knee is braced for 6 weeks. In all other cases it is more prudent to follow the conservative regime described earlier; the cast-brace is worn only until symptoms subside and thereafter movement and muscle-strengthening exercises are encouraged. About half of these patients regain sufficiently good function not to need further treatment. The remainder complains of varying degrees of instability; late assessment will identify those who are likely to benefit from ligament reconstruction. Isolated tears of the PCL are treated conservatively. Most patients end up with little or no loss of function however, some experience instability whilst walking up stairs and are sufficiently disabled to warrant late reconstruction. Combined injuries may result in significant loss of function. With concurrent ACL and collateral ligament injury, reconstruction of the ACL often obviates the need for collateral ligament treatment; however, early operation

carries the risk of postoperative joint fibrosis, so it is wiser to start treatment with joint support and physiotherapy in order to restore a good range of movement before following on with ACL reconstruction. A similar approach is adopted for combined injuries involving the PCL, but here all damaged structures will need to be repaired.

3. Operative treatment: The torn ACL is replaced by an auto graft (usually from the patellar tendon or from hamstring tendons) or by an allograft. Postoperative care will depend on the fixation of the new ligament; in many cases a short period of splintage can be followed by regular physio-therapy to avoid joint stiffness and improve muscle control. Many patients return to sports within 6 months. The treatment of combined injuries in which the PCL is involved is changing; until recently, it was thought that most of these patients had good function and therefore did not need reconstructive surgery. Newer studies have shown that there is an increased risk of osteoarthritis (especially of the medial compartment) and this is seen as an indication for PCL reconstruction in patients who have more than 10–15 mm of posterior tibial translation in the drawer test. Unlike injuries involving the ACL, combination injuries involving the PCL require all damaged structures to be repaired.

2. Rupture of the patellar tendon:

This is an uncommon injury; it is usually seen in young athletes and the tear is almost always at the proximal or distal attachment of the ligament. There may be a previous history of tendinitis and local injection of corticosteroid.

Clinical presentation:

The patient gives a history of sudden pain on forced extension of the knee, followed by bruising, swelling and tenderness at the lower edge of the patella or more distally.

Diagnosis:

1. X-rays may show a high-riding patella and a tell-tale flake of bone torn from the proximal or distal attachment of the ligament.
2. MRI will help to distinguish a partial from a complete tear.
- 3.

Management:

- a) ACUTE TEARS: Partial tear can be treated by applying a plaster cylinder. Complete tears need operative repair or re-attachment to bone. Tension on the suture line can be lessened by inserting a temporary pull-out wire to keep the distance between the inferior pole and attachment to the tibial tuberosity constant. Immobilization in full extension may precipitate stiffness – it is, after all, a joint injury – and it may be better to support the knee in a hinged brace with limits to the amount of flexion permitted.
- b) This range can be gradually increased after 6 weeks. Early repair of acute ruptures gives excellent results. Late repairs are less successful and the patient may be left with a permanent extension lag.
- c) Late cases: are difficult to manage because of proximal re-traction of the patella. A two-stage operation may be needed: first to release the contracted tissues and apply traction directly to the patella, then at a later stage to re-pair the patellar ligament and reinforce it with grafts of tendon from gracilis or semitendinosus. Here, again, a tension-relieving pull-out wire is helpful.

3. Patellar dislocation:

Mechanism of injury:

▪ While the knee is flexed and the quadriceps muscle relaxed, the patella may be forced laterally by direct violence; this is rare. More often traumatic dislocation is due to indirect force: sudden, severe contraction of the quadriceps muscle while the knee is stretched in valgus and external rotation. Typically this occurs in field sports when a runner dodges to one side. The patella dislocates laterally and the medial patellofemoral ligament and retinacular fibers may be torn.

Clinical features:

- 1) In a 'first-time' dislocation the patient may experience a tearing sensation and a feeling that the knee has gone 'out of joint'; when running, he or she may collapse and fall to the ground. Often the patella springs back into position spontaneously; however,
- 2) if it remains unreduced there is an obvious (if somewhat misleading) deformity: the displaced patella, seated on the lateral side of the knee, is not easily noticed but the uncovered medial femoral condyles is unduly prominent and may be mistaken for the patella.
- 3) Neither active nor passive movement is possible.
- 4) In the rare intra-articular (downward) dislocation the patella is stuck between the condyles and there is a marked prominence on the front of the knee.
- 5) If the dislocation has reduced spontaneously, the knee may be swollen and there may be bruising and tenderness on the medial side.
- 6) If there is fluid in the joint, aspiration may show that it is bloodstained; the presence of fat droplets suggests a concurrent osteochondral fracture.

Diagnosis:

- 1) Anteroposterior, lateral and tangential ('skyline') x-ray views are needed: In an unreduced dislocation, the patella is seen to be laterally displaced and tilted or rotated. In 5 % of cases there is an associated osteochondral fracture.
- 2) MRI may reveal a soft-tissue lesion (e.g. disruption of the medial patellofemoral ligament) as well as articular cartilage and/or bone damage.

Management:

- 1) In most cases the patella can be pushed back into place without much difficulty and anesthesia is not always necessary;
- 2) The exception is an intra-articular (intercondylar) dislocation, which may need open reduction.
- 3) If there are no signs of soft tissue rupture – i.e. there is minimal swelling, no bruising and little tenderness – cast splintage alone will usually suffice.
- 4) The knee is aspirated and then immobilized in almost full extension; a small pad along the lateral edge of the patella may help to keep the medial soft tissues relaxed. The cast is retained for 2 or 3 weeks.
- 5) The patient then undergoes a long period (2–3 months) of quadriceps strengthening exercises.

4. Lesions of the menisci:

- The menisci have an important role in improving articular congruency and increasing the stability of the knee, controlling the complex rolling and gliding actions of the joint and distributing load during movement.
- The medial meniscus is much less mobile than the lateral, and it cannot as easily accommodate to abnormal stresses. This may be why meniscal lesions are more common on the medial side than on the lateral.
- Torn cruciate ligaments account for around 70% of knee haemarthrosis in young people, they often coexist with a meniscal tear.

Mechanism of injury:

- The split is usually initiated by a rotational grinding force, which occurs (for example) when the knee is flexed and twisted while taking weight; hence the frequency in footballers. In middle life, when fibrosis has restricted mobility of the meniscus, tears occur with relatively little force.
- The medial meniscus is affected far more frequently than the lateral, partly because its attachments to the capsule make it less mobile. Tears of both menisci may occur with severe ligament injuries in 75 % of cases the split is vertical in the length of the meniscus. If the separated fragment remains attached front and back, the lesion is called a bucket-handle tear. The torn portion sometimes displaces towards the centre of the joint and becomes jammed between femur and tibia, causing a block to extension ('locking'). If the tear emerges at the free edge of the meniscus, it leaves a tongue based anteriorly (an anterior horn tear) or posterior (a posterior horn tear).

Clinical presentations:

- 1) Pain (usually on the medial side) is often severe and further activity is avoided;
- 2) Occasionally the knee is 'locked' in partial flexion.
- 3) Swelling appears some hours later or perhaps the following day.
- 4) With rest the initial symptoms subside, only to recur periodically after trivial twists or strains. Some-times the knee gives way spontaneously and this is again followed by pain and swelling.
- 5) On examination the joint may be held slightly flexed and there is often an effusion.
- 6) In longstanding cases the quadriceps will be wasted.
- 7) Tenderness is localized to the joint line, in the vast majority of cases on the medial side. Flexion is usually full but extension is often slightly limited.
- 8) Between attacks of pain and effusion there is and McMurray's test, Apley's grinding test or the Thessaly test may be positive.

Diagnosis:

- 1) MRI is a reliable method of confirming the clinical diagnosis,(but Plain x-rays are usually normal) and may even reveal tears that are missed by arthroscopy.
- 2) Arthroscopy has the advantage that, if a lesion is identified, it can be treated at the same time.

Tests for meniscal injuries:

McMurray's test this classic test for a torn meniscus is seldom used now that the diagnosis can easily be made by MRI. Patients with meniscal tears experience

medial or lateral joint line pain and may have a sense of locking. The test has shown a high diagnostic accuracy rate at the level of 95 % in detecting meniscal tears, with a low number of false positive and negative recordings.

Management:

- 1) Dealing with the locked knee usually the knee ‘unlocks’ spontaneously; if not, gentle passive flexion and rotation may do the trick. Forceful manipulation is unwise (it may do more damage) and is usually unnecessary; after a few days’ rest the knee may well unlock itself. However,
- 2) If the knee does not unlock, or if attempts to unlock it cause severe pain, arthroscopy is indicated.
- 3) If symptoms are not marked, it may be better to wait a week or two and let the synovitis settle down, thus making the operation easier; if the tear is confirmed, the offending fragment is removed.
- 4) Conservative treatment If the joint is not locked, it is reasonable to hope that the tear is peripheral and can therefore heal spontaneously.
- 5) After an acute episode, the joint is held straight in a plaster backslap for 3–4 weeks.
- 6) The patient uses crutches and quadriceps exercises are encouraged.
- 7) Operation can be put off as long as attacks are infrequent and not disabling and the patient is willing to abandon those activities that provoke them. MRI will show if the meniscus has healed.

Operative treatment Surgery is indicated: If the joint cannot be unlocked, if symptoms are recurrent. For practical purposes, the lesion is often dealt with as part of the ‘diagnostic’ arthroscopy.

- 8) Postoperative pain and stiffness are reduced by prophylactic non-steroidal anti-inflammatory drugs.
- 9) Quadriceps-strengthening exercises are important.

Rehabilitation:

- It is an essential part of the treatment of any injured athlete, done by a physiotherapist.
- Effective rehabilitation these involves four stages:
 - 1) Protection of the injured part.
 - 2) Rest and restoring the movement of the injured limb.
 - 3) Ice.
 - 4) Compression.
 - 5) Elevation.
 - Then the pain and swelling start to settle.
 - Restoration of movement is an essential part of the rehabilitation process, because the longer a structure is out of using the more atrophy result and in severe cases contracture and osteoporosis may develop.
 - Restoration of movement is by:
 - a) Passive movement using continuous passive movement machines.
 - b) Active exercises after healing had occurred, including:
 - i. Isometric exercises (the muscle is moved but the joint is not).
 - ii. Isotonic exercises (the muscle contracts under a constant load and the joint are moved through a range of movement).

Presentation and discussion of the results:**Table No. (1) Showing the incidence of the different knee injuries:**

Type of knee injury	Number of cases	percentage
1. Ligament injuries.	2	17%
2. Meniscal injuries.	9	75%
3. Patellar injuries.	1	8%
Total.	12	100%

▪ From the table above we conclude that the highest (the most common) knee injury were meniscal injuries (75%), followed by ligament injuries (17%) and the least occurring are patellar injuries (8%).

▪ These injuries result from either:

1. Inappropriate, unsuitable or inadequate exercises.
2. Violent and careless playing.
3. Football fields related causes, mainly bad field surfaces.
4. Lack of good, balanced nutrition.
5. Inadequate water and electrolyte replacement.

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