KNEES

HISTORY, HISTORY, HISTORY

1. Giving out
2. Catching
3. Locking
4. Grinding
5. Where does it hurt?
6. Knee cap
7. What relieves pain?
8. What makes it worse?

TEST

1. Initial (+)
2. Confirmation

MENISCUS

Menisci can be torn during innocuous activities such as walking or squatting. They can also be torn by traumatic force encountered in sports or other forms of physical exertion. The traumatic action is most often a twisting movement at the knee while the leg is bent. In older adults, the meniscus can be damaged following prolonged ‘wear and tear’ called a degenerative tear.

McMurray’s Test –

Meniscal tear or pathology The test is performed with the patient in a relaxed supine position. The knee to be tested should be fully flexed. The examiner holds the sole of the foot with one hand and palpates the medial or lateral aspect of the tibio-fibular joint. This test is used to determine damage to either the lateral or medial meniscus. The examiner palpates the side of the joint being tested. When testing the medial meniscus the tibia starts the manoeuvre in internal rotation. When testing the lateral meniscus the tibia starts the manoeuvre in external rotation.

Thessaly Test –

The examiner supports the pt. by the outstretched hands to provide support for balance. The pt. flexes the knee to be tested to approximately 20 degrees ( the 40 degrees if negative at 20) while in flexed position, the pt. rotates the femur on tibia 3 times, both internally and externally ( do the twist, dance with them).
**Appley's grinding test**

Place pt. in prone position with knee flexed to 90 degrees. Climb up on table (no dresses please) put your knee on to their thigh to stabilize. You then rotate medial and laterally with distraction (pulling up on foot and rotating), noting excessive movement, restriction or discomfort. The process is repeated using compression. Pain or excessive motion with distraction = ligament, pain with compression = meniscus.

**ACL : mechanism**

- ACL tears most often occur during football and basketball in younger patients, and occur most often from skiing injuries in older patients;
  - substantial anterior tibial shear forces that stress ACL are produced from quadriceps contraction, esp in 0-30 deg of extension;
  - typically, the ACL is torn in a noncontact deceleration situation that produces a valgus twisting injury;
    - this usually occurs when the athlete lands on the leg and quickly pivots in the opposite direction. (see pivot shift)
- mechanisms are:
  1. extension
  2. hyperextension
  3. marked internal rotation of tibia on femur;
  4. pure deceleration valgus position

**Anterior Drawer Test –**

*ligamentous stability*

The test is performed with the patient in a relaxed supine position with knees bent to approximately 90 degrees. The examiner sits on the both feet of the subject and places his hands around the upper tibia of one leg. The thumbs of both hands are on the supero-anterior aspect of tibia.

**Lachman Test –**

*ligamentous stability*

The test is performed with the patient in a relaxed supine position. The knee to be tested should be flexed to about 15 degrees. One of the examiners hands holds and stabilizes the distal femur of the leg to be tested. The examiners other hand firmly grasps the proximal tibia of the same leg.
PCL

Posterior Drawer Test

- pt. supine
- valgus stress on knee
- foot in ER (outward)
- bring knee from 90 deg flexion to full extension
- feel for palpable “shift” of lateral tibial plateau as it moves anteriorly from a posteriorly subluxed position
- lateral tibial plateau shifts from position of posterior subluxation to a position of reduction as the flexed knee is extended under valgus
- stress and w/ foot in external rotation; (w/ the true pivot shift the tibia is internally rotated); - clunk is appreciatted as the knee is extended;
- plateau subluxates again as knee is flexed in the opposite manner;
- since it describes shift of lateral tibial plateau in opposite direction from true joint shift, its called reverse pivot shift;
- significantly positive reverse pivot shift suggest that PCL, ACL, and the LCL are all torn;
- in the position of tibial internal rotation, the sign disappears

Observations on rotatory instability of the lateral compartment of the knee: Experimental studies on the functional anatomy and pathomechanism of the true and reversed pivot shift sign.

COLLATERAL LIGAMENTS

Because the knee joint relies just on these ligaments and surrounding muscles for stability, it is easily injured. Any direct contact to the knee or hard muscle contraction — such as changing direction rapidly while running — can injure a knee ligament.

Injured ligaments are considered "sprains" and are graded on a severity scale.

Grade 1 Sprains

The ligament is mildly damaged. It has been slightly stretched, but is still able to help keep the knee joint stable.

Grade 2 Sprains
stretches the ligament to the point where it becomes loose. This is often referred to as a partial tear of the ligament.

**Grade 3 Sprains**

This type of sprain is most commonly referred to as a complete tear of the ligament. The ligament has been split into two pieces, and the knee joint is unstable.

**Complete tears of the MCL (left) and LCL (right)**

The MCL is injured more often than the LCL. Due to the more complex anatomy of the outside of the knee, if you injure your LCL, you usually injure other structures in the joint, as well.

**Cause**

Injuries to the collateral ligaments are usually caused by a force that pushes the knee sideways. These are often contact injuries, but not always.

Medial collateral ligament tears often occur as a result of a direct blow to the outside of the knee. This pushes the knee inwards (toward the other knee).

Blows to the inside of the knee that push the knee outwards may injure the lateral collateral ligament.

– ligamentous stability

**Varus Stress Test** -

one hand on distal medial thigh and other hand on lateral proximal fibula (calf). Apply force in opposite direction causing a varus stress. Feel for laxity or no end point.

**Valgus Stress Test**-

hand on lateral distal aspect of thigh and other hand medial proximal tibia (calf). Apply force in opposite directions. Feel for laxity or no end point.

**IT BAND SYNDROME**

**Ober's Test**

Steps
Patient is lying on the side opposite that being tested
Examiner stabilizes the pelvis with one hand and the lateral side of the examiner's hip against the patient's pelvis
Examiner grasps the femur above the knee with the other hand & abducts & extends the hip
Examiner allows the hip to passively adduct to the table with the knee straight
Positive Test
Leg does not adduct past parallel
Positive Test Implications IT Band tightness

Noble Compression Test

Steps
Patient is supine with the knee flexed
Examiner is positioned lateral to the patient on the involved side
Examiner supports the knee above the joint line with the thumb over or just superior to the lateral femoral condyle
Examiner applies pressure over the lateral femoral condyle, while the knee is passively extended & flexed
Positive Test
Pain underneath the thumb as the knee approaches 90 deg
Positive Test Implications
IT Band inflammation

PATELLAR PATHOLOGY

1. Patellar Grind Test

A. Passive patellar grind test
knee extended ,press down on patella & flex knee , (+) if examiner feels distinctive crunching sensation

B. Active patellar grind test
patient sits with knees flexed over table, press down on patella, patient actively extends knee
Examiner appreciates grind

2. Step-up-step down test
patient steps up & down low stool
examiner feels for patellofemoral grind
SUBLUXING PATELLA

- an injury of the knee, typically caused by a direct blow or a sudden twist of the leg.[1] It occurs when the patella (kneecap) slips out of its normal position in the patellofemoral groove, and generally causes intense pain with swelling of the knee. Sports commonly associated with the injury involve sudden twisting motions of the knee and/or impact, such as soccer, gymnastics and ice hockey.

1. Apprehension Test
Pt. supine & relaxed ,push patella laterally with 30 degree of flexion of knee pain & apprehension

2. Dynamic patellar tracking
ask seated patient to extend flexed knee watch to tracking
normally movement is straight with minimal shift & tilt laterally near terminal extension

3. Patellar Tilt test
knee extended, quads relaxed
Examiner lifts lateral edge of patella from the lateral femoral condyle
tight lateral structures indicated in neutral or negative angle to the horizontal
should rise to horizontal plane in N
Q-angle: Not routine
line from ASIS to center of patella to tibial tubercle
14° men, 17° women
  - patellofemoral pain
  - subluxation of patella
Tubercle-sulcus angle: Not routine
Knees flexed to 90°
Osteoarthritis

Osteoarthritis is the most common form of arthritis in the knee. It is a degenerative,"wear-and-tear" type of arthritis that occurs most often in people 50 years of age and older, but may occur in younger people, too.

In osteoarthritis, the cartilage in the knee joint gradually wears away. As the cartilage wears away, it becomes frayed and rough, and the protective space between the bones decreases. This can result in bone rubbing on bone, and produce painful bone spurs.

Osteoarthritis develops slowly and the pain it causes worsens over time.

Rheumatoid Arthritis

Rheumatoid arthritis is a chronic disease that attacks multiple joints throughout the body, including the knee joint. It is symmetrical, meaning that it usually affects the same joint on both sides of the body.

In rheumatoid arthritis the synovial membrane that covers the knee joint begins to swell, This results in knee pain and stiffness.

Rheumatoid arthritis is an autoimmune disease. This means that the immune system attacks its own tissues. The immune system damages normal tissue (such as cartilage and ligaments) and softens the bone.

Posttraumatic Arthritis

Posttraumatic arthritis is form of arthritis that develops after an injury to the knee. For example, a broken bone may damage the joint surface and lead to arthritis years after the injury. Meniscal tears and ligament injuries can cause instability and additional wear on the knee joint, which over time can result in arthritis.

A knee joint affected by arthritis may be painful and inflamed. Generally, the pain develops gradually over time, although sudden onset is also possible. There are other symptoms, as well:

The joint may become stiff and swollen, making it difficult to bend and straighten the knee. Pain and swelling may be worse in the morning, or after sitting or resting.
Vigorous activity may cause pain to flare up. Loose fragments of cartilage and other tissue can interfere with the smooth motion of joints. The knee may "lock" or "stick" during movement. It may creak, click, snap or make a grinding noise (crepitus). Pain may cause a feeling of weakness or buckling in the knee. Many people with arthritis note increased joint pain with rainy weather.

Physical exam

Joint swelling, warmth, or redness
Tenderness about the knee
Range of passive-rom & active
Instability of the joint
Crepitus with movement
Pain when weight is placed on the knee
Problems with gait
Any signs of injury to the muscles, tendons, and ligaments surrounding the knee
Involvement of other joints (an indication of rheumatoid arthritis)

Imaging Tests

X-rays. These imaging tests create detailed pictures of dense structures, like bone. They can help distinguish among various forms of arthritis. X-rays of an arthritic knee may show a narrowing of the joint space, changes in the bone and the formation of bone spurs (osteophytes).

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