Conditions of the patella

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topics

Anatomy
Chondromalacia patella
Patellar fracture
Bursitis
Patellar dislocation
Patellar tendon tear
i) Anterior Surface

- Base
- Apex

ii) Posterior Surface

- Medial facet
- Lateral facet

TeachMeAnatomy
Chondromalacia patellae

AKA Runner’s knee
Deterioration and damage of the cartilage on the posterior surface of the patella.
Causes:

Improper movement of the knee joint due to

- overuse

- trauma

- weak or imbalanced muscles

- poor alignment
Risk factors

Adolescents and young adults

Females

Previous injury

High activity level

Arthritis
Anterior knee pain on walking up or down stairs, when kneeling, squatting, or after sitting for long periods of time.

Knee stiffness, tenderness, crepitus, swelling and malalignment. In some cases, a history of patellar dislocation may be present.
Imaging to assess anatomy, alignment, cartilage

Patellar tilt angle (>12) (AT/AP)

Caton_Deschamps index
Congruence angle (between bisecting sulcus angle and central patellar ridge = -6±6)
Chondromalacia grading

grade I
focal areas of hyperintensity with normal contour
arthroscopically: softening or swelling of cartilage

grade II
blisters-like swelling/fraying of articular cartilage extending to surface
arthroscopically: fragmentation and fissuring within soft areas of
articular cartilage

grade III
partial thickness cartilage loss with focal ulceration
arthroscopically: partial thickness cartilage loss with fibrillation (crab
meat appearance)

grade IV
full thickness cartilage loss with underlying bone reactive changes
arthroscopically: cartilage destruction with exposed subchondral
bone
Treatment

Conservative

Resting, stabilization, physiotherapy and exercise

NSAID to reduce inflammation and pain

Operative

Lateral release, smoothing the articular surface of the patella, cartilage graft, or relocating the insertion of the muscles.
Patellar fractures

Patella is prone to fractures because of its subcutaneous location. and the fracture can be due to either compression or tensile force or a combination of them.

The type of force can determine the pattern of fracture which can be:
Patellar fracture: Clinical features

History

Pain, tenderness, history of extensive flexion, history of trauma (direct blow or fall).

On examination we may see abrasion and ecchymosis, joint effusion.

If the fracture is displaced, the defect is palpable.

We must rule out open joint injury by saline load test.

We must evaluate the extensor mechanism by straight leg raise test, if painful, we inject lidocaine in the joint and aspirate hemarthrosis if present.
Patellar fractures : imaging

Most patella fractures can be adequately visualized and classified by using standard anteroposterior (AP), lateral, and axial (Merchant or sunrise) radiographs of the knee.
Treatment: conservative

If:

Not displaced or < 2mm displacement

Extensor mechanism is not disrupted

Immobilization (knee straight) to 4-6 weeks then reassess union and healing by X-ray and examination (nontender on palpation).

Then we use removable hinge brace and start physiotherapy to regain range of movement.

Once the patient is able to perform a straight leg raise without extensor lag and has greater than 90° of knee flexion, brace use may be discontinued.
Surgery

Indications

Disruption of the extensor mechanism
Articular incongruity with more than 2 mm of step off

Contraindications

- Preexisting lack of active extensor function
- Septic arthritis
- Fixed flexion contractures of the knee
Procedures

1- Tension band technique (most common)
   convert a tensile force into a compressive force
   A cerclage wire may be added to support the tension band
   Mainly used in two part fractures.
Tension band can be placed on Kirschner wires (K-wires) or through cannulated screws.
Plate fixation method is used in comminuted fractures and a cerclage wire can be used.
In case of pole fracture we stabilise the fracture by a nonabsorbable heavy material suture to through the patellar or quadriceps tendon.
Patellectomy

Total or partial

In case of severely comminuted patella

We try to preserve the bone as much as we can but sometimes it is irreparable.
Partial patellectomy

If the distal pole is severely comminuted and <40% is affected

Excising more than 40% leads to poor outcome.

You should do medial and lateral retinacular repair.
Total patellectomy

When the fractured patella cannot be fixed

Leads to extensor lag and loss of extensor strength

The quadriceps torque is reduced by 50%

Knee instability can also occur
Prepatellar bursitis

Inflammation to the bursa in front of the patella due to irritation and friction which leads the bursa to produce more fluid and swell, trauma and infection may cause it

seen mainly in carpet layers, paving workers, floor cleaners and miners who do not use protective knee pads.

Patient comes with pain, tenderness, swelling

Stretching, bandaging and steroid injection

Aspiration

Excision
Infrapatellar bursitis

Superficial

Same as prepatellar bursitis

Deep

usually develops from chronic overuse of the knee extensor tendon (patellar tendon) as can occur with repetitive flexing of the knee under pressure in work duties or exercise. Examples might include climbing stairs, jumping, or deep knee bends.
Patellar dislocation

When the patella comes completely out of its groove

Subluxation means partial dislocation. Recurrence 15-20%
Risk factors

It can occur due to injury to the medial patellofemoral ligament

Or non traumatic (many predisposing factors)

- generalized ligamentous laxity

-underdevelopment of the lateral femoral condyle

-maldevelopment of the patella, which may be too high or too small

-valgus deformity of the knee

-external tibial torsion

-primary muscle defect.
Previous dislocation increase the risk of further dislocation

Girls are at more risk
Clinical features

Occurs when the patient try to extend the leg from flexion position

Very restricting and painful

Followed by swelling , tenderness

Positive apprehension test

Examine for predisposing condition
Imaging
Imaging (indirect)
Patellar tendon tear

Complete or partial disruption of the patellar tendon

Most commonly in the attachment point of the tendon with the patella
Causes

Injury: fall / jumping / cuts

Weak tendon

- patellar tendonitis (jumper’s knee)

- steroid use: corticosteroid / anabolic steroid

- surgery
Symptoms Signs

Pain
Swelling
Indentation at the bottom of the patella
Bruising
Tenderness
Cramping
Upward moving of the patella
Difficulty straightening the knee
Imaging
Treatment

Conservative - in partial and very small tears

Immobilization 3-6 weeks

Crutches

Physiotherapy - after the pain subsides
Treatment

Operative

Sutures

sutures are placed in the tendon and then threaded through drill holes in the patella

Suture anchors

attach the tendon to the bone using small metal implants (called suture anchors)
Thank you