Knee disorders

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OSTEOCHONDRITIS DISSECANS

Epidemiology:

# the patient usually **between 15 and 20** years of age

#The prevalence of osteochondritis dissecans (OCD) is **between 15 and 30 per 100 000**

#with a male to female ratio of **5:3**.

#An increase in its incidence has been observed in recent years, probably due to the growing participation of young children of both genders in competitive sports.
Definition: A small, well-demarcated, avascular fragment of bone and overlying cartilage sometimes separates from one of the femoral condyles and appear as a loose body in the joint.

## The fact that over 80% of lesions occur on the lateral part of the medial femoral condyle.
**Cause**: the most likely cause is **trauma**, either a **single impact** with the edge of the patella or **repeated microtrauma** from contact with an adjacent tibial ridge.

**Other causes**: **restricted blood supply** & **hereditary**

About the **restricted blood supply** which causes **avascular necrosis**, usually associated with **corticosteroid therapy** or **alcohol abuse** it is seen in an **older age group** and on X-ray the lesion is always on the **dome of the femoral condyle**.

Lesions are bilateral in 25% of cases.
Pathophysiology:
At first the overlying cartilage is intact and the fragment is stable; over a period of months the fragment separates but remains in position (‘OCD lesion in situ’); finally the fragment breaks free to become a loose body in the joint, leaving a depression on the articular surface.

Clinical features:
1- **tenderness** localized to one femoral condyle
2- **small effusion**, because the quadriceps muscle is wasted
3- **Wilson’s sign**
Imaging:

1- **MRI** is the most effective imaging technique to Define the **site**, **size** and **activity** of an OCD lesion.

2- **x-ray** best displayed in special intercondylar (tunnel) view

3- **arthroscopy** not used for diagnostic purposes but it can be deployed to determine if an OCD lesion is stable or unstable

Management:

Lesions in **adults** have a greater propensity to **instability** (depend on the **size**, if small > removed by arthroscopy, if large> should be fixed in situ with **pins** or **Herbert screws**) whereas **juvenile** osteochondritis is typically **stable** (no treatment is needed but activities are curtailed for 6–12 months).
**PLICA SYNDROME**

**Plica**: is a remnant of an embryonic synovial partition which persists into adult life.

During development of the embryo, the knee is divided into three cavities – a large suprapatellar pouch and beneath this the medial and lateral compartments – separated from each other by membranous septa. Later these partitions disappear, leaving a single cavity, but part of a septum may persist as a synovial pleat or plica.

Over 20% of people, usually as a **median infrapatellar fold**.
Pathology: The plica itself is not pathological.

But if acute trauma, repetitive strain or some underlying disorder (e.g. a meniscal tear) causes inflammation, the plica may become oedematous, thickened and eventually fibrosed; it then acts as a tight bowstring, impinging on other structures in the joint and causing further synovial irritation.

Clinical features:

An adolescent or young adult complains of an ache in the front of the knee (occasionally both knees), with intermittent episodes of clicking or ‘giving way’.

Symptoms are aggravated by exercise or climbing stairs, especially if this follows a long period of sitting.
On examination:
1- muscle wasting
2- small effusion.
3- tenderness near the upper pole of the patella and over the femoral condyle

Diagnosis:
The diagnosis is often not made until arthroscopy is undertaken.
Treatment:

The first line of treatment is rest, anti-inflammatory drugs and adjustment of activities. If symptoms persist the plica can be divided or excised by arthroscopy.
Charcot’s disease (neuropathic arthritis) is a rare cause of joint destruction. Because of loss of pain sensibility and proprioception, the articular surface breaks down and the underlying bone crumbles. Fragments of bone and cartilage are deposited in the hypertrophic synovium and may grow into large masses. The capsule is stretched and lax, and the joint becomes progressively unstable.

Clinical features: (feels like a bag of bones and fluid)
1. Instability of joint
2. Swelling
3. Gross deformity

Management:
For the instability > moulded splint & caliber to control the joint
But if the pain become intolerable > arthrodesis
Replacement arthroplasty is not indicated.
A- This axial knee MRI of a patient with Charcot-Marie-Tooth disease demonstrates diffuse enlargement of the tibial nerve (long arrow) and common peroneal nerve (short arrow). B- This axial knee MRI demonstrates a normal tibial nerve (long arrow) and common peroneal nerve (short arrow).
Loose bodies in the knee: small fragments of cartilage or bone that move freely around the knee in joint fluid, or synovium, produced by:

1) injury (a chip of bone or cartilage);
2) osteochondritis dissecans (which may produce one or two fragments); usually in adolescents
3) osteoarthritis (pieces of cartilage or osteophyte) usually in adults
4) Charcot’s disease (large osteocartilaginous bodies)
5) synovial chondromatosis (cartilage metaplasia in the synovium)
Clinical features:
1-symptomless
2-attacks of sudden locking without injury (the commonest complaint)
Sometimes the locking is only momentary and usually the patient can wriggle the knee until it suddenly unlocks.
The patient may be aware of something popping in and out of the joint (joint mice)

Imaging: x-ray

Treatment:
loose body causing symptoms should be removed unless the joint is severely osteoarthritic. This can usually be done through the arthroscope, but it difficult to find the loose bodies
SYNOVIAL CHONDROMATOSIS

This is a rare disorder

the joint comes to contain multiple loose bodies resembling sago (‘snowstorm knee’).

The usual explanation is that myriad tiny fronds undergo cartilage metaplasia at their tips; these tips break free and may ossify

The loose bodies should be removed arthroscopically and a synovectomy performed.
TENDINITIS AND CALCIFICATION AROUND THE KNEE
CALCIFICATION IN THE MEDIAL LIGAMENT

Acute pain in the medial collateral ligament may be due to a soft calcific deposit among the fibres of the ligament, although this is relatively uncommon. There may be a small, exquisitely tender lump in the line of the ligament.

Pain is dramatically relieved by operative evacuation of the deposit.
PELLEGRINI–STIEDA DISEASE

X-rays sometimes show a plaque of bone lying next to the femoral condyle under the medial collateral ligament.

It is generally ascribed to ossification of a haematoma following a tear of the medial ligament.

No specific treatment is required.
PATELLAR ‘TENDINOPATHY’ (SINDINGLARSEN JOHANSSON SYNDROME)

Following repetitive strain or a partial rupture of the patellar ligament the patient (usually a young athletic individual) develops a traction ‘tendinitis’ characterized by **pain and point tenderness** at the lower pole of the patella. Sometimes, if the condition does not settle, calcification appears in the ligament.

A similar disorder has been described at the proximal pole of the patella *(jumper’s knee)*.

If rest fails to provide relief over the longer term: **injections, high frequency ultrasound therapy** and very occasionally **surgical decompression** of the tendon with **removal of the abnormal area** may be required.
Swellings
1- Acute swelling of the entire joint
   Traumatic synovitis
   Post-traumatic haemarthrosis
   Non-traumatic haemarthrosis
   Acute septic arthritis
   Aseptic inflammatory arthritis

2- Chronic swelling of the entire joint
   Non-infective arthritis
   Chronic infective arthritis
1- acute swelling of the entire joint

**Traumatic synovitis**

Any moderately severe injury (including a **torn or trapped meniscus** or a **torn cruciate ligament**) can precipitate a reactive synovitis, but typically the swelling appears only after several hours.

**Post-traumatic haemarthrosis**

Tense swelling **immediately after injury** means **blood** in the joint. The knee is painful and it feels warm, tense and tender. Movements are restricted. X-rays are essential to see if there is a **fracture**; if there is not, then suspect a **tear of the anterior cruciate ligament**.

**Non-traumatic haemarthrosis**

In patients with **clotting disorders**, the knee is a **common site for acute bleeds**. Bleeds can also occur from **tears to vascular lesions in the knee** (e.g. pigmented villonodular synovitis).
Acute septic arthritis

The joint is swollen, painful and inflamed; this may be accompanied with elevation of the white cell count, erythrocyte sedimentation rate (ESR) and C-reactive protein. Aspiration reveals pus in the joint, after microculture. The organism is usually Staphylococcus aureus, but in adults gonococcal infection is almost as common. Treatment consists of intravenous antibiotics and drainage of the joint.

Aseptic inflammatory arthritis

Acute swelling without a history of trauma or signs of infection
1- gout and pseudogout
2- rieters disease
2-Chronic swelling of the entire joint

#Non-infective arthritis
Osteoarthritis & rheumatoid arthritis

#Chronic infective arthritis
In TB

#Other synovial disorders

synovial chondromatosis (accumulation of loose bodies) and pigmented villonodular synovitis (PVNS) (synovial tumor)

##Treatment involves operative removal of pathological tissue
Swellings in front of the knee

Prepatellar bursitis
This fluctuant swelling is confined to the front of the patella and the joint itself is normal. It is an uninfected bursitis due to constant friction between skin and bone.

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

Treatment consists of firm bandaging, occasionally aspiration is needed. In chronic cases the lump is best excised.

Infrapatellar bursitis
The swelling is below the patella and superficial to the patellar ligament, being more distally placed than prepatellar bursitis. Treatment is similar to that for prepatellar bursitis.
Swellings at the back of the knee

# Semimembranosus bursa
The bursa between the semimembranosus and the medial head of gastrocnemius may become enlarged in children or adults. It presents usually as a painless lump behind the knee, slightly to the medial side of the midline.

# Popliteal ‘cyst’ (baker cyst)
Bulging of the posterior capsule and synovial herniation.
It is usually caused by rheumatoid or osteoarthritis.
‘cyst’ ruptures and the synovial contents spill into the muscle planes causing pain and swelling in the calf.
The swelling may diminish following aspiration and injection of hydrocortisone; to differentiate from DVT.

## Popliteal aneurysm
Swellings at the side of the joint

1- Calcification of the collateral ligament
2- Bony swellings
RUPTURES OF THE EXTENSOR APPARATUS

RUPTURE ABOVE THE PATELLA
RUPTURE BELOW THE PATELLA
OSGOOD–SCHLATTER DISEASE (‘APOPHYSITIS’ OF THE TIBIAL TUBERCLE)
TUBERCULOSIS