“Andromeda Chained to the Rock by the Nereids”. Oil on canvas, Theodore Chasseriau 1840
The Nereids, outraged at the boasting of the beauty of Andromeda by her mother Cassiopeia, are given permission by the god Poseidon to sacrifice Andromeda to the Kraken. And as if the sea monster wasn’t enough, as poor Andromeda struggles to free herself from her tormentors she only adds to her woes. As she twists violently, internally rotating her left femur on her ground-stabilized tibia, she puts herself at severe risk of a lateral patella dislocation of her knee!

**PATELLA DISLOCATION**

**Introduction**

Dislocation of the patella is a relatively common injury.

It is most commonly seen in adolescent females.

Reduction is usually easily attained in the ED.

Spontaneous reduction will often occur.

**Anatomy**

The patella is the largest sesamoid bone in the body, and is embedded within the complex of the quadriceps muscle superiorly and patellar tendon inferiorly.

**Mechanism**

The vast majority of patella dislocations show lateral displacement due to the natural line of pull of the quadriceps muscles.

Patella dislocations may be the result of:

1. A sudden forceful contraction of the quadriceps, in combination with sudden flexion of the knee while the femur medially rotates over the ground-stabilized tibia.

2. A direct medial blow to the patella with the knee in flexion, (less commonly).

The injury is more likely to occur in those with predisposing risk factors.

**Predisposing Factors:**

1. Females:

   Patella dislocations are most commonly seen in teenage or young adult females.

   Many cases are associated with sports injuries.
Females have a wider quadriceps angle which is the angle formed by a line drawn from the ASIS to central patella and a second line drawn from central patella to tibial tuberosity, (see below).

This wider quadriceps angle (or “Q” angle) means that there is a relatively greater lateral pull by the quadriceps muscle on the patella which in turn puts it a greater risk of lateral dislocation.

The quadriceps angle if greater in females than in males.

2. Previous dislocation:
   - Dislocation is more likely to occur in those who have had a previous dislocation.

3. Genetic predispositions resulting in a loss of static stability:
   Examples include:
   - Genu valgum.
   - This is an abnormally high riding patella in relation to the femur.
   - Lateral insertion of patellar ligament on the tibia
   - Hypoplastic lateral femoral condyle.
Lower extremity of right femur viewed from below, (Gray’s Anatomy, 1918). The more prominent flange of the lateral femoral condyle of the femur acts as a counter barrier to the natural pull of the quadriceps muscle complex, (which is greater in females).

**Complications**

1. Increased likelihood of recurrent dislocation.
2. Osteochondral damage to the patella or lateral femoral condylar articular surfaces with subsequent degenerative osteoarthritis.

**Clinical Features**

*Laterally displaced patella of right knee in young female patient.*

Dislocations of the patella usually present either with the dislocation or post a spontaneous reduction.

Dislocations will show:
Pain that is usually significant.

Deformity which is obvious. There is lateral displacement of the patella as demonstrated above.

If the patient presents following a spontaneous reduction:

- The injury may be suggested by the patient’s description of deformity prior to the reduction. *Note that patients will often call their injury, a “dislocated knee”. This is a very severe injury of the knee and is not at all the same thing as a dislocated patella!*
- There will usually be pain, swelling tenderness over the medial aspect of the patella.
- X-rays may show avulsion fragments from the medial aspect of the patella or lateral femoral condyle.
- The patella apprehension test may provide extra information.

*The patella apprehension test:*

This test involves applying a laterally directed force to the medial patella with the knee flexed at 30 degrees.

- In patients with a prior dislocation or subluxation, this will often provoke some degree of anxiety. Patients will often attempt to resist this test and may grab the examiner’s hand to prevent further pain and apprehension.
- For patients with no prior patellar dislocation, the apprehension test is tolerated well.

*Investigations*

The diagnosis is usually obvious clinically and reduction may be done without x-rays.

Pre-reduction X-rays may be done when the diagnosis is less obvious clinically.

X-rays should still be done, even post reduction to look for any associated fractures.

Standard knee views include:

- A-P
- Lateral
- “Skyline” patella views.

Note that the lateral side of the patella is the narrower section on the skylight view. The medial femoral condyle appears more prominent on this view; however this is merely an effect of the view taken. The lateral femoral condyle is in fact more anatomically prominent.

Subluxed patella of the right knee of a 25 year old female.
Lateral dislocation of the patella of the right knee.

**Management**

1. Analgesia as clinically indicated.

2. Reduction can usually be achieved in the ED.
   - Only light analgesia is usually necessary.
     
     In most cases the best option will be nitrous oxide or penthrane.
   - Reduction is best achieved with the knee *fully extended*.
   - Reduction (for lateral dislocations) is then achieved by firm pressure on the lateral aspect of the patella pushing it back toward the medial side.

3. Reduction may prove difficult due to:
   - Patient apprehension with consequent muscular resistance
If the patella has been dislocated for a prolonged period of time.

In these cases:

- Extra sedation may be required.
- A femoral nerve block may prove useful in difficult cases. 

4. Immobilization:

- First time patients can be discharged with a Zimmer splint and crutches.
- Patients with recurrent dislocation can be discharged with tubigrip and crutches.

Disposition

- Follow up physiotherapy should be arranged.
- In selected cases, referral to the orthopedic unit.

Surgical intervention may be considered in cases of:

- Recurrent dislocations.
- Those with predisposing anatomical abnormalities.

References


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