Chondral lesions associated with acute patellar dislocation

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Associated Injuries
- Osteochondral fracture of the lateral femoral condyle and/or patella
- Damage to articular surface of patella, resulting in chondromalacia patella
- Pediatric patellar avulsion fractures

Evaluation parameters
- AGING:
  - ACUTE (3 weeks)
  - CHRONIC
- LOCALIZATION:
  - WEIGHT-BEARING ZONE OF FEMORAL CONDYLES
  - TIBIAL (SUBPATELLAR)
  - PATELLA - TROCHLEAR GROOVE
- DEEPNESS:
  - SUPERFICIAL
  - PARTIAL
  - COMPLETE
  - OSTEOCHONDRAL
- SIZE:
  - SMALL < 1 cm
  - MEDIAL 1-3 cm
  - LARGE > 3 cm

Forces acting on patella
- Walking: 1/3 to 1/2 body weight
- Stair climbing: 3 times body weight
- Squatting: 7 times body weight

Anterior knee pain differential
- Patella:
  - Patellofemoral pain syndrome
  - Episodic patellar dislocation
  - Stress fracture
  - Symptomatic bipartite patella
  - Patellofemoral osteoarthritis
- Soft tissue:
  - Patella/quadriiceps tendinopathy
  - Prepatellar bursitis
  - Fat pad impingement
  - Synovial plica
  - Osgood-Schlatter/ Sinding-Larsen-Johansson syndrome
  - Iliotibial band syndrome
  - Pes anserinus bursitis

Articular cartilage injury
- History
  - Trauma
  - Mechanical symptoms may occur if loose body
- Physical examination
  - Effusion
  - Tenderness of involved structure
    - Femoral condyles
    - Patella
  - Patellar grind test (Zöllner)
Trochlear dysplasia
Impingement Trochlea – Patella

Cartilage damage!

Accurate diagnosis

Non Operative Treatment

- Non-operative treatment:
  - Toning exercises, stretching, bracing, taping
  - Reinforce VMO: open chain en isometrisch exercise
  - Stretching, Closed chain exercises by McConnel
  - Balance exercises
  - Ice, NSAID
  - Ultrasonic, iontophoresis, phonophoresis, nerve stimulation

Operative Treatments of Cartilage Lesions

- Joint lavage and debridement
- Abrasion arthroplasty and subchondral drilling

Tissue transplantation
  - Periosteal and perichondral resurfacing
  - Osteochondral (allo/auto)grafts

Cell transplantation
  - Transplantation of chondrocytes in suspension
  - Transplantation of cells in scaffolds

Microfractures - Patella
Open procedure with collagen I/III membrane

Shaving?
Mosaicplasty

Indications for ACI

- Symptomatic
- CHONDRAL or OSTEO-CHONDRAL (OCD) lesions
- Femoral or patellar articular surface
- 1 to 16 cm²
- Opposing surface undamaged

Results 1ST Generation ACI

- 1994: 87% good/excellent result in FC and 28% in patella
- 5-11 year follow-up
  - 89% in FC
  - 76% in patella
  - 81% in FC + ACL
- OCD: 91% g/e result

Is there room for improvement?
M.A.C.I

- After biopsy cells are expanded on a collagen I/III scaffold in vitro
- Subsequently implanted into the cartilage defect over mini arthrotomy
- Fixation is made with fibrin glue

HYALOGRAFT® C in the treatment of knee cartilage defects:
3-year follow-up results of a multicenter Italian study

Patient Population

Centers: 11

Patients included: 192

With a follow-up ≥ 24 months: 141
With a follow-up < 24 months: 41
Failures*: 10

* defined as cases requiring a reoperation to remove the implant or reimplant it or a procedure that violates the subchondral bone to treat the defect (Peterson, 2000)

Baseline Characteristics

Sex

- Male 65.1%
- Female 34.9%

Lesion type

- Single 75.5%
- Multiple 24.5%

Mean age

37.6 ± 12.7 Year

Total surface area implanted

Mean: 3.5 ± 2.7 cm²
Max: 19 cm²

Baseline Characteristics

235 defects treated in 192 patients
1.2 defects/patient

Localization

Pfenal Condyle 75.7%
Tibial plateau 7.7%
Patella 7.7%
Thermal 9.5%

Baseline IKDC:
lesion type/localization

Subjective IKDC:

<table>
<thead>
<tr>
<th>Localization</th>
<th>Base</th>
<th>Follow-up</th>
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</thead>
<tbody>
<tr>
<td>Femoral Condyle</td>
<td>76.3</td>
<td>76.7</td>
</tr>
<tr>
<td>Multiple</td>
<td>76.7</td>
<td>47.4</td>
</tr>
<tr>
<td>Patella</td>
<td>4X: 13.2 %</td>
<td>4X: 48.8 %</td>
</tr>
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CONCLUSIONS

- Always exclude associated lesion / abnormalities.
- Correct diagnosis.
- Do NOT be to aggressive!

GENERAL CONCLUSIONS

- Cells are here to stay!
- … but cells need a scaffold.
- Biomimetic scaffolds avoid the use of cells.
- Allogenic chondrocytes is an option for the future!
- PFJ – always normalize primary factors!

Thank You