


Osteochondral fixation: how I do it



Prof Dr med Jacques Menetrey
 Centre de médecine de l'appareil locomoteur et du sport
 Swiss Olympic medical Center
 Unité d'Orthopédie et Traumatologie du Sport (UOTS)
 Service de chirurgie orthopédique et traumatologie de l'appareil moteur
 University Hospital of Geneva,
 Geneva Switzerland

HUG Hôpitaux Universitaires de Genève ESKA UNIVERSITÉ DE GENÈVE FACULTÉ DE MÉDECINE

Outline

- Management
 - Do we have to fix it ?
 - How to assess the stability ?
 - Imaging?
 - How to address osteochondral defect?
- Post-operative program

OCD history


Long-term results after operative treatment of osteochondritis dissecans of the knee joint—30 year results
 J. W. P. Michael · A. Warth · P. Eysel · D. P. Klotz

- n= 30 / 118
- Most of time retrieval of the fragment
- Clinical - radiological examination
- FU: 30 years
- 92% rate of OA in the operated knee

Michael et al Int Orthop 2008

Subchondral bone analysis

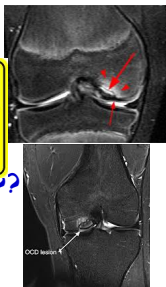
- Arthro-ct
- MRI
 - T2-weighted fat sat



Menetrey et al
 Knee Surg Sports Traumatol Arthrosc 2010

Subchondral bone analysis

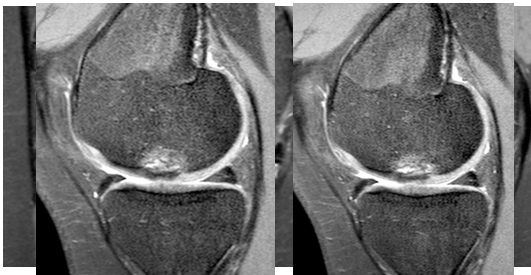
- Size
- Location
- Cartilage surface
- Surrounding bone
- Stability of the fragment??



CAUTION

Knee MRI Magnetic Field! Electromagnetic forces may cause doctor to lose common sense!

Stability?



ROLE OF THE SUBCHONDRAL BONE IN ARTICULAR SURFACE LESIONS

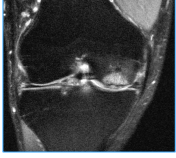
Pathological aspect
Primarily or secondarily involved

- ✓ OCD
- ✓ Trauma
- ✓ Osteonecrosis
- ✓ Chondral defects?

Prognostic sign
Before or after surgical treatment

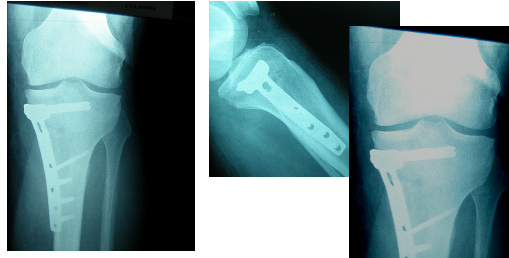
↓

**OSTEO-CHONDRAL
FIXATION OR
RECONSTRUCTION I**



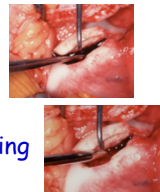
Malalignment - HTO

■ Male, 36 y., bowling, OCD of MFC + varus




OCD fixation

- Principles:
 - Biologically competent subchondral bone
 - Debridement
 - Microfracturing
 - Cancellous bone grafting

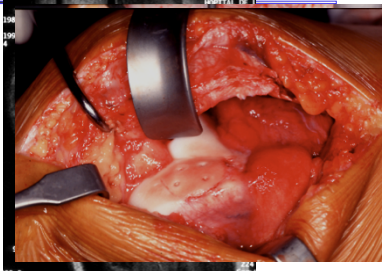


OCD fixation

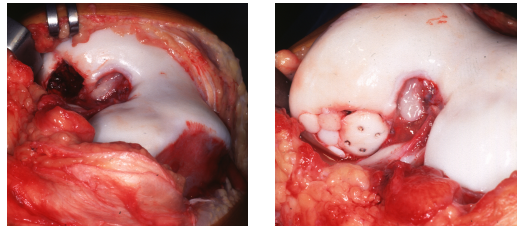
- Principles:
 - Anatomical reduction
 - Shaping of the fragment
 - Stable fixation
 - Rigid - compression



Cartilage original = gold standard

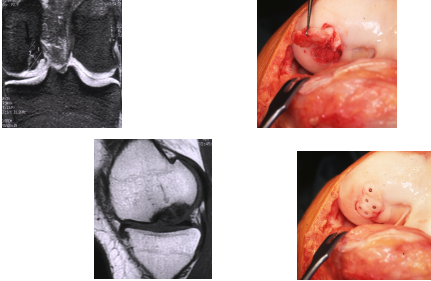


Basketball player, 20 years, OCD Grade IV, medial femoral condyle

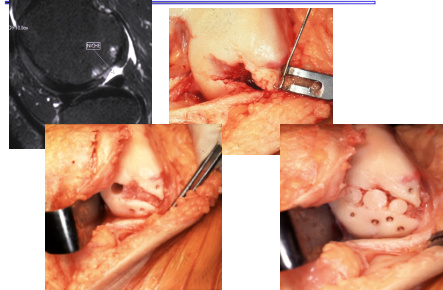


OCD

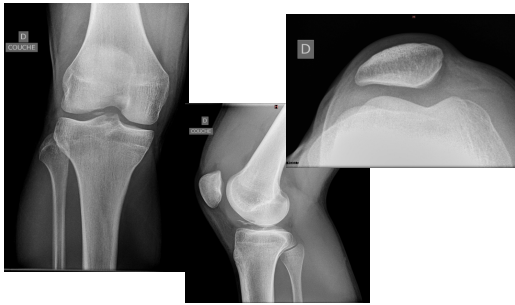
Female, 21 years old, tennis player, pain after 30' in the game



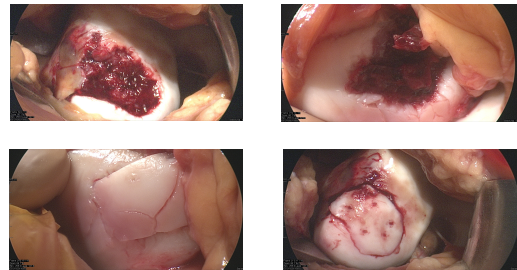
Preserve the cartilage



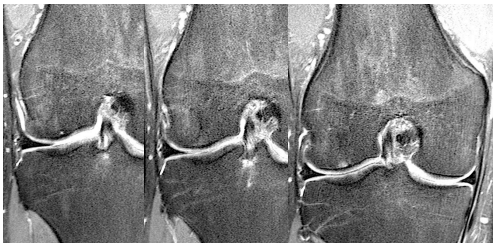
Osteochondral fracture R. B. 1996



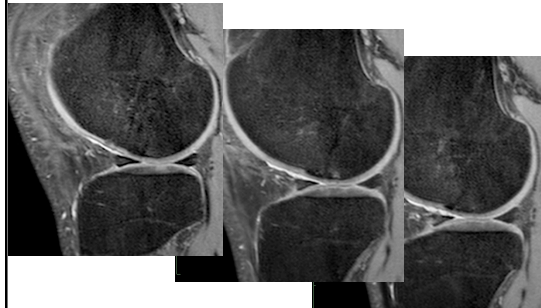
Osteochondral fracture R. B. 1996



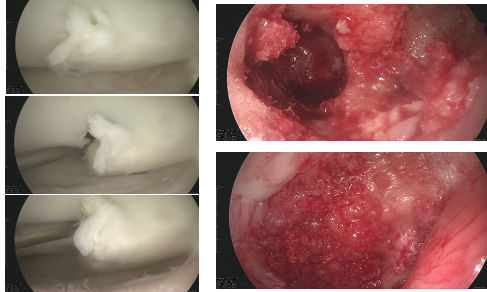
R. B. 1996, 12 months later



R. B. 1996, 12 months later



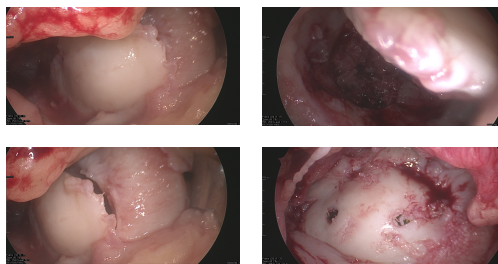
Mr R. D. Pro soccer player 1990



Mr R. D. Pro soccer player 1990

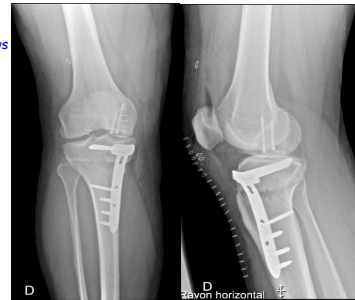


Mr M. 36 years old, MFC OCD in varus knee

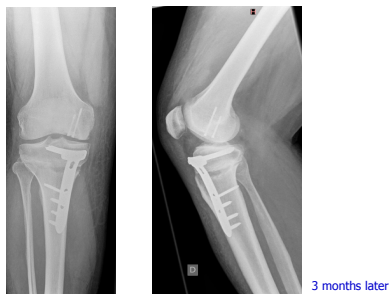


Mr M. 36 years old

- Autologous bone graft
- Fixation by 2 HCS screws
- Biplanar HTO
- Tomofix system

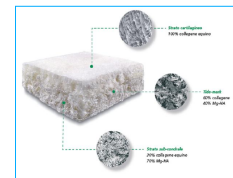


Mr M. 36 years old

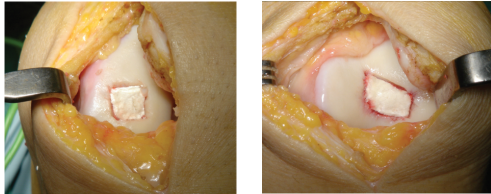


Multi-layered scaffolds

- Gradient biomimetic scaffold
- HA NanoCrystals
- Type I Collagen Fibrils



In patients

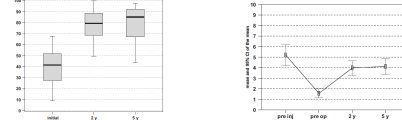


Clinical Results and MRI Evolution of a Nano-Composite Multilayered Biomaterial for Osteochondral Regeneration at 5 Years

Elisaveta Kon,¹ MD, Giuseppe Filardo,¹ MD, Alessandro Di Martino,¹ MD, Maurizio Baccarelli,¹ MD, Antonio Miceli,¹ MD, Francesco Puddari,¹ MD, and Maurizio Marcacci,¹ MD
Investigation performed at the Royal Orthopaedic Institute, Bologna, Italy

Kon et al *Am J Sports Med* 2013

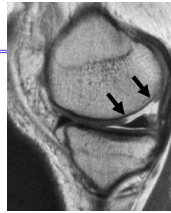
- n=27 patients
- FU: 5 years
- IKDC score - MOCART (Magnetic Resonance Observation of Cartilage Repair Tissue)
- Significant clinical improvement
- Complete filling and incorporation in 79%
- Repair tissue surface was intact in 61%



Post-op rehab

Principles:

- Program "à la carte"
 - Profile of the patient
 - Size of the lesion
 - Position
 - Quality of the fixation
 - State of the adjacent cartilage
 - Associated procedures (cartilage-wise)



Load management

- Protection of the injured or repaired site
- Maintain stimulation of the cartilage
- Should be adapted to the period of healing
- Should be constantly adjusted

Joint motion

- CPM: continuous passive motion
 - Limited to the safe zone
 - Nutrition of the cartilage
 - Stimulation of the biological process
 - Initially passive, then active

Strengthening (>6 weeks)

- ROM: "In the safe zone"
- Isometric
- Close chain concentric, eccentric
- ATTENTION !!!
 - Open chain: shearing forces!
 - Pliometry

Proprioceptive ttr

- A “Must”
- Can rapidly begin in water
- Close chain training
- Adapted to every situation and patient
- “Core stability”

Outcomes

Does Operative Fixation of an Osteochondritis Dissecans Loose Body Result in Healing and Long-Term Maintenance of Knee Function?

Robert A. Magnusen, MD, James L. Carey, MD, and Kurt P. Spindler, MD
From the Vanderbilt Orthopaedic Institute, Nashville, Tennessee

- n=12
- FU 9 years
- ORIF fixation of OCDs

Conclusion: Operative fixation of grade IV OCD loose bodies results in stable fixation. At an average 9 years after surgery, patients did not have symptoms of osteoarthritis pain and had normal function in activities of daily life. However, patients reported significantly lower knee-related quality of life. Operative fixation of OCD loose bodies is a better alternative to lesion excision.

Magnussen et al Am J Sports Med 2009

In summary

- Site, size, depth, adjacent cartilage
- Patient expectation
- Alignment
- Integrity of menisci
- Preserve the native cartilage
- Solid et stable fixation
- High standard rehabilitation
- MRI assessment at one year for RTP



Post-op rehabilitation

- Good outcomes:
 - “Good nature” of the patient
 - Quality of the rehab program
 - High standard rehab program
 - Compliance to the rehab program
 - Motivation
 - Patience
 - Risk management

Return to sports

Return to Sports Participation After Articular Cartilage Repair in the Knee

Scientific Evidence

- n=1363
- Overall 73% return to sports
- Time to return: 7 to 18 months
- Continued sport participation at the pre-injury level: 65%
- Factors:
 - Athlete's age
 - Preoperative duration of the symptoms
 - Level of play
 - Lesion size
 - Repair tissue morphology

van Marrewijk W, van Veenendaal FL, Meijer G, Steyer Jaarsma H, van der Wal AC, van der Wal AC, et al. (2008) Return to Sports Participation After Articular Cartilage Repair: A Systematic Review of the Literature. *Journal of Orthopaedic Trauma*, 22(10): e1-e11. doi:10.1097/BOT.0b013e31817b0001

The American Journal of Sports Medicine, Vol. 37, Supplement 1
DOI: 10.1177/0898010109351800
© 2009 The Author(s)

Epidemiology

- 192/1'000'000 upon 2007-2011
- Peak incidence: age 12-19 years (11.2/100'000)
- 3.3-fold increase risk of OCD 12-19 y old
- 3.8 times greater risk of OCD in male
- Black has a higher odds ratio

Kessler et al *Am J Sports Med* 2013

Mark your calendar



AMSTERDAM / THE NETHERLANDS

16th ESSKA Congress
May 14-17, 2014
CALL FOR ABSTRACTS

