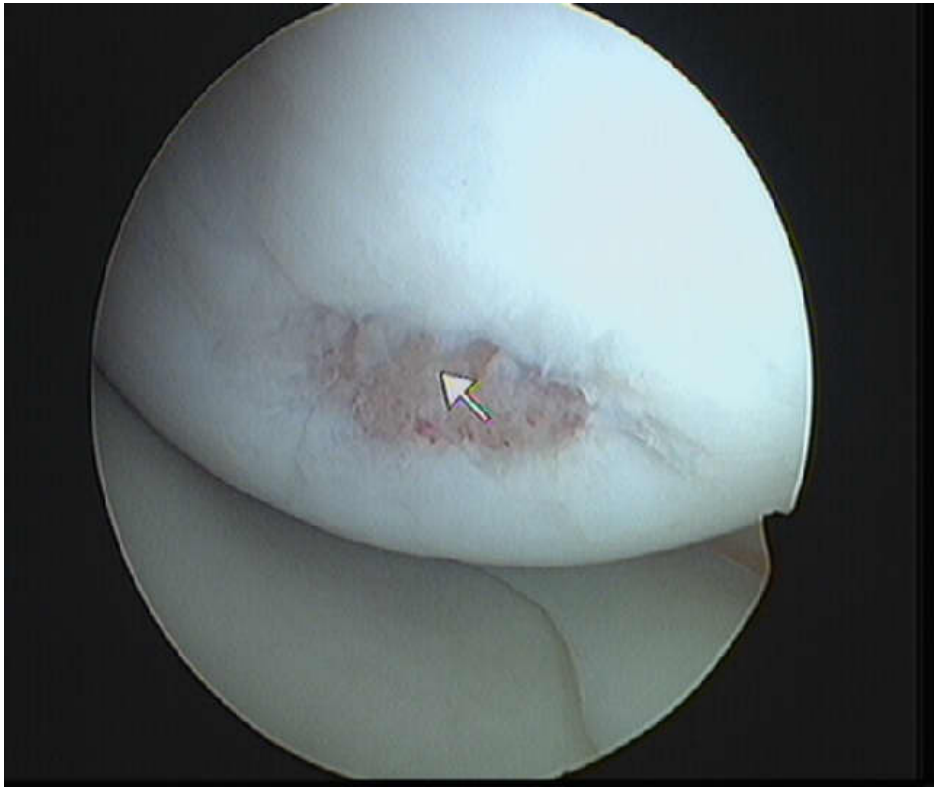
The focal cartilage lesion
Aethiology and symptoms

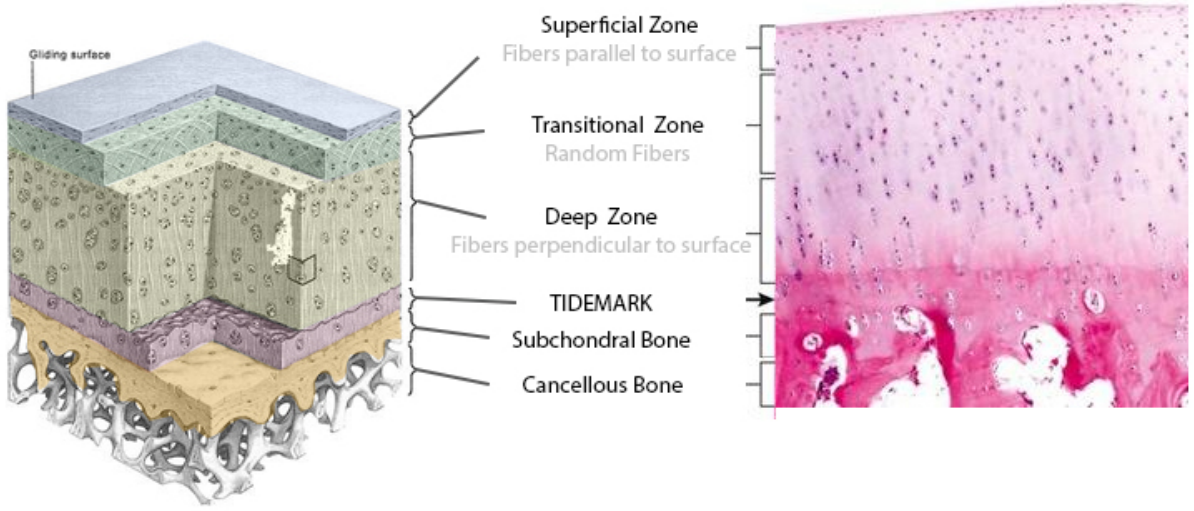


Focal cartilage lesion aethiology

- **Trauma**
  - **Superficial**
  - **Full thickness**
  - **osteochondral**
- **Blunt trauma (Impaction)**
- **Non traumatic**
  - **Altered biomechanical conditions**
    - **Meniscus/ligament lesions**

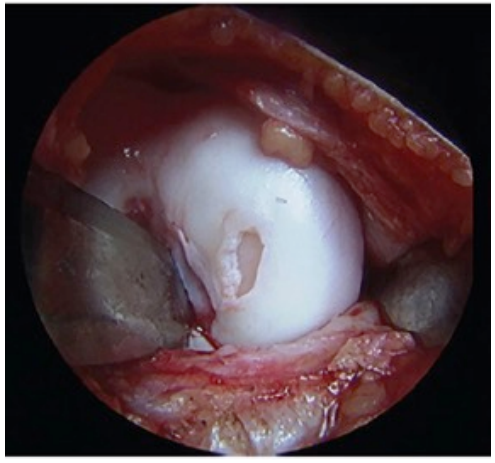
Superficial cartilage lesion

- **Superfial zone protects againt shear forces**
- **Structure**
- **Process**
  - **Collagen fibrillation**
  - **Decrease in proteoglycans**
  - **Increased tissue permability**
  - **Decrease load absorbance**

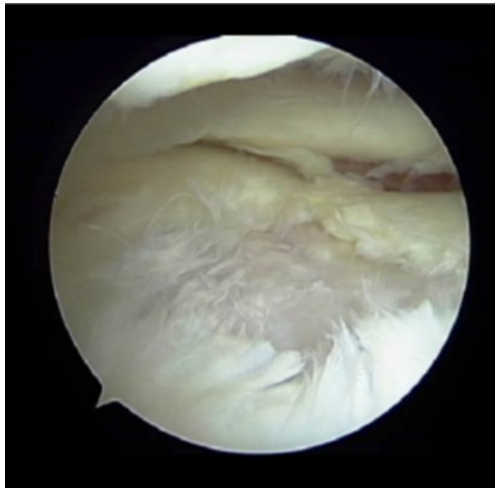


Full thickness lesion (ICRS grade IV)

- **Can be acute**

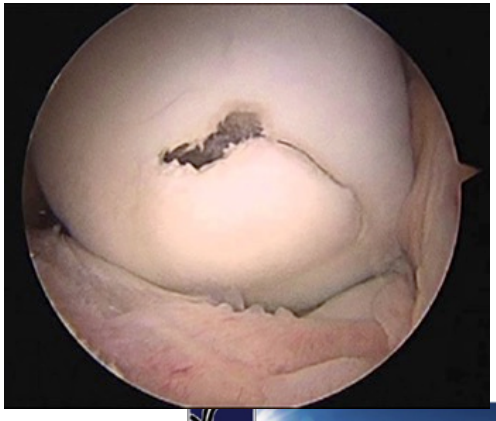


- **Secondary to instability or**
- **meniscus deficiency**



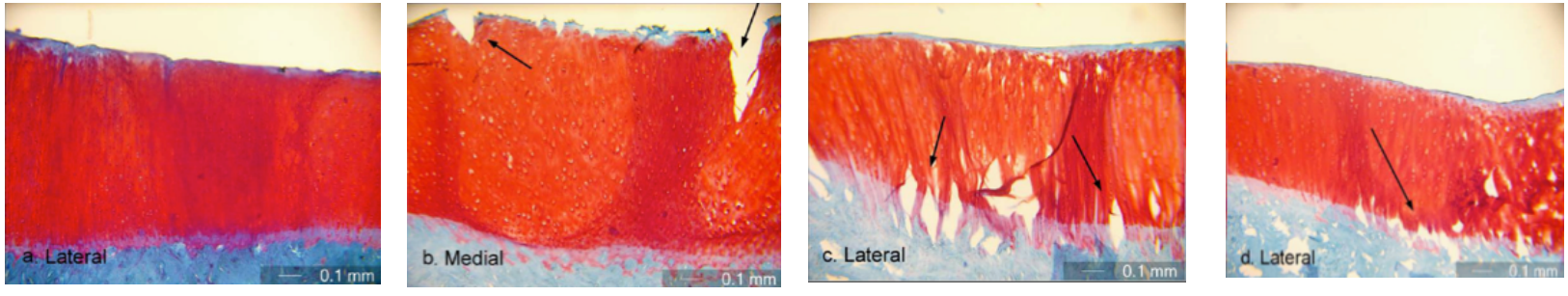
Osteochondral lesion

- **Traumatic**
  - **Combined impact and shear mechanism**
- **Patella dislocation**
  - **Osteochondral fracture**
- **Osteochondritis dissicans**



Blunt cartilage lesion

- **Impact affect both subchondral bone layer and collagen fibers**
- **Process**
  - **Subchondral thickening**
  - **Cell loss (apoptosis)**
  - **Decrease load absorbance**



Control | Post trauma | 6 months | 1 year

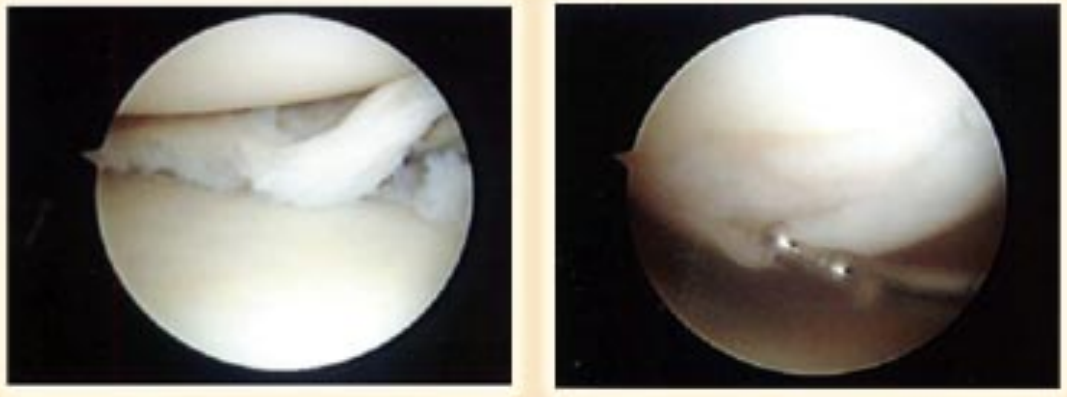
Biomechanical cause of local increase cartilage biomechanical load

- **Meniscus pathology**
  - **Meniscus lesion**
  - **Partial menisectomy**
  - **Meniscus root lesions**
- **Ligament laxity**
  - **Cruciate ligament injury**
  - **Collateral ligament injury**

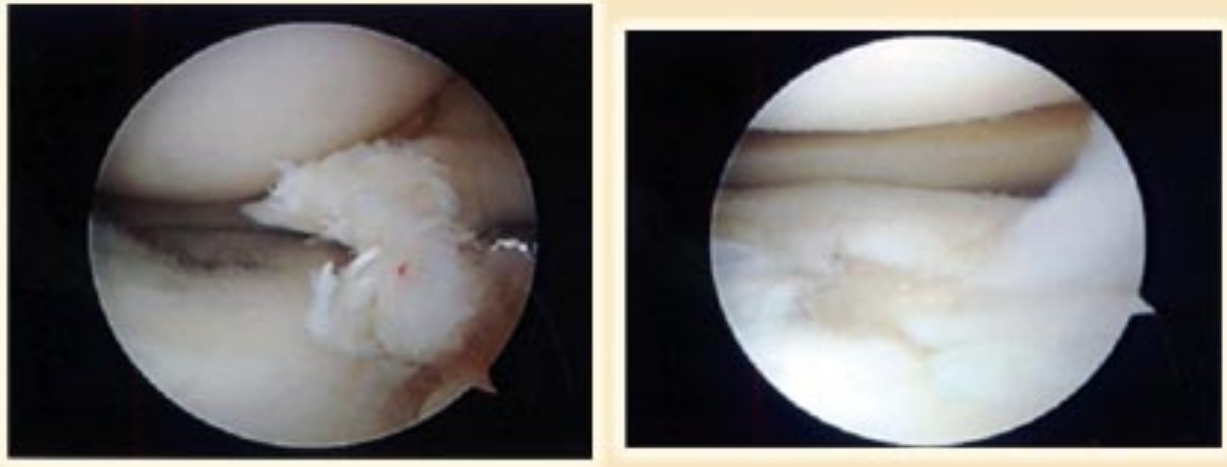
Meniscus lesion

- **bil**

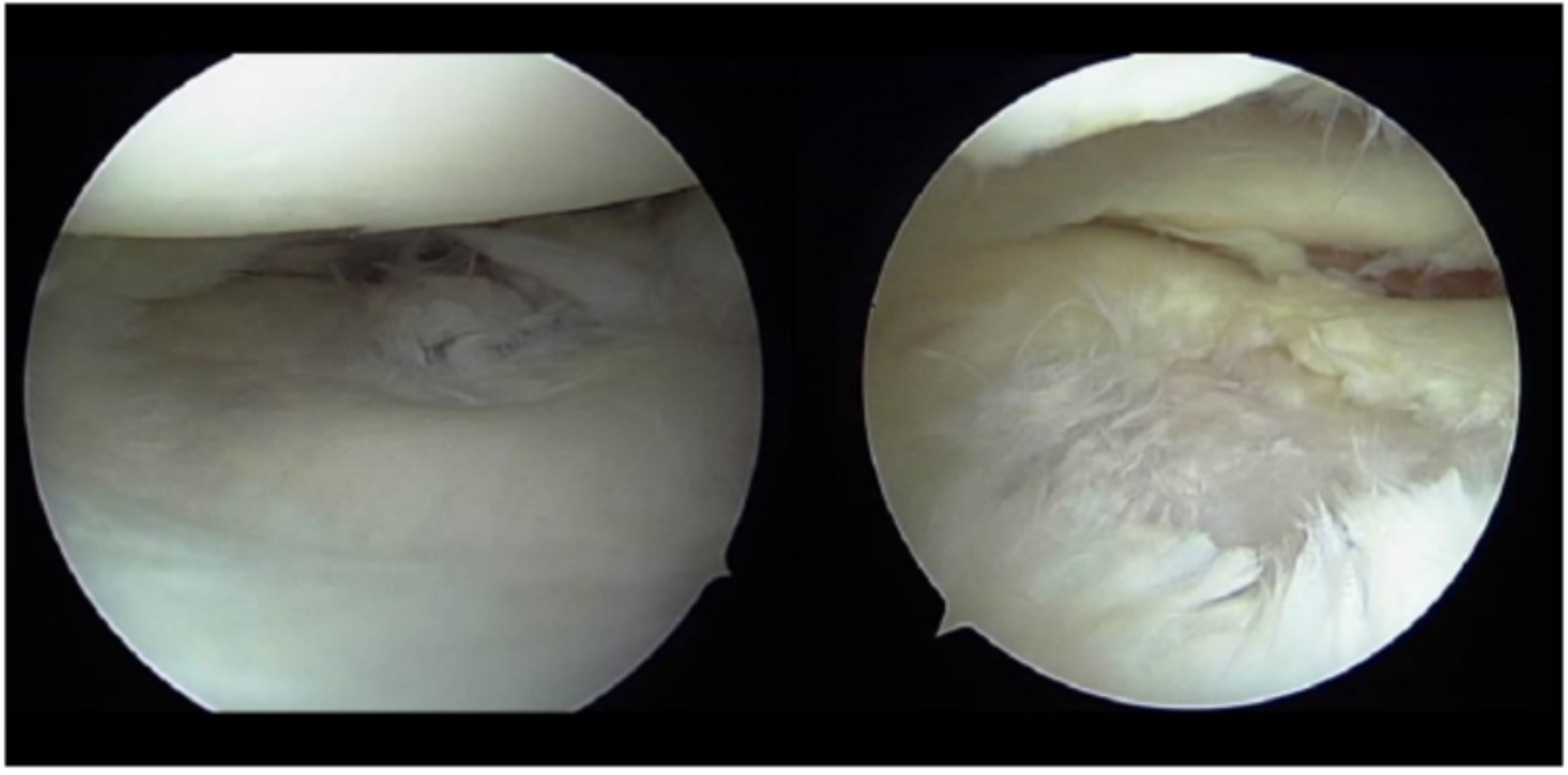
Tear of Posterior Horn of Medial Meniscus Causing Cartilage Wear in Medial Femoral Condyle



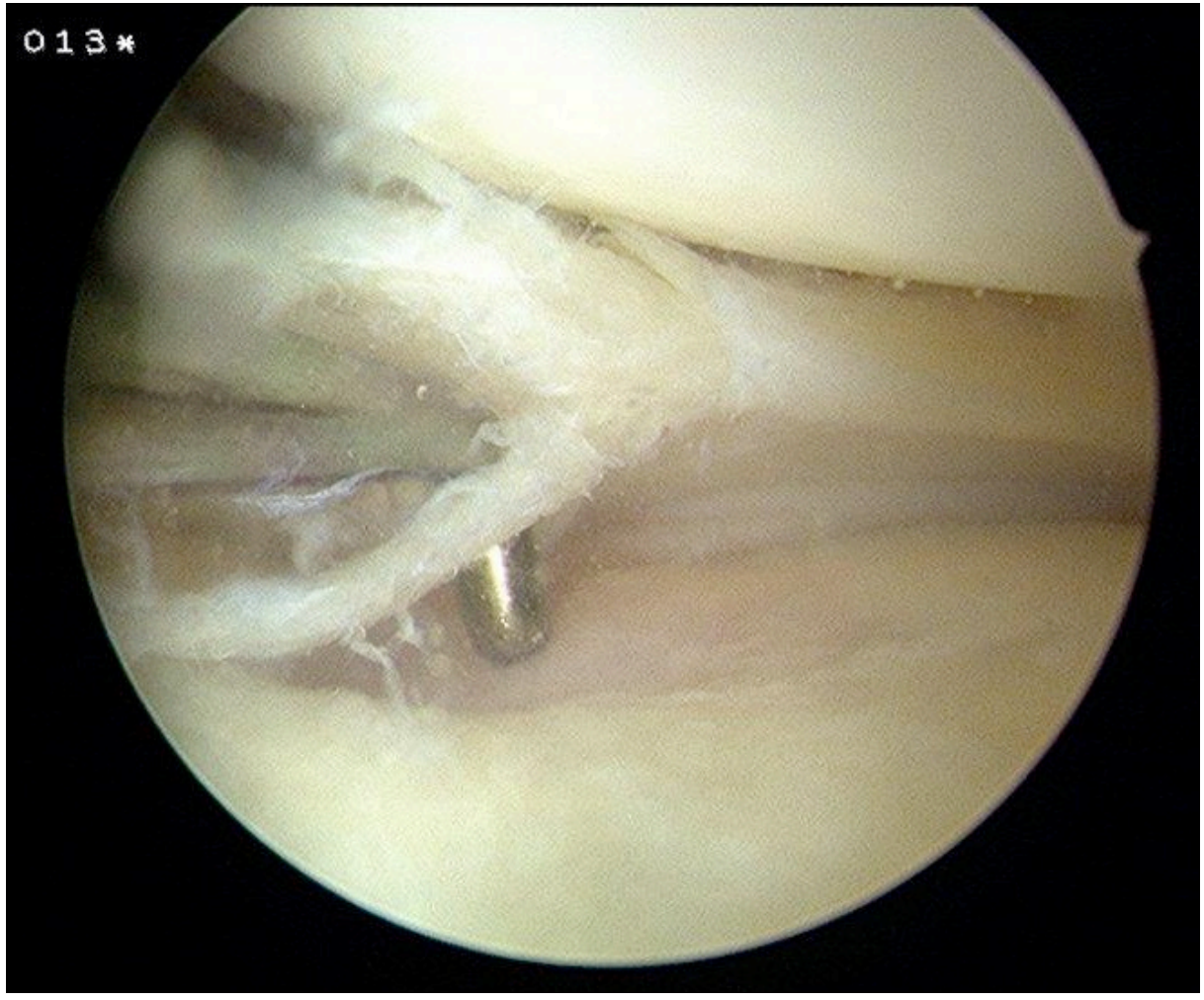
Torn Lateral Meniscus Tear Leading to Lateral Tibial Plateau Cartilage Ulcer



Meniscus resection



Meniscus root lesion

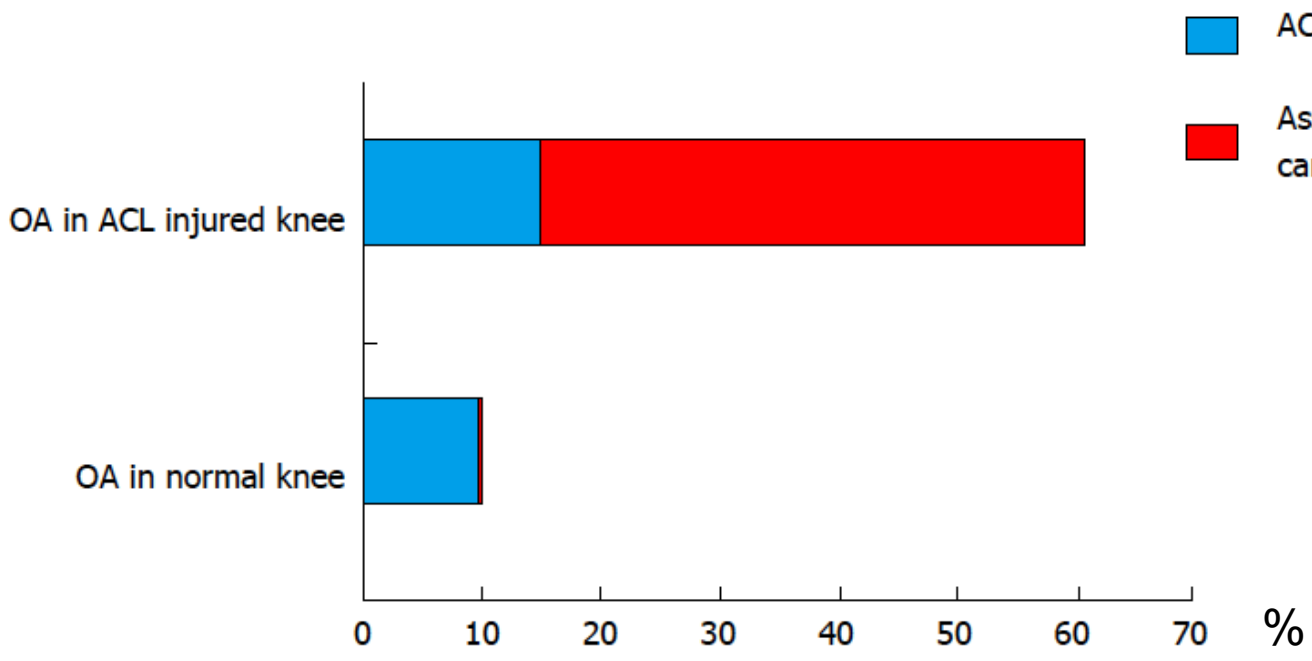


ACL lesion and cartilage injury

OA changes 20 year after injury

World Journal of Orthopedics
Submit a Manuscript: http://www.wjgnet.com/esps/ World J Orthop 2017 March 18; 8(3): 212-217
DOI: 10.5312/wjo.v8.i3.212 ISSN 2218-5836 (online)
EDITORIAL

Anterior cruciate ligament reconstruction and knee osteoarthritis



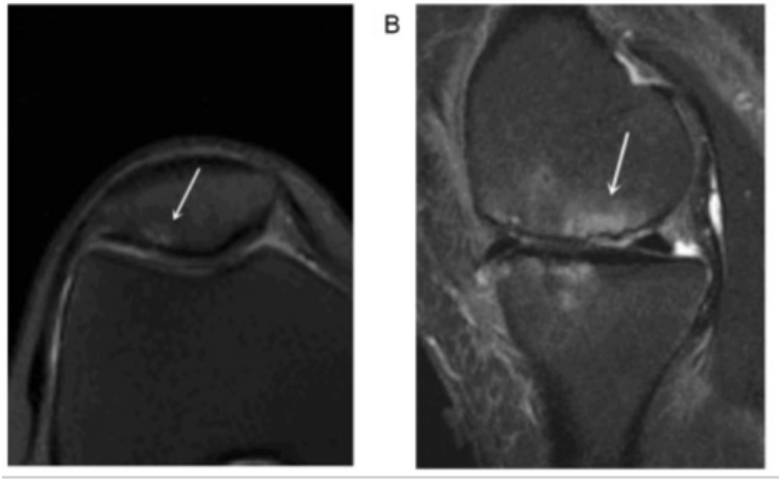
Symptom aethiology (Pain)
Subchondral changes

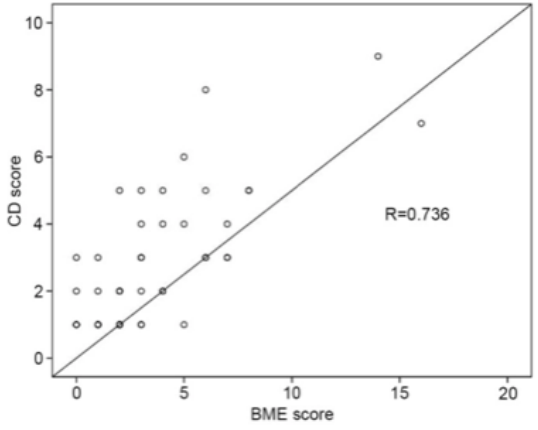
EXPERIMENTAL AND THERAPEUTIC MEDICINE
SPANDIDOS PUBLICATIONS

Exp Ther Med. 2017 May; 13(5): 2079–2084. PMCID: PMC5443282
Published online 2017 Mar 7. doi: 10.3892/etm.2017.4190

Severity and distribution of cartilage damage and bone marrow edema in the patellofemoral and tibiofemoral joints in knee osteoarthritis determined by MRI

Baoming Dong,[1] Yanliang Kong,[2] Lei Zhang,[3] and Yongqian Qiang[1]





Correlation between cartilage lesion size and bone edema

Poor correlation between boen edema and pain level

Prevalence of cartilage lesions relevant for repair treatment

- **A single, well-defined ICRS grade III or IV defect with an area of at least 1 cm(2)**

- **< 40 years: 5.3%**
- **< 50years: 7.1%**

- **of all arthroscopies.**

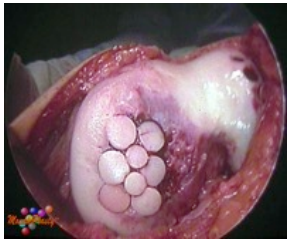
- **Hjelle K et al. Arthroscopy. 2002 Sep;18(7):730-4. Articular cartilage defects in 1,000 knee arthroscopies.**

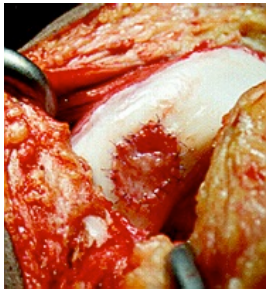
Indications for cartilage repair
The ideal patient

- **Severe pain resistant to well-conducted exercise and medical treatment.**
- **The lesion must be deep (ICRS grade 3 or 4) on a single surface, and kissing lesions should not be treated surgically.**
- **The lesion's size must greater than 1.0 cm2,**
- **The knee must be stable, with a favorable axis**
- **No morbid obesity (BMI < 30).**

Current surgical cartilage lesion treatment options in the knee

- **Debridement ?**
- **Marrow stimulation**
- **Osteochondral transplantation**
- **Autologous chondrocyte implantation**
- **Allogenic cartilage transplantation**





Cartilage repair modalities “History”

Pridie drilling

Abrasion arthroplasty

Autologous Chondrocyte Implantation (ACI)

Microfracture

Enhanced microfracture

Particulated Juvenile Allogenous Cartilage

Bone marrow cell repair

1959

1986

1989

1994

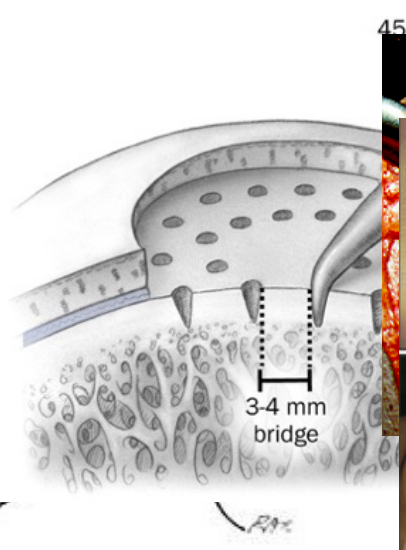
1997

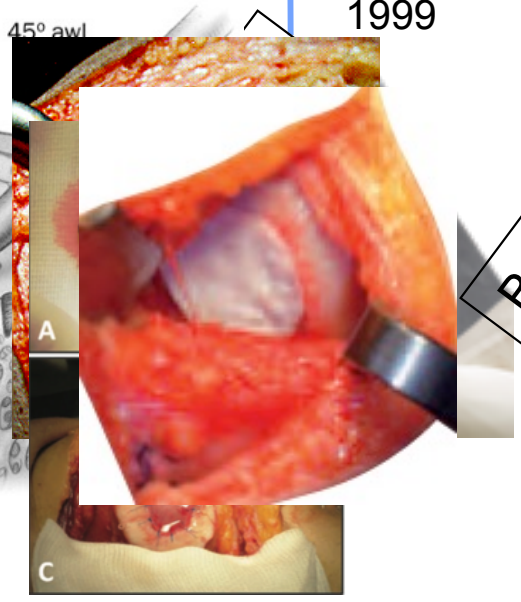
1999

1999

2011

2011





Placebo effect in cartilage injury patients

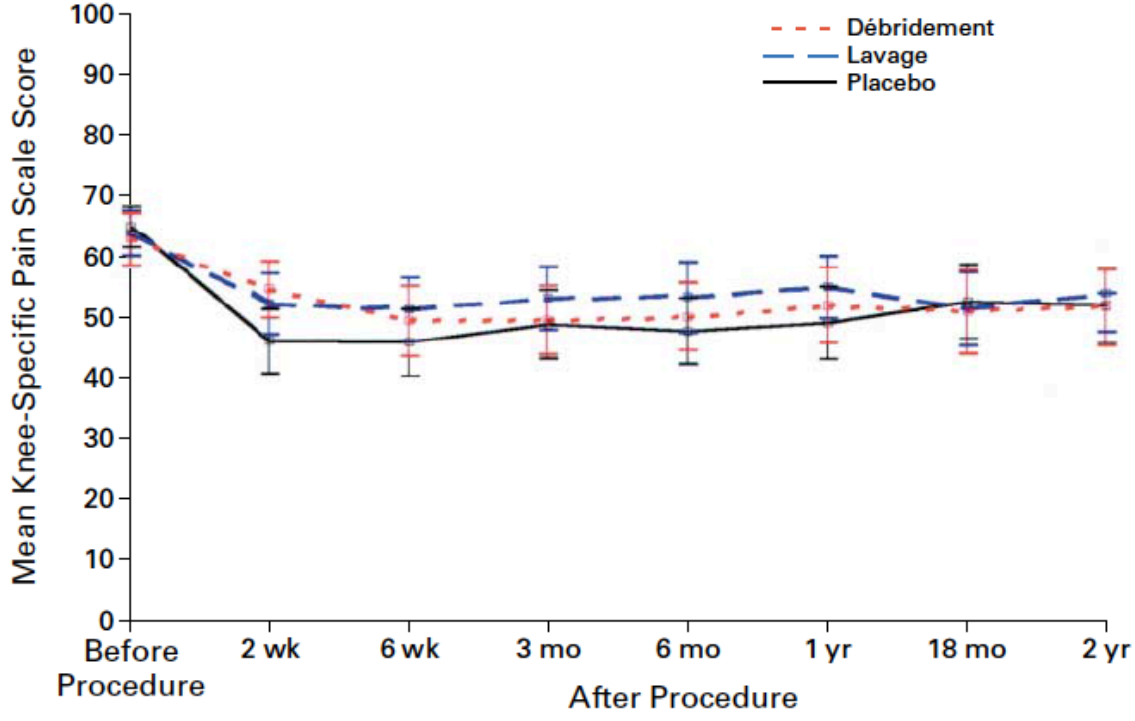
- **Mosely study (2002)**

The New England
Journal of Medicine

VOLUME 347 JULY 11, 2002 NUMBER 2

A CONTROLLED TRIAL OF ARTHROSCOPIC SURGERY
FOR OSTEOARTHRITIS OF THE KNEE

J. Bruce Moseley, M.D., Kimberly O'Malley, Ph.D., Nancy J. Petersen, Ph.D., Terri J. Menke, Ph.D., Baruch A. Brody, Ph.D., David H. Kuykendall, Ph.D., John C. Hollingsworth, Dr.P.H., Carol M. Ashton, M.D., M.P.H., and Nelda P. Wray, M.D., M.P.H.



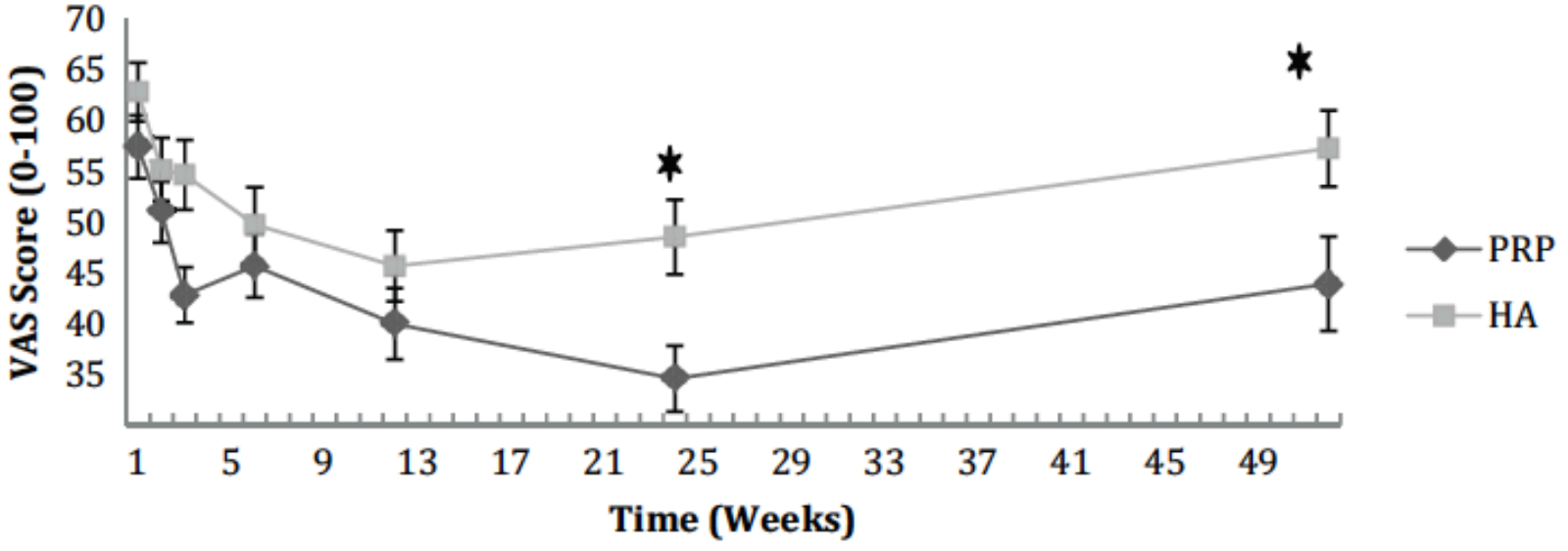
Placebo effect of in cartilage injury patients

- **PRP/HA treatment**

Hyaluronic Acid Versus Platelet-Rich Plasma

A Prospective, Double-Blind Randomized Controlled Trial Comparing Clinical Outcomes and Effects on Intra-articular Biology for the Treatment of Knee Osteoarthritis

Brian J. Cole,*†‡§‖¶ MD, MBA, Vasili Karas,# MD, MS, Kristen Hussey,† MS, David B. Merkow,† BA, Kyle Pilz,†¶ MMS, PA-C, and Lisa A. Fortier,** DVM, PhD, DACVS
Investigation performed at the Rush University Medical Center, Chicago, Illinois, USA



Placebo effect of in cartilage injury patients

- **Microfrakture/ACI**

A Randomized Trial Comparing Autologous Chondrocyte Implantation with Microfracture

Findings at Five Years

By Gunnar Knutsen, MD, Jon Olav Drogset, MD, PhD, Lars Engebretsen, MD, PhD, Torbjørn Grøntvedt, MD, PhD, Vidar Isaksen, MD, Tom C. Ludvigsen, MD, Sally Roberts, PhD, Eirik Solheim, MD, PhD, Torbjørn Strand, MD, and Oddmund Johansen, MD, PhD

JBJS 2010

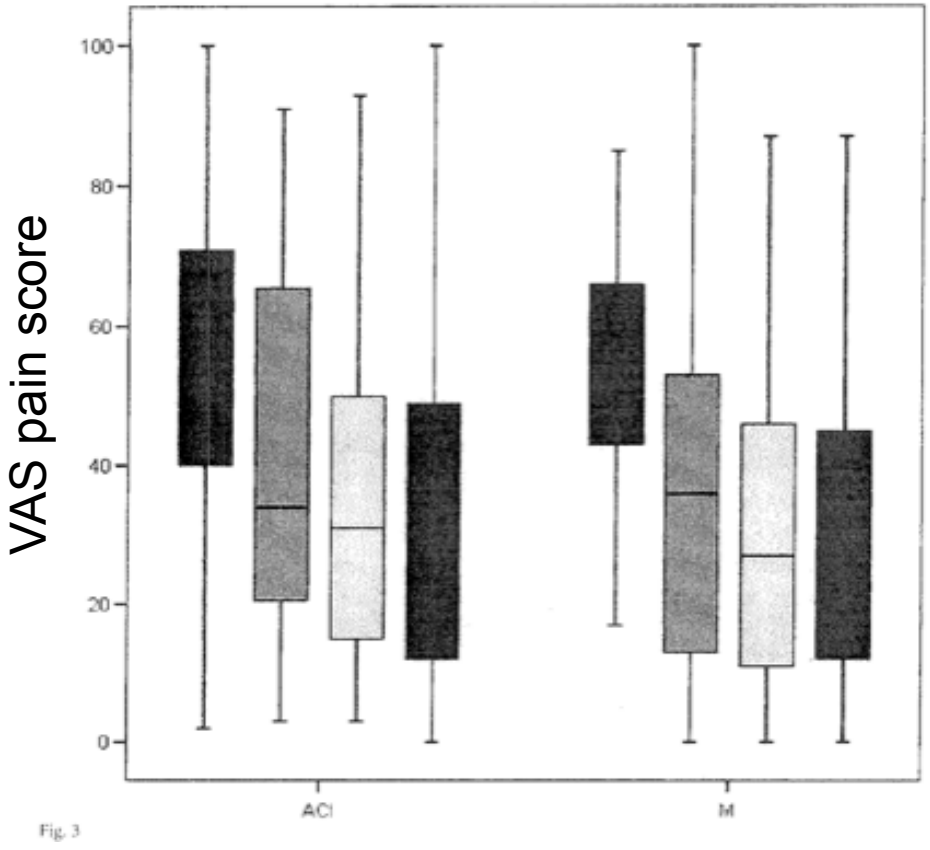


Fig. 3

ACI Microfracture

Today we will hear more on

- **Mesenchymal stem cell cartilage repair**
- **Auto/allo osteochondral transplantations**
- **Scaffold enhanced cartilage repair**
- **The need for cells in cartilage repair**

- **Limitation in age and degenerative states for cartilage repair outcome**

- **Treatment algoritm**