Arthroscopic Treatment of Osteoarthritis

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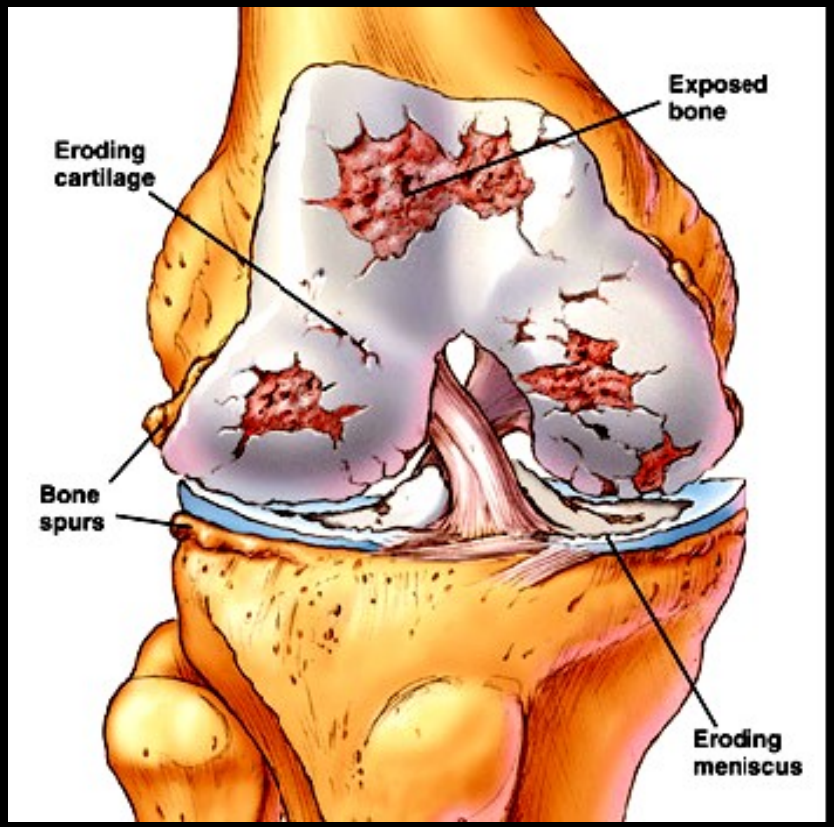
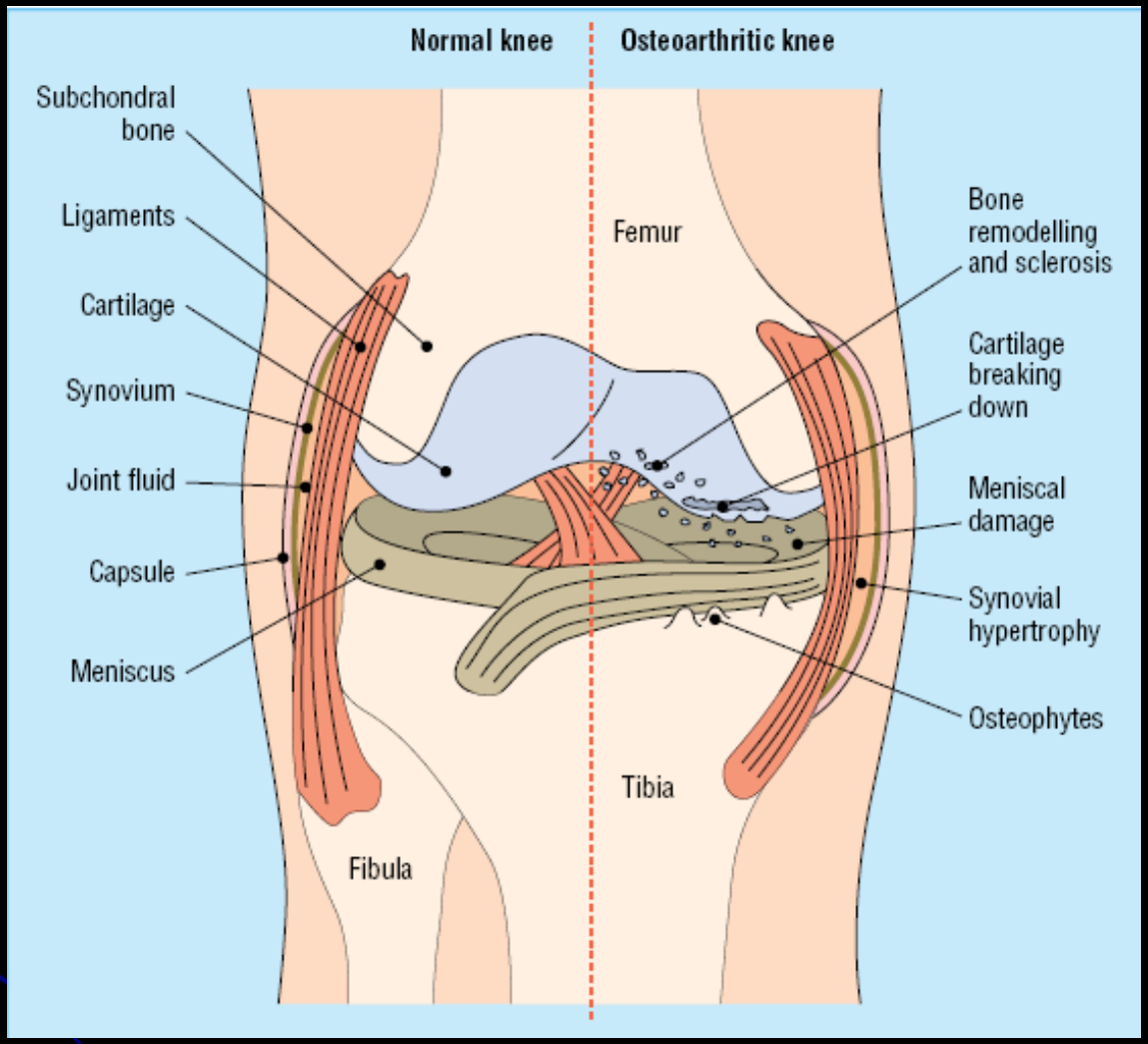
Osteoarthritis

A condition of synovial joints characterised by focal cartilage loss and an accompanying reparative bone response.





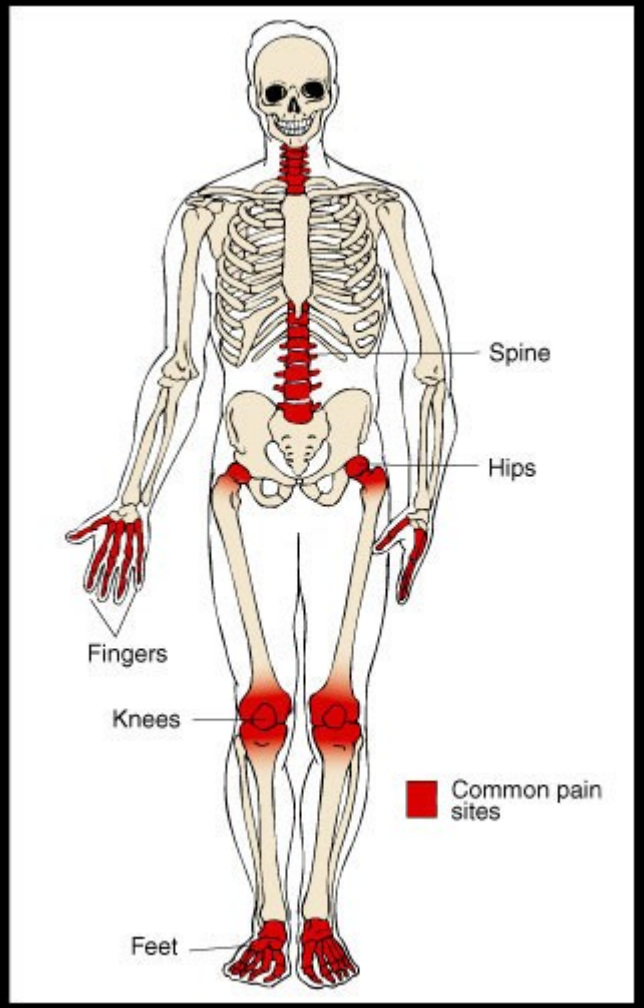
OA is not just a disease of cartilage.

It is also associated with synovitis, subchondral bone and bone marrow lesions.

Osteoarthritis is the most widespread joint disease and the greatest source of disability among elderly individuals.

Osteoarthritis

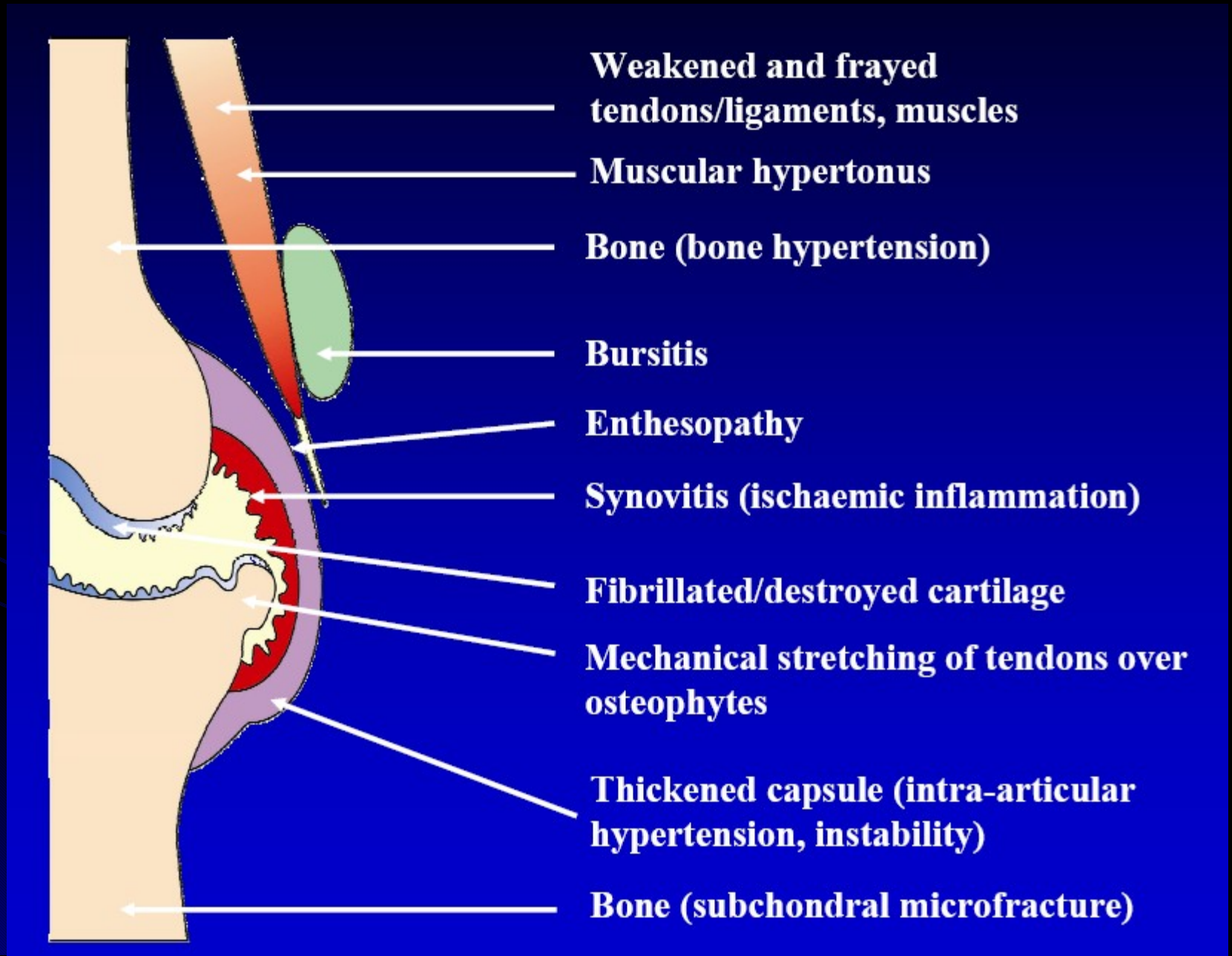
- ✓ Strongly age related
- ✓ Pronounced *female* preponderance for severe radiographic grades of OA, OA of the hand and knee, and symptoms



The most commonly affected joint is the knee.

Approximately 11% of people >64 years have symptomatic knee OA.

Mechanism of Pain in Osteoarthritis



Goals of OA management

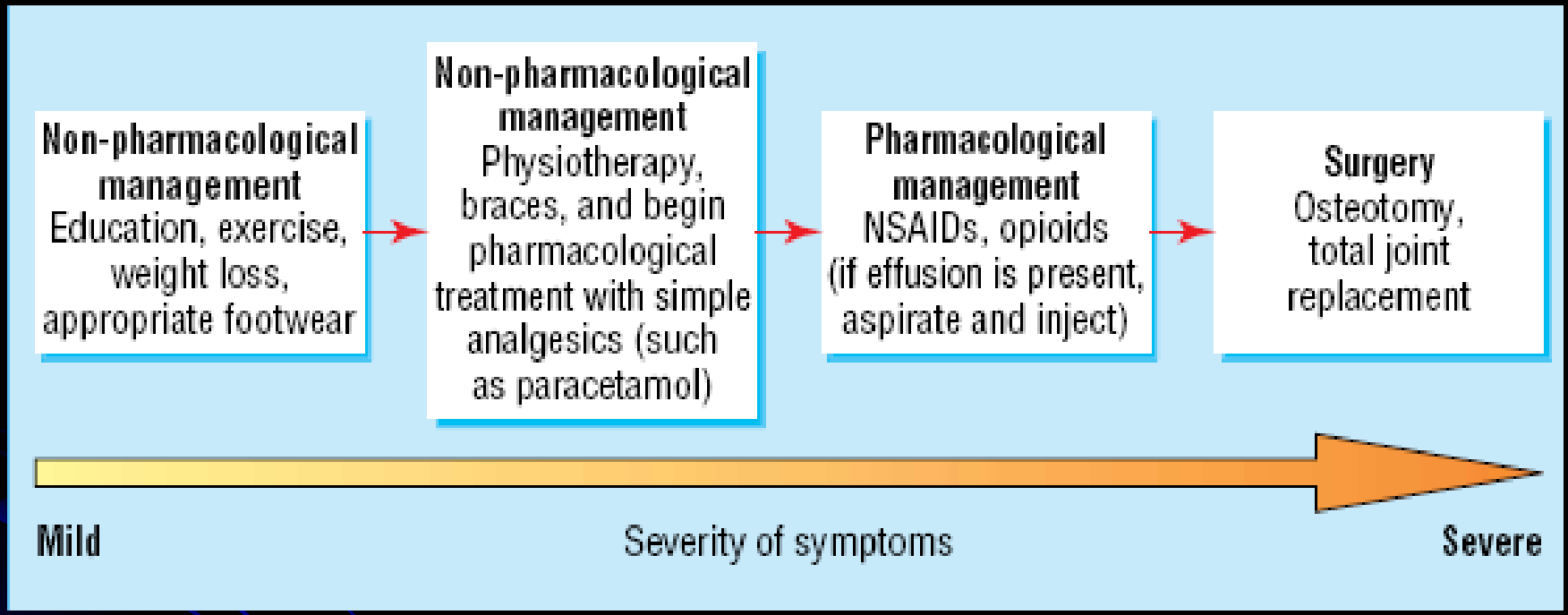
a) Educate the patient about OA and its management

b) Alleviate pain

c) Improve function and decrease disability

d) Prevent or retard progression of the disease and consequences

Treatment of Osteoarthritis



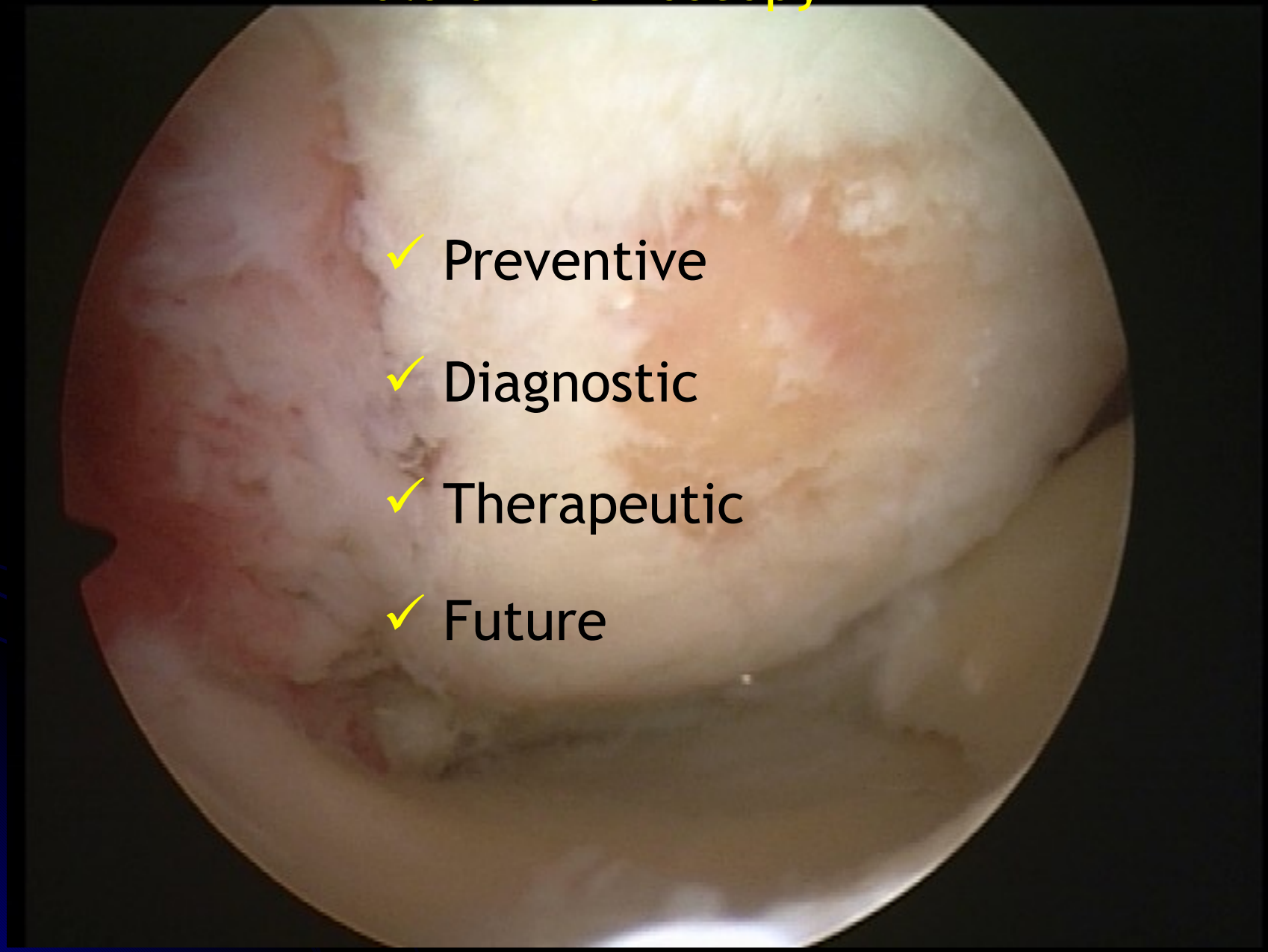
Conservative treatment does not alter the natural history of the disease!

The final solution!!

Surgical treatment of Osteoarthritis

- ℝ Arthroscopy (diagnostic / Rx)
- ℝ Soft Tissue eg synovectomy
- ℝ Osteotomy
- ℝ Arthrodesis
- ℝ Arthroplasty

Role of Arthroscopy



- ✓ Preventive
- ✓ Diagnostic
- ✓ Therapeutic
- ✓ Future

What arthroscopy can do!

- joint distension
- joint cooling
- removal of microcrystals
- cartilage debridement
- cartilage regeneration
- meniscus excision
- dilution of degrading enzymes and various cytokines involved in chondrolysis
- disruption of intra-articular adhesions

What arthroscopy can't do!

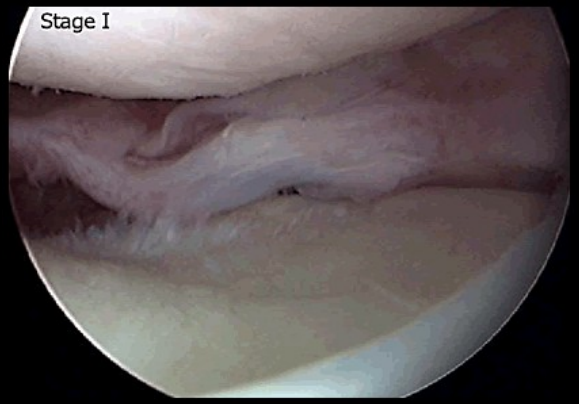
- Cure osteoarthritis
- Provide permanent relief

Arthroscopy

- low invasiveness
- low morbidity
- does not preclude future surgery
- increased patient demand

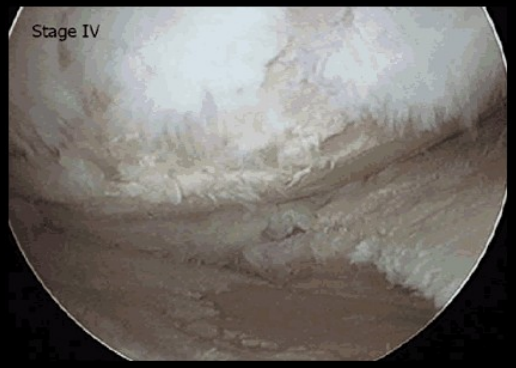
Role of Arthroscopy

- Early accurate diagnosis
- Minimally invasive treatment
- Make informed consent decisions regarding treatment


Stage I


Stage II


Stage III


Stage IV

Normal Cartilage

Preventive Role of Arthroscopy

- Meniscectomy
- Meniscal repair
- ACL reconstruction
- Chondral repair

Arthroscopy in Osteoarthritis - I

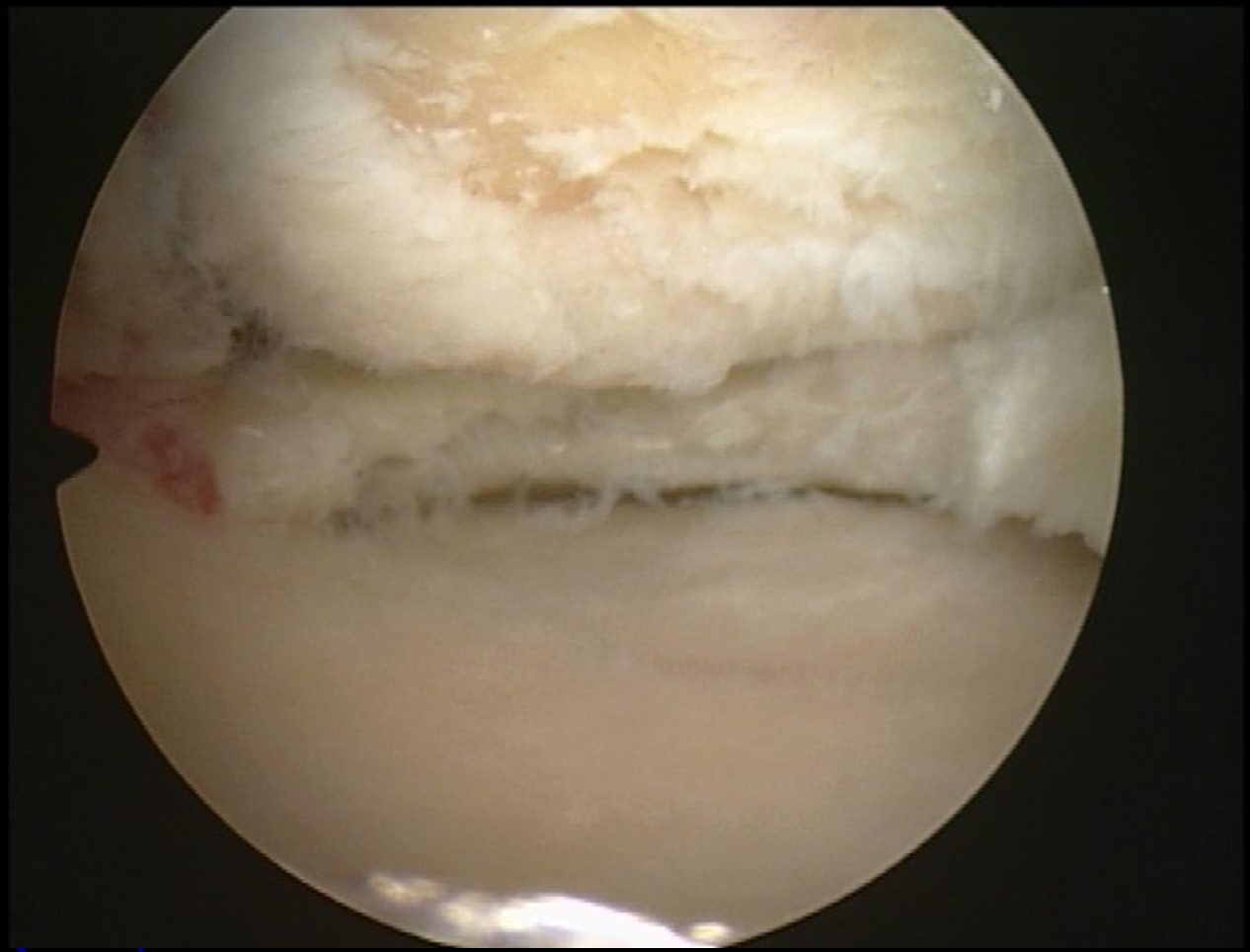
- Lavage
- Capsular stretching with 180 mL of fluid
- Removal of loose bodies
- Resection of unstable meniscus tears

and loose or unstable chondral flaps

- Preservation of meniscus tissue is prioritized

Arthroscopy in Osteoarthritis - II

- Partial synovectomy
- Lysis of adhesions within the suprapatellar pouch
- Release adhesions that tether the extensor mechanism
- A scar or plica in the anterior is released
- Osteophytes are removed if they involve the intercondylar notch and limit extension



- Be conservative with debridement.
- Debride only loose cartilage only.

Better outcomes

- preoperative mechanical symptoms (loose bodies or meniscal tears)
- radiographic evidence of only mild articular degeneration

Chang RW, Falconer J, Stulberg SD, et al. A randomized, controlled trial of arthroscopic surgery versus closed-needle joint lavage for patients with osteoarthritis of the knee. *Arthritis Rheum* 1993; 36: 289-296.
Yang SS, Nisonson B. Arthroscopic surgery of the knee in the geriatric patient. *Clin Orthop* 1995; (316): 50-58.
Fond J, Rodin D, Ahmad S, Nirschl RP. Arthroscopic debridement for the treatment of osteoarthritis of the knee: 2- and 5-year results. *Arthroscopy* 2002; 18: 829-834.

3 variables are significantly associated with improvement after arthroscopic debridement

- The presence of medial joint-line tenderness
- A positive Steinman test
- The presence of an unstable meniscal tear at arthroscopy

Only 44% of the patients classified with use of reliable, validated outcome measures, had successful outcome.

Dervin, JBJS 2003

other studies have not been able to identify *any* predictive factors for outcome.

McLaren AC, Blokker CP, Fowler PJ, et al. Arthroscopic debridement of the knee for osteoarthrosis. *Can J Surg* 1991; 34: 595-598.

Predictors of poor outcomes from arthroscopy

- marked malalignment
- restricted range of motion
- marked radiographic evidence of OA
- prior surgery
- increased age
- presence of “kissing” grade 4 chondral degeneration
- longer duration of preoperative symptoms

One reason for the continued controversy is the lack of sufficient Level I investigations including randomized control trials and prospective studies.

Most published studies investigating the effectiveness of arthroscopic treatment of knee OA are limited because of:

- Short term followup
- Lack of randomization or a control group
- Inconsistent methods of assessing and separating varying degrees of arthritis severity.

- Many studies compare two or more types of treatment.
- Only one study had a control group.

- randomized, single blind, prospective trial
- medical management vs tidal knee irrigation
- 77 patients with non-end stage OA of the knee
- pain after 50' walk, pain after 4-stair climb, most intense pain in previous day better in latter

Ike et al. J Rheumatol. 1992

- PRCT
- 76 knees with isolated degenerative changes

  in the medial femoral condyle of grades 3 or 4
- arthroscopic debridement (40) or washout (36)
- no abrasion and drilling of lesions
- mean follow-up time was 4.5 years
- better functional results with less symptoms

Articular debridement versus washout for degeneration of the medial femoral condyle. A five-year study. **Hubbard MJ., JBJS, Br, 1996**

CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 367, pp. 190–194

Debridement Arthroscopy

10–Year Followup

Brian J. McGinley, MD*; Fred D. Cushner, MD**; and W. Norman Scott, MD

- telephone interview of patients done 10 or more years after arthroscopic debridement
- all were candidates for total knee replacement who selected arthroscopy as a temporizing procedure.
- 77 patients (91 knees)
- 67% did not have TKA at an average of 13.2 years followup.
- The Tegner activity score averaged 3.5 and patient satisfaction averaged 8.6 on a 0 to 10 scale.
- 33% had TKR at an average of 6.7 years.

Patient satisfaction and a decrease in symptoms following arthroscopic débridement can be marked but also unpredictable.

The New England Journal of Medicine

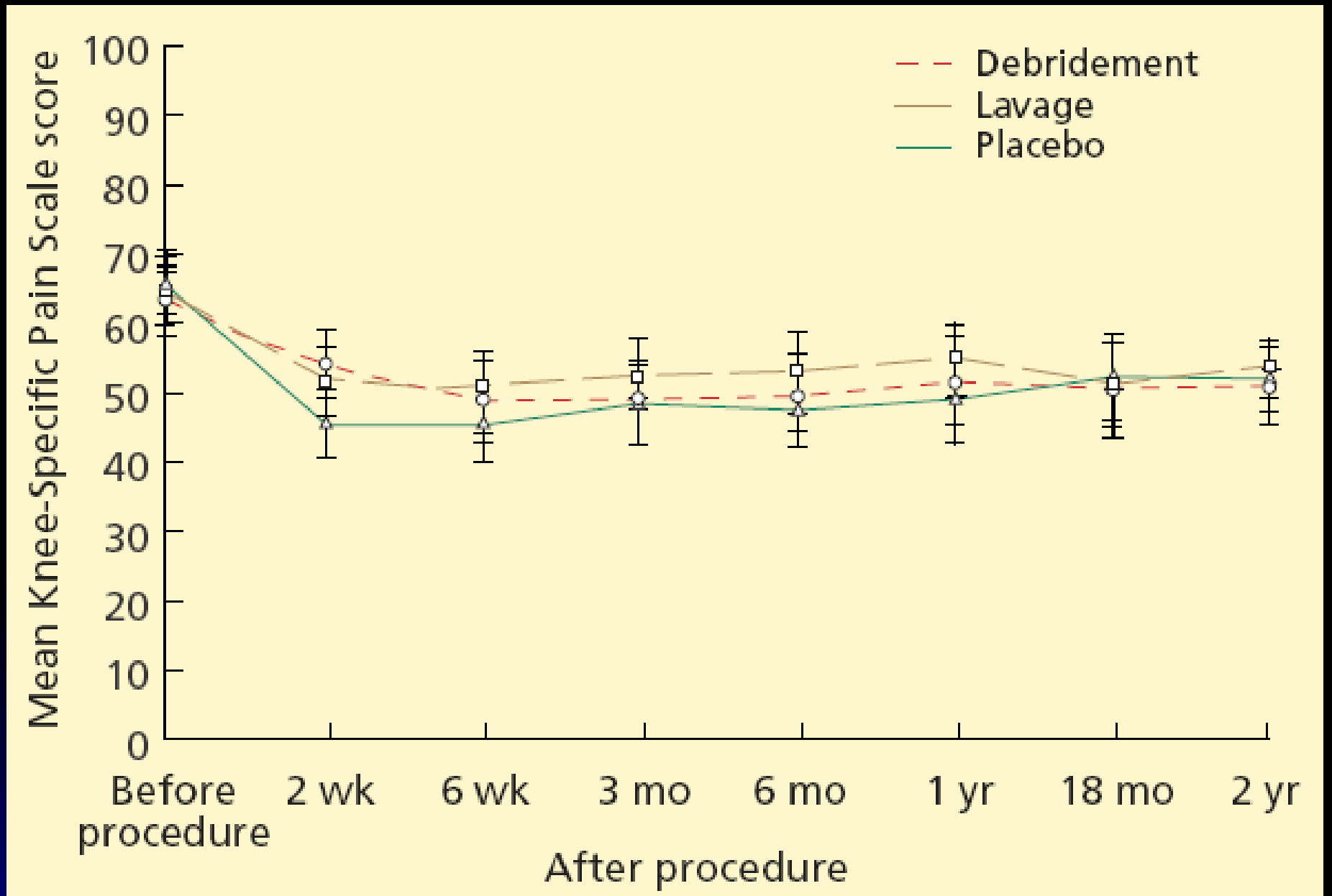
VOLUME 347 JULY 11, 2002 NUMBER 2

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.

Moseley *et al*. 2002

- Knee OA
- 180 patients
- 3 three treatment groups: arthroscopic lavage alone - debridement – placebo
- moderate pain, no recent arthroscopy, no suspected ligament or meniscal problems, and no mechanical symptoms.


Mean Knee-Specific Pain Scale score
100
90
80
70
60
50
40
30
20
10
0
Debridement
Lavage
Placebo
Before procedure
2 wk
6 wk
3 mo
6 mo
1 yr
18 mo
2 yr
After procedure

But

- Selection bias
- male patients
- 1 institution
- 1 surgeon
- 44% of those approached rejected participation
- Underpowered
- No stratification of results by grade of OA

Placebo effect

So what?

Specific clinical indications for arthroscopy are not clearly defined.

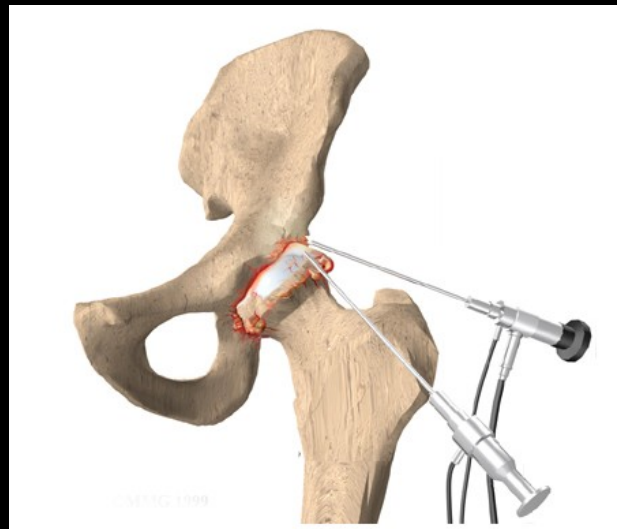
Why arthroscopy might not be effective

- addresses only surface phenomena
- the damaged articular cartilage itself may play only a contributory role in the clinical manifestations of the disease
- arthroscopy cannot prevent more debris from accumulating.

How about the non-Knee Joints??

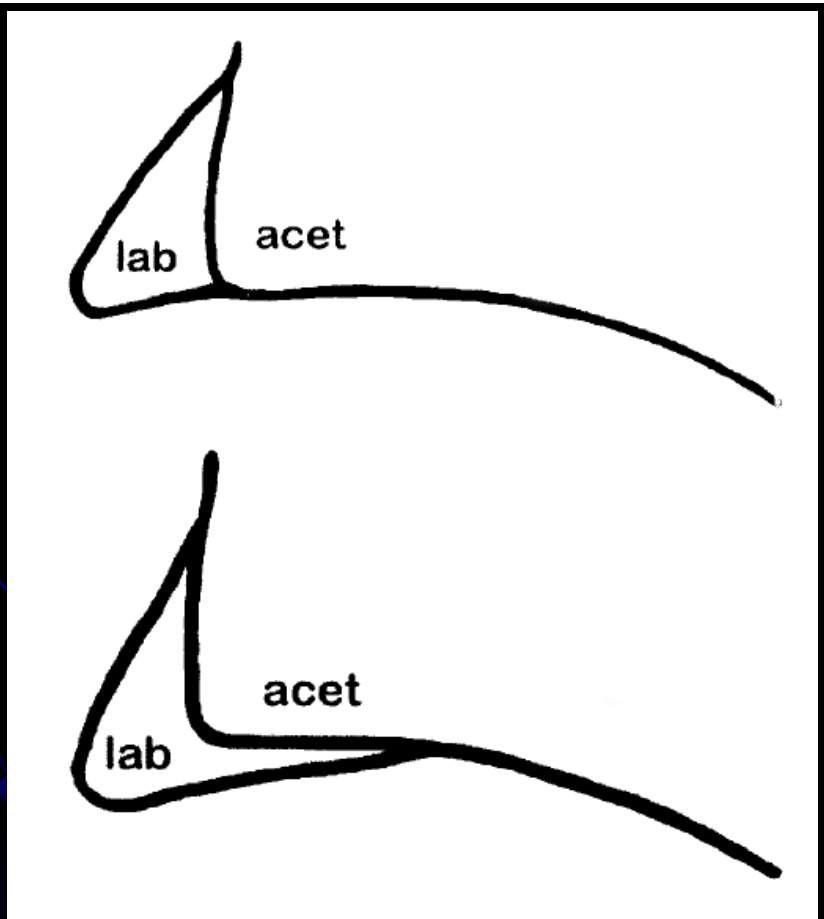
Therapeutic Applications of Hip Arthroscopy

- Osteoarthritis
  - Aid in staging
  - Indicated in young patient with residual joint space who has failed traditional conservative therapy
  - Recent acute change in symptomatology
  - Debridement of chondral flaps

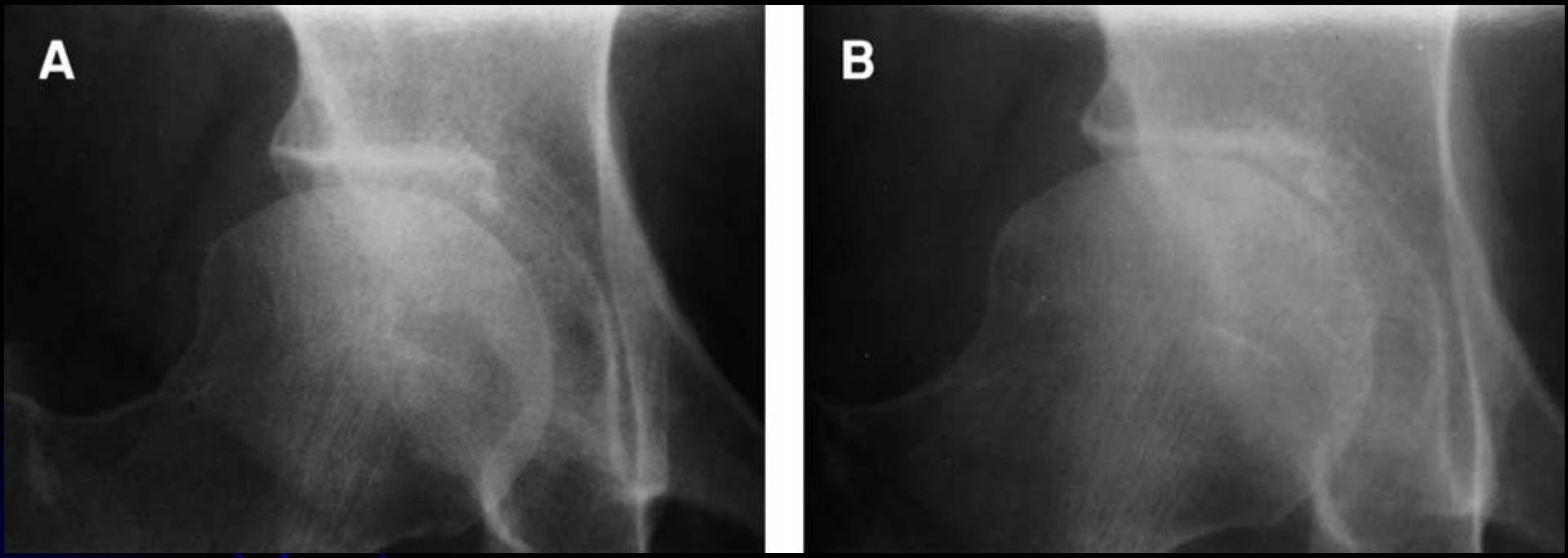


Osteoarthritis Caused by an Inverted Acetabular Labrum: Radiographic Diagnosis and Arthroscopic Treatment

J. W. Thomas Byrd, M.D., and Kay S. Jones, M.S.N., R.N.



63-year-old woman
spontaneous onset of right hip pain



(A) Initial radiographs were fairly unremarkable.

(B) Follow-up radiographs 3 months later showed a pronounced change with loss of the superolateral joint space.

Arthroscopic debridement in degenerative hip joint disease has been shown to produce an improvement in 34% to 60% of patients.

Byrd JW. Hip arthroscopy: patient assessment and indications. *Instr Course Lect* 2003;52:711-19.

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Byrd JW. Hip arthroscopy: patient assessment and indications. *Instr Course Lect* 2003;52:711-19.

Shoulder Osteoarthritis

- 8 patients
- improvement in range of motion
- pain reduction

Arthroscopic debridement and capsular release for glenohumeral osteoarthritis. Richards DP, Arthroscopy. 2007

Basal Joint Arthritis

- stage II thumb basal joint arthritis.
- 43 patients
- arthroscopic synovectomy, debridement,
- extension-abduction closing wedge corrective osteotomy
- satisfactory results in terms of pain relief, stability, and pinch strength

Treatment of early basal joint arthritis using a combined arthroscopic debridement and metacarpal osteotomy. Badia Tech Hand Up Extrem Surg. 2007

Elbow Arthritis

Elbow Arthritis

Arthroscopic debridement and fenestration of the olecranon fossa may be a more suitable procedure when painful symptoms predominate.

Cohen AP, Redden JF, Stanley D. Treatment of osteoarthritis of the elbow: a comparison of open and arthroscopic debridement. Arthroscopy. 2000;16(7):701-6.

Conclusions

- ✓ Arthroscopy is a procedure to buy time and provide pain relief.
- ✓ No long-term effects of the procedure.
- ✓ Patient selection is crucial for the success.

A good surgeon

"Good surgeons know how to operate, better surgeons when to operate, and the best when not to operate."

Osteoarthritis

The plain radiograph remains the best means of assessment, with evidence of cartilage loss (*joint space narrowing*) and bone response (*osteophytes*)