





8th Advanced Course on Knee Surgery





## Outside-in meniscal repair (poor man's repair)



**Nicola Maffulli**



## History

- ✦ Sutton 1897
  - “functionless remnants of intra-articular muscles”
- ✦ Closed reduction standard
- ✦ Open excision for re-tears

## History

- ✦ King 1936
  - Non-uniform fibrous regeneration
  - Peripheral tears – healing
- ✦ Smillie 1944
  - 600 cases - regeneration

## History

- ✦ Fairbank 1948
  - Pre & postop XR up to 14 yr
  - Flattening, joint space loss, osteophytes
  - “possible predisposition to early degenerative changes”
- ✦ Jackson 1968
  - Clinical confirmation

## Summary

- ✦ No randomised trials or comparative studies
- ✦ Good evidence for degenerative changes
- ✦ Good arguments for meniscal preservation

## Management Options

- ✦ Open total meniscectomy
- ✦ Arthroscopic total meniscectomy
- ✦ Arthroscopic partial meniscectomy
- ✦ Open meniscal repair
- ✦ Arthroscopic meniscal repair

## Management

- ✦ Northmore-Ball & Dandy 1983
- ✦ Open total v Open partial v Arthroscopic partial meniscectomy
- ✦ ↑ knee scores
- ✦ ↑ pt satisfaction
- ✦ ↓ Fairbank changes

## Management

- ✦ Allen 1984
- ✦ Late degenerative changes after meniscectomy  
210 pts:10-22 years post meniscectomy
- ✦ Radiological degeneration was seen in 18%
- ✦ increased changes in older patients, abnormal leg alignment,
- ✦ lateral meniscectomy

## Management

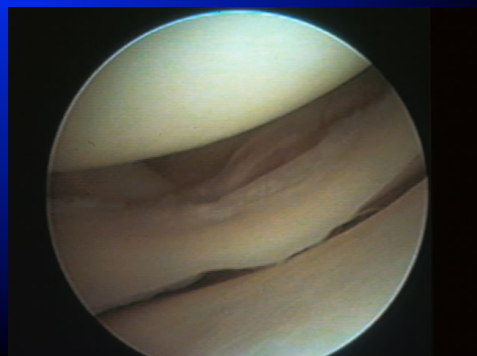
- ✦ Cochrane 2000
- ✦ 3 trials, 260 pts
- ✦ Partial / total / surgical access
- ✦ Long term adv partial not established
- ✦ @6yr
- ✦ No conclusions can be drawn

## Repairable Menisci

- ✦ Outer 1/3 – Red Red Zone
- ✦ Middle 1/3 – Red White Zone

## Non-Repairable Menisci

- ✦ Middle 1/3 Red White Zone
- ✦ Inner 1/3 – White White Zone
- ✦ But... see work by F Noyes on white on white repairs



## Meniscal Repair

- ✦ 750,000 meniscal procedures/year
- ✦ 1996: 13,54600 repairs
- ✦ 2000: 200,000 repairs
- ✦ 2010: 270,000 repairs

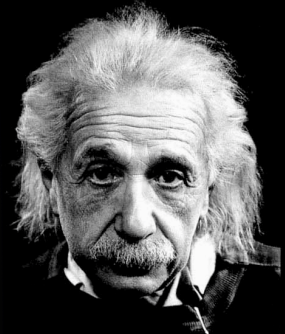
## Repair Techniques

- ✦ Arthroscopic
  - ✦ Inside-Outside
  - ✦ Outside-Inside
  - ✦ Inside-Inside
  - ✦ No evidence to compare
- ✦ Implants

## Outside-In Technique

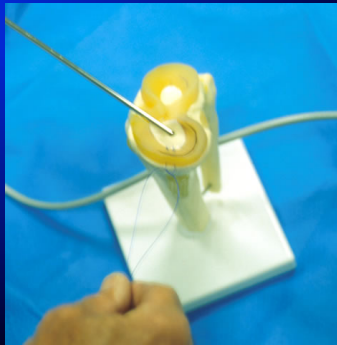
Everything should be made  
as simple as possible,  
but not simpler.

Albert Einstein



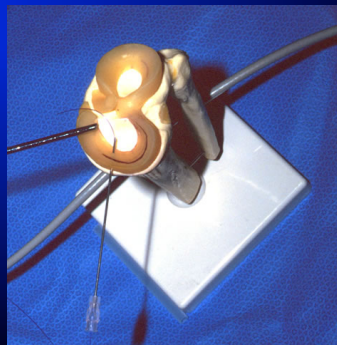
Use the **KISSO**  
principle

**K** eep  
**I** t  
**S** imple for the  
**S** imple  
**O** rthopods



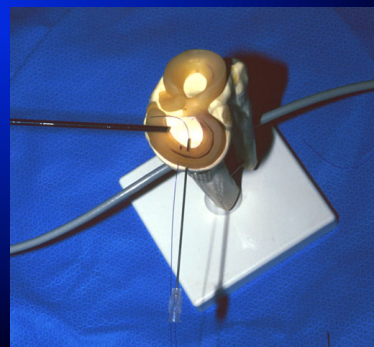
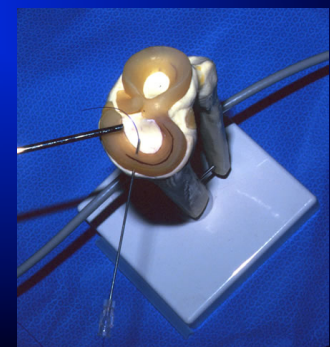
## Technique Medial Meniscus

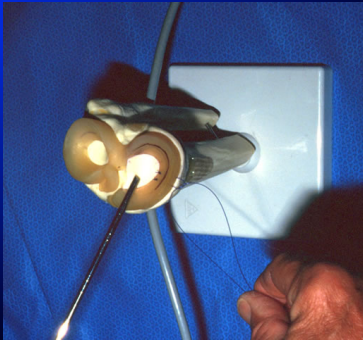
- ✦ Arthroscope through anterolateral portal
- ✦ Pass needle through tear
- ✦ Pass monofilament suture through needle



## Technique Medial Meniscus

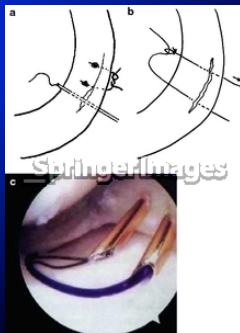
- ✦ Retrieve suture through antero-medial portal
- ✦ Mulberry knot
- ✦ Repeat with adjacent stitch
- ✦ Incise skin
- ✦ Identify capsule
- ✦ Tie sutures over capsule





## Technique Lateral Meniscus

- ✦ Scope medial
- ✦ Identical procedure



## Advantage

Cheap & Easy

## Disadvantage

Posterior tears difficult to reach

## Fibrin Clot

- ✦ Enhances healing
- ✦ Large tears
- ✦ Failed repairs
- ✦ Probably not necessary with combined ACL reconstruction

## Results

### **Cannon**

- ✦ 90% success combined with ACL reconstruction
- ✦ 60% success with isolated tears

### **Rosenberg**

- ✦ 92% success when repaired in red zone

### **Dehaven – open repair**

- ✦ 95% success in stable knees
- ✦ 62% success in ACL deficient knees

### **Rehabilitation**

- ✦ ?
- ✦ Movement and non-weight bearing
- ✦ No movement and weight bearing
- ✦ Limited movement and partial weight bearing

✦ ?

### **Conclusions**

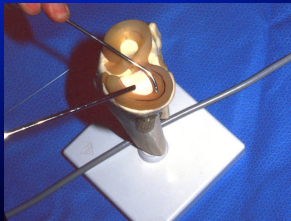
- ✦ Meniscus
- ✦ Complex structure
- ✦ Multiple functions
- ✦ Limited repair facility
- ✦ Meniscectomy bad (?)
- ✦ Possibly leave some alone (see RCT in NEJM)
- ✦ Meniscal repair alternative

### **Conclusions**

- ✦ Meniscal repair
- ✦ Indications expanding
- ✦ Alternative techniques
- ✦ Sutures stronger than implants
- ✦ Sutured Acute traumatic best
- ✦ ACL reconstruction beneficial
- ✦ Augmentation may help (rasp, clot)



Become familiar with more  
than one technique



If  
you  
wish  
to  
know  
more ...







*Thank You....*

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