



Universitat Autònoma de Barcelona

## Post-TKR Arthroscopic Arthrolysis



Joan Carles Monllau



Marc Tey



Xavier Pelfort



Pablo Eduardo Gelber



Juan Ignacio Erpacia


www.equilae.com

*Joan C. Monllau MD, PhD*  
Hospital de la Sta Creu i Sant Pau  
ICATME-Institut Universitari Dexeus  
Barcelona  
Spain

## Introduction

Stiffness after TKR is a common problem

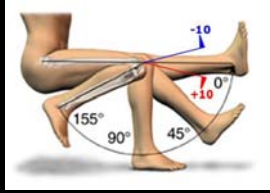
Affects the patient's ability to perform ADL



Does not have a well-defined treatment algorithm

## Knee Flexion Requirements

- 83° to climb stairs foot over foot
- 93° to sit in a chair without using one's hands
- 106° tying one's shoes while seated



Laubenthal et al. A quantitative analysis of knee motion during activities of daily living. *Phys Ther*, 1972

## What is Stiffness after a TKR ?

- Limited ROM that affects a patient's ability to perform activities of daily living
- 2006 Yercan et al. defined the stiff knee as one that flexed < 95° and had a flexion contracture of 10°

Yercan et al. *Knee* 2006

## Causes of stiffness

MULTIFACTORIAL

- Infection
- Poor component positioning or sizing
- Inadequate soft tissue balancing
- Aseptic loosening
- Complex regional pain syndrome




## Arthrofibrosis

– excessive scarring within the knee due to fibrocartilaginous metaplasia

- ✓ increased interstitial fibrosis
- ✓ formation of dense intra-articular adhesions
- ✓ isolated infrapatellar adhesions
- ✓ diffuse (suprapatellar pouch, medial and lateral gutters, and posterior capsule)




Ries MD, Badalamente M. Arthrofibrosis after total knee arthroplasty. *Clin Orthop*, 2000

## New insights

- TGF-*beta*1 is a potent inducer of arthrofibrosis
- BMP-2 is overexpressed and its concentrations are consequently higher in patients suffering from arthrofibrosis after TKA



Watson et al. Gene delivery of TGF- $\beta$ 1 induces arthrofibrosis and chondrometaplasia of synovium in vivo. *Lab Invest*. 2010  
Pfitzner et al. Increased BMP expression in arthrofibrosis after TKA. *KSSSTA* 2011

## Therapeutic options

- Physical therapy (PT)
- MUA
- Arthroscopic Arthrolysis
- Open débridement
- Revision surgery

## Therapeutic options

- Physical therapy (PT)
- MUA
- Arthroscopic Arthrolysis
- Open débridement
- Revision surgery

### Arthroscopic Arthrolysis Principles

- Selective breaking of the adhesions inside the knee
- Gentle manipulation
- Postoperative regional pain blockade
  - (postop analgesia will have an effect on motion after TKR)
- Physical therapy (CPM) started immediately (in-patient)

### Arthroscopic Arthrolysis Surgical Technique

- Suprapatellar pouch release
- Reestablish the medial and lateral gutters
- Release the patella
- Resect any remaining meniscal tissue
- Resect anterior compartment
- Release posterior capsule

### Arthroscopic Arthrolysis Surgical Technique

#### Patient position



**Arthroscopic Arthrolysis**  
**Surgical Technique**

**Portals**

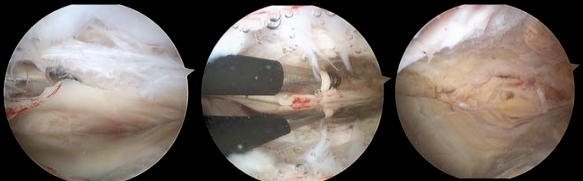
- Antero-lateral

- to visualize and evaluate the location, and type of fibrosis
- the following portals are created under direct vision
- sometimes difficult due to extensive scar tissue
- use as many portals as needed



**Arthroscopic Arthrolysis**  
**Surgical Technique**

- **Suprapatellar pouch**
  - release of fibrous bands
  - opening obliterated superior recess
  - until the dimensions of the original pouch are re-established (or until fibres of *articularis genu* muscle are seen)



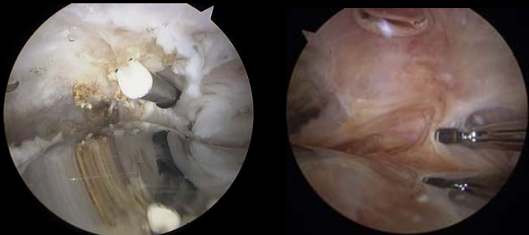
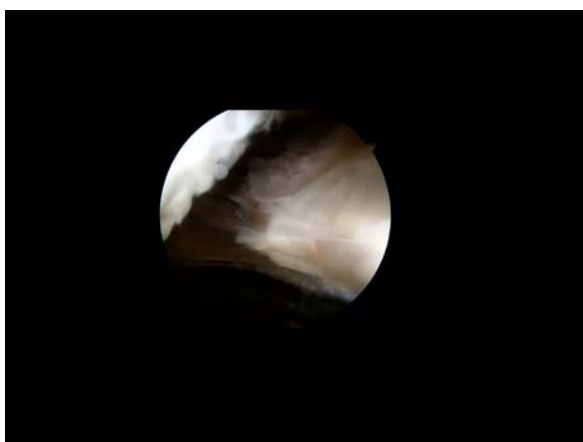
**Arthroscopic Arthrolysis**  
**Surgical Technique**

- **Anterior Compartment**
  - Sometimes difficult (tight patella) to get in the suprapatellar pouch then start in anterior compartment or use suprapatellar portals




**Arthroscopic Arthrolysis**  
**Surgical Technique**

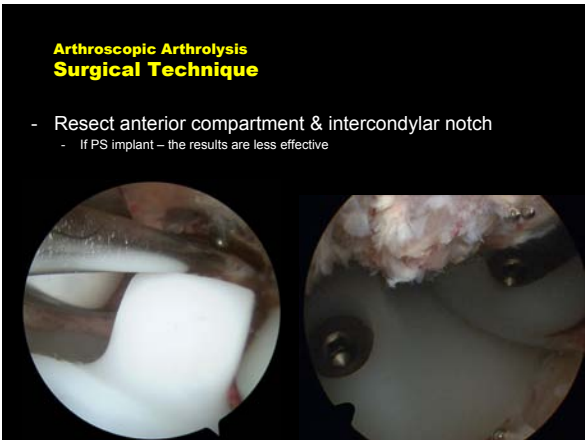
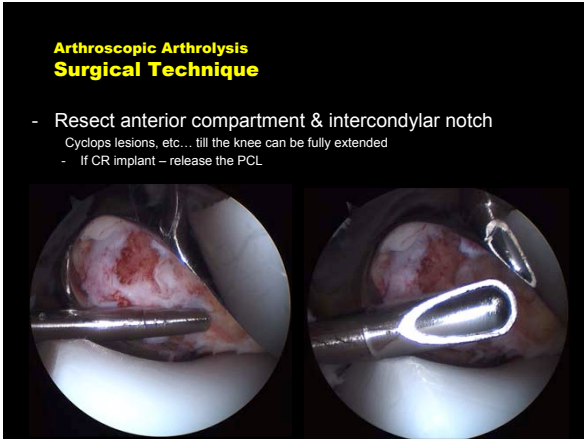
- Reestablish the medial and lateral gutters
- Particularly the medial one to free the MCL

**Arthroscopic Arthrolysis**  
**Surgical Technique**

- **Release the patella**
  - If it is lateralized
    - Lateral release
  - If it is tight but centralized
    - Medial and lateral releases





## If flexion contracture persist

Treatment of the final 10° of extension can still be unsuccessful.

If so, consider posterior capsulotomy as it is technically feasible arthroscopically



## Arthroscopic Arthrolisis Surgical Technique

- Release the posterior capsule
  - Need for posterior medial and lateral portals (Kim approach)

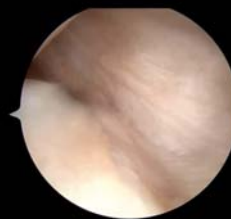


## Arthroscopic Arthrolisis Surgical Technique

- Resect the impinging tissue from the back of the polyethylene



## Posterior capsulotomy



## Results

- Generally good (in terms of motion and pain)

Williams et al. Clin Orthop. 1996  
Diduch et al. Arthroscopy. 1997  
Lucas et al. Clin Orthop. 1999  
Scranton. J Arthroplasty. 2001  
Jerosch et al. KSSTA. 2007  
Arbuthnot et al. KSSTA. 2010

- Not reliable for severely stiff knees

Yercan et al. Knee 2006

- No major complications have been reported  
There is an unreported risk of instrument breakage and abrasion or scratching of the polyethylene or the components of the prosthesis

- Technically difficult and requires a significant amount of experience

## AA in the stiff TKR

- The gains in ROM after MUA and AA (with or without MUA) are similar
- Open arthrolysis seems to have inferior gains in ROM
- AA combined with MUA still is useful 1 year after the index TKA.

Fitzsimmons et al. How to Treat the Stiff Total Knee Arthroplasty? A Systematic Review Clin Orthop Relat Res. 2010

### Our protocol

- Arthrofibrotic knee (ROM 0/10/90°) before 3 months after index surgery → **MUA**
- Arthrofibrotic knee between 3 and 9 months after TKR → **Arthroscopic Arthrolysis**
- If a cause (Infection, malpositioning or sizing of the components, inadequate soft tissue balancing, aseptic loosening, etc...) is suspected → **TKA revision**

### Conclusions

#### Arthrofibrosis after TKR

- Arthroscopic Arthrolysis is reproducible and safe
- AA may have greater success

### Conclusions

#### Stiff TKR

- The results of revision TKR have the lowest incidence of failure or recurrence
- Therefore, a revision gives the best chances of gaining motion

Thank you



[jmonllau@santpau.cat](mailto:jmonllau@santpau.cat)