

Clinica Ortopedica e Traumatologica  
Università degli Studi di Pavia

Fondazione IRCCS - Policlinico  
S. Matteo

Chairman: Prof. FM Benazzo



Hot topic: release of extensor system for  
stiff knee (pre, per, post TKA)

F. Benazzo, SMP Rossi

# What to do?

- Pre
- Per
- Post





**PRE**

# Pre

Know the risk factors and inform the patient:

- Preop stiffness (!)
- Previous surgery  
(HTO;Meniscectomy;TTO;fractures)
- Diabetes
- Tendency to create hypertrophic scars
- Arthrofibrosis (?)

# Pre

## What to do?

- No available literature data
- Plan correct maneuvers during surgery
- Preop physiotherapy may be helpful :

- ➔ Quad strengthening
- ➔ Hamstring stretching
- ➔ Eccentric Strengthening
- ➔ ...



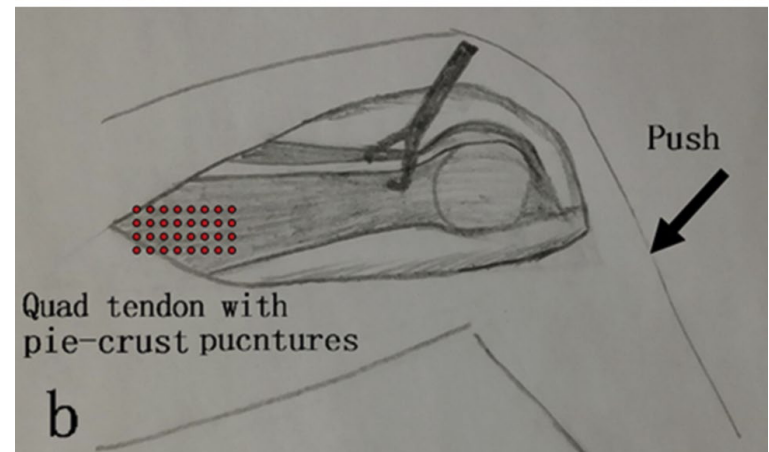
**PER**

# Per

- Ranawat
- Tarabichi
- Gap Balancing (reduced extension gap)
- Patellar eversion
- TT osteotomy

# Ranawat

- Quad tendon pie crusting
- At index procedure or as secondary procedure
- Few literature with good results...



J Orthop Sci (2015) 20:669–674  
DOI 10.1007/s00776-015-0731-7



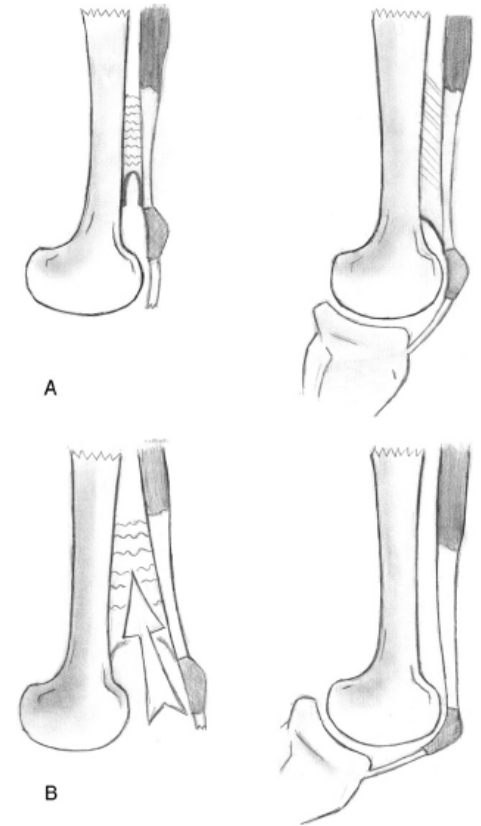
ORIGINAL ARTICLE

**Quadriceps tendon pie-crusting release of stiff knees in total knee arthroplasty**

Yu Zhang<sup>1</sup> · Lu-you Ye<sup>1</sup> · Hai-xiao Liu<sup>1</sup> · Hong Wen<sup>1</sup>

# Tarabichi

- It works!
- Must be associated with extensive sinovectomy
- Bleeding control



The Journal of Arthroplasty Vol. 25 No. 4 2010

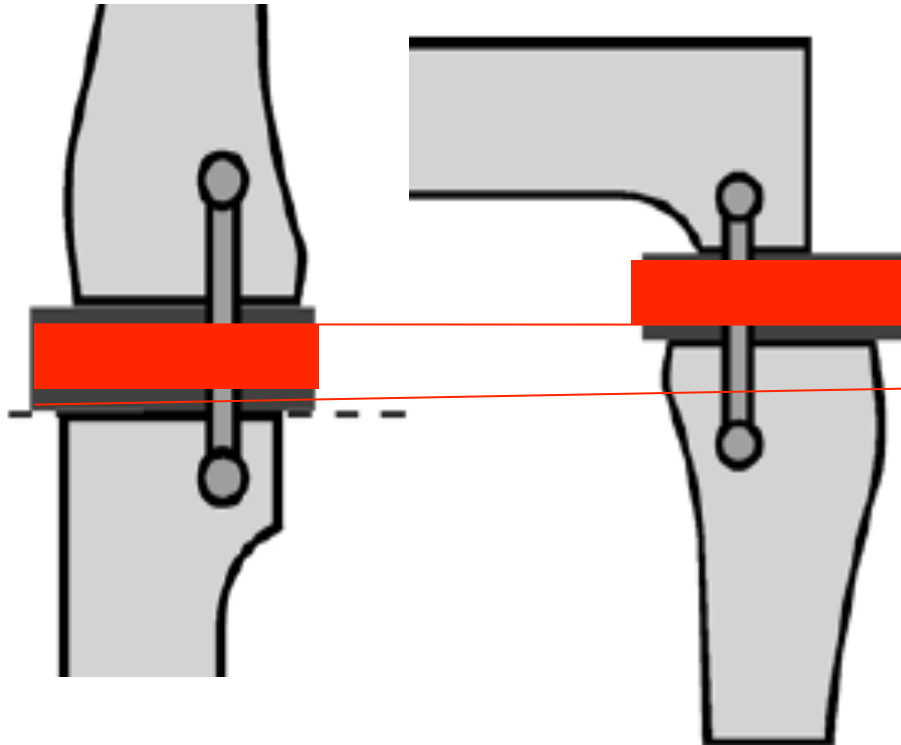
**Can an Anterior Quadriceps Release Improve  
Range of Motion in the Stiff Arthritic Knee?**

Samih Tarabichi, MD, MS, FRCSC,\* and Yasir Tarabichi, MD†

# Gap Balancing (reduced extension gap)

- Mismatch flexion / extension gap

Extension gap ↓





# Gap Balancing (reduced extension gap)

Goal: increase the size of extension space

How?

- > distal femoral resection
- Removal posterior osteophytes
- Posterior soft tissue release



# Gap Balancing (reduced extension gap)

Component positioning errors:

- Femoral component in flexion
- Excessive tibial slope

# Gap Balancing (reduced extension gap)

Failure to balance flexion extension gap:

Common errors:

- . ↑ poly to stabilize knee in flexion  
→ *flexion contracture*
- . ↑ Cut more tibia to solve flexion contracture  
→ *flexion instability*

# Gap Balancing (reduced extension gap)

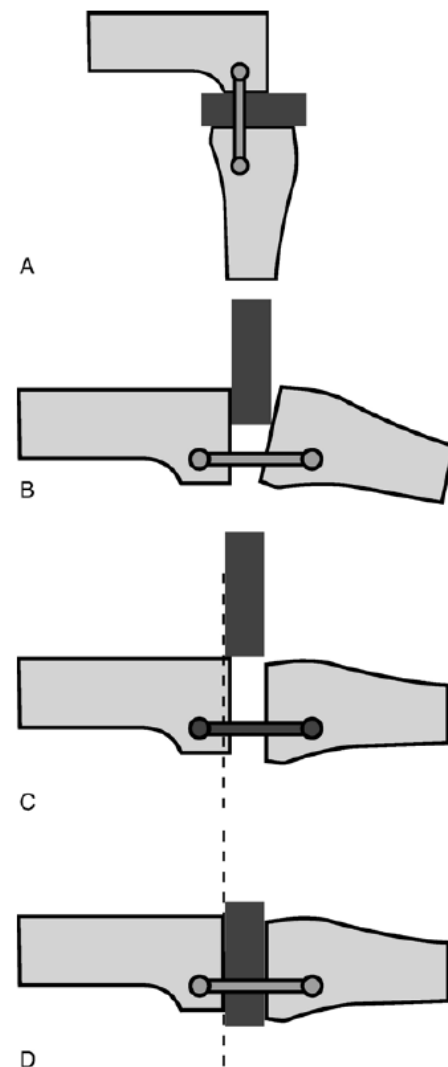
## Extension tight

**Flexion ok  
or  
Flexion loose**

1. Posterior release
2. Resect distal femur

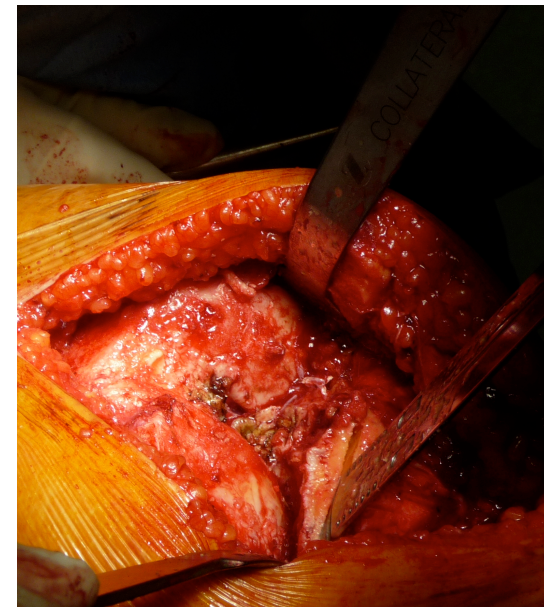
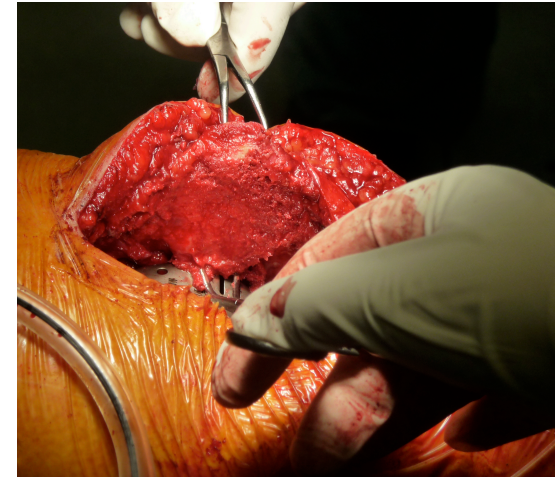
**Flexion tight**

Resect more tibia  
Thinner poly



# Patellar eversion!!

- Preliminary patella flat cut to enhance lateral mobility
- Lateral dislocation of the patella
- Avoid eversion (ischemia can cause patellar tendon retraction/shortening)



# TT osteotomy

- Helpful in difficult approaches
- Possibility to proximalise the TT and raise the patella!



**POST**

# Post

- MUA
- Arthroscopic release
- Open release
- Revision
- Non operative treatment



# MUA

- Favourable results also in long term :

→ better if early

→ Around 30 in flexion, 5 in extension

- Low complications

→ Haematomas

→ Supracondilar fracture (!!)



## Long-Term Outcomes of MUA for Stiffness in Primary TKA

Robert Pivec, MD<sup>1</sup> Kimona Issa, MD<sup>1</sup> Mark Kester, PhD<sup>2</sup> Steven F. Harwin, MD<sup>3</sup> Michael A. Mont, MD<sup>1</sup>

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J Knee Surg 2013;26:405-410.

The Knee 19 (2012) 751-759



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The Knee



Review

Management of stiffness following total knee arthroplasty: A systematic review

H. Ghani <sup>a</sup>, N. Maffulli <sup>b</sup>, V. Khanduja <sup>a,\*</sup>

<sup>a</sup> Addenbrooke's - Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK

<sup>b</sup> Barts and The London School of Medicine, London, UK

# Arthroscopic release

- Not real difference comparing to MUA
- To be done if MUA fails
- Low rate of complications

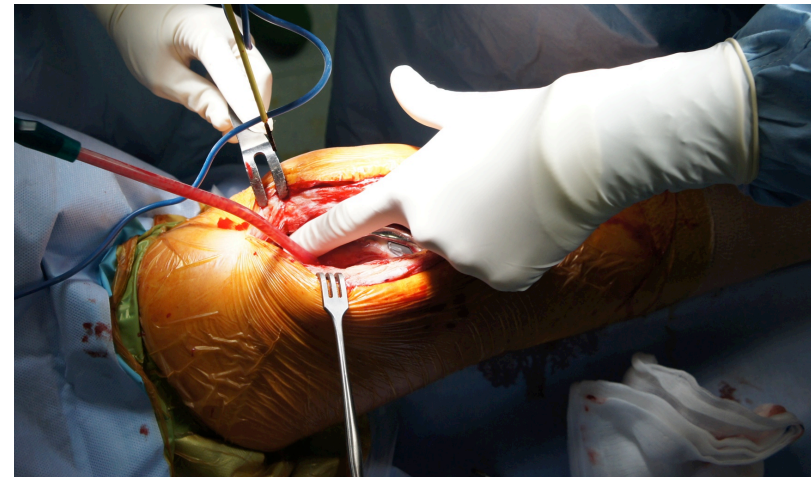
*“Patients can reliably expect an improvement after arthroscopic lysis of adhesions for a stiff TKA using a standardized arthroscopic approach; however, patients achieved approximately half of the improvement that was obtained at the time of surgery.”*

## **Arthroscopic Lysis of Adhesions for the Stiff Total Knee: Results After Failed Manipulation**

FOTIOS PAUL TJOMAKARIS, MD; BRADFORD SCHOFIELD TUCKER, MD; ZACHARY POST, MD;  
MATTHEW DAVID PEPE, MD; FABIO OROZCO, MD; ALVIN C. ONG, MD

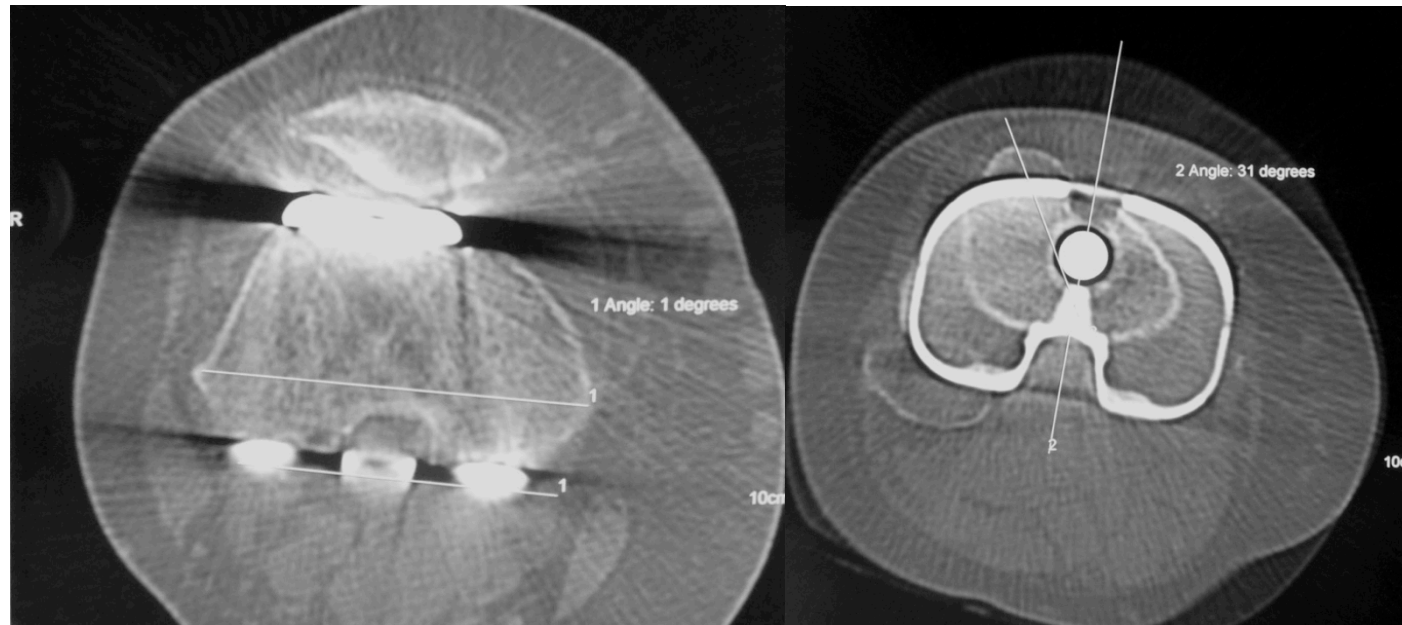
# Open surgical debridement

- Tarabichi
- Extensive sinovectomy
- Ranawat quad pie crusting
- Bleeding control!!
- Low complication rate



# Revision

- Only If correct diagnosis  
done!!



# Non operative treatment

## Astym:

- Topical application of a series of hand-held instruments to areas of dysfunction
- Feel of underlying texture of soft tissues, which ultimately allows for detection of rough or improperly organized tissue
- Applies appropriate shear force and pressure to initiate a reparative cellular response in dysfunctional tissue.

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## A Novel, Nonoperative Treatment Demonstrates Success for Stiff Total Knee Arthroplasty after Failure of Conventional Therapy

Morad Chughtai, MD<sup>1</sup> Michael A. Mont, MD<sup>1</sup> Chris Cherian, BS<sup>1</sup> Jeffrey Jai Cherian, DO<sup>2</sup>  
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# Non operative treatment

Astym:

Back to the old concept of Fibrolysis??

Significant mean improvements in

- Flexion contracture
- Both Knee Society objective (80 vs. 57 points;  $p < 0.0001$ ) and functional scores (80 vs. 54 points;  $p = 0.0003$ )
- No harms were reported.



# Conclusions

- Different options
- Identify patients at risk