

1.3% to 13% of all TKAs'

Study	Number of patients	Prevalence (%)
Kim et al. [25]	1000	1.3
Yercan et al. [50]	1188	5.3
Mauerhan et al. [30]	745	12.3
Seranton [40]	250	13.2
Gandhi et al. [15]	1216	3.7

Which options in the stiff TKA?

- ✓ Rehabilitation
- ✓ MUA
- ✓ @Release
- ✓ Open Release
- ✓ Revision

Soft tissue release

- Large Medial arthrotomy
- Synovectomy
- Fibrous tissue excision
- Suprapatellar pouch
- Condylar gutters
- Lateral retinaculum

Soft tissue release

- Progressive patellar eversion
- Lateral release
- Multiple biopsy

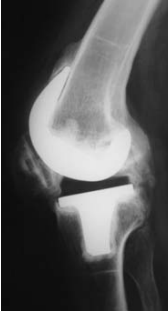
Soft tissue release

- Resection cruciate(s)

Then it's finished and I go back home!...

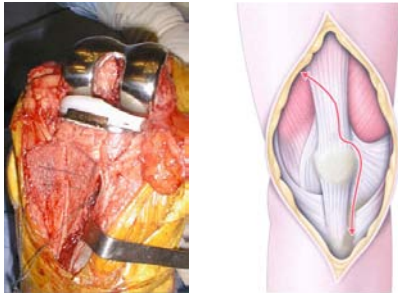
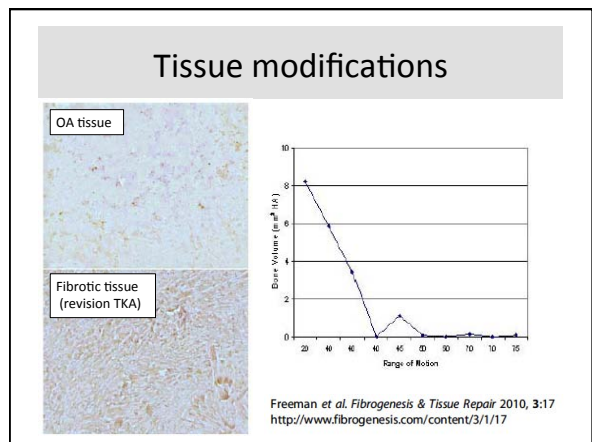
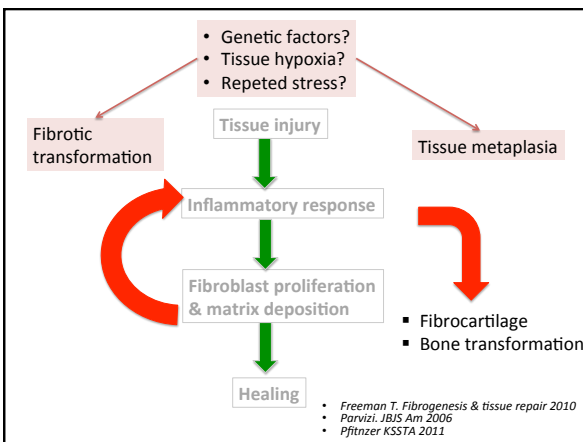
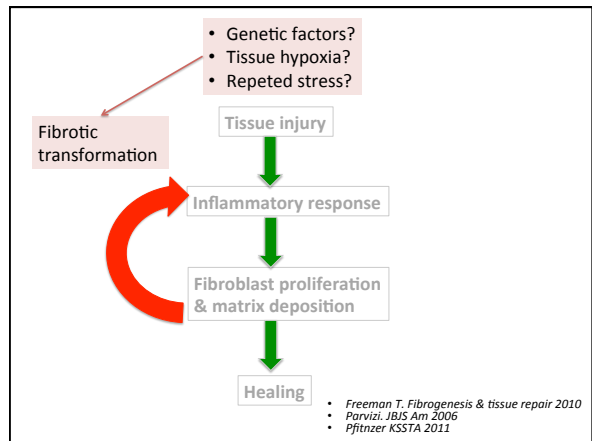
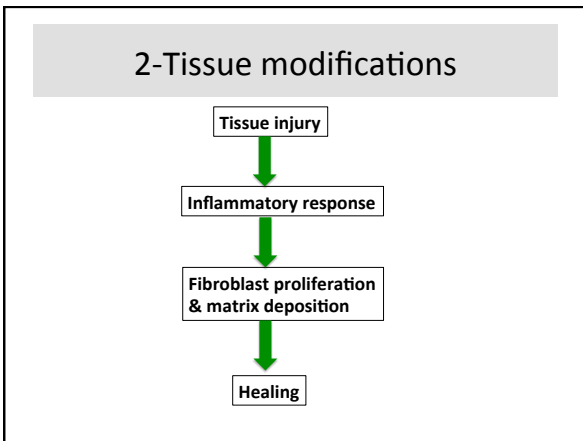
### Is it so easy??

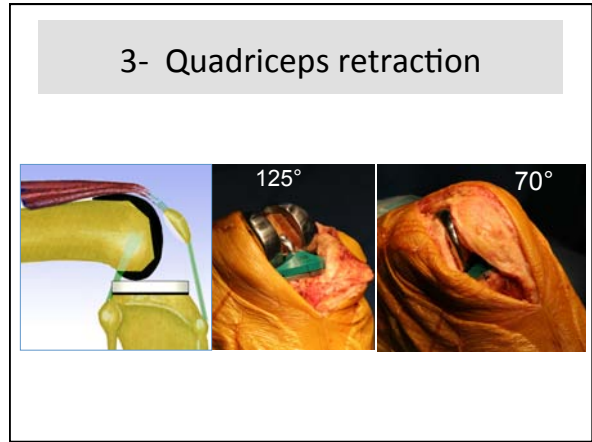
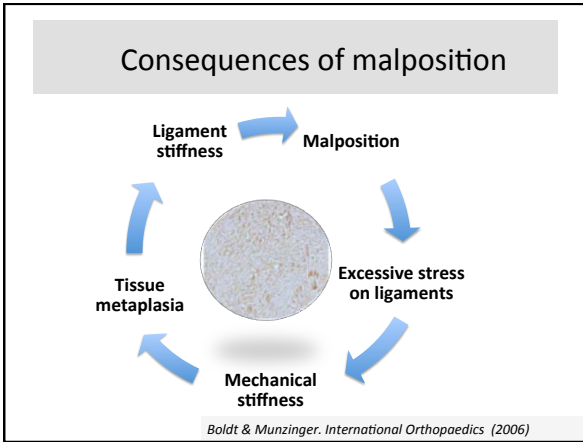
1. Approach
2. Tissue modification
3. Retraction of Quadriceps
4. Capsule and skin retraction



### Approach: Q Snip – ATT osteotomy?

Creation of a « weak point »



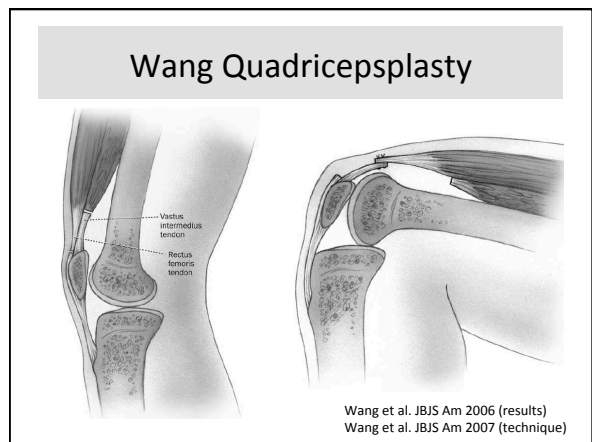
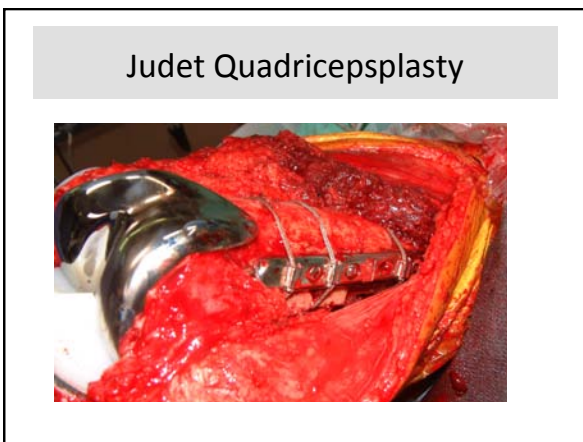
### Patella Baja

- ✓ Check the joint line level
- ✓ Osteotomy ATT
- ✓ Prox displacement
- ✓ Careful rehab.

### No patella Baja

- ✓ V-Y Quad Turndown
- ✓ Q. Snip
- ✓ Flynn & Ranawat

Coonse & Adams 1943    Insall JN 1993    Garvin 1995    Flynn & Ranawat



### 4-The skin and capsule



### Results of revision for stiff TKA

- ✓ Meta-analysis Fitzsimmons CORR 2010.
- ✓ French Orthopaedic Society Multicenter analysis

### MUA: Gain = 39°

Mean delay = 2.2 months

Table 1. Gains in knee ROM, timing of procedure, and final followup

Study	Number of knees (number of patients)	Final increase in ROM (mean)	Final increase in flexion (mean)	Final increase in extension (mean)	Timing of procedure (mean in months)
MUA group					
Daliga et al. [6]	94 (60)	—	42°	—	—
Eder et al. [9]	47 (42)	—	35°	—	3
Fox and Posa [10]	76 (—)	—	30°	—	0.5
Keating et al. [14]	113 (90)	—	35°	—	2.5
Maloney [16]	24 (—)	47°	—	—	1.5
Pariente et al. [20]	65 (60)	32°	—	—	1.5
Scranton [24]	19 (19)	42°	—	—	1.5-15
Yercan et al. [33]	46 (46)	47°	—	—	1

Fitzsimmons CORR 2010

### @Release: Gain = 34.8°

Mean delay = 16 months

Table 1. Gains in knee ROM, timing of procedure, and final followup

Study	Number of knees (number of patients)	Final increase in ROM (mean)	Final increase in flexion (mean)	Final increase in extension (mean)	Timing of procedure (mean in months)
Arthroscopy group					
Bae et al. [2]	13 (11)	—	42°	45°	-3°
Campbell [4]	7 (7)	18.5°	—	—	—
Didach et al. [8]	8 (8)	26.3°	—	—	7.4
Jerosch and Almaroudy [11]	32 (32)	—	34°	23°	8.5
Johnson et al. [13]	2 (2)	—	30°	—	—
Parisien [21]	1 (1)	50°	45°	5°	3
Scranton [24]	7 (7)	31°	—	—	—
Szyrak et al. [26]	1 (1)	23°	5°	18°	12
Tong et al. [28]	11 (11)	30.8°	29°	1.8°	13
Wasilewski and Frankl [29]	6 (6)	34°	26°	8°	30
Williams et al. [30]	10 (9)	33°	30.5°	2.5°	29
Yercan et al. [33]	3 (3)	60°	58.4°	1.6°	—

Fitzsimmons CORR 2010

### Open release: Gain = 23.6°

Mean delay = 31 months

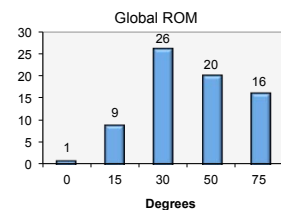
Table 1. Gains in knee ROM, timing of procedure, and final followup

Study	Number of knees (number of patients)	Final increase in ROM (mean)	Final increase in flexion (mean)	Final increase in extension (mean)	Timing of procedure (mean in months)
Open group					
Babis et al. [11]	5 (5)	19°	—	—	—
Mont et al. [19]	18 (17)	31°	—	—	31
Yercan et al. [33]	3 (3)	21°	—	—	—

Fitzsimmons CORR 2010

### Series SOFCOT 2000 (D Hutten & P Burdin)

- Multicenter study
- 72 patients
- Age 65 y (40 to 86)
- 27 PS, 39 CR, 2 bicruciate
- Previous surgery: 31%



- 51: loss of flexion
- 20 loss of flexion+extension
- 1 loss of extension

Series SOFCOT 2000 (D Hutten & P Burdin)

	N
MUA	20
@ Release	12
Open release	15
Revision	25

Series SOFCOT 2000 (D Hutten & P Burdin)

	n	Delay (months)
MUA	20	1.5
@ Release	12	8
Open release	15	15
Revision	25	36

Series SOFCOT 2000 (D Hutten & P Burdin)

	n	Delay (months)	Gain on flexion
MUA	20	1.5	42°
@ Release	12	8	17°
Open release	15	15	20°
Revision	25	36	35°

Series SOFCOT 2000 (D Hutten & P Burdin)

	n	Delay (months)	Gain on flexion	
			If preop <60°	If preop >60°
MUA	20	1.5	53	20
@ Release	12	8	28	5
Open release	15	15	23	15
Revision	25	36	41	14

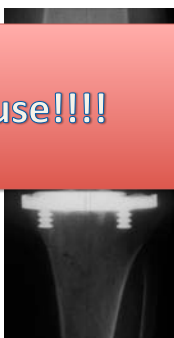
Series SOFCOT 2000 (D Hutten & P Burdin)

	n	Delay (months)	Gain on extension
MUA	20	1.5	7°
@ Release	12	8	8°
Open release	15	15	5°
Revision	25	36	6°

Which strategy??

**Find the cause!!!!**


- ✓ Skin quality
- ✓ Cause of the stiffness
- ✓ Constraint of the TKA



### Cause of stiffness after TKA

**Intrinsic factors**

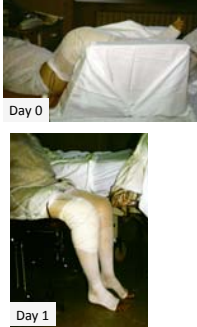
- ✓ Preop Stiffness
- ✓ Patella Baja
- ✓ Multioperated knee
- ✓ Previous MUA
- ✓ Young
- ✓ Hip joint
- ✓ Risk of artrofibrosis??



### Cause of stiffness after TKA

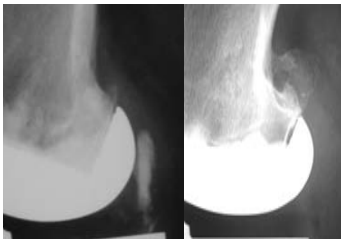
**Post op factors**

- ✓ Aggressive rehab
- ✓ Painful knee
- ✓ Hemarthrosis
- ✓ Too much anticoagulant
- ✓ Low grade infection

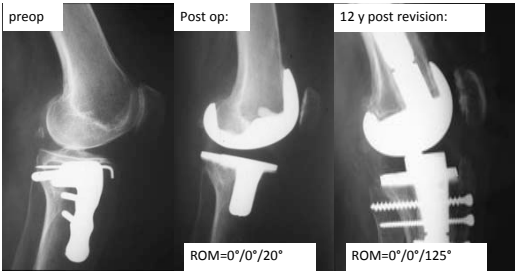


### Surgical technique

1. Bone fragments
2. Oversizing components
3. Malrotation
4. Tibial slope
5. Joint line level
6. Malbalanced knee
7. PE thickness



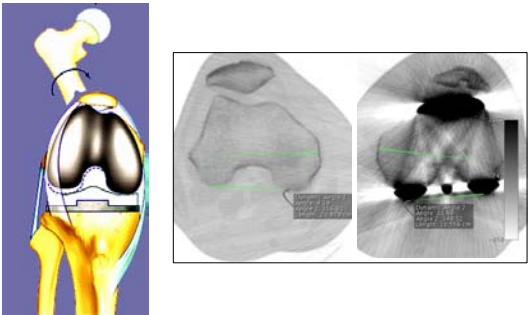
### Over sizing AP



### Over sizing ML



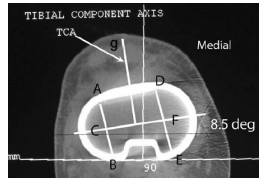
### Malrotation: femur



*Boldt & Munzinger. International Orthopaedics (2006)*

### Malrotation: tibia

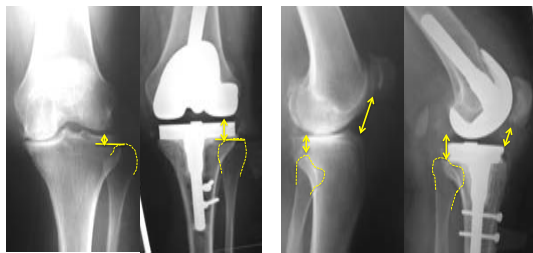
- ✓ Bédard & Vince. CORR 2011
- ✓ 34 patients revised for stiffness
- ✓ 33 Internal rotation of the tibia
- ✓ Mean: 13.7°



### Tibial slope



### Joint line level

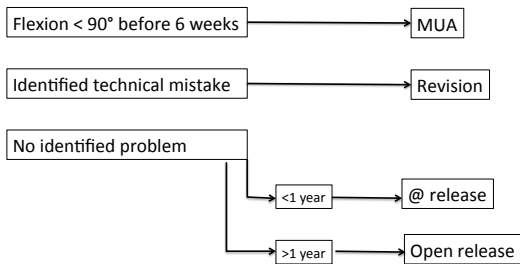


### -Find and treat the cause

- ✓ Surgical report
- ✓ Preop XR
- ✓ Biology
- ✓ Aspiration
- ✓ Comparative CT-scan
- ✓ Bone-scan
- ✓ Labeled leucocyte bone-scan



### In daily practice...



### Conclusion

- ✓ Difficult decision
- ✓ Limited improvement on flexion
- ✓ If malposition: revise early
- ✓ If no malposition: MUA at 1 month
- ✓ The real patella baja???

