4th Advanced Course on Knee Surgery

Val d'Isère 2012

Total Knee Replacement

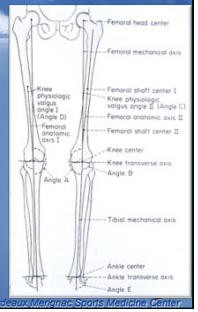
Severe Varus Deformity

Ph. COLOMBET

Definition

VARUS greater > 10 °

- Mechanical axis
- Standing long leg films
- Frontal plane only
- Sagittal plane not take in care



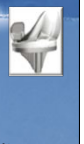
T. Knee Replacement aim

- **M**obile,
- **I**ndolence
- **S**tability in Extension and Flexion
- **C**orrect alignment

- Stability and Alignment are constant worry for:
  - function and
  - prosthesis duration expectancy

T. Knee Replacement aim

- Stability depends on ligaments
  - Ligaments are and can remains good
    Unconstraint prosthesis
  - Uncontrolled laxity
    Constraint prosthesis



- Alignment depends on the origin of deformity
  - Osseous deformity
    Intra or extra articular
  - Soft tissue deformity
    Soft tissue balance

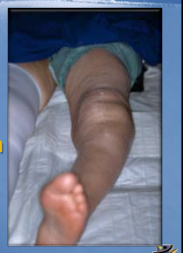
Deformity analysis

- Gait analysis
- Reducibility

Deformity analysis

- Osseous component
- Soft Tissue component
- Sometime combination of both

Precise assessment
is required !!



Deformity analysis

Osseous Component

- Location of the Deformity direction :

femoral, tibial

Intra-Articular :
OA Stage, wear

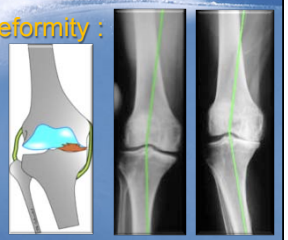
Extra-Articular :
Constitutional or Acquired
(HTO overcorrected,
post traumatic malunion)

Deformity analysis

Soft tissue Component

- Concavity of the deformity :
  Reducibility ?
- Convexity :
  Laxity ?

Soft Tissue Envelope

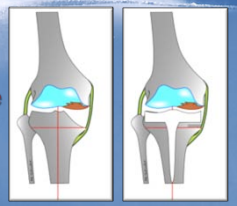


Deformity analysis

Osseous Component

- Intra articular :

Ligament release
Bone cut
Bone grafting



Surgical Strategy

Osseous Component

- Intra articular :

Bone cut
Ligament release

Surgical Strategy

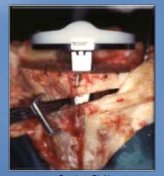
Osseous Component

- Extra articular :
  - Bone cut correction
  - Previous Osteotomy

Surgical Strategy

Osseous Component

- Extra articular :
  - Simultaneous
    Osteotomy



Courtesy Ph Neyret

Courtesy B Moyen

Surgical Strategy

1 - OSTEOTOMY First & TKA later

ADVANTAGES

- Simplicity
- Rapid healing of the osteotomy
- The results are sometimes good enough for TKA to be unnecessary or delayed

DISADVANTAGES

- 2 consecutive operations (6 to 12 months)
- 2 anesthesia, 2 rehabilitation tasks, DVT risk

Surgical Strategy

2 - OSTEOTOMY + TKA

ADVANTAGES

- A single operation
- Joint line and ligament balance preserved

DISADVANTAGES

- Technical difficulties
- Rather prolonged osteotomy fusion

Surgical Strategy

Soft tissue Component

- Constrained Prosthesis: Reducibility ?

Literature : Worse Results ?

Alignment

More difficult to be well aligned

- Karachalios JBJS-B 94
- Laskin JA 87
- Meding JA 2000
- Stern JBJS 92
- Teeny CORR 91

Nordin JY : 500 TKA
71 % aligned at 180 + 3°
91 % aligned at 180 + 5°

59 % to 75 % Well aligned

Literature : Worse Results ?

KNEE SCORE

Knee Score

- Teeny 91
  IKS K score = 89
  Flexion = 98°
- Laskin JA 96
  Flexion = 86°
- Lerat Moyen 2009
  IKS K score = 89
  Flexion = 98°
- C Hulet 2004
  IKS K score = 89
  Flexion = 110°

Literature : Worse Results ?

KNEE SCORE

SCORES	Knee	Function	Global
	89	73	162

IKS	Exc.	Good	Fair	Poor
	12 %	47 %	33 %	8 %

59 %

C Hulet 2004

Literature : Worse Results ?

Subjective Score

Mean F.up 4 years, Revision rate = 96 %

- **Subjective results**
  - Very satisfied 64 %
  - Satisfied 31 %
- **Pain** : 47/50 pts.
  - 91 % between 45 and 50

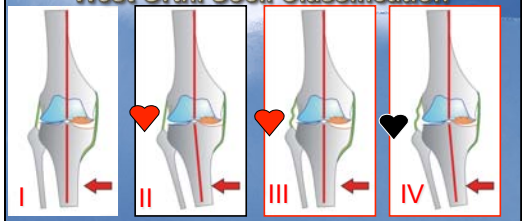
Mean flexion :
111° [30° à 135°]
90° à 109° : 24 %
110° à 119° : 30 %
120° et plus : 40 %

C Hulet 2004

Predictive elements in the planning

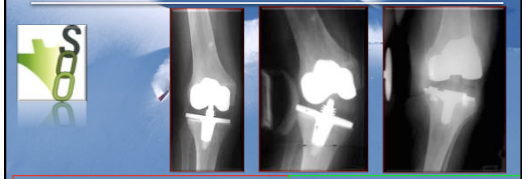
(Clinically and X-rays)

West Orth. Soci. Classification



Soft tissue balancing: Stable joint gap from ext. to flexion
The reference is the side where the ligaments had maximal length
Release on the opposite side

How to Improve ours results ?



Severe Deformity	Control Group
n = 331 cases	***n = 206 cases***
• 305 semi-constraint TKA • 11 « Hinge » • 15 associated osteotomy	Alignment within 5° of normal

How to Improve ours results ?

STABILITE	ALIGNED	MISALIGNMENT
Exc.	EXC. 59 %	23 % (67 cas)
Good	GOOD 7 %	4 %
Poor	4 %	3 %

Poor result : 34 %

C Hulet 2004

How to Improve ours results ?

STABILITE	ALIGNED	MISALIGNMENT
Exc.	EXC. 59 %	23 % (67 cas)
Good	GOOD 7 %	4 %
Poor	4 %	3 %

The stability was always perfect …

Poor result : 34 %

16 % had a slight misalignment (180 ± 5°)
Better stability rather than a slight misalignment

Loosening
Longer follow-up ?

Poor : 18 %

How to Improve ours results ?

Pre-operative planning +++

Deformity analysis is not always very easy

- X-rays stress views analysis
- 4 Types WOA
- Guidelines for soft tissue releases
- Clinical examination intra-operatively once all osteophytes have been removed

«May be too much releases and
They were not always pertinent»

How to Improve ours results ?

Improve Surgical skills and Technique

Misalignment 30 %

Bony cuts Errors :

	Varus
None	58 %
Tibia only	23 %
Femur only	14 %
"Booth"	5 %

No Errors in only 6 cases
About 10

CAO Surgery ++++



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CONCLUSION

VARUS greater > 10 °

- Frequency decrease with time < 20%
- Worse clinical results
- Extremely precise pre op assessment required
- Navigation very helpful

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Thanks for your attention!

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