STEPS IN TKR

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& BEGINNERS: UNDERSTAND THE CONCEPTS

♦ PRO GUYS: UNDERSTAND FINE THINGS/ TIPS

- **♦ FINER THINGS AHEAD**

 - ♦ DAY CASE ARTHROPLASTY
 - **♦ ALIGNMENT CONCEPTS**
 - **♦ CEMENTED/CEMENTLESS FIXATION**

LEARNING SURGERY

♦ MECHANICAL SKILLS

THEORY AND UNDERSTANDING

& EITHERWAYS TO BECOME PRO

MY AIM: CLEAR UNDERSTANDING IN MIND
 NOT AS DIFFICULT AS IT SEEMS
 NOT AS EASY AS IT SEEMS



♦ SKIN

♦ DEFORMITY

- **♦ CORRECTIBLE OR NOT**
- **♦ LIGAMENT STATUS**
- ♦ ROM
- ♦ HIP EXAMINATION
- **♦ LOCALIZATION OF PAIN**



*** BONE QUALITY**

♦ DEFORMITY

♦ BONE LOSS

♦ IDEALLY LONG LEG VIEWS



♦ **SUPINE**

♦ TQ NO TQ

 \diamond **U DRAPE**

♦ DOUBLE PREP

♦ HAIR REMOVAL

✤ THEATRE DISCIPLINE

***** ANAESTHETIC COOPERATION

✤ TRANEXAEMIC ACID

***** BLOCK

✤ LAMINAR AIRFLOW

* SIDE SUPPORT AND ROLLS UNDER FOOT

TECHNICAL GOALS

♦ 1. Alignment

♦ 2. Joint Line

♦ 4. Patella Tracking



WORK HORSE: MEDIAL PARAPATELLAR

OTHERS:

SUBVASTUS

LATERAL PARAPTELLAR

EXTENDED:

1. RECTUS SNIP

2. V-Y PLASTY QUADRIPEDS

3. TT OSTEOTOMY





✤ PATELLAR TENDON RELEASE

- ♦ 1. GOOD DISSECTION: NOT MUCH LATERAL
 - ♦ TIP: START PROXIMALLY, USE MCINDOSH SCISSORS, SWAB

***** OSTEOPHYTES

♦ RAISE SINGLE FLAP

* ACL

- ♦ NOT FAN OF SMALL INCISIONS CORNER NECROSIS
- ♦ IMPORTANT TO GET GOOD FLAP NEAR TT
- ♦ MEDIAL RELEASE
- ♦ POSTEROMEDIAL REPLEASE

✤ MENISCI ??? AT THIS STAGE??

✤ FAT PAD: CONTROVERSY

SYNOVIUM SUPRAPATELLAR POUCH??

FEMUR FIRST

$\Leftrightarrow \quad \textbf{OSTEOPHYTE OUT}$

- **♦ INTRAMEDULLARY ALIGNMENT**

♦ FULL LENGTH OF ROD WHY??



♦ 5/6 DEG

♦ 8-10MM

♦ FFD



♦ CONSIDER JOINT LINE

♦ VALGUS KNEE ISSUES??

♦ TIP: GO TWICE/ REVERSE SAW

♦ COMMON PROBLEM: UNDERCUTTING

- **♦ TIGHT EXTENSION GAP**
- **♦ LOWERING JOINT LINE**
- ♦ PATELLA ALTA



SIZING AND CUTTING BLOCK

♦ SIZING:

- ♦ ANGEL WING
- \diamond STYLUS

EXTERNAL ROTATION 3 DEGREE



EXTERNAL ROTATION OF COMPONENT

♦ GLASSGOW TECHNIQUE





FINDING YOUR LINES



WHERE DOES IT HELP





VALGUS KNEE





INTERNAL ROTATION OF FEMORAL COMPONENT





HOW TO TACKLE ?

FILL THE GAP:

A. Mc Intosh: Guess work

B. Darby Technique: 6 deg Ext Rotation

C. Best way: Use lines. Get block parallel to transepicondylar line.



VALGUS KNEE





FEMORAL CUTS

♦ CAN CHANGE YOUR ROTATION



MEDIO LATERAL SIZING

CAN GAUGE MED LATERAL OVERHANG



FEMORAL CUTS



Hyperflex Knee





EXTRA BOX CUT

TO ACCOMMODATE CAM MECHANISM



Figure 14



TRIALLING OF FEMORAL COMPONENT

Advantage: 1. Extension gap/ adequate cut

2. Can check patella tracking

3. Can check overhang

1. Lug holes in CR knee at this stage or not?



TIBLA PREPARATION

Intramedullary referencing- not common

Extramedullary referencing:

Three things 1. Slope

2. Varus/ Valgus of component

3. Amount of bone to be resected

Tip: Never align with foot





Intramedullary referencing

Not common Embolism Blood loss Not much significant changes



TIBLA RESECTION

Amount of Bone to cut 2mm from affected or 9 mm from normal side

Tip: Trust your guts Be conservative initially You can always cut more but cant put anything back



Out tibia Out Out

- ♦ Tip:
- ♦ Medial is easy.
- For lateral protect Patellar tendon



Take meniscus out

♦ Tip:

- ♦ Good exposure
- ♦ Fat pad clear
- Little release of upper
 Patellar tendon
- Extra retractor/ Mcdonald





SIZE TIBLA

No overhang

Try to accommodate a size higher better results

Tip: check around over the edges with forcep/ Mc Donald



TRIALLING

♦ TRIALLING

- **♦ 1. TO MAKE SURE ADEQUATE TIBIA CUT**
- ♦ 2. GAUZE INSERT SIZE
- **♦ 3. ALIGNMENT OF TIBIA COMPONENT**
- **♦ 4. CHECK PATELLAR TRACKING**

♦ 5. PREPARE PATELLA AT THIS STAGE

♦ ALL COMPONENTS IN PLACE FOR PATELLAR TRACKING AFTER PREPARATION



PATELLA PREPARATION

♦ Caliper

- ♦ 13mm bone to be left
- ♦ Generally 9mm smallest, 10/12 bigger ones





TIBIA ALIGNMENT

- ♦ 1. Either by Trialling
 - **♦** More time
 - ♦ Make sure no overhang

- ♦ 2. Medial of middle third of tibial tuberosity

 - ♦ Good exposure all around
 - ♦ Counterproductive if rotation issues happen



AIM EQUAL FLEXION EXTENSION GAPS

- **♦** What determines Flexion gap
 - ♦ 1. Tibia Slope
 - ♦ 2. Femoral component size
 - **♦ 3.** PCL tightness in CR knee

- What determines Extension gap
 - * 1. Distal femoral cut
 - ***** 2. Posterior osteophytes
 - ***** 3. Posterior Tightness

Slope Is major issue or tightness of tissues

Remember: You CAN NOT add to loose gap

You CAN only increase tight gap

- Scenario One: Loose flexion gap means tight extension gap
- ♦ Issue commonly is: Slope...

ANSWER

- What determines Flexion gap
- ♦ 1. Tibia Slope
- ♦ 2. Femoral component size
- ♦ 3. PCL tightness in CR knee

- What determines Extension gap
- ♦ 1. Distal femoral cut
- ♦ 2. Posterior osteophytes
- ♦ 3. Posterior Tightness

Increase Extension gap use bigger insert

- Scenario Two: Tight flexion gap means loose extension gap
- ♦ Issue commonly is: Slope...

- ♦ <u>ANSWER</u>
- What determines Flexion gap
- ♦ 1. Tibia Slope
- ♦ 2. Femoral component size
- ♦ 3. PCL tightness in CR knee

- What determines Extension gap
- ♦ 1. Distal femoral cut
- ♦ 2. Posterior osteophytes
- ♦ 3. Posterior Tightness

Increase Flexion gap

- Scenario Three: Tight flexion tight extension
- ♦ Issue commonly is: Inadequate tibia cut

♦ <u>ANSWER</u>

- What determines Flexion gap
- ♦ 1. Tibia Slope
- ♦ 2. Femoral component size
- ♦ 3. PCL tightness in CR knee

- What determines Extension gap
- ♦ 1. Distal femoral cut
- ♦ 2. Posterior osteophytes
- ♦ 3. Posterior Tightness

Cut more tibia After that you may get scenario 1 or 2

HIGHER ORDER THINKING

SITUATIONS 4: MEDIAL SIDE IS TIGHT OR LATERAL SIDE IS TIGHT

♦ 1. Soft tissue tightness: varus or valgus knee

- ♦ 2. Coronal Alignment:
 - Tibia/Femur medial to lateral slope is oblique

Answer:

Oifficult to alter cuts, answers is soft tissue release.....and accept some error

Tibia slope in coronal plane If tightness in both flexion extension



Distal femur cut in coronal plane Affect Extension



Femoral rotation: More or less rotation can give tightness in flexion on either side











BUILDING LOOSE G&PS

♦ Use of augments

- ♦ Revision scenarios / Mistakes in primary
- ♦ Eg:
- ♦ 1. Loose extension gap
 - ♦ If you cut too much distal femur
 - ♦ Use distal femur augments
- ♦ 2. Loose flexion gap:
 - ♦ Upsize femur + Post Augment
- ♦ 3. Same thing can be played with rotational issues with augment on either side
 - ♦ Generally subtle







- * DEEP MCL RELEASE/ MEDIAL OSTEOPHYTE REMOVAL
- * RELEASE POSTEROMEDIAL CORNER
- * MEDIAL TIBIAL REDUCTION OSTECTOMY (SCOTTS OSTEOTOMY)
- ***** CONSIDER PCL RELEASE/SUBSTITUTION
- *** RELEASE SEMIMEMBRANOSIS**
- * PIE CRUST SUPERFICIAL MCL
- ***** COMPLETE SUPERFICIAL MCL RELEASE / PES ANSERINUS
 - * RARELY REQUIRED
 - *** DESTABILIZES MEDIAL FLEXION GAP**
 - ***** CONSIDER A CONSTRAINED PROSTHESIS



***** TIGHT IN EXTENSION

- *** POSTERIOR PORTION IS TIGHT IN EXTENSION**
- * TIGHT IN FLEXION* ANTERIOR PORTION
- *** LATERAL TIGHTENING**
 - *** USE A PROSTHESIS THAT IS SIZED TO "FILL UP" THE GAP**

*** CONSIDER USE OF A CONSTRAINED PROSTHESIS**



*** OSTEOPHYTES/ POSTEROLATERAL CAPSULE**

*** ILIOTIBIAL BAND IF TIGHT IN EXTENSION**

*** POPLITEUS IF TIGHT IN FLEXION**

* LCL

CONSTRAINED PROSTHESIS
 MEDIAL TIGHTENING
 FILL UP MEDIAL SIDE
 MCL RECONSTRUCTION

FIXED FLEXION DEFORMITY

* 1 POSTERIOR FEMORAL & POSTERIOR TIBIAL OSTEOPHYTES

* 2 POSTERIOR CAPSULE

*** 3 ADDITIONAL RESECTION OF DISTAL FEMUR**

* 4 GASTRONEMIUS MUSCLES (MEDIAL AND LATERAL)

TIBLA PREPARATION

♦ DRILL OR USE SAW



CEMENTATION

- **COMMON MISTAKES**
 - ♦ 1. TOO MUCH OF CEMENT
 - ♦ 2. MAKING NEW TRACKS
 - ③ 3. GENTLE HAMMERING: FRACTURES

- ♦ VARIATION
 - ♦ FINAL INSERT
 - ♦ TRIAL INSERT





♦ CLOSE IN FLEXION

♦ MARK SKIN/ TENDON

 ONTINUOUS/ INTERMITTENT CLOSURE

♦ TIP: CLOSURE NEAR TT

SKIN: CLIPS/ MONOCRYL/ RAPID VICRYL

♦ DRESSINGS: COMPRESSION DRESSING





































THANKS GN

