ROUND TABLE: MY KEYS FOR SUCCESS TO AVOID PAIN AT INDEX TKA

Mark Clatworthy
Middlemore Hospital
Auckland
New Zealand
Key Factors

- Patient Selection and Education
- Comprehensive Anaesthesia & Analgesia Regime
- Surgical Technique
  Anatomic Alignment
  Anatomic Tibia, Balanced Femur
Patient Selection

- Must have advanced OA – bone on bone on weight bearing X rays
  Only exception is avascular necrosis

- Preoperative Education – realistic postop expectation
  6 month recovery process
  Night pain is common particularly in the first 8 weeks
  Knee will be stiffer in the morning so it will be more painful to get going in the morning than the night before
Preoperative Medication

- Oxycontin 5-10mg
- Gabapentin 100-300mg
Intraoperative Medication

- **Bupivcaine 0.5% - 2.5 -3.5mls Spinal**

- **Cocktail – Around the capsule and ligaments**
  - 40mls 0.25% Bupivcaine with adrenaline
  - 5-10mg Morphine
  - 75mcg Clonidine
  - Vancomycin 1g
  - Kenacort 40mgs

In the quads tendon, subcutaneous tissue and medial skin 40mls 0.25% Bupivcaine with adrenaline
Post operative Medication

- Tramadol SR 100mg bd
- Codeine 30mg q6h
- Gabapentin 200-300mg tds
- Celebrex 200mg daily
- Paracetmol 1 g q6h
- Oxycontin 5-10mg b.d
- Oxynorm 5-10mg q2h prn
- PCA – Oxycontin – 36-48 hours
- Anti-emetic prn – Ondandestron 4-8mg q8h IV/PO
- Cyclizine 12.5-25mg IV, Scopoderm patch
Discharge Medication

- 6 week course
- Tramadol SR 100mg bd
- Gabapentin 200-300mg tds
- Celebrex 200mg daily
- Paracetmol 1 g q6h
Anatomic Tibia Balanced Femur TKA

- CAS controlled – BrainLab 3.0 software
- Aim to restore constitutional varus to a max 3° varus
- Tibia cut anatomically to a max of 3° varus
- CAS Ligament Balancer used to optimize femoral component position to enable an equal gap through a full ROM
- Favour balanced femur over anatomic

Based on 10 years of CAS balanced TKA where marked variability in femoral rotation and posterior femoral bone cuts
Brainlab 3.0 Software

- Sophisticated Balanced Approach
- Enables real time feedback on implant positioning
- Determines balance through a full ROM
- Enables improved femoral component positioning
Femoral Component - Graduated Radius
Better stability in flexion

1mm poly – enables better stability

14 Femoral component sizes - enables better anatomical fit and no overhang – less pain

More anatomical PFJ

Studies shows less pain cf PFC Sigma
Surgical Technique

- Remove medial & lateral osteophytes
- Determine alignment and correctability. Happy to leave TKA in max 3° of varus
- Estimate chondral and bone loss in arthritic compartment. Cut the tibia anatomically in up to 3° of varus
  Resect extra tibia if fixed flexion >10°
- Remove any posterior osteophytes, release posterior capsule if necessary
- Insert ligament tensor place knee through ROM
- Optimize femoral component position ensuring a balanced knee
- Release PCL if medial compartment tight in flexion
  Release popliteus of femur if lateral compartment tight in flexion
- Piecrust MCL if tight - rare
Workflow Steps
Anatomic Tibia Balanced Femur Technique Evaluation

- 215 patients with a varus knee July 2013 - 2015
- 75% anatomic tibial cut
  43% neutral tibial cut, 32% anatomical varus cut ,
  25% cut in 3° varus – under-corrected

- 79% patients correctable to neutral in extension
  All patients correctable to a max of 3° of varus
  No collateral ligament releases – with anatomic tibial cut

- All TKA’s final alignment ≤ 3° of varus

- 75% of anatomic tibias +/- 3° to neutral posterior condylar axis cf 48% non anatomical tibias
Mean 2.3° varus

43% of tibia’s are neutral

75% of tibia’s can be cut anatomically
Femoral Rotation - PCA

75% +/- 3° to neutral PCA – Mean 1.4° ext
Concept – Anatomical Tibial Cut so the natural joint line is restored to enable better TKA kinematics. 75% of the time this achieved. 43% tibia is in neutral.

Concept – Balanced Femur to enable the TKA to be stable through a full ROM. Ideally the femoral cuts would be anatomical. Distal Femoral cut - 80% ± 1mm of 9mm. Femoral Rotation – 75% ± 3° of rotation relative to neutral. Posterior medial femoral cut - 56% ± 1mm of 8mm. Posterior lateral femoral cut – 31% ± 1mm of 8mm.
Summary

- If you cut the femur anatomically there might be a degree flexion extension mismatch and medial lateral imbalance.

- The anatomic tibia balanced femur technique using CAS to determine balance and maintain the 3° boundary will give you a reproducible well balanced TKA.
CAS ANATOMIC TIBIA
BALANCED FEMUR TOTAL KNEE
ARTROPLASTY
CLINICAL STUDIES

Mark Clatworthy
Middlemore Hospital
Auckland
New Zealand
Results

- Six month NZJR Oxford Outcome Study
- In hospital early Outcome Study
Attune Oxford Score 6 months – 392 patients
Mean Attune score - all surgeons 39.5
Mean anatomic tibia balanced femur score 41.3
Mean neutral tibial cut varus Attune 35.2  p=0.025
Measured resection non navigated Attune 38.3  p=0.000004
<table>
<thead>
<tr>
<th>Alignment</th>
<th>Patients</th>
<th>Flexion</th>
<th>Exercycle</th>
<th>VAS Rest</th>
<th>VAS Exercise</th>
<th>SF 1</th>
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<tr>
<td>Varus Neutral Tibia</td>
<td>18</td>
<td>97</td>
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<td>0.89</td>
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<td>Varus Anatomical Tibia</td>
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<td>111</td>
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Conclusion

- There is significant variation in the bony topography and soft tissue envelope of the osteoarthritic knee.

- CAS Anatomic Tibia Balanced Femur technique enables the surgeon to implant a reproducible well balanced TKA that better matches the patient's anatomy.

- Oxford scores @ 6 months show significantly better scores.

- In hospital study shows a trend to increased ROM, less pain and function – numbers small.