Preoperative Hip Xrays: Templating

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THR: Getting Limb Length Right

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What are the methods to avoid LLD

- Preoperative Templating and Intraoperative execution

- Intraoperative Methods
  - Measurements: Pelvis-Femur
  - Leg to Leg comparison
  - Soft tissue tension: Shuck Test, Drop Kick Test
  - Intraoperative X rays
Clinical Examination

Assess

- Apparent LL
- True LL
TEMPLPLATING
To Template an Xray (for THR)

- Have the desired magnification.
- Reference for Measurements
Radiologic Limb Length Discrepancy

Measure the distance between Fixed point on Pelvis and a Fixed point on Femur on either sides and compare.

Inter tear drop line to fixed point on the Lesser Trochanter.
How do we estimate and make adjustments?
Marking Centre of rotation of acetabulum

45°
FEMORAL TEMPLATING

- Stem Size
- Offset
- Neck length
- Neck Resection level
Mental Templating
THR: Intraoperative Measurements and Checks
Intraoperative Measurements
Ranawat’s Technique

- For posterior approach, before Dislocating

- Steinman Pin in Infra-cotyloid Groove

- Mark on the Trochanter

- Note the position of limb
Ranawat’s Technique

- Simple, Accurate, Reproducible
- Near the centre of rotation of hip
- Good Correlation
- False results
  - Large osteophyte
  - Failure to identify infracotyloid notch properly
  - Variable Verticality of pin
  - Dis-similar position of hip
Soft Tissue Tension

Surrogate Marker for Lengthening or Shortening
• Knee to Knee Comparison.mp4
Shuck Test

- Assessment of stability and overall soft-tissue tension around the hip joint, by distracting the hip joint

- LONGITUDINAL DISTRACTION (Direct Axial Traction) IN NEUTRAL POSITION OF HIP
• Shuck Test in Primary Hip.mp4
Shuck Test

- Assessment of stability by distracting the hip joint
- Allows a subjective determination of the overall soft-tissue tension around the hip joint
- LONGITUDINAL DISTRACTION IN NEUTRAL POSITION OF HIP
- More than half of femoral head should not disengage from liner
Dropkick Test

• Hip is held in extension while the knee is concomitantly flexed to 90°. If tissue is overtly tight then >>>>>>

• Knee has a tendency to passively swing into extension when the leg is released (Kick)
• Drop Kick Test.mp4
• Obers Test and Knee to Knee Comparison.mp4
Word of Caution

Soft Tissue Tension Assessment

• Subjective

• May be less reliable with Spinal or CSC when compared with GA
THR Soft Tissue Tension BY PALPATION.mp4
Adjustments

- **Coxa vara** - Lower the neck cut with **High Offset**

- **Coxa Valga** – **Higher neck cut** with **Lower offset**.
VARUS Hip

VALGUS Hip
Adjusting for Large Offset
High Offset Stems
Remember

- Stability at hip takes precedence over limb length equalisation.
- Less than 1 cm LLD after THR goes unnoticed.
- As many as one third healthy individuals have 5 mm to 1.5 cm of UNNOTICED LLD.


Remember

- In **hypoplastic limbs** (because of developmental disorders of childhood diseases), **equalisation of limb lengths is always not possible**.

- The permissible upper limits to lengthen (as compared to preoperative length) is **2.7 to 4.4 cm**

- **Apparent LLD** usually **correct over time** unless patient has fixed Scoliosis.
Thank You