The Birmingham Interlocking Pelvic Osteotomy [BIPO] at 20 years

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Disclosures

• The Birmingham Hip Clinic.com
• The Royal Orthopaedic Hospital, Birmingham
• The Birmingham Children’s Hospital
• Royalties from Matortho PLC (Adept instrumentation and Extra-Fixation Cup Design)
The BIPO is a triple osteotomy of the pelvis where the acetabular maldirection is fully defined pre-operatively with CT scans, the bone cuts reflect the deformity to be corrected, a leg-lengthener is used to reliably realign the Central Acetabular fragment and a predictable solid bony interlock is achieved to allow immediate FWB and rapid mobilisation. The ischium and pubis are first divided very close to the joint.

All cuts are made under direct vision.
The essential principle of the operation is to make three linked bone cuts on the ilium, the angle between them (here 30°) reflecting the intended lateral rotation of the central acetabular fragment (CAF).

An external fixator (yellow) is attached to the CAF in the plane of the presenting acetabular mal-alignment (in all planes) to provide a powerful lever to mobilise the CAF and manoeuvre it into a position of predictable and reproducible correction. The technique allows reproducible adjustment of acetabular anteversion. Medialisation is automatically achieved.
The Bone cuts; When adjusting lateral cover only (here 30 degrees), the screws should be inserted in the strict sagittal/axial plane and the bone cuts should be of equal width. Thus the C cut of the CAF will sit up snugly and securely on the B cut of the Ilium. Adjustment of anteversion will not be possible. Adjustment of anteversion is achieved by introducing the schantz screws in internal or external tilt and widening the B cut 2-3mm to allow enough wiggle to allow internal /external rotation as indicated by CT scans.
Method

• First 100 consecutive patients identified (116 Hips)
• Patient demographics and outcome determined from questionnaires, hospital notes, computer records, telephone interviews.
• Primary Outcome: Survival before Resurfacing/THR required.
• Secondary Outcomes: OHS and UCLA score
Results

• First 116 TPOs performed by JOH
• 3 TPOs without follow-up
• Mean follow-up 17.5 years (13.8 to 21.5)
• Mean age 31 (range 7 – 57)
• Mean Acetabular Index pre-op 23
• Mean Acetabular Index post-op 2
• 37 Arthroplasties at mean 8 years (95% CI 6.8 – 9.3)
• 1 revision (2008) for xss AAV @ 14yrs
• 1 anterior acetabular edge trimming @ 4yrs
  (compare with 14% malposition after PAO)
BIPO Outcome @20yrs for dysplasia = 50% (as PAO)

Aged 7-57yrs (adversely affected by age p<.02)

<20yrs – 89%
<25yrs – 76%
> 30 yrs – 67%
Secondary Outcomes

- Oxford Hip Score
  Median 41
  (interquartile range 24-46)

- UCLA: 5
  (interquartile range 3-7)
Neonatal Septic dislocation

@13yrs

Treated by BIPO + Valgus
Now 21yrs FU,
Excellent function,
Dance leader on a ship
Complications – 10/116 = 8.6%

- 1 temporary sciatic nerve palsy
  - 1st pt – solved by mobilisation of the nerve x 16cm
- 1 PE(from contralateral leg, flight 12/7 earlier)
- 2 DVT (1 of which in non-operated leg)
- 3 Non-unions (1 ischial, 2 pubic) united after bone grafting (4 since in >1000 cases)
- 2 Permanent lateral cutaneous nerve injuries
- 1 infection

- A fraction of those following PAO
Conclusions

• The BIPO is a valuable and reliable tool to accurately correct acetabular dysplasia,
• The Survival at 20 yrs is the same as a PAO.
• The complication rate was \( \frac{1}{4} \) to \( \frac{1}{2} \) of that reported by Ganz, Millis, DeWitt & others
• In a world where there are not enough pelvic osteotomy surgeons, (because of fear of complications after PAO) why risk a PAO?
  when a much more precise, less risky alternative is available
  (and allows FWB, and more rapid rehab, no litigation in 1000 cases and easier sleep for the surgeon)
  So, do a BIPO!