DDH Ultrasound & Surgical Approaches
Background

• Previously CDH, now termed DDH
• Recognition that dislocation may be developmental/acquired not only congenital
• Includes a range from acetabular dysplasia to dislocation (dislocation, irreducible, early or late)
• Dislocation may present early (at birth) or late (usually > 6 months)
Incidence

- Significant DDH 1/1000
- Unstable hips at birth 5-10/1000
- F:M 8:1
- Left hip > right hip
- More common if
  - Breech
  - First born
  - Oligohydramnios
  - Family History
Natural History

• 90% of unstable hips become stable by 9 weeks
• Acetabular remodelling maximum by 18 months
• False acetabulum smaller than true acetabulum – osteoarthritis
• Limb will be shorter
• Unilateral toe-walkers
Screening

• Ortolani and Barlow tests (48 hours)
• Late present with a limp and limb length inequality
• Assymetrical skin creases not reliable
• Galeazzi sign
Ultrasound

• Some centres use routinely, arguments for and against
• Non-invasive, accurate, diagnoses dysplasia, dislocatability and dislocation
• Graf –static
  – Mid-coronal scan of hip joint. Straight line of ileum must be seen
  – Alpha angle – line of bony acetabulum and ileum
  – Beta angle – line of ileum and labrum
Ultrasound

F.H. = Femoral Head
B.A. = Bony Acetabulum
T.R.C = Triradiate Cartilage

Normal
Alpha angle > 60 degrees

Dysplastic Graf type 3
Alpha angle < 43 degrees

Adapted from: Broughton, Pediatric Orthopaedics, WB Saunders Company Ltd
Radiographs

- > 6 months of age
- Difficult to distinguish between dysplasia and dislocation before walking age
- Shenton's line
- Hilgenreiner and Perkins line
- Acteabular index <30 1 year
- Metaphyseal edge
- Centre Edge angle
Less than one year

Safe zone: 90 degrees flexion, 30 to 60 abduction
1 to 3 years

- Closed reduction only if the hip remains in the safe zone – spica, but AVN rate high
- Most advocate open reduction, medial approach vs Smith-peterson
- +/- pelvic osteotomy
- +/- femoral osteotomy
3 years onwards

- Open reduction and femoral shortening
- +/- acetabuloplasty
Open Reduction

- Medial approach open reduction
- Useful aged 6mnths to 1 year
- Contained indicated in “high hip”
- Capital epiphysis must be visible or increases AVN rate
Medial Approach

- Supine, hip flexed, abducted, externally rotated
Medial Approach

- Develop a plain between adductor longus and gracilis
Smith Peterson

- Supine
- Internervous plane – sartorius (Fem n) & TFL (SGN)
- More deeply – rectus femoris (femn) & glutius medius (SGN)
Femoral Shortening

- Undertaken if hip is difficult to reduce
- If extreme cast position necessary
- Separate lateral incision
- Primary or staged