MANAGEMENT OF HIP SUBLUXATION/DISLOCATION
IN CHILDREN WITH CEREBRAL PALSY

Jon R Davids, MD
Assistant Chief of Orthopaedic Surgery
Director Motion Analysis Laboratory
Shriners Hospital Northern California, Sacramento, CA USA

I. Neuromuscular Hip Dysplasia
   A. Pathophysiology / Pathomechanics / Pathoanatomy
   B. Incidence / Natural History
   C. Goals of Surgical Intervention
   D. Treatment Options

II. Pathophysiology of Neuromuscular Hip Dysplasia (Not DDH)
   A. Spasticity
      1. Dynamic / Myostatic Muscle Imbalance

III. Pathomechanics
   A. Adduction / Flexion Bias
   B. Abnormal Loading of Femoral and Acetabular Physes

IV. Pathoanatomy (Not DDH)
   A. Proximal Femur
      1. Persistent Increased Femoral Anteversion
      2. Progressive Coxa Valga
         a. Femoral Neck, Physis, Epiphysis
   B. Acetabulum
      1. Postero-superior Insufficiency Most Common
         a. Anterior, Global Also Possible
C. Pelvis

1. Obliquity
   a. Infrapelvic: Myostatic Muscle Deformities
   b. Suprapelvic: Scoliosis

V. Incidence / Natural History

A. Wide Range Reported in Literature (3-47%)
B. Related to GMFCS Level (IV, V >> I, II, III)
   1. Global Medical Concerns
      a. Pulmonary (Aspiration), GI (Reflux), Neurologic (Seizures, Bleeding)
      b. Malnutrition (Wound Healing)
C. Natural History Controversial
   1. 57-72% Not Painful in Young Adult
   2. Longer Follow Up: More Painful

VI. Goals of Surgical Intervention

A. Restore Alignment
   1. Correct Myostatic Muscle Deformities
   2. Correct Femoral / Acetabular Malalignments
B. Prevent Recurrence of Deformities
   1. Manage Spasticity
   2. Normalize Forces Across Physes
C. Right Patient, Right Time, Right Surgery
   1. 95% Success Rate at 7 Years Follow Up
D. Complications (Hope for the Best, Prepare for the Worst)
   1. Overall 25%
   2. GMFCS V (with Trach or Gtube) 68%

VII. Treatment Options: Overview
A. Decision Making Is Complex, Multi-faceted

1. Comprehensive Assessment of Pathoanatomy (Not DDH)
2. Surgery to Address All Components of Deformity
   a. Errors of Omission versus Co-mission
3. Tone Management
4. GMFCS V: Philosophical Discussion with Family
   a. Proactive versus Reactive

VIII. Surgical Techniques

A. Early Soft Tissue Balancing

1. Indications: Hip at Risk
   a. Age < 6 Years
   b. Migration Index >30%, < 60%
   c. GMFCS I-III Best Results

B. Reconstruction

1. Congruent (VDRO + Dega, More Is Better!)
   a. Age > 6 Years
   b. Migration Index >30%
   c. Femoral Alignment Goals
      1) Consider Remodeling with Growth
   d. Acetabular Alignment Goals
      1) No Remodeling (Not DDH)

2. Non-congruent (Acetabular Shelf / Chiari + VDRO; Pelvic Support)
   a. Age > 15 Years
   b. Migration Index >60%
   c. Non-ambulatory

C. Resection
1. Subtrochanteric Level
2. Soft Tissue Interposition
3. Tone Management
4. Heterotopic Ossification

C. Replacement
D. Arthrodesis

**Selected References** 1-47