PERCUTANEOUS SUBTROCHANTERIC VALGUS OSTEOTOMY FOR PAINFUL DISLOCATED HIPS IN PATIENTS WITH CEREBRAL PALSY
INTRODUCTION

- Hip instability affects 90% of GMFCS 5 patients with CP

- Surgical Indications
  - Pain
  - Seating Issues
  - Personal Hygiene

- Surgical Options
  - Reconstructive:
    - Soft tissue release
    - VDRO +/- pelvic osteotomy
  - Salvage:
    - Hip arthrodesis, valgus osteotomy, proximal femoral resection, THA
SUBTROCHANTERIC VALGUS OSTEOTOMY (SVO)

- Pain control
- Improves sitting tolerance, nursing care
- Varying techniques involving
  - Internal Fixation
  - External Fixation
AIM

1. Does percutaneous SVO using an external fixator improve caregiver satisfaction and patient’s quality of life?
2. Compare clinical results and complications with previous reports using internal fixation.
METHODS

- Retrospective series
- Single surgeon (2000-2013)

Chart Review
- Demographics
- Physical Exam
- Complications

Radiographic Analysis
- Pelvic-Femoral Shaft Angle
- Osteotomy Angle

Caretaker survey
- CPCHILD (2/7 sections)
  - Patient comfort and emotions
  - Overall QOL

- Hogan et al
SURGICAL TECHNIQUE
Open Adductor Tenotomy
SURGICAL TECHNIQUE

First Pin Placement
SURGICAL TECHNIQUE
Distal Pin placement
SURGICAL TECHNIQUE
Multiple Drill Hole Osteotomy
RESULTS

Demographics

- Spastic, non-verbal CP with SVO + external fixator
  - 15 patients (18 hips)
  - Age: 14.3 (10.7-26.8) yrs
  - F/U: 40 (6-100) months
  - Hospital Stay: 2.8 (1-8) days
  - Avg. blood loss: 49 (10-250) cc
  - Time in ex fix: 18 (11-30) weeks
### RESULTS

#### Clinical and Radiographic Measurements

<table>
<thead>
<tr>
<th></th>
<th>Pre-Op</th>
<th>Intra-Op</th>
<th>Latest Follow-up</th>
<th>Difference (preop.-f/u)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abduction (Degrees)</strong></td>
<td>-7.7 (-32-5)</td>
<td>22 (-20-50)</td>
<td>31 (10-60)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td><strong>Osteotomy Angle</strong></td>
<td>0</td>
<td>48 (2-93)</td>
<td>35 (12-71)</td>
<td>35 (12-71)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Pelvic Femoral Angle</strong></td>
<td>-15 (-48-7)</td>
<td>25 (-5-66)</td>
<td>17 (-44-92)</td>
<td>32 (-23-69)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
RESULTS

Pain Survey (10 Patients, 12 Hips)

*Overall (Pain) p = 0.02

- Time to Pain: *p = 0.02
- Pain Quantity: *p = 0.02
- Transfers
- Diaper Change Ease: *p = 0.01

Hogan et al, JBJS 2006
RESULTS

CPCHILD: 9 Patients, 11 Hips

- ADLs: p = 0.06
- Total: P = 0.19

Narayanan et al, DMCN 2006
COMPLICATIONS

- 73% (11/15 patients)
  - 7 minor complications (non-op)
    - 4 Pin Site Infections (oral abx)
    - 3 superficial decubitus ulcers (local wound care)
  - 4 major complications
    - 2 deep decubitus ulcers (debridement)
    - 1 Persistent pain
      - Resolved with Femoral Head Resection
    - 1 fracture s/p fixator removal (non-op – Spica cast)
      (only adult patient!)
- 0 avascular necrosis
### DISCUSSION

<table>
<thead>
<tr>
<th>Author</th>
<th>Fixator</th>
<th>Patients</th>
<th>Complications</th>
<th>“Major” Complications</th>
<th>Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hogan et al</td>
<td>Internal</td>
<td>24</td>
<td>24 (100%)</td>
<td>9 (38%)</td>
<td>9 (38%)</td>
</tr>
<tr>
<td>Agashe et al</td>
<td>External</td>
<td>11</td>
<td>11 (100%)</td>
<td>5 (45%)</td>
<td>1* (9%)</td>
</tr>
<tr>
<td><strong>Our Series</strong></td>
<td>External</td>
<td>15</td>
<td>11 (73%)</td>
<td>4 (27%)</td>
<td>3 (20%)</td>
</tr>
</tbody>
</table>

*Agashe et al, Orthopaedics 2013
Hogan et al, JBJS 2006*
LIMITATIONS

- Retrospective study
- Varying follow-up times
- Limited sample size (underpowered)
  - Power analysis suggests 29 patients
- Other QOL factors not considered
  - Spinal and oral problems, socioeconomic factors
- Concurrent surgeries
- Single surgeon
CONCLUSIONS

- Improves abduction
- Improves caregiver satisfaction / patient comfort
  - May improve QOL
- (Perhaps) fewer complications compared to other techniques