Objectives: Persistent OP: Manual Rotation?

- Background
  - Incidence & Etiology
  - Associated Maternal & Neonatal morbidity
- Diagnosis of Persistent OP
- Management
  - Pre-labor & Stage I
  - Stage II
    - Prophylactic, After a pre-defined time period, “Late”
- Manual Rotation: Technique
- Clinical scenarios

Clinical scenario – you get a page….

39 yo G1 at 40 3/7 weeks
- Pushing for 3 ½ hours, fatigued
- Category II tracing
  - Minimal-moderate variability, intermittent late decelerations
- EFW 3800g…..
Clinical scenario – you get a page....

39 yo G1 at 40 3/7 weeks
- Pushing for 3 ½ hours, fatigue
- Category II tracing
  - Minimal-moderate variability, intermittent late decelerations
- EFW 3800g
- …and “I think she is OP”

Can you come and assess her?

Background: Persistent OP

• Onset of Labor – 25% of fetuses in OP (~1/2 OT)
  - 80-90% rotate to OA prior to delivery
• OP and Stage II
  - If OP at onset of stage 2 – rotation to OA? - 50-80%
  - If OA at onset of stage 2 - rotation to OP? ~5%
  - At birth: 5-12% OP
    • Right OP (60%), Left (30%), Direct (10%)

Background: Etiology

• Parity – nulliparous; Age >35; BMI >30; >41 weeks
• Anterior placenta; Fetal macrosomia (>4000g)
• Labor augmentation
• Prior OP birth
• Shape of pelvis - occiput attracted to area of most room
**Background: Etiology**

- Parity – nulliparous; Age >35; BMI >30; >41 weeks
- Anterior placenta; Fetal macrosomia (>4000g)
- Labor augmentation
- Prior OP birth
- Shape of pelvis - occiput attracted to area of most room
  - Anthropoid
    - More common - African American
- Epidural

**Background: Etiology - Epidural**

- Epidural → More relaxed levator complex
  - Inhibits rotation of OP to OA – more persistent OP
  - Retrospective cohort studies* (OR: 2.2-3.25)
  - But Nulliparous women have more OP!
  - “Back labor” – no difference in rate of epidural®
- Randomized controlled trials^
  - Epidural vs. No analgesia/other methods
  - RR 1.4 (0.98-1.99)


**Persistent OP – Maternal Outcomes/Morbidity**

Suboccipitobregmatic: 9.5cm
Occipitofrontal: 11.5cm
Occipitomental: 13.5cm

Fig. 1. Anteroposterior diameters of a newborn head. For occiput anterior delivery, the suboccipitobregmatic diameter (green) typically passes through the outlet and over the perineal body, for occiput posterior deliveries, the larger occipitofrontal (yellow) or occipitomental (red) diameters typically pass through the outlet as a result of extension of the fetal head.

Barth WH, Obstet Gynecol 2015
Persistent OP – Maternal Outcomes

• Labor dystocia
  – Longer stage I, more likely – prolonged stage I
    • Augmentation – oxytocin, amniotomy
  – Longer stage 2 – PEOPLE* – Add 45 minutes
• Operative vaginal birth - ~2 fold increase
  – Failed operative vaginal delivery
  – 3rd & 4th degree lacerations
    • VAVD and persistent OP: ~33%
    • FAVD and persistent OP: 50-70%
• Cesarean – strongest association in late stage II
  ↑ Bleeding, extension, injury

*Senecal J Obstet Gynecol 2005

Persistent OP – Neonatal Outcomes*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>OR (95% CI)</th>
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<tbody>
<tr>
<td>Apgar &lt;7 @ 5min</td>
<td>1.5 (1.2-1.9)</td>
</tr>
<tr>
<td>CUA acidemia</td>
<td>2.0 (1.5-2.7)</td>
</tr>
<tr>
<td>Meconium</td>
<td>1.3 (1.2-1.4)</td>
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<tr>
<td>Birth Trauma</td>
<td>1.8 (1.2-2.6)</td>
</tr>
<tr>
<td>NICU admission</td>
<td>1.6 (1.3-1.9)</td>
</tr>
<tr>
<td>Neonatal morbidity</td>
<td>1.4 (1.2-1.6)</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>0.5 (0.3-0.97)</td>
</tr>
<tr>
<td>Brachial Plexus Injury</td>
<td>10.4 (3.0-35.9)</td>
</tr>
</tbody>
</table>


Diagnosis - OP

• Digital examination
  – May be challenging – caput, molding
  – Differ by >45°? -- 30-80%

*Barth WH Obstet Gynecol 2015

Diagnosis - OP

• Ultrasound
  – Axial view – orbits, post fossa, falx
  – Axial/Sagittal view – Location of fetal spine
  – All vs. selective/uncertain examination

*Barth WH Obstet Gynecol 2015
Diagnosis - OP

- Ultrasound
  - Axial view – orbits, post fossa, falx
  - Axial/Sagittal view – Location of fetal spine
  - All vs. selective/uncertain examination

Management – Persistent OP

What to do…?
Dictated by when you are aware of OP

- Pre-labor/Antepartum
- Active Labor – Stage I
- Stage II
  - Onset of stage II – “Prophylactic”
  - After some Pre-defined period of time ~ 1h
  - Lack of Progress/Arrest
  - No large RCTs to guide management

Management - Pre-labor/Antepartum period

- Can we prevent Persistent OP?
  - Can exercises facilitate anterior rotation of the occiput?
    - Hands/Knees thought to promote rotation to OA^*
    - Multicenter, randomized, n= >2500*
    - 36-37 weeks
    - Daily Walk vs. Hands/Knees/Pelvic rocking 10 min 2/day
      - Await spontaneous labor
    - Persistent OP: ~8% in both groups
  - No difference in CD
    - No evidence of benefit

*Karimina A BMJ 2004
Management - Active labor, Stage I

- Most OP fetuses spontaneously rotate to OA
- RCTs* - Maternal repositioning did not:
  - Increase OA at time of delivery
  - Decrease operative vaginal delivery rates
- Late stage I – manual rotation
  - Less success^  
  - Increased risk for cord prolapse & cervical laceration
- No intervention has proven successful


Management – Stage 2

OPTIONS:
1) Prophylactic manual rotation
2) Rotation after some defined period of time - 1h nullip
3) Rotation for Arrest of Descent
4) Expectant management

Management – Stage 2: Examination

- Station - May be difficult to assess
  - BPD above spines?
    • Leopold for BPD
  - Pelvis: Is the pelvis adequate – Arch, Spines, AP?
    - Treat Android, Anthropoid and Gynecoid differently
    - Do the fetus and pelvis match?, EFW?
- Progress?
  - Onset of stage II
  - Manual rotation success indirectly related to time in OP
  - Limit unnecessary procedures
  - Frequent assessments of descent

Persistent OP and fetal station

- Leopold – Abdominal palpation of BPD
  - High station despite visible scalp

*Barth WH Obstet Gynecol 2015
Management – Stage 2: **Examination**

- Station - May be difficult to assess
  - BPD above spines?
    - Leopold for BPD
- **Pelvis**: Is the pelvis adequate – Arch, Spines, AP?
  - Treat Android, Anthropoid and Gynecoid differently
  - Do the fetus and pelvis match?, EFW?
- **Progress?**
  - Onset of stage II
  - Rotation success indirectly related to time in OP
  - Limit unnecessary procedures

Management – Stage 2: **Examination**

- Other clinical factors
  - Urge to push
  - Anesthesia
  - Chorioamnionitis

- What is the **timeline** for this birth?

Management – Stage 2

**OPTIONS:**

1) Prophylactic rotation (manual or forceps)
2) Rotation after some defined period of time - 1h nullip
3) Rotation for Arrest of Descent
4) **Expectant management**

Management – **Expectant management**

- Labor progressing, FHR category I
  - Occiput posterior at onset of stage II
    - 50-80% spontaneously rotate to OA
  - Manual rotation is not risk free
    - Uncommon but important related morbidity
    - Cervical laceration (~2%), NRFHT (1%), discomfort
  - Frequent assessment of descent/progress
  - May continue to progress and undergo SVD
    - What is the pelvis type?
Management - Onset of stage 2

OPTIONS:
1) Prophylactic rotation (manual)
2) Rotation after some defined period of time - 1h nullip
3) Rotation for Arrest of Descent
4) Expectant management

Management – Prophylactic rotation

- RCT: Term, Nulliparous, Epidural, OP, n=64*
  - Onset of stage II:
    - Manual rotation vs. Expectant management
  - Early manual rotation
    - Successful rotation: 83% vs. 20% (p=0.001)
    - Shorter stage II: 65 vs. 82 minutes (p=0.04)
  - No difference:
    - 3rd/4th degree lacerations,
    - Cesarean
    - Operative vaginal birth
  - No evidence of harm

*Broberg Am J Ob Gyn 2016 S63.

Management – Stage 2

OPTIONS:
1) Prophylactic rotation (manual or forceps)
2) Rotation after some defined period of time - 1h nullip
3) Rotation for Arrest of Descent/NRFHT
4) Expectant management

Management – Stage 2 Rotation after some period of time

- Prospective, n=61
  - 2nd stage, sono confirmed persistent OP
  - Randomized by time period
  - Expectant vs. Manual rotation
  - Nulliparas – at 60 minutes (90 min if epidural)
  - Multiparas – at 30 minutes (60 min if epidural)

*Reichman Eur J Obstet Gynecol 2006
Management – Stage 2 Rotation after some period of time

• Underwent a Trial of Rotation:
  – High Success rate: 93% OA at delivery vs. 15%
  – More Likely to have SVD: 77% vs. 27%
  – Less Likely to have VAVD: 23% vs. 50%
  – Less likely to have CD: 0% vs. 23%
  – Shorter stage II: 117 vs. 156 min

* Reichman Eur J Obstet Gynecol 2006

Management – Stage 2: Rotation after some period of time

• POP-OUT - Persistent OP position – OUTcomes following manual rotation: study protocol*
  – Trial of manual rotation at onset of stage 2
    • Urge to push or after 1 hour – whatever occurs first
    • Reduction in operative delivery (vaginal or cesarean)
      – Start date April 2012
  • Illustrates need to adequately answer these important clinical questions
  • Results?

*Phipps H Trials 2015

Management – Stage 2

OPTIONS:
1) Prophylactic rotation (manual or forceps)
2) Rotation after some defined period of time - 1h nullip
3) Rotation for Arrest of Descent
4) Expectant management

Management – Stage 2: Rotation after Arrest of Descent

• Retrospective case control: Predictors of failed rotation
• n=147 -- 68 failed & 79 successful rotations
• Risk of failure - Univariable:
  – Age>35, nulliparous, non-engaged,
  – Rotation during 1st stage, indication of FTP, time of day
• Risk of failure: Multivariable
  – Failure to progress, OR 3.3 (1.2-8.5)
  – If failure: Cesarean: 59% vs. 4% after a successful rotation
• Technique

*Le Ray C Obstet Gynecol 2007
Digital Rotation: Technique

- Digital rotation – LOP
  - Appropriate anesthesia
  - Right hand: two fingers – index and middle
  - Posterior margin of the anterior parietal bone
    - Junction of lambdoid suture and posterior fontanelle
  - Gentle pressure
  - Counterclockwise motion

Manual Rotation: Technique

- Manual rotation: Left OP
  - Anesthesia, relaxed uterus, breakdown bed
  - Whole right hand in birth canal, palm up
  - Four fingers across left posterior parietal bone
    - Chin to occiput
    - Thumb is placed Anterior

Clinical scenario

39 yo G1 at 40 3/7 weeks
- >4h push, no “real” progress for 2h, fatigued
- Category II tracing
  - Minimal-moderate variable, intermittent late decelerations
- Exam – LOP, Station 0 to +1,
- Leopold – Fetal BPD, EFW 3800g,
- Sono confirms LOP, fetal back is posterior
- Assessment of pelvis – narrow arch, prominent sacrum and short posterior segment (1 fingerbreadth)
- Management?
Clinical scenario
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- Management?

Clinical scenario
31 yo G2P1001 at 40 3/7 weeks, cat I FHR
- Pushing for 30 min, fair effort
- SVE: Direct OP, Zero station; no BPD on Leopold
  - FHR – cat I
- Sono: confirms OP, fetal back is posterior
- Pelvis:
  - Anterior segment is crowded
  - Posterior segment ample
  - Spines are not prominent
- Management?

Clinical scenario
31 yo G2P1001 at 40 3/7 weeks, cat I FHR
- Pushing for 30 min, fair effort
- SVE: Direct OP, Zero station; no BPD on Leopold
  - FHR – cat I
- Sono: confirms OP, fetal back is posterior
- Pelvis:
  - Anterior segment is crowded
  - Posterior segment ample
  - Spines are not prominent
- Management?

Clinical scenario
36 yo G1 at 40 3/7 weeks, cat I FHR
- Pushing for 90 min, great effort
- SVE: ROP, Zero station
  - FHR – cat I
- Sono: confirms ROP, fetal back is to maternal right
- Pelvis:
  - Anterior segment is adequate
  - Posterior segment is wide
  - Spines are not prominent
- Management?
Clinical scenario
36 yo G1 at 40 3/7 weeks, cat I FHR
- Pushing for 90 min, great effort
- SVE: ROP, Zero station
  - FHR – cat I
- Sono: confirms ROP, fetal back is to maternal right
- Pelvis:
  - Anterior segment is adequate
  - Posterior segment is wide
  - Spines are not prominent
- Management?

Summary – Persistent OP
• POP: Difficult to predict until (late) stage 2
• POP: associated with considerable maternal morbidity
• POP: associated with some neonatal morbidity
• Assess fetal position early in stage 2
  – Fetal Position, Leopold, US
• Assess pelvis and EFW for fit
• Consider manual rotation 30-90 min
  – Maximize success and minimize unnecessary procedures
• Gentle technique
• Prevent the first cesarean!

Persistent OP
• Thank you!

Manual Rotation – Technique II
• From LOP: Cradle the head; frequently disengages to 0/+1 station, middle finger pushes the shoulder across the maternal sacral promontory, move hand clockwise over fetal face, grasp the head with the fingers on the right side of the fetal face and the thumb on the left, flex the head, rotate to ROA, apply pressure from the L abd place forceps Deliver

Walkowiak RG Obstet Gynecol (1971)