Operative Vaginal Delivery

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Common Areas of Liability

- Poor assessment of the case ("rush in and do the delivery")
- No good indication (ACOG Guidelines)
- Lack of basic knowledge about anatomy and definitions
- Poor preparation of patient/room/anesthesia/OR/neonatal staff

Common Areas of Liability

- Lack of appropriate discussion/consent
- Lack of appropriate documentation/late documentation
- Failure to examine the patient after a repair
- Failure to disclose or follow-up on a complication
Know these Definitions well!
- Lie
- Presentation
- Engagement
- Station
- Attitude
- Position
- Asyntilism
- Caput/Cephalhematoma
- Moulding

Engagement
- Engagement has occurred once the widest diameter of the presenting part (usually the BPD) is at or below the plane of the maternal pelvic inlet - usually equates with 0 station BUT not always
- Best determined by a combination of abdominal and vaginal assessment

Station
- Relationship between the leading bony part of the fetal presenting part and the maternal ischial spines
- Usually, but not always, the head is engaged when the skull bone (NOT SCALP!) is felt at 0 station
- Most common error is failing to take into account caput succidaneum and severe molding in CPD
- Where severe caput succidaneum prevents accurate diagnosis of the station or head position, OVD should NOT be attempted
  - “There was too much caput for vacuum so I did a forceps”

ACOG Classification of Station
- In 1989 station was reclassified by ACOG
- Level of the leading bony point of the fetal head in cm at or below level of the ischial spines (0 - 5cm)
- The previously used method of described the birth canal in terms of thirds (0 - 3+)

ACOG. Obstetric Forceps. 1989; Committee Opinion # 71. (Level III)
Farabeuf Method – S2

Paris, 1891.

Know the anatomy of the fetal head

1. MCA
2. Fifth

Know the diameters of the fetal head
**Basovertical Diameter**

- Distance from base of skull to most distant point of the vertex
- Molding can give a false impression of engagement because the basovertical diameter is lengthened
- This can occur without excessive caput
- Thus the lowest part of the skull and scalp descends below the spines **but** the base of the skull may still be high and unengaged


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**Subgaleal Hematoma**

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**Degrees of Moulding**
**Type of Forceps Delivery**

- Know what type of delivery you are doing
- Be sure you are familiar with the definitions
- Document it as such BEFORE doing it
- No mid pelvic delivery without experience or supervision, OR/anesthesiologist/pediatrician ready, and have informed the mother of the alternatives

**Indications for vacuum or forceps**

- Must have a valid indication
- Document it BEFORE the procedure
- Make sure patient understands and agrees with the indication

**Indications**

- Standard Indications:
  a) Delayed second stage
  b) Suspicion of immediate or potential fetal compromise
  c) Elective shortening of the second stage for maternal or fetal benefit

**Delayed Second Stage**

- Based on parity and anesthesia
  1. Nulliparous - lack of continuing progress:
     - 3 hours with regional anesthesia, or
     - 2 hours without regional anesthesia
  2. Multiparous - lack of continuing progress:
     - 2 hours with regional anesthesia, or
     - 1 hour without regional anesthesia

ACOG. Operative Vaginal Delivery.1994 Technical Bulletin #196. (Level III)
Philpott Partogram
Alert and Action Lines

Friedman Curve – Is it still valid?
Zhang et al 2002

Table II. Expected time interval and rate of change at each stage of cervical dilation

<table>
<thead>
<tr>
<th>Cervical dilation (cm)</th>
<th>Time (hrs)</th>
<th>Rate (cm/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3.2 (0.6, 15.6)</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2.7 (0.6, 16.1)</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>1.7 (0.4, 6.0)</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>0.8 (0.2, 3.1)</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>0.6 (0.2, 2.2)</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>0.5 (0.1, 1.5)</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>0.4 (0.1, 1.5)</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>0.4 (0.1, 1.4)</td>
</tr>
</tbody>
</table>

*Median (5th and 95th percentiles)

What is Progress?
- Not all progress is assessed by our current metrics:
  - rotation/flexion/synclitism of the head without change in station is still progress (i.e from OP to OT)
  - Thinning of the lower segment in a patient with a high assimilation pelvis?
  - Improvement in uterine contraction efficiency?
**Contraindications**
- OVD should not be performed:
  - suspected feto-pelvic disproportion
  - an unwilling or uncooperative patient
  - live fetus with a known problem (osteogenesis imperfecta, thrombocytopenia, hemophilia)...good reason to look carefully at the prenatal records
  - unengaged fetal head – singleton
  - unknown position of the fetal head (should document position before application and at delivery)

**Prerequisites**
- **F**avorable head position, Fetus (weight/status) (2)
- **O**pen Os (completely dilated cervix), OR ready (2)
- **R**uptured membranes, Rule of 3’s (2)
- **C**ontractions present, Consent (verbal or written) (2)
- **E**ngaged head, Empty bladder, Epidural/other anesthesia (3)
- **P**elvis adequate, Prepared for C/S, Pedi, Preop note (4)
- **S**tirrups (lithotomy position with bottom over edge of the bed, attention paid to avoiding nerve apraxias) (1)

**Consent**
- **There is no SOC as to consent for OVD:**
  - Verbal versus written?
  - Elective versus emergency
- **Recommendations:**
  - provide detailed materials during PNC
  - answer questions and allay fears
  - inform of alternatives (waiting, cesarean section)
  - obtain written consent on admission before crisis
  - document that patient understands that she can change her mind at any time
  - Even in an emergency try to get verbal informed consent and ask a witness (nurse/CNM) to document it

**Value of a maternal abdominal examination**
- Confirm the lie, presentation, and often position
- Give an idea of where the fetal back is in relation to the uterine midline
- Fetal weight can be assessed and in experienced hands this can be quite accurate (ACOG states that at term it’s equal to US)
- Amount of fetal head above the pelvic brim – useful to think of this in “fifths”
"Rule of 3's"

"In an OA presentation, if the sum of the number of fifths of the fetal head palpated above the pelvic inlet abdominally, and the degree of molding of the fetal head palpated vaginally, equals or exceeds three, then attempted operative vaginal delivery is likely to be unsuccessful and should be avoided"

**Documentation**

- Strongly Recommend:
  - Written or (better) dictated pre-op note
  - Written or (better) dictated post-op note
  - Details of discussion with patient
  - Details of procedure with times, number of pulls, pop-offs, VE suction
  - Details of maternal/neonatal trauma
  - Rationale for decisions at the time

**Failed/Sequential OVD**

- Recent important publications addressing these issues:
  - Towner et al., Gardella et al., Murphy et al.

- The bottom line: It is now been shown that:
  - sequential OVD attempts with multiple instruments,
  - failing with an OVD attempt
  - more than 3 pulls with an OVD attempt
  - more than 3 hours of pushing

  lead to significant increases in:
  - neonatal intracranial bleeds/seizures
  - facial nerve and brachial plexus lesions
  - neonatal trauma and NICU admission
  - maternal trauma

**Intracranial Bleeds**

**Incidence of I/C bleeding in the Towner Study:**

- 1:860 V/E
- 1:664 forceps
- 1:907 C/S during labor — failed vaginal delivery
- 1:2750 C/S without labor
- 1:1900 NSVD
- 1:334 failed V/E(forceps followed by C/S

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- neonatal intracranial bleeds/seizures
- facial nerve and brachial plexus lesions
- neonatal trauma and NICU admission
- maternal trauma
Failed Operative Delivery

- Much higher rates of intracranial hemorrhage, convulsions and need for ventilation
- I/C bleeds in 1:334 after failed V/E and/or forceps
  - 5.7 X higher than NSVD
  - 2.6 X higher than V/E alone
  - 2.9 X higher than C/S after labor alone


Sequential Operative Delivery

- Compared with NSVD, the risk of I/C bleeding was:
  - 2.8 X higher with VE alone
  - 1.4 X higher with forceps alone
  - 7.8 X higher with sequential methods
- Compared with SVD, the risk of Facial Nerve injury was:
  - 1.7 X higher with VE alone
  - 6.8 X higher with forceps alone
  - 13.2 X higher with sequential methods


How Many Pulls?

- Not well defined:
  - Kiwi package insert:
    - 1 or 2 pulls for outlet
    - 2 or 3 pulls for low
    - 3 or 4 pulls for midpelvic delivery
    - 1st pull – flexion of head and some descent
    - 2nd pull – head on pelvic floor
    - 3rd pull – delivery of head should be complete or imminent

Kiwi Instructions:
- do not re-apply vacuum after 2nd pop-off (450-600 mmHg)
- between pop-offs re-examine position and station and inspect scalp for trauma


What is a Pull?

- Not well defined:
  - traction efforts during a single contraction?
  - each traction movement however small?
  - only those traction efforts with obvious strain?

What about:
- repositioning if there is leaking?
- relaxing during a maternal breath?
- slight direction changes?
How Many Pulls?

Traditional: “3 pulls and you’re out”

“3 plus 3 Rule”

- based on 2 phase division of the 2nd stage:
  - Descent Phase: birth canal to pelvic floor
  - Perineal Phase: pelvic floor to delivery

- Vacca states that 3 pulls in each phase is acceptable
  - epidural
  - some progress occurs with each pull
  - traction is not excessive

Compared with CS after Labor:

- Failed OVD:
  - increased maternal trauma: OR = 4.1 [1 - 17]
  - More than 3 pulls with OVD instrument led to significantly increased neonatal trauma:
    - completed OVD: OR = 4.2 [2 - 10]
    - failed OVD: OR = 7.2 [2 - 24]
  - Failed OVD with more than 3 pulls:
    - increased NICU admission: OR = 6.2 [2 - 23]

Handout: Information Slides

- Spontaneous subdural, subarachoid and parenchymal hemorrhages can occur in human labor and delivery

- Read the FDA Advisory document
Operative Vaginal Delivery (OVD) Checklist: To be completed prior to beginning procedure.

**Parameter** | **Standard Of Care** | **Check**
--- | --- | ---
Fetal Status | Appropriate for operative vaginal delivery | ✔
Indication: Mark appropriate indication when indicated (see chart below) | ✔
  - Delayed second stage
    1. Nulliparous - lack of continuing progress:
      - 3 hours with regional anesthesia, or
      - 2 hours without regional anesthesia
    2. Multiparous - lack of continuing progress:
      - 2 hours with regional anesthesia, or
      - 1 hour without regional anesthesia
  - Suspicion of immediate or potential fetal compromise
  - Elective shortening of the second stage for maternal or fetal benefit
  - Adequate midpelvis and outlet
  - Cervix completely dilated (no rim palpable)
  - Complete Maternal Contractions: Present and normal
  - Fetal Estimated Weight: (Leopold’s or US) < 4500g (GDM) < 5000g
  - Fetal Head Position: Appropriate for either forceps application or vacuum application (flexion point felt)
  - Fetal Head Position is known
  - Head position is known
  - Station: – NB. From bone of skull to ischial spines (NOT from skin of head) 0 to +2 cm
  - Degree of Caput: Severe caput suggests CPD
  - Degree of moulding (parieto-parieto moulding only): 0 = suture wide open, 1+ = sutures opposed, no overlap, 2+ = overlap that can be reduced, 3+ = overlap that cannot be reduced
  - Amount of fetal head above the symphysis pubis
    - 1+ = 2cm, 2+ = 4cm, 3+ = 6cm
    - Only for Occipito Anterior head position
  - Risk of 3’s: Degree of moulding + fifths of head above symphysis
  - ≥ 3
  - Adequate Anesthesia
  - Bladder catheterized
  - OR ready and all equipment checked
  - Anesthesia, NICU staff, OR staff alerted and ready
  - Informed consent/assent obtained – written or verbal (witnessed) and patient understands she can request a cesarean section – patient requests OVD
  - Maternal positioning: correct in lithotomy/Table height, no nerve compression by lithotomy pole
  - Fetal heart rate monitoring (EFM or auscultation) while preparations being made
  - Preop Note: written or checklist checked off and signed

**THIS IS AN APPROPRIATE CASE FOR OVD AND ALL CHECKLIST ITEMS ARE CHECKED**

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Patient Name…………………………..  MR#............................ Hospital:…………….
Physician Signature………………………………Witness:………………………………
Date…………..….  Time…………...         LDR# ……………           OR#………………

Thank You