Breech Delivery
Shoulder Dystocia

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Background:

- Prevalence of breech presentation varies with gestational age.
  - 33% 21-24 weeks
  - 14% 29-32 weeks
  - 3-4% term

- Prenatal mortality and morbidity higher (3 times cephalic)

- Umbilical cord prolapse- more prevalent (except with frank breech presentation)
Background (2)

- Breech presentation may be independent risk factor for neurologically-impaired infant
- Breech presentation associated with cerebral palsy - irrespective of route of delivery
- “It is possible that breech presentation is not coincidental but is a consequence of poor fetal quality, in which case medical intervention is unlikely to reduce perinatal mortality”

(Schutte and associates, 1985; Gilstrap, 1995)
Factors Associated With Breech Delivery

- High parity
- Prematurity
- Multiple Gestation
- Polyhydramnios/Oligohydramnios
- Uterine Anomalies
- Fetal Anomalies
- Prior Breech Delivery
United States Trends: Breech Delivery

- In the U. S., trend for delivery of breech infants has shifted toward C-section
  - 22% C-section rate 1963-1973
  - 94% in 1979
  - Breech presentations account for 15% of all C-section

- Reasons for shift in trend:
  - Belief that perinatal mortality/morbidity improved
  - Inadequate resident training
  - Medicolegal climate
Term Breech- Delivery

• Outcome data are mixed for vaginal versus C-section delivery in breech presentation at term

• Weiner reported 57% success in planned delivery of frank breech- no significant difference in perinatal morbidity/mortality (3.1 versus 3.7/1000)

• Cheng and Hannah reported higher m/m in planned vaginal delivery [OR 3.86 (2.2-6.7) mortality; OR 3.96 (2.76-5.67) morbidity]

(Weiner, 1992; Cheng and Hannah, 1993)
Preterm Delivery-Breech

• At present, no large randomized studies for preterm breech delivery
• Retrospective studies suggest improved outcome with C-section of fetuses < 1500 gm
• In extremely low birthweight infants (<1000 gm) difference in outcome not as pronounced
• Relative size of fetal head may play a role in morbidity. Issue of intracerebral hemorrhage and preterm breech delivery is not clear

(Gilstrap, 1995; Effer, 1983; Cunningham, 1997)
Version of Breech Presentation

• External Version- performed entirely exterior to the external abdominal wall
• Internal Version-hand introduced into the uterine cavity
• If external version is not applied in the early term period, 80% of non-cephalic presentations will remain as such at delivery
• U.S. reported success rate approx. 50-80%

(Zhang et al, 1993; Van Dorsten et al, 1981)
Version of Breech Presentation(2)

• Indication: Malpresentation at early term
• Predictors for success:
  – Presenting part not engaged
  – Normal amount of amniotic fluid
  – Fetal back not positioned posteriorly
  – Mother not obese
• Contraindications:
  – Obvious CPD or anomaly
  – Surgically scarred uterus
Version of Breech Presentation(3)

- Informed consent- 1% serious complication rate
- Leopold and ultrasound ascertainment of fetal position and lie
- Fetal buttocks lifted out of pelvis with cephalic hand providing countertraction
- Uterine relaxation (betasympathomimetic) possibly beneficial
- Rh-immune globulin given as indicated

(Thorp, 1991; Fernandez, 1997)
Conduct of Breech Delivery - Requirements

• Facilities- Capable of C-section
• Physician- Experience in vaginal breech delivery
• Anesthesia-Personnel present for delivery
• Type-Frank breech
• Size-1500 gm < Estimated fetal weight < 4000 gm
• Exclusion of macrocephaly, intractable head extension
• Adequate labor and adequate pelvimetry

(ACOG, 1986)
Mechanics of Labor and Delivery-
Breech Presentation

- Labor mechanism
- Spontaneous versus extraction (until periumbilical delivery afforded)
- Pinard maneuver
- Extraction
- Nuchal arms
- Mauriceau maneuver
- Piper forceps
Shoulder Dystocia

• Incidence of “true” shoulder dystocia approx. 1%
  – Maneuvers used for delivery
  – Head-to-body delivery time of > 60 seconds
• Positive (albeit not absolute) relationship to birthweight and torso to head ratios
• Fetal injury or asphyxia risk is present
  – Brachial plexus injury
  – Clavicular fracture

(Gabbe and Benedetti, 1978; Spong, 1995, Cunningham, 1997)
Brachial Plexus Injury

• Erb Palsy- paralysis of nerve roots of C5-T1- with upper arm paralysis
  – Arm paralysis with sparing of hand
  – C5-6 associated with breech delivery
  – C5-7 or C5-T1 associated with vaginal deliveries
  – Occurs from stretching of nerve roots- can occur as consequence of “unremarkable” delivery
  – < 10% of shoulder dystocia cases result in permanent brachial plexus injury (75-90% Erb cases resolve, 4-40% shoulder dystocia cases associated with Erb palsy)

• Klumpke paralysis- Lower nerve brachial plexus injury
  – Associated with hand paralysis

(Cunningham, 1997)
Clavicle Fracture/Humeral Fracture

• Incidence:
  – 1-2%-Clavicle
  – Humeral: much less common

• Clavicular fractures may occur as consequence of “normal delivery”- they generally are not associated with clinical significance

• Humeral fractures may occur with difficult deliveries- may also occur spontaneously

(Chez, 1994; Turpenny and Nimmo, 1993)
# Relationship Between Birthweight and Shoulder Dystocia - Parkland Hospital

(Modified from Cunningham et al, 1997)

<table>
<thead>
<tr>
<th>Birthweight</th>
<th>Total Births</th>
<th>Shoulder Dystocia</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4000 gm</td>
<td>10,101</td>
<td>0.42%</td>
</tr>
<tr>
<td>4001-4500 gm</td>
<td>704</td>
<td>5.4%</td>
</tr>
<tr>
<td>&gt;4500 gm</td>
<td>91</td>
<td>19%</td>
</tr>
<tr>
<td>All Weights</td>
<td>10,896</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
### Relationship Between Diabetes, Birthweight and Shoulder Dystocia

<table>
<thead>
<tr>
<th>Birthweight</th>
<th>No Diabetes</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4000 gm</td>
<td>0.1-1.1%</td>
<td>0.6-3.7%</td>
</tr>
<tr>
<td>4000-4449 gm</td>
<td>1.1-10%</td>
<td>4.9-23%</td>
</tr>
<tr>
<td>≥ 4,500 gm</td>
<td>4.1-22.6%</td>
<td>20-50%</td>
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## Risk of Shoulder Dystocia - Diabetes

### Risk of Shoulder Dystocia According to Diabetic Status

<table>
<thead>
<tr>
<th>Study</th>
<th>Rate Ratio</th>
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<tbody>
<tr>
<td>Acker et al, 1985</td>
<td>Rate Ratio 5.2</td>
</tr>
<tr>
<td>Bahar, 1996</td>
<td>OR 4.3 (2.2-8.3)</td>
</tr>
<tr>
<td>Langer, 1991</td>
<td>RR &lt;4000 gm 2.6 (1.29-5.34)</td>
</tr>
<tr>
<td></td>
<td>RR &gt;4000 gm 3.6 (2.37-4.76)</td>
</tr>
<tr>
<td>Sandmire, 1988</td>
<td>RR 6.5 (1.5-27.1)</td>
</tr>
</tbody>
</table>

(ACOG, 1997)
Planned C-section? - Shoulder Dystocia

• Estimation of birthweight not reliable (± 20% by ultrasound)
• Pelvimetry subjective
• Approx. 2500 C-sections required to prevent one case of shoulder dystocia if all babies > 4000 gm delivered by C-section
• Data may be suggestive of better yield in diabetics > 4000 gm (4250 gm?; > 4500 gm?)

(ACOG, 1997; Keller, 1991; Langer, 1991)
Prior History of Shoulder Dystocia-Recurrence Risk

• Smith reported 12% recurrence – recurrence not related to increased birthweight as compared to prior delivery
• Baskett and Allen reported 1-2% recurrence of shoulder dystocia
• Conclusion: Prior history confers increased subsequent risk (how much?)

(Smith, 1994; Baskett and Allen, 1995)
Summary- Shoulder Dystocia

- Most cases of shoulder dystocia cannot be predicted or prevented
- Ultrasound estimation of fetal weight to determine macrosomia are of limited accuracy
- Planned C-section for the non-diabetic is not a reasonable strategy
- Planned C-section for diabetic pregnancies greater than 4000-4500 gm may be reasonable