Twins
A Generalist’s Perspective

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Famous Twins
A. Bill Clinton
B. Jeremy Irons
C. Scarlett Johansson
D. Bill Parer

Disclosures:
I have nothing to disclose!

Overview
- Introduction
- Antepartum Care
- Preterm Labor/Prematurity
- Induction/Labor Management
Twins

- Monozygotic (MZ)
  - 3.5-4/1000
- Dizygotic (DZ)
  - Variable (2/1000 Japanese; 49/1000 Yorubans)

Twins/Multiples

- In 2002, 130,000 infants born of multifetal gestations
- Since 1980,
  - 76% increase in twins
  - 400% increase in triplets or greater
- 3% of all births
- 77% of preterm births
- Disproportionate share of perinatal M&M

ACOG Practice Bulletin, Number 144, May 2014

Assisted Reproduction and Multiple Gestation

- Risk of multiples increased 20-40%
- Clomiphene – 5-10%
- # of embryos directly correlate with risk of multiple pregnancy
  - 1 - 1.4%
  - 2 - 17.9%
  - 4 – 24.1%
- Higher than expected incidence of monochorionic twins – 3.2% (background - .4%)

Number of Embryo Transfer

- 1 vs. 2
  - Less likely to become pregnant
    RR 0.69 (95% CI 0.51 - 0.93)
  - Decreased risk of twins
    RR 0.12 (95% CI 0.03 - 0.48)
  - Decreased risk of low infant birth weight
    RR 0.17 (95% CI 0.04 - 0.79)

Dare et al. Australian and New Zealand Journal Obstetrics & Gynecology 2004; 44(4)
Twin Morbidity and Mortality

- Avg. birth weight: 2,347 gms.
- Avg. gestational age: 35.3 wks.
- % IUGR: 14-25
- % NICU: 25
- Avg. NICU stay: 18 days
- Risk CP: 4x
- Risk of death by 1 yr: 7x

Perinatal Mortality

<table>
<thead>
<tr>
<th>Cause</th>
<th>Singleton</th>
<th>Multifetal</th>
<th>RR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>5.7</td>
<td>20.8</td>
<td>3.6(3.1-4.1)</td>
</tr>
<tr>
<td>Embolism</td>
<td>1.3</td>
<td>5.3</td>
<td>4.2(3.2-5.5)</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>.9</td>
<td>3.7</td>
<td>3.8(2.8-5.5)</td>
</tr>
<tr>
<td>HTN</td>
<td>1.2</td>
<td>3.7</td>
<td>3.1(2.2-4.3)</td>
</tr>
<tr>
<td>Infection</td>
<td>0.7</td>
<td>2.4</td>
<td>3.5(2.4-5.3)</td>
</tr>
<tr>
<td>Cardiomyo</td>
<td>0.4</td>
<td>1.6</td>
<td>3.6(2.2-5.9)</td>
</tr>
<tr>
<td>Other</td>
<td>0.9</td>
<td>3.3</td>
<td>3.7(2.6-5.3)</td>
</tr>
</tbody>
</table>

Incidence of major maternal complications in multiples

<table>
<thead>
<tr>
<th></th>
<th>Singleton</th>
<th>Twin</th>
<th>Triplet</th>
<th>Quadruplet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preeclampsia</td>
<td>6</td>
<td>10-12</td>
<td>25-60</td>
<td>&gt;60</td>
</tr>
<tr>
<td>GDM</td>
<td>3</td>
<td>5-8</td>
<td>7</td>
<td>&gt;10</td>
</tr>
<tr>
<td>PTL</td>
<td>15</td>
<td>40</td>
<td>75</td>
<td>&gt;95</td>
</tr>
<tr>
<td>PTB &lt; 37 wks</td>
<td>10</td>
<td>50</td>
<td>92</td>
<td>&gt;95</td>
</tr>
<tr>
<td>PTB &lt; 32 wks</td>
<td>2</td>
<td>8</td>
<td>26</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

Maternal Mortality

ASRM Practice Committee Opinion Fert & Sterility 2012

MacKay et al., Obstetrics and Gynecology 2006; 107 (3)
IVF vs. Spontaneous

- Increased risk of preterm birth between 32-36 weeks
- Increased risk of preterm birth < 37 weeks matched for parity
- More NICU admissions
- More cesarean deliveries
- Longer maternal hospital stay

McDonald et al., AJOG 2005; 193

Management – 1st trimester US

- Confirm gestational age -> establish twins
  -> establish chorionicity
- 99% sensitive for detecting twins
- Lambda sign or twin peak most reliable for chorionicity between 10-14 weeks

Twin Peak Sign on Ultrasound
Prenatal Care – Nutrition

- 300 kcal/day increase
- 35-45 lb. weight gain

Management - Genetics

- Increased risk of congenital anomalies
- 31 yo with twins = 35 yo with singleton (1:190)
- NT similar sensitivity,
- Serum analytes used to predict risk for whole pregnancy
- NIPT not recommended by ACOG or SMFM
- CVS – 4-6% twin/twin contamination

Reduction

- Clear benefit for ≥ triplets
- Reduced twins have similar M&M
- Selective termination has higher risk

Preterm Birth Prevention

A. Progesterone
B. Serial cervical lengths
C. Prophylactic cerclage
D. none

<table>
<thead>
<tr>
<th>Prevention Method</th>
<th>Risk Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progesterone</td>
<td>21%</td>
</tr>
<tr>
<td>Serial cervical</td>
<td>10%</td>
</tr>
<tr>
<td>Prophylactic cerclage</td>
<td>4%</td>
</tr>
<tr>
<td>None</td>
<td>65%</td>
</tr>
</tbody>
</table>
Prediction of preterm birth by second trimester cervical length

Retrospective study: 65 twin gestations, 15 of which were born preterm

<table>
<thead>
<tr>
<th>Cervical length characteristics</th>
<th>Rate of spontaneous preterm birth (%)</th>
<th>Rate of spontaneous preterm birth (%)</th>
<th>Rate of spontaneous preterm birth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical length &gt; 25 mm</td>
<td>9% (6)</td>
<td>67% (4)</td>
<td>83% (5)</td>
</tr>
<tr>
<td>22–24 mm</td>
<td>14% (10)</td>
<td>75% (5)</td>
<td>100% (6)</td>
</tr>
<tr>
<td>19–21 mm</td>
<td>15% (11)</td>
<td>54% (4)</td>
<td>92% (6)</td>
</tr>
<tr>
<td>Cerclage funneling present</td>
<td>11% (4)</td>
<td>75% (3)</td>
<td>100% (4)</td>
</tr>
<tr>
<td>Cerclage funneling absent</td>
<td>50% (2)</td>
<td>100% (2)</td>
<td>100% (2)</td>
</tr>
<tr>
<td>Cerclage placement not done</td>
<td>94% (6)</td>
<td>56% (4)</td>
<td>94% (6)</td>
</tr>
</tbody>
</table>

Outcome Cerclage No Cerclage RR
Twins Perinatal mortality 11/48 (22.9%) 3/50 (6%) 2.66 (0.83-8.54)
Twins PTB <35 18/48 (37.5%) 9/25 (36%) 2.15 (1.15-4.01)

Yang JH et al. Ultrasound Obstet Gynecol 2000

Routine cervical length in twins and perinatal outcomes

2007 American J of Perinatology Retrospective study: 262 twin gestations 184 undergoing routine cervical length surveillance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cervical length &gt; 25 mm</th>
<th>Cervical length &gt; 22-24 mm</th>
<th>Cervical length &gt; 19-21 mm</th>
<th>Cerclage funneling present</th>
<th>Cerclage funneling absent</th>
<th>Cerclage placement not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical length (mm)</td>
<td>25 (4)</td>
<td>24 (3)</td>
<td>23 (2)</td>
<td>1 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>


ACOG Cochrane Database

NO Benefit

- Cervical lengths
- Bedrest
- Home uterine monitoring
- Prophylactic cerclage
- Prophylactic tocolytics
- Prophylactic progesterone
- Prophylactic pessary

Cerclage did not result in a reduction of PTB <35 weeks for all pregnancies

Cerclage did result in a reduction of PTB <35 weeks for singletons with a history of preterm birth

Cerclage was associated with a significantly higher risk of PTB in twins
**August 2, 2007 NEJM**

**A Trial of 17 Alpha-Hydroxyprogesterone Caproate to Prevent Prematurity in Twins**
- Prospective randomized study of 655 twins
- No difference in any of the outcomes including PTB

**Progesterone and the Risk of Preterm Birth among Women with a Short Cervix**
- Randomized study of 250 singletons and twins
- Progesterone decreased spontaneous PTB prior to 34 weeks RR 0.56 (0.32-0.91), p=0.02
- Only 24 of 250 patients were twins!

**Meta-analysis of progesterone in twins and effect on GA**

<table>
<thead>
<tr>
<th>Study</th>
<th>N Progesterone/Placebo</th>
<th>Type of Progesterone and dose</th>
<th>Duration of Treatment</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fonseca et al. 2007</td>
<td>11/13</td>
<td>200 mg. daily vaginal</td>
<td>24-34 weeks</td>
<td>0.49 (0.09-2.53)</td>
</tr>
<tr>
<td>Rouse et al. 2007</td>
<td>325/330</td>
<td>17P weekly IM</td>
<td>16-20 weeks till 35 weeks</td>
<td>1.09 (0.77-1.53)</td>
</tr>
<tr>
<td>Norman et al. 2009</td>
<td>247/247</td>
<td>90 mg. daily vaginal</td>
<td>24-34 weeks</td>
<td>1.36 (0.89-2.09)</td>
</tr>
<tr>
<td>Combs et al. 2011</td>
<td>160/78</td>
<td>17P weekly IM</td>
<td>16-24 weeks till 34 weeks</td>
<td>1.46 (0.69-3.09)</td>
</tr>
<tr>
<td>Rode et al. 2011</td>
<td>334/331</td>
<td>200 mg. daily vaginal</td>
<td>20-24 weeks till 34 weeks</td>
<td>0.78 (0.89-2.09)</td>
</tr>
</tbody>
</table>

Brubaker SG et al. Seminars in Perinatology 2012

**SMFM Clinical Guideline**

“No evidence of effectiveness of progesterone For preterm birth prevention in an asymptomatic patient”

SMFM Publications Committee AJGO 2012

**Antepartum Surveillance**

- Ultrasound
  - Growth restriction is more predictive of fetal outcome than discordance

- NST/BPP
  - Not validated in well grown multi-fetal pregnancies
Twin chorionicity and stillbirth risk

2008 Obstet Gynecol Retrospective Study of 1000 twins, 196 Mono-Di

Lee YM et al. Obstet Gynecol 2008

Recommendation for delivery timing

Uncomplicated Dichorionic-Diamniotic

38-39 weeks gestation

Uncomplicated Monochorionic-Diamniotic

34-37 weeks gestation

Spong CY et al. Obstet Gynecol 2011

Timing of Delivery

- Cochrane (1RCT) – insufficient evidence for induction at 37 weeks
- Sairam (2002) – IUFD >39wks twins = 42 wks singleton

Twin Presentation

Figure 2. Graph of common presentations for twins. (Adapted and reprinted with permission.)

Ramsey et al., Seminars in Perinatology 2003:27 (1)
**Mode of Delivery**

- **Twin A Vertex**
  - EFW > 1500g
  - Vertex vaginal delivery of both twins
  - Cesarean delivery of both twins
- **Twin B Vertex**
  - EFW < 1500g or Twin B 500g larger than twin A
  - Combined vaginal-abdominal delivery
  - Successful
  - Combined vaginal-abdominal delivery
- **Twin B Nonvertex**
  - Contraindication to vaginal breech delivery
  - Intrapartum external cephalic version

- **EFW > 1500g**
- **EFW < 1500g**

Ramsey et al., Seminars in Perinatology 2003;27 (1)

**US Trends – Cesarean Delivery**

Greatest increase over time was seen in those without risk factors for cesarean delivery, presumed vertex-vertex twins

Lee HC et al. Obstet Gynecol 2011

**Neonatal outcomes of twins by birth order and mode of delivery**

- Twin A has reduced morbidity and mortality compared with twin B
- Twin A’s morbidity and mortality was not altered by mode of delivery
- Morbidity increased in twin B following combined delivery of both twins
- Cesarean delivery of twin B in non-vertex presentation had higher mortality than vaginal delivery

2011 Rossi et al. BJOG Meta-analysis of >30,000 twin gestations

**Mode of Delivery Twins**

- Skilled and experienced nursing, anesthesia, obstetrics, and pediatrics
- Continuous monitoring
- Delivery in an operative setting
- Ultrasound
- Blood products available
Unencumbered by Data!

Delayed Cord Clamping

BMZ

MgSO4

Di/Di Twins
A Reasonable Approach

- Appropriate nutrition counseling
- Appropriate genetic counseling
- Serial ultrasound
- More frequent visits
- Antepartum surveillance as with other pregnancies
- Deliver 38 weeks
- Delivery based on presentation and obstetrician experience

Which Bay Area team not in a championship or first place

A. SF 49ers (not really SF, but I’m not bitter)
B. SJ Sharks (also not SF)
C. Golden State Warriors
D. San Francisco Giants