Multiple gestation = multiple potential problems

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Educational objectives

- Review trends in the incidence of multiple gestation
- Discuss risks for twins and higher order multiple gestations
- Identify complications unique to monozygous twins
- Develop management strategies for multiple gestations
Multiple Gestation: knowledge & practice patterns

- Survey of ACOG Fellows & Jr Fellows 51% return rate
- 62% manage twins without MFM input
- 57% mean correct for 12 knowledge-based questions
- Test scores correlated negatively with number of years in practice
- Majority manage twins according to recent ACOG educational materials

Cleary-Goldman. OG 2004;104:232
Significance of multiple gestation fetus/neonate

Birth gest age (wk) | IUGR (%) | NICU adm (%) | NICU los (d) | Maj handicap (%)

- twins
- trips
- quads
Significance of multiple gestation

maternal risk

Other complications more likely in multiple gestation:
- Hyperemesis gravidarum
- Anemia
- Acute fatty liver
- PUPPS
- Post-partum hemorrhage
- Malpresentation
- Cesarean delivery
ART's impact on multiple gestation rate

![Graph showing the impact of ART on multiple gestation rate over time, with a significant increase from 1986 to 1997.]

Pre-pregnancy mgmt

Umstad. MJA 2003;178:613
Zygosity in multiple gestations

- 1000 twins
  - 333 MZ
    - 84 DA/DC
    - 246 DA/MC
    - 3 MA/MC
  - 667 DZ
    - 667 DA/DC

ART

DZ = relatively Low risk profile

Pre-pregnancy mgmt
Risks related to monozygosity

- Monoamniotic twins
- Twin-twin transfusion syndrome
- Twin reversed arterial perfusion (TRAP) sequence
- Conjoined twins
- Increased risk in the event of
  - Multifetal reduction
  - Single fetal death
Determination of chorionicity

Monochorionic
- Same gender
- Single placental mass
- Relatively thin intervening membrane
- “T” insertion

Dichorionic
- ± same gender
- 1 or 2 placental masses
- Relatively thick intervening membrane
- “lambda” (twin peak) insertion

Early preg mgmt
Utility of US in multiple gestation management – *early pregnancy*

- **1\textsuperscript{st} TM**
  - Determination of chorionicity
  - Nuchal translucency

- **2\textsuperscript{nd} TM anatomic survey**
  - Anomalies more common in multiple gestations
Nuchal translucency screening for trisomy

- UK multicentre project
- 22 centers and 306 sonographers
- 100,311 pts screened at EGA 10-14 wks
- Trisomy 21 risk calculation: maternal age, gestational age, NT thickness

Snijders. Lancet 1998;352:343

* 77% sens @ 5% FPR
60% sens after correction for FDIU
Preterm labor prediction
cervical length

% SPTB for TWINS,
cx ≤ 2 cm long @ 15-20 wks

- Prospective, n=131, serial scans
- Cx length threshold 2 cm selected by ROC
- Note NPV is most robust

Guzman. AJOG 2000;183:1103

- Similar results for TRIPLETS
  - Cx length ≤ 2.5 cm @ 26 wks predicts SPTB ≤ 33 wks with sensitivity 45% & 70% NPV

Maymon. Hum Reprod 2001;16:956

Early preg mgmt
Preterm labor prediction
fetal fibronectin

- Identifying twins low risk for SPTB < 32 wks
  - 24 wk exam in unselected twins
  - Digital exam, cx length by TVUS, fFN, and cx length + fFN all have similar specificity (81-94%) and NPV (≥ 95%)
    McMahon. AJOG 2002;186:1137

- fFN screening as a predictor of SPTB in twins (meta-analysis)
  - Sensitivity 46% (0-100, 95% CI)
  - Specificity 86% (73-99, 95% CI)
    Leitich. BJOG 2003;110 (suppl 20):66

Early preg mgmt
Which of these prophylactic measures prevent SPTB in multiple gestations?

- Bedrest
- Hospitalization
- Cerclage
- Tocolytics
- HUA
- 17-OH-progesterone caproate
- Early preg mgmt
Impact of major anomaly on its normal twin sibling (vs normal twin pairs)

- BW (x 100 gm)
- Mechanic vent (%)
- Mean LOS (d)
- Nurs > 1 mo (%)

NS for mortality or other morbidities

Early preg mgmt

Alexander. AJOG 177:849
Multifetal reduction typically considered for ≥ quads

Benefits
- Reduce prematurity risks (& costs)
- Limit family size

Risks
- Loss of whole pregnancy
- Earlier STPB
- IUGR
- Grief/guilt

Early preg mgmt
Multifetal reduction to twins
vs spontaneous twins

Early preg mgmt

Antsaklis. Hum Reprod 1999;14:1338
Multifetal reduction

-other risk factors-
- Reduction to > twins
  Evans. AJOG 2000;182:1575
- Monochorionicity: 100%!
- Relative inexperience *

Early preg mgmt
Multifetal reduction

“Most studies have concluded that the risks associated with a quadruplet or higher pregnancy clearly outweigh the risks associated with fetal reduction.”

ACOG Prac Bull #56, 10/04

“There are insufficient data available to support pregnancy reduction for women with a triplet or higher order multiple pregnancy.” (No RCTs)

Dodd. Cochrane Database, 2003
Selective fetal termination

- Fetal reduction technique applied selectively to an anomalous or aneuploid fetus
- Usually done at 18-22 wks (vs 10-12)
- Risks of preterm birth and loss of the whole pregnancy are higher than for multifetal reduction

Early preg mgmt
Utility of US in multiple gestation management – *late pregnancy*

- Growth surveillance
- *r/o uncommon problems*
Growth surveillance for multiple gestations

- Normal growth ≈ singleton until 3rd TM
- “Optimal frequency of US exams is not clear”
- My practice for o/w uncomplicated twins:
  - DC: q 6 wks
  - MC: q 4 wks
Growth surveillance for multiple gestations

- Normal growth ≈ singleton until 3rd TM
- Discordance: smaller 15-25% < larger
- IUGR more important than discordance
- Increased rate of velamentous cord insertion & abnormal placental insertion
- Discordance d/dx: IUGR vs TTTS
Antepartum fetal surveillance

- Uncertain whether antenatal fetal surveillance beyond US is needed in normally growing dichorionic twins
- No prospective data address
  - Timing of initiation of testing
  - Best testing technique or frequency
  - Testing for > twins
- “Antenatal testing is recommended if it would be done for a singleton in a similar situation”

ACOG Prac Bull #56, 10/04
Single fetal death

1st Trimester
- Vanishing twin: no significant risk to remaining fetus(es)

≥ 20 weeks
- Incidence: 3-6%
- Fetal risk
  - Demise
  - Preterm birth
  - Cystic lesions (renal, cerebral)
  - Morbidity risk: 10x MC > DC
- Maternal risk
  - Coagulopathy (0-25%)
  - Psychological distress

Late preg mgmt
Single fetal death

- Retrospective
- n=972 twin sets
- Single twin demise > 20 wks in 32 twin sets (3.3%)

Late preg mgmt
Aslan. Twin Rsch 2004;7:1
Single fetal death
Management recommendations

- **Dichorionic**
  - Expectant management
  - Antenatal surveillance
  - Deliver at term

- **Monochorionic**
  - Remote from term – same as for DC (risk from cystic lesions likely < SPTB risk and may have already occurred)
  - Near term - deliver

Late preg mgmt
Zygosity in multiple gestations

1000 twins

333 MZ
- 84 DA/DC
  - 25 TTTS
- 246 DA/MC
- 3 MA/MC
- 667 DA/DC
  - 1 TRAP Sequence
  - 1 Conjoined

667 DZ
Twin-twin transfusion

- Unbalanced transfer of blood between MC twins through placental vascular anastamoses
- Criteria: MC; vertical AF pockets < 2 and > 8 cm
- Management options
  - Expectant (95% mortality)
  - Termination (100% mortality)
  - Cord occlusion (death of at least 1 fetus)
  - Septostomy
  - Serial amnioreductions
  - Laser
## Twin-twin transfusion

### Staging
1. Bladder of donor visible
2. Bladder of donor NOT visible
3. AEDV/REDV in umb artery
   - Rev flow in DV
   - Pulsatile umb vn
4. Hydrops
5. Demise

### Management outcomes
- **Survival (compiled data)**
  - Laser 61%
  - Amnio 53%
  - Ropacka. Twin Rsch 2002;5:507
- **Intact survival (Stage 3 & 4)**
  - Laser 70%
  - Amnio 25%
  - Quintero. AJOG 2003
Twin reversed arterial perfusion sequence

- Uncertain whether primarily vascular or fetal anomaly
- Anatomically normal “pump” twin vulnerable to
  - Heart failure (hydramnios & hydrops)
  - Death (50-75%)
- Management options beyond fetal surveillance
  - Early delivery
  - Umbilical cord occlusion (coils) or ligation

Late preg mgmt
Monoamniotic twins

- Retrospective
- N=13 MA twin pairs dx’d antenatally
- ALL LIVEBORN
- NST ± BPP, ≥ 2x/wk, starting 24-26 wks
- Mean GA 32.9 wk
- Cord “knotting” in 8/13
- PMR 2/26 (sepsis; CHD)

Late preg mgmt

Rodis. AJOG 1997;177:1046
Monoamniotic twins

- Historical outcomes: PMR 30-70%
- Fetal deaths observed all the way to term
- No consensus or RCT data to direct management
- My practice
  - Frequent fetal testing after viability – minimal of NST 3x/wk + serial US, including Doppler of umbilical arteries
  - Deliver at 34 wks, unless …
  - Deliver @ 32-33+ wks after betamethasone (by patient preference)
  - Deliver < 32 wks for non-reassuring testing
Conjoined twins

- Site of fusion and likelihood for shared organs determines severity of prognosis

- Management
  - Comprehensive imaging
  - Informed decisions regarding degree of aggressiveness desired
  - Fetal surveillance
  - Abdominal delivery may be necessary even if considered non-viable
Delivery of twins

Be prepared:
- Hemorrhage
- Monitoring (FHR & US)
- Anesthesia
- Team (peds, nursing, anesth)

Non-Vtx A
- Cesarean delivery usually recommended

Vtx/Vtx
- Vaginal delivery usually recommended

Vtx/Other

Late preg mgmt
Delivery of non-vertex twin B breech extraction vs ECV

- Retrospective
- Groups o/w similar
- NS for mean art pH & NICU admission rate
- No perinatal injuries

Chauhan. AJOG 1995;173:1015

“The route of delivery for twins should be determined by the position of the fetuses, the ease of FHR monitoring, and maternal & fetal status.”

ACOG Prac Bull #56, 10/04
Mode of delivery affects outcome

**Triplets** in US, 1995-98

- **FDIU Neon death Infant death**

**RR by vaginal delivery vs CD**

Vintzileos. *AJOG* 2005;192:464
Nadir of perinatal mortality
(weeks gest age)

Late preg mgmt
Delayed delivery in multiple gestations

- Candidates: DC; 1st del remote from term; delivery of remaining fetus(es) not imminent or indicated; n=9 attempted
- Procedure: hi ligation of UC, Abx, tocolysis, cerclage, McDonald cerclage, hosp x 7d
- Mean latency 34 d (range 3-76)
- Perinatal mortality rate:
  - 1st born: 70%
  - Delayed delivery: 18%

Porreco. AJOG 1998;178:20
ACOG Recommendations
Practice Bulletin #56; 10/04

Level A (good and consistent scientific evidence)

No such data; no recommendations
ACOG Recommendations
Practice Bulletin #56; 10/04

Level B (Limited or inconsistent scientific evidence)

- Use tocolysis judiciously
- Acknowledge increased risk for HELLP syndrome
- Screen for GDM & HTN
Level C (Primarily consensus and expert opinion)

- Counsel about the risk of high-order multiple gestation before beginning ART
- Administer one course of steroids in PTL, regardless of number of fetuses
- Do not prophylactically administer cerclage, hospitalization, bed rest, or HUAM
“Should I take care of this multiple gestation?”

- Risk stratification for a particular patient
  - ≥ twins
  - Chorioniticy
- Your capabilities, experience, & interest in mgmt of what may become very complex
  - Time
  - Antenatal testing
- Locally available resources
  - 24/7 anesthesia
  - MFM