Assessment of Multiple Pregnancies in First Trimester

Greg Ryan
Fetal Medicine Unit
Twin Pregnancies

Prevalence: 2-3%

Monochorionic
- TTTS
- TAPS
- Co-twin death
- Acardiac
- Monoamniotic

Dichorionic
- Premature labour
- Discordant growth

Prenatal Dx.
- Timing of Delivery
The “11-14 wk” scan

- Living / Non-viable
- Gestational Age
- Chromosomnal markers
  - Nuchal Translucency, Nasal Bone, TR, DV, facial angle ...
- Fetal anatomy
- Multiples & Chorionicity
ISUOG Practice Guidelines: role of ultrasound in twin pregnancy
Levels of Evidence

- **1++**: High-quality meta-analyses, systematic reviews of RCT’s or RCT’s with very low risk of bias
- **1+**: Well-conducted meta-analyses, systematic reviews of RCT’s or RCT’s with low risk of bias
- **1−**: Meta-analyses, systematic reviews of RCT’s or RCT’s with high risk of bias
- **2++**: High-quality systematic reviews of case–control or cohort studies or high-quality case-control or cohort studies with very low risk of confounding, bias or chance and high probability of causal relationship
- **2+**: Well-conducted case-control or cohort studies with low risk of confounding, bias or chance and moderate probability of causal relationship
- **2−**: Case-control or cohort studies with high risk of confounding, bias or chance and significant risk that relationship is not causal
- **3**: Non-analytical studies, e.g. case reports, case series
- **4**: Expert opinion
## Grades of Recommendation (GOR)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description of grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>At least 1 meta-analysis, systematic review, or randomized controlled trial rated as 1++ and directly applicable to the target population, or a systematic review of randomized controlled trials or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population and demonstrating overall consistency of results</td>
</tr>
<tr>
<td>B</td>
<td>A body of evidence including studies rated as 2++ directly applicable to the target population and demonstrating overall consistency of results, or extrapolated evidence from studies rated as 1++ or 1+</td>
</tr>
<tr>
<td>C</td>
<td>A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results, or extrapolated evidence from studies rated as 2++</td>
</tr>
<tr>
<td>D</td>
<td>Evidence level 3 or 4, or extrapolated evidence from studies rated as 2+</td>
</tr>
</tbody>
</table>

**GOOD PRACTICE POINT:**
Recommended best practice based on clinical experience of guideline development group
Dating of Twin Pregnancies

- Twin pregnancies should ideally be dated when CRL is between 45-84 mm (i.e. 11\(^+0\) - 13\(^+6\) wks)
  
  GOR: D

- In pregnancies conceived spontaneously, use larger of the two CRL’s to estimate GA
  
  GOR: C

- > 14 wks, use larger HC to estimate GA

- Date IVF twins using oocyte retrieval date or embryonic age from fertilization

EVIDENCE LEVEL: 2+
1st trimester US dating of twins

- Retrospective analysis of 266 singletons, 118 twins (110 DC & 8 MC) conceived by IVF, with known conception date

- Variation in fetal CRL between singletons & twins at 11-14 wks unlikely to be of clinical significance

- Normal twins do not exhibit significant growth restriction in first trimester

- Singleton CRL charts can be used to date twin pregnancies accurately

Dias T. BJOG 2010;117:979–984
Chorionicity / Amnionicity in Twins

- Determine chorionicity between 11+0 - 13+6 wks using membrane thickness at site of insertion into placenta, identifying T or λ sign, and # of placental masses

- Record US image demonstrating chorionicity for future reference

- If impossible to determine chorionicity by TA or TV US, seek 2nd opinion from tertiary referral center

GOOD PRACTICE POINT EVIDENCE LEVEL: 3

- If chorionicity still uncertain, safer to classify as MC
Chorionicity / Amnionicity in Twins

- Amnionicity should be simultaneously documented
- Refer MA twins to tertiary center with expertise in their management  
  GOOD PRACTICE POINT

- > 14 wks, chorionicity best determined using same US signs, esp. by counting membrane layers, and noting discordant sex

- # of placental masses unreliable:
  - DC placentae are commonly adjacent to one other, appearing as single mass
  - 3% of MC twins have 2 placental masses on US
    - does not preclude presence of vascular anastomoses
Twins

Zygosity & Chorionicity

All DZ = DC

1/3 MZ = DC

MC

Twin placentation
100 twin pairs

MZ 30

MZ 70

DC, separate

DC, fused

MC, DA

MC, MA
Zygosity & Chorionicity

<table>
<thead>
<tr>
<th>ZYGOSITY:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• DNA “fingerprinting”</td>
<td></td>
</tr>
<tr>
<td>• Requires invasive test</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHORIONICITY:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• # Yolk Sacs</td>
<td></td>
</tr>
<tr>
<td>• # Extra embryonic coelomic spaces</td>
<td></td>
</tr>
<tr>
<td>• Fetal sex</td>
<td></td>
</tr>
<tr>
<td>• Number of placentae</td>
<td></td>
</tr>
<tr>
<td>• Thickness of membrane</td>
<td></td>
</tr>
<tr>
<td>• Base of inter-twin membrane (“T” or “λ”)</td>
<td></td>
</tr>
</tbody>
</table>
Twin Pregnancies at 11-14 wks

Monochorionic:
Always T sign

Dichorionic:
Two separate placentas or λ sign

“empty” λ sign
## 1st Trimester US Guidelines

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th>SOGC</th>
<th>ACOG</th>
<th>AIUM</th>
<th>ACR</th>
<th>RANZCOG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrauterine Pregnancy</strong></td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Gestational Age</strong> (CRL or gest. sac diameter)</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Fetal Number</strong></td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Chorionicity &amp; Amnionicity</strong></td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Cardiac Activity</strong></td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Nuchal Translucency</strong></td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
<td>♦</td>
</tr>
<tr>
<td><strong>Fetal anatomy</strong></td>
<td>♦</td>
<td></td>
<td></td>
<td></td>
<td>♦</td>
<td></td>
</tr>
</tbody>
</table>
1st Trimester Ultrasound

CAR - 2010

- May be performed either TA, TV or both.
- If TA US fails to provide definitive information, → TV US should be performed
- If TV US fails to image all areas needed for dx., → TA US should be performed
- Doppler of embryo/fetus should be avoided in T₁, except in special high risk circumstances

US in 1\textsuperscript{st} Trimester

\textit{CAR - 2010}

- Embryonic/fetal anatomy appropriate for T\textsubscript{1} should be assessed.
- Nuchal region should be assessed, if possible.
- For patients wishing to assess their risk of fetal aneuploidy $\rightarrow$ measure NT
- NT should be used in conjunction with serum biochemistry, as part of screening program.
- NT performance & reporting requires special qualifications

US in Twins in 1\textsuperscript{st} Trimester

\textit{CAR - 2010}

- Report multiple pregnancies only where multiple embryos are seen
- Document fetal #
- Determine & report chorionicity & amnionicity
- NT should be assessed, if possible.

Ultrasound in Twin Pregnancies

SOGC - 2011

1\textsuperscript{st} Trimester US:

- \textless 10 wks:
  - number of gestational sacs
  - number of amniotic sacs within chorionic cavity
  - number of yolk sacs

- \textgreater 10 wks:
  - placental number
  - chorionic peak sign
  - membrane characteristics
  - fetal genitalia
Ultrasound in Twin Pregnancies

SOGC - 2011

Determination of GA in Twins:

- $T_1$ = ideal time to confirm accurate GA dating
- Optimal time to determine chorionicity = 10-14 wks
- $T_2$ dating also acceptable & accurate
- Parameters:
  - CRL (1st T)
  - BPD (2nd T)

accuracy +/- 7 days

SOGC Consensus Statement #92. JOGC 2000
SOGC Clin Pract Guideline #260. JOGC 2011
US determination of chorionicity in twins

- Retrospective observational study 1999-2010
- 648 twin pregnancies

- Chorionicity correctly assigned by US at 11-14 wks in 612 of 613 pregnancies (accuracy 99.8%).

- Monochorionicity determination:
  - Sensitivity 100%
  - Specificity 99.8%

- \( T_1 \) US can be used to determine chorionicity reliably by noting:
  - # of placental masses
  - \( T \) or \( \lambda \)-signs

Dias T. USOG 2011; 38: 530–532
Incorrect US Dx. of Chorionicity

\[ n = 328 \]

1998-2012

- Not mentioned
- "Monoamniotic"
- "Dichorionic"

<table>
<thead>
<tr>
<th>Year</th>
<th>Not mentioned</th>
<th>&quot;Monoamniotic&quot;</th>
<th>&quot;Dichorionic&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-2002</td>
<td>19</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>2003-2005</td>
<td>7</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>2006-2010</td>
<td>9</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>2011-2012</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Monoamniotic (MA) Twins

- In case of doubt, absence of inter-twin membrane is best confirmed by TVS
- Cord entanglement - almost universal in MA twins
- On Doppler, 2 distinct arterial waveforms with different FHR’s within same sampling gate

EVIDENCE LEVEL: 4
“Hidden mortality” in MC twins

Sebire NJ. BJOG 1997;104:1203
Co-twin death >14wk 4%

Twin Twin Transfusion Snd. (TTTS) 10-15%

Twin Anaemia Polycythaemia Snd. (TAPS) 4%

>25% Discordant growth 15%

Co-twin death >14wk 4%

Monoamniotic 5%

Acardiac / TRAP 1%

Courtesy of Enrico Lopriore
Impact of Co-Twin Death

White matter damage:
- 25% in MC survivors
- 3% in DC survivors

- IUFD: 26% in MC, 2% in DC
- Anaemia: 51.4% in MC, 0% in DC
- Intracranial Lesions: 46% in MC, 0% in DC

Bejar R. AmJOG 1990;162:1230-6
Bajoria R. Human Reprod 1999;14(8):2124
Impact of Co-Twin Death in Monochorionic Twins

Placental Vascular Communications

BP

Recovery
Death
Cerebral Palsy

Death of Smaller Twin (Donor)

15-20%

Bajoria R. Human Reprod 1999;14(8):2124
Impact of Co-Twin Death in Monochorionic Twins

Death of Larger Twin (Recipient)

Recovery
Death
Cerebral Palsy

94%

Placental Vascular Communications

BP

Bajoria R. Human Reprod 1999;14(8):2124
## Co-Twin Death: Pregnancy Outcome

<table>
<thead>
<tr>
<th></th>
<th>Monochorionic</th>
<th>95% CI</th>
<th>Dichorionic</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Twin Demise</td>
<td>12%</td>
<td>7-15</td>
<td>4%</td>
<td>2-7</td>
</tr>
<tr>
<td><strong>OR 6.04</strong> (95% CI 1.8-19.9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurological Abnormality</td>
<td>18%</td>
<td>11-26</td>
<td>1%</td>
<td>0-7</td>
</tr>
<tr>
<td><strong>OR 4.07</strong> (95% CI 1.3-12.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premature Delivery</td>
<td>68%</td>
<td>56-78</td>
<td>57%</td>
<td>34-77</td>
</tr>
</tbody>
</table>

Screening for chromosomal abnormalities in twins

- Screening for trisomy 21 can be performed in 1st trimester using combined test: NT, free β-hCG, PAPP-A
- Alternative is combination of maternal age & NT only

- In “vanished” twin, if there is still measurable fetal pole, NT alone + maternal age, should be used for risk estimation

- Detection rate of NIPT for trisomy 21 may be lower in twins than singletons, but data are still limited
Prenatal screening at 11-20 wks

FTS:
PAPP-A
Free βhCG
ADAM 12

MSS:
αFP
hCG
uE₃
Inhibin A

IPS

DV
TR

10 12 14 16 18 20 wks

Ontario 2016

Twins

Singletons

cffDNA NIPT

Ontario 2016
Ultrasound Screening in Twins

SOGC - 2011

Screening for anomalies & aneuploidy:
- $T_1$: NT + maternal age
- $T_2$: Detailed anatomical US @ 18-22 wk

Screening for preterm birth:
- Insufficient data to recommend routine preterm labour surveillance protocol in terms of frequency, timing or optimal cervical length thresholds
- TV US measurement of cervix should be performed
Invasive prenatal diagnosis in twins

- CVS preferred in DC twins
  - can be performed earlier than amnio
  - lower risk of selective TOP in 1st vs 2nd trimester
    - 7% risk of entire pregnancy loss
    - 14% risk of delivery < 32 wks
- Map positions of twins carefully
- Amnio in MC twins: acceptable to sample only 1 sac
  - V rare discordant chromosomal anomalies will be missed

EVIDENCE LEVEL: 3
Twins
Prenatal Screening & Aneuploidy Diagnosis

- NT + maternal age = acceptable $T_1$ screening test

- $T_1$ serum screening + NT may be considered

- Integrated screening with NT plus $T_1$ & $T_2$ serum screening are options.
  - To be validated in prospective studies

- In non-MC multiple pregnancies:
  - Transabdominal & transcervical CVS
  - Transabdominal CVS only

US screening for structural abnormalities in twins

- Twins should be assessed for any major anomalies at 1\textsuperscript{st} trimester scan

- Routine 2\textsuperscript{nd} trimester (anomaly) scan ~ 20 (18–22) wks

GOOD PRACTICE POINT

- Cardiac screening should be performed in MC twins

GOOD PRACTICE POINT

- Major congenital anomaly affecting only one twin:
  - 1 : 25 DC
  - 1 : 15 MC/DA
  - 1 : 6 MA

EVIDENCE LEVEL: 3
Selective Feticide in Twins

DC twins:

- US ultrasound-guided i/cardiac or i/vascular KCl or lignocaine
- preferably in 1\textsuperscript{st} trimester

When dx. made in 2\textsuperscript{nd} trimester, women might opt for late selective TOP in 3\textsuperscript{rd} trimester, if law permits

Lethal abN + high risk of IUFD → conservative management

GOOD PRACTICE POINT
EVIDENCE LEVEL: 2++

MC twins:

- Selective feticide: cord occlusion, laser ablation or RFA

Lethal abN + high risk of IUFD → intervention
  - to protect healthy co-twin against adverse sequelae of co-twin death
Abnormal Twin

Selective Termination vs Expectant Management

Management depends on:

- Chorionicity
  - Impact of fetal death

- Type of abnormality
  - Renal Agenesis vs Gastrochisis
  - Trisomy 18 vs Trisomy 21
MC/DA Twin Outcome
90% survival overall

0 Alive
0%

1 Alive
7.5%

Both Alive
85%

MC/DA Deaths

Causes

- Miscarriage: 18%
- TTTS < 16 wk: 16%
- TTTS > 16 wk: 44%
- IUGR: 16%
- Anomaly: 4%
- TAPS: 2%

MC/DA Deaths

Causes

TTTS < 16 wk
16%

TTTS > 16 wk
44%

TAPS
2%

62%

Twin Pregnancies

Prevalence: 2-3% (456 / 24,959)

Fraternal (Dichorionic) 85%
Identical (Monochorionic) 15%

TTTS 15%
TTTS:
More DA-RV
Fewer A-A, V-V
Severe TTTS

Outcome without Treatment

Alive 10%
Dead 90%
Severe TTTS – Therapeutic Options

Amnioreduction

Laser Ablation of Placental Anastomoses
Lasers for TTTS
Origin of Referrals to Mount Sinai
1998-2016
(n = 537)
(Triplets = 21)

Singapore USA Jamaica UAE
Survival at 6 months by stage

- Stage 0: 90%
- Stage 1: 97%
- Stage 2: 92%
- Stage 3R: 89%
- Stage 3D: 94%
- Stage 3R+D: 92%
- At least 1: 97%

n=488
### “Early” vs “Conventional” Laser

<table>
<thead>
<tr>
<th></th>
<th>“Conventional” (16-26 wks)</th>
<th>”Early“ (&lt; 16 wks)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Survivor</td>
<td>13.2%</td>
<td>16.7%</td>
<td>0.54</td>
</tr>
<tr>
<td>Donor Survivor</td>
<td>66.4%</td>
<td>62.5%</td>
<td>0.8</td>
</tr>
<tr>
<td>Recipient Survivor</td>
<td>77%</td>
<td>78.3%</td>
<td>1.0</td>
</tr>
<tr>
<td>NND &lt; 7 days</td>
<td>7.4%</td>
<td>8.8%</td>
<td>0.7</td>
</tr>
<tr>
<td>Donor B Wt (g) (median)</td>
<td>1,372</td>
<td>1,352</td>
<td>0.9</td>
</tr>
<tr>
<td>Recipient B Wt (g) (median)</td>
<td>1,668</td>
<td>1,537</td>
<td>0.44</td>
</tr>
</tbody>
</table>

Baud D. AmJOG 2013;208(3):197
**TTTS cases / yr 250**

**Laser:**  
- \( n = 100 \)

- \( n = 150 \)
  - Amnioreduction
  - Intrauterine death
  - Premature labour

*Statistics Canada: 2012/13*
Can we predict MC twin complications using US in early pregnancy?
US tools to assess multiple pregnancies:

- Size, Placental share
- Haemodynamics
- Structure:

Important predictable endpoints:

- Growth discordance  sIUGR  >20%
- Aneuploidy
- TTTS
- Premature labour < 32 wks
Implications of discordance in NT or CRL in 1st trimester

- Management of twins with CRL discordance ≥ 10% or NT discordance ≥ 20% should be discussed with fetal medicine specialist
  
  GOR: B

- Detailed US assessment
- Testing for karyotype abnormalities (+ microarray)
Twin NT > 99\textsuperscript{th} % & Normal Karyotype

- 206 twin pregnancies (166 DC, 40 MC)
- If NT > 99\textsuperscript{th} % & Normal karyotype:
  - Anatomy scan
  - Fetal Echo
  - Maternal serology

Results:
- Incidence: 5\% in twins vs 2.6\% in singletons
- 60\% had structural abN
- 80\% → fetal abN or demise

Goncé A. Ultrasound Obstet Gynecol 2010; 35: 14-18
<table>
<thead>
<tr>
<th>Ref.</th>
<th>Parameter</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>+LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sebire NJ. Human Reprod 2000</td>
<td>↑ NT in one twin</td>
<td>0.32</td>
<td>0.88</td>
<td>1.45</td>
</tr>
<tr>
<td>Kagan KO. USOG 2007</td>
<td>NT discordance &gt; 20%</td>
<td>0.57</td>
<td>0.77</td>
<td>1.73</td>
</tr>
<tr>
<td>Matias A. J Mat Fetal Neonat Med 2005</td>
<td>↑ NT + abN DV</td>
<td>0.66</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Sebire NJ. USOG 1998</td>
<td>Membrane folding</td>
<td>0.43</td>
<td>0.98</td>
<td>4.2</td>
</tr>
<tr>
<td>Linskens IH. Twin Res Hum Gen 2009</td>
<td>NT discordance &gt; 20%</td>
<td>0.64</td>
<td>0.78</td>
<td>2.91</td>
</tr>
</tbody>
</table>
NT discordance - early prediction of complications in MC twins

Kagan KO. USOG 2007; 29: 527-32

- Early fetal death
  - Normal outcome: 25%
  - Severe TTTS: 52%
  - Early death: 63%

- Likelihood ratio

n=512
1st trimester US & outcome prediction in MC/DA twins

NT Discordance  CRL Discordance  NT&CRL Discordance

<table>
<thead>
<tr>
<th>Condition</th>
<th>TTTS</th>
<th>PTB &lt;28 weeks</th>
<th>&gt;20% Discordant Growth</th>
<th>IUGR</th>
<th>IUFD</th>
<th>Composite Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Under ROC curve (95% CI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n=177  9 US perinatal centres

Allaf M. J Ultrasound Med 2014;33:135-140
Abnormal DV in singletons in 1st Trimester

- Highly predictive of aneuploidy:

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>Normal</th>
<th>Trisomy 21</th>
<th>Trisomy 18</th>
<th>Trisomy 13</th>
<th>Turner syndrome</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 publications</td>
<td>26,958</td>
<td>3.7%</td>
<td>69%</td>
<td>72%</td>
<td>65%</td>
<td>76%</td>
<td>56%</td>
</tr>
</tbody>
</table>

- Highly predictive of cardiac abN:

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>Cardiac defect</th>
<th>Abnormal DV flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td></td>
<td>No cardiac defect</td>
</tr>
<tr>
<td>8 publications</td>
<td>791</td>
<td>5.7%</td>
<td>19.3%</td>
</tr>
</tbody>
</table>

Maiz N, Nicolaides K. Fetal Diagn Ther 2010;28:65-71
### NT, CRL, DV in 1st Trimester US – TTTS Prediction

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in NT</td>
<td>1.6</td>
<td>1.2 - 2.1</td>
</tr>
<tr>
<td>NT ratio</td>
<td>1.58</td>
<td>1.16 – 2.03</td>
</tr>
<tr>
<td>Difference in CRL</td>
<td>1.24</td>
<td>0.71 – 2.05</td>
</tr>
<tr>
<td>CRL ratio</td>
<td>1.36</td>
<td>0.81 – 2.15</td>
</tr>
<tr>
<td>abN DV in ≥ 1 fetus</td>
<td>15.5</td>
<td>4.6 - 70.1</td>
</tr>
<tr>
<td>NT discrepancy + abN DV</td>
<td>21</td>
<td>5.5 – 98.3</td>
</tr>
</tbody>
</table>

Matias A. USOG 2010;35:142-148
NT, CRL, DV in 1st Trimester US – TTTS Prediction

AUC

----- NT difference  0.76

_ _ _ NT ratio 0.75

_ _ _ CRL difference  0.57

…….. CRL ratio 0.58

abN DV flow 0.84
in ≥ 1 fetus

Sensitivity

1 - Specificity

False + Rate

Matias A. USOG 2010;35:142-148
AFV discrepancy

Twin A

Membrane Folding?

Twin B

Widely spaced cord roots

12 wk

AFV (≤ 8cm)

Megacystis or rapidly cycling bladder

Membrane Folding?
Labeling of twin fetuses

- Follow reliable & consistent strategy
- Document clearly in woman’s notes
  
  GOOD PRACTICE POINT

- Options:
  - Label according to site, either “Lt. & Rt.” or “upper & lower”
  - Map in 1st trimester according to cord insertions relative to placental edges & membrane insertion.

- Describe each twin using as many features as possible - to enable others to identify them accurately
Labelling Twins

**Twin A:**
- Maternal Rt.
- Larger
- Polyhydramnios
- AVSD
- Ant. placenta

**Twin B:**
- Maternal Lt.
- Smaller
- N AFV
- N anatomy
- Post. placenta

Overkill...?? No such thing in twins!
Routine US monitoring of twins

Uncomplicated:
- first-trimester scan
- detailed second-trimester anatomy scan ~ 20 wks
- every 4 wks thereafter

Complicated:
- scan more frequently, depending on condition & severity

GOOD PRACTICE POINT

Uncomplicated:
- first-trimester scan
- detailed second-trimester anatomy scan ~ 20 wks
- every 2 wks after 16 wks to detect TTTS & TAPS

Complicated:
- scan more frequently, depending on condition & severity

EVIDENCE LEVEL: 4    GOR: C
US documentation in Twins

- Fetal biometry, AFV & UA Doppler (from 20 wks) for both twins
- Calculate EFW discordance. Document at each US from 20 wks.
- In MC twins, record MCA-PSV from 20 wks, to screen for TAPS.
- In MC/DA twins, document AFV (deepest vertical pocket) at each US to screen for TTTS.
- Measure cervical length, ideally at 2nd trimester anomaly scan, to identify women at risk of extreme preterm birth

EVIDENCE LEVEL: 2+, 2++
US in Twins in 2\textsuperscript{nd} & 3\textsuperscript{rd} Trimester

\textit{CAR - 2010}

- chorionicity & amnionicity
- placental number
- relative fetal position
- comparison of fetal size
- AFV on each side of membrane
- Characteristics, such as gender, which allow specific fetal identification on follow up exams

Fetal Surveillance:

- Uncomplicated MC pregnancies:
  • US every 2-3 wk, starting at 16 wk

- Uncomplicated DC pregnancies:
  • US every 3-4 wk, starting from anatomy US (18-22 wk)

- UA Doppler should not be routinely offered in uncomplicated twins

Amniotic Fluid Assessment:

- Oligohydramnios: DVP < 2 cm
- Polyhydramnios: DVP > 8 cm
“Take home” messages

- Early determination of chorionicity
  - Options for prenatal diagnosis in twins
  - More frequent US monitoring of MC twins

- Early recognition of MC problems
  - Educate mother re symptoms
  - Distinguish TTTS vs Placental Discordance

- Management options
  - TTTS
  - complicated MC twins

Timely Referral