

How to perform Routine Anomaly Scan 2008

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Ultrasound Screening

RCOG Working Party 2000

The twenty week anomaly scan is to reassure the woman that her baby appears to have no obvious structural abnormalities. Lack of explicitness about which structures have been examined may lead to confusion. The literature provides a range of detection rates and therefore individual units should provide their own figures to inform women undergoing the "20 week" scan.

The value of identifying fetal abnormalities at this stage is that it offers parents options. Some, probably the majority, for serious lesions, will elect to terminate the pregnancy. Those couples who choose to continue the pregnancy have the opportunity to prepare themselves through discussions with health care personnel and self-help groups, whilst attendants can ensure appropriate care during pregnancy and following delivery.

Ultrasound Screening

RCOG Working Party 2000

Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

Abdominal shape and content at level of kidneys and umbilicus

Renal pelvis (<5 mm AP measurement)

Longitudinal axis - abdominal-thoracic appearance (diaphragm/bladder)

Thorax at level of 4 chamber cardiac view

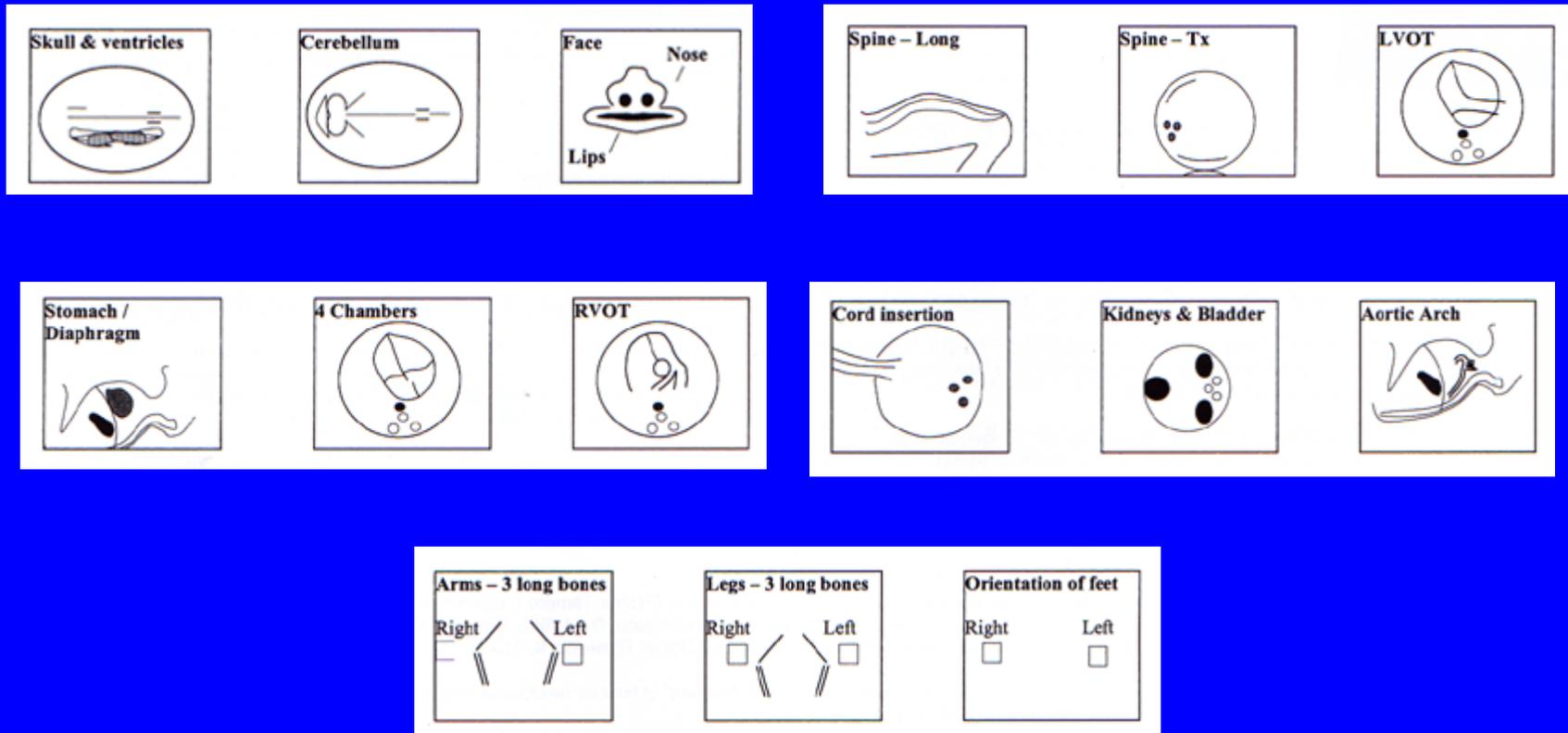
Cardiac outflow tracts

Arms - three bones and hand (not counting fingers)

Legs - three bones and foot (not counting toes)

Ultrasound Screening

RCOG Working Party 2000



Ultrasound Screening

RCOG Working Party 2000

| Fetal anomalies | Chance of being detected by USG |
|---------------------------------|--|
| Spina bifida | 90% |
| Anencephaly | 99% |
| Hydrocephalus | 60% |
| Major congenital heart problems | 25% |
| Diaphragmatic hernia | 60% |
| Exomphalos/ Gastroschisis | 90% |
| Major kidney problems | 85% |
| Major limb abnormalities | 90% |
| Cerebral palsy | 0% |
| Autism | 0% |
| Down syndrome | 40% |

Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
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Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

7.2cm / 1.3 / 47Hz

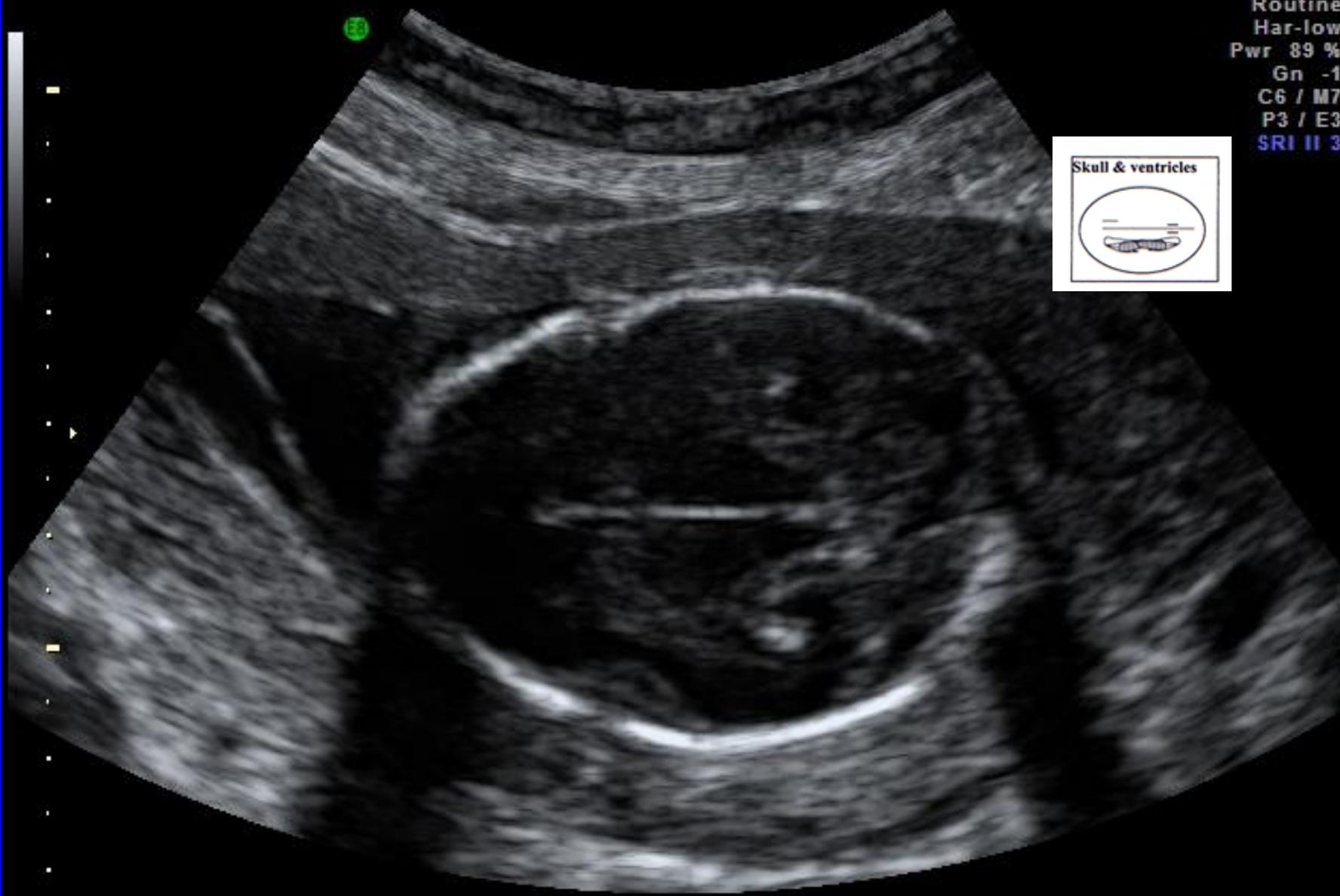
TIs 0.1

12.08.2008

12:41:45 PM

Routine
Har-low
Pwr 89 %
Gn -1
C6 / M7
P3 / E3
SRI II 3

Skull & ventricles



Voluson



E8

MFM 0810947G

AB2-7-D/OB

MI 0.9

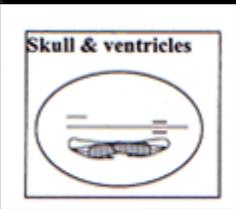
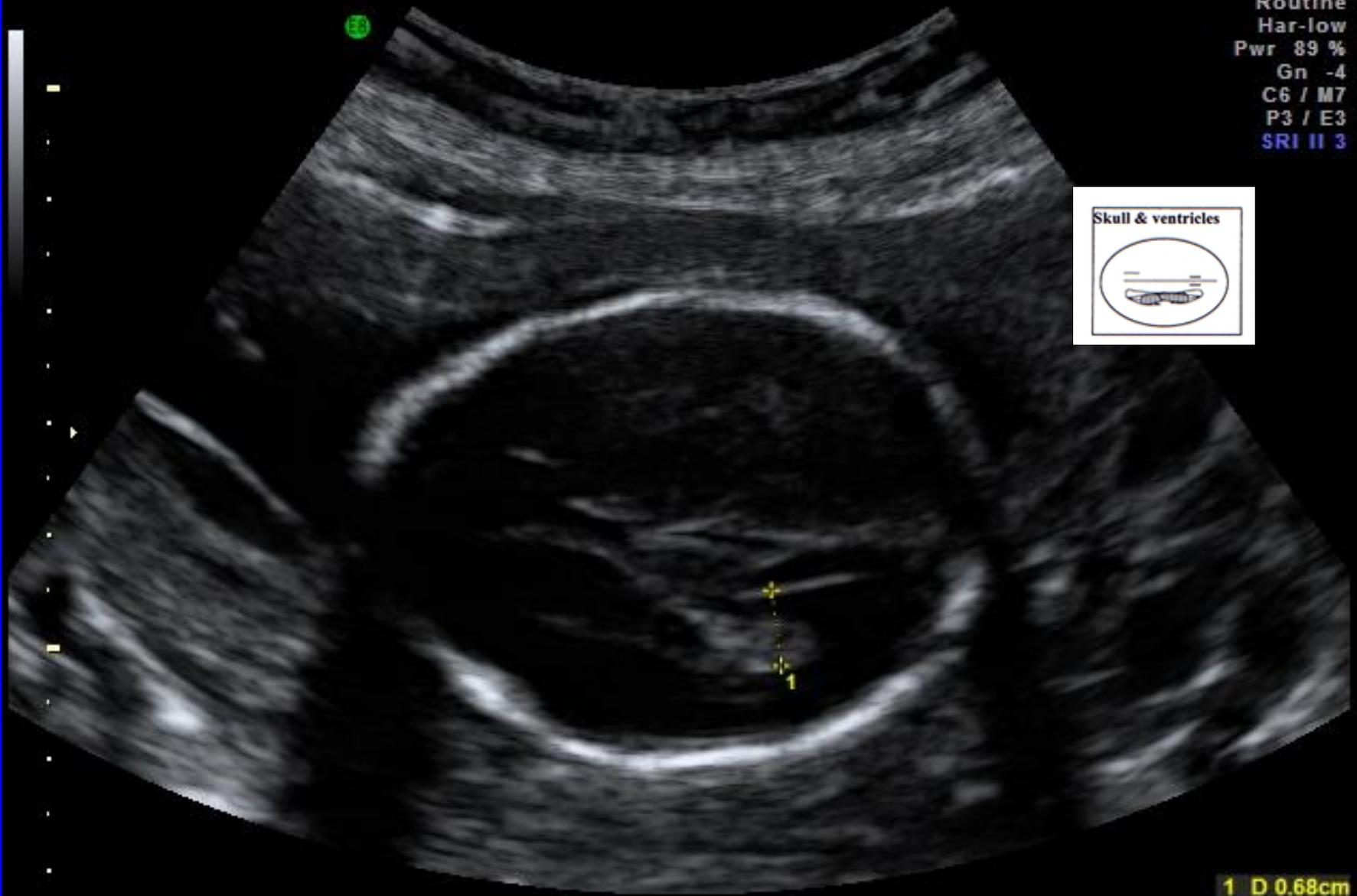
7.2cm / 1.3 / 47Hz

Tls 0.1

12.08.2008

12:40:12 PM

Routine
Har-low
Pwr 89 %
Gn -4
C6 / M7
P3 / E3
SRI II 3



1 D 0.68cm

Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

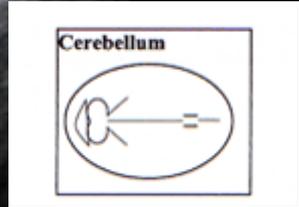
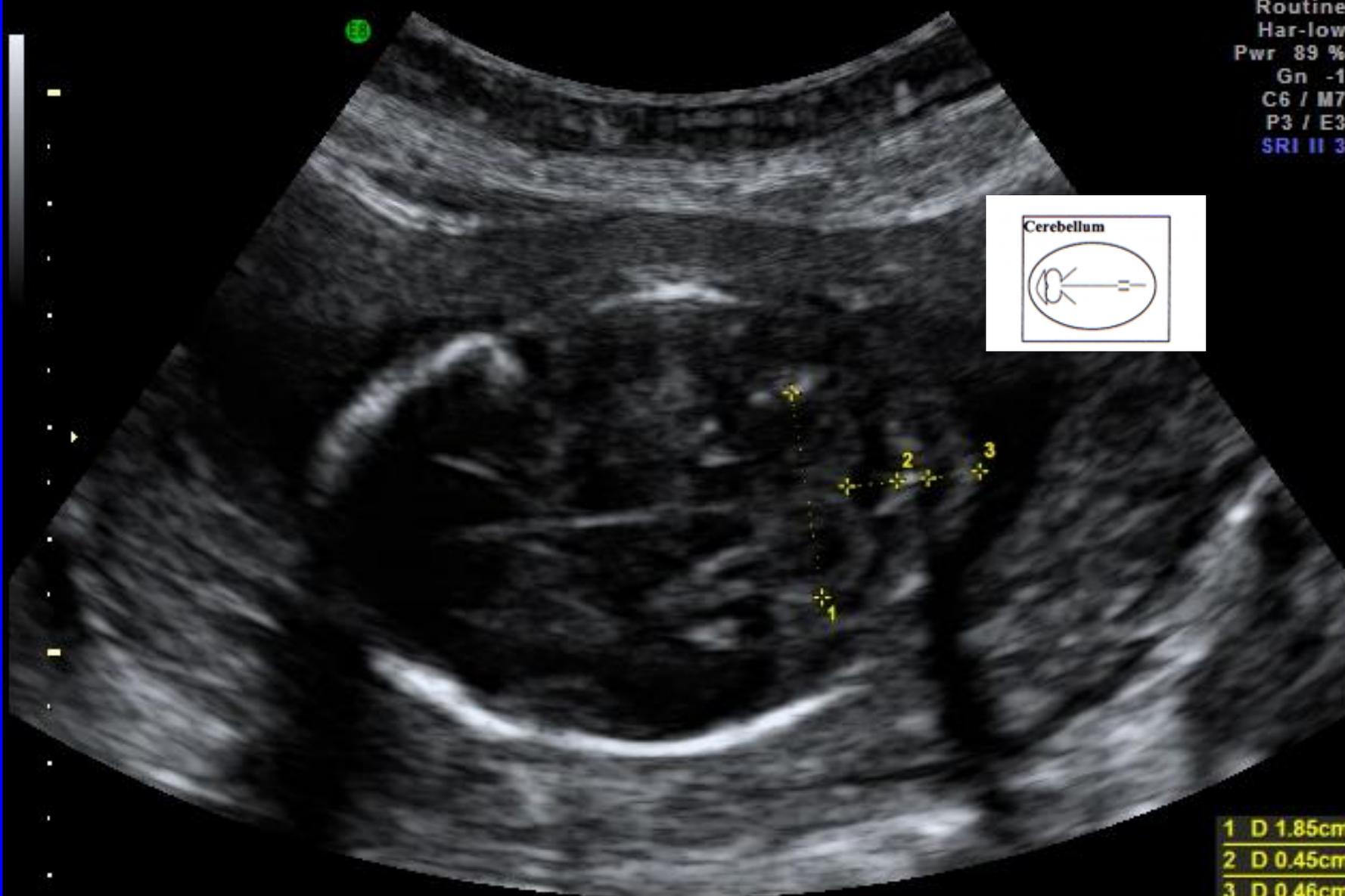
7.2cm / 1.3 / 47Hz

TIs 0.1

12.08.2008

12:41:00 PM

Routine
Har-low
Pwr 89 %
Gn -1
C6 / M7
P3 / E3
SRI II 3



1 D 1.85cm
2 D 0.45cm
3 D 0.46cm

Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
Renal pelvis (<5 mm AP measurement)**

**Longitudinal axis - abdominal-thoracic appearance
(diaphragm/bladder)**

Thorax at level of 4 chamber cardiac view

Cardiac outflow tracts

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Voluson



MFM-0610898H

AB2-7-D/OB

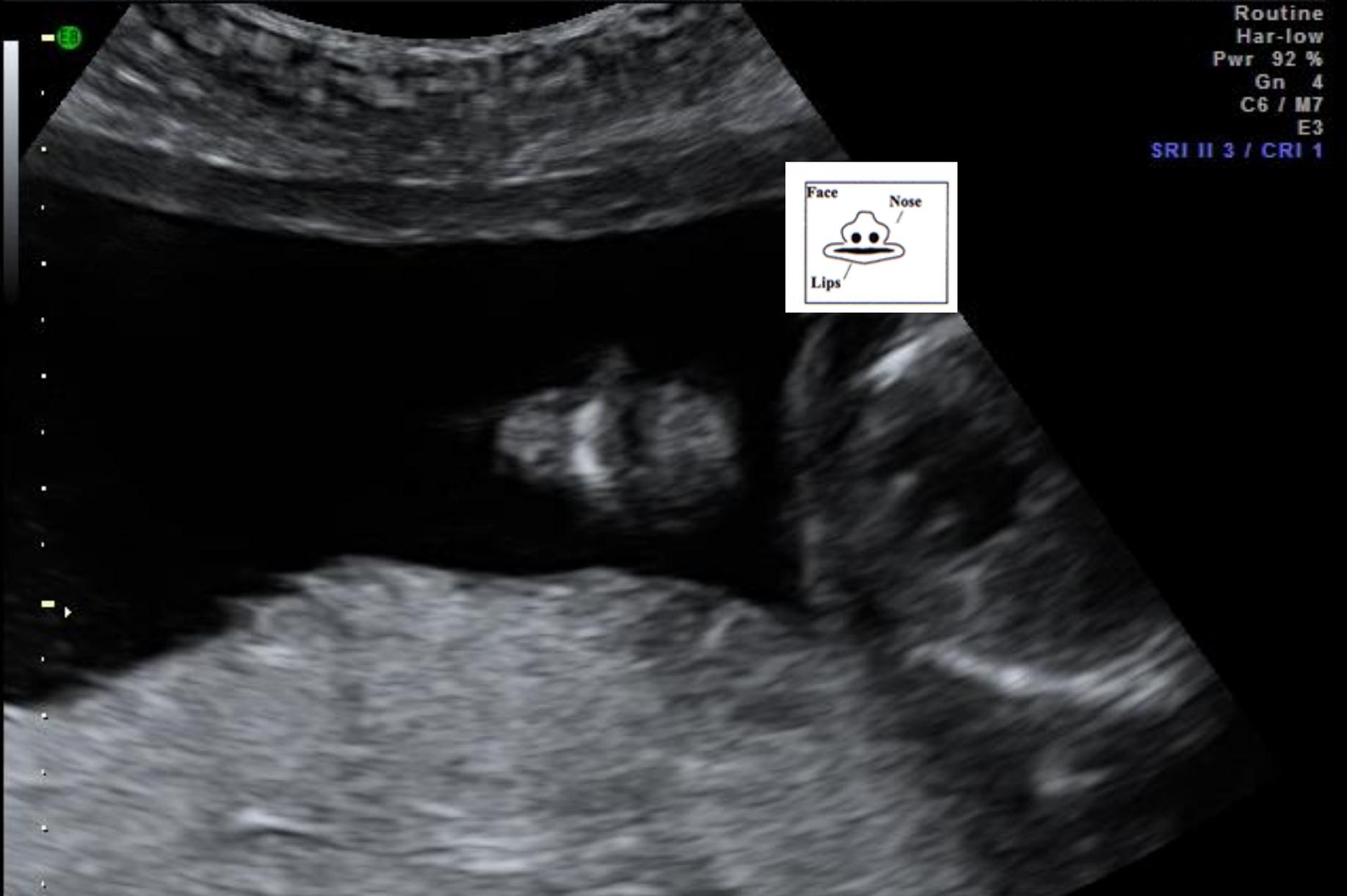
MI 0.9

8.8cm / 1.6 / 58Hz

TIs 0.1

14.08.2008 03:14:38 PM

Routine
Har-low
Pwr 92 %
Gn 4
C6 / M7
E3
SRI II 3 / CRI 1



Face
Nose
Lips

Voluson



AB2-7-D/OB

MI 0.9

MFM0811016P

8.8cm / 1.5 / 42Hz

TIs 0.1

12.08.2008

01:23:41 PM

Routine
Har-low
Pwr 92 %
Gn -2
C6 / M7
P3 / E3
SRI II 3



Voluson



MFM0811170F

AB2-7-D/OB

MI 0.9

10.4cm / 1.7 / 53Hz

TIs 0.1

14.08.2008 04:44:32 PM

Routine
Har-low
Pwr 92 %
Gn 4
C6 / M7
E3
SRI II 3 / CRI 1



1 D 0.71cm

Voluson



MFM0810902G

RAB4-8-D/OB

MI 1.1

9.9cm / 1.0 / 2.1Hz

TIs 0.2

13.08.2008 04:00:25 PM

Default
Th30/Qual high2
B50°/V65°
Mix50/50
SRI II 3
4D Real Time



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
Renal pelvis (<5 mm AP measurement)**

**Longitudinal axis - abdominal-thoracic appearance
(diaphragm/bladder)**

Thorax at level of 4 chamber cardiac view

Cardiac outflow tracts

Arms - three bones and hand (not counting fingers)

Legs - three bones and foot (not counting toes)

Voluson



MFM-0610898H

AB2-7-D/OB

MI 0.9

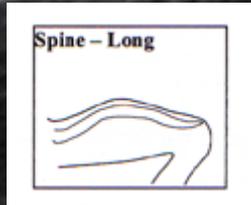
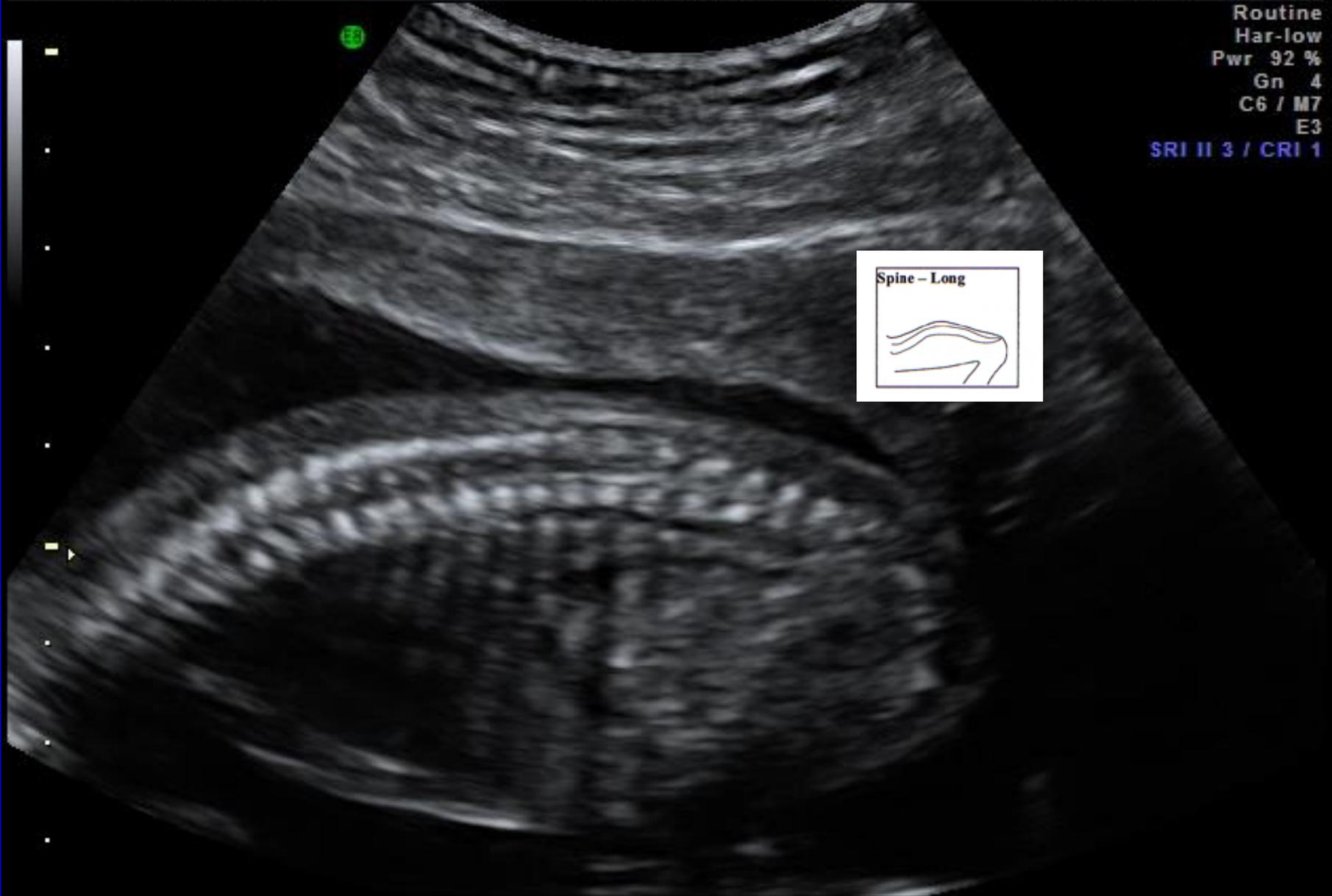
8.8cm / 1.4 / 58Hz

TIs 0.1

14.08.2008

03:05:11 PM

Routine
Har-low
Pwr 92 %
Gn 4
C6 / M7
E3
SRI II 3 / CRI 1



Voluson



MFM-0610898H

AB2-7-D/OB

MI 0.9

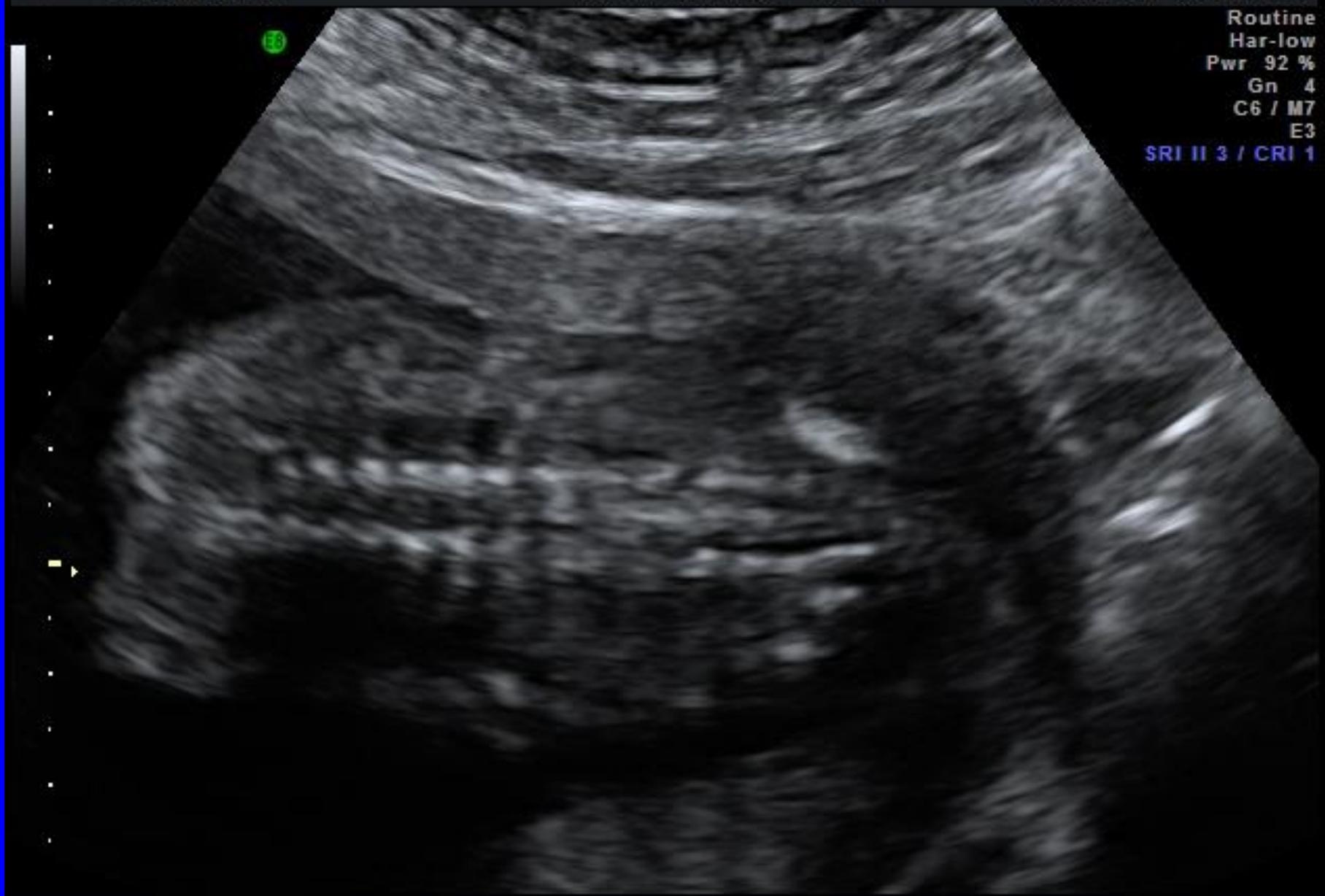
8.8cm / 1.6 / 58Hz

TIs 0.1

14.08.2008

03:05:50 PM

Routine
Har-low
Pwr 92 %
Gn 4
C6 / M7
E3
SRI II 3 / CRI 1



Voluson



MFM0810983N

AB2-7-D/OB

MI 0.9

7.2cm / 1.4 / 47Hz

TIs 0.1

12.08.2008 01:39:55 PM

Routine
Har-low
Pwr 89 %
Gn -2
C6 / M7
P3 / E3
SRI II 3

E3

Spine - Tx



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
Renal pelvis (<5 mm AP measurement)**

**Longitudinal axis - abdominal-thoracic appearance
(diaphragm/bladder)**

Thorax at level of 4 chamber cardiac view

Cardiac outflow tracts

Arms - three bones and hand (not counting fingers)

Legs - three bones and foot (not counting toes)

Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

10.4cm / 1.8 / 38Hz

TIs 0.1

12.08.2008

12:52:04 PM

Routine
Har-low
Pwr 92 %
Gn -4
C6 / M7
P3 / E3
SRI II 3



AC

AC 13.87cm
GA 19w2d
EFW 277g (10oz)
GA 19w0d

Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
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Cardiac outflow tracts

Arms - three bones and hand (not counting fingers)

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Voluson



MFM0811016P

AB2-7-D/OB

MI 0.9

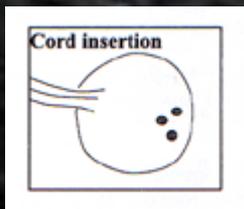
8.3cm / 1.1 / 47Hz

TIs 0.2

12.08.2008

01:20:32 PM

Routine
Har-low
Pwr 94 %
Gn -2
C6 / M7
P3 / E3
SRI II 3



Voluson

AB2-7-D/OB

MI 0.9



EB

MFM0810983N

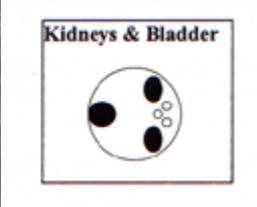
7.2cm / 1.4 / 47Hz

TIs 0.1

12.08.2008 01:39:55 PM

Routine
Har-low
Pwr 89 %
Gn -2
C6 / M7
P3 / E3
SRI II 3

E3



Voluson



AB2-7-D/OB

MI 0.9

MFM 0811274P

8.8cm / 1.6 / 42Hz

TIs 0.1

13.08.2008

03:10:01 PM

Routine
Har-low
Pwr 92 %
Gn -1
C6 / M7
P3 / E3
SRI II 3



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
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Arms - three bones and hand (not counting fingers)

Legs - three bones and foot (not counting toes)

Voluson



MFM0811016P

AB2-7-D/OB

MI 0.9

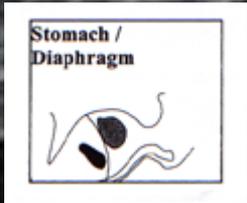
8.8cm / 1.5 / 42Hz

TIs 0.1

12.08.2008

01:23:07 PM

Routine
Har-low
Pwr 92 %
Gn -2
C6 / M7
P3 / E3
SRI II 3



Voluson



EB

MFM0810458K

AB2-7-D/OB

MI 0.9

7.2cm / 1.4 / 65Hz

TIs 0.1

13.08.2008 03:38:15 PM

Routine

Har-low

Pwr 89 %

Gn -1

C6 / M7

E3

SRI II 3 / CRI 1



Voluson



MFM0811016P

AB2-7-D/OB

MI 0.7

8.8cm / 1.5 / 15Hz

TIs 0.5

12.08.2008

01:22:22 PM

15cm/s



-15cm/s

E0

Routine

Har-low

Pwr 83 %

Gn -2

C6 / M7

P3 / E3

SRI II 3

Pwr 100 %

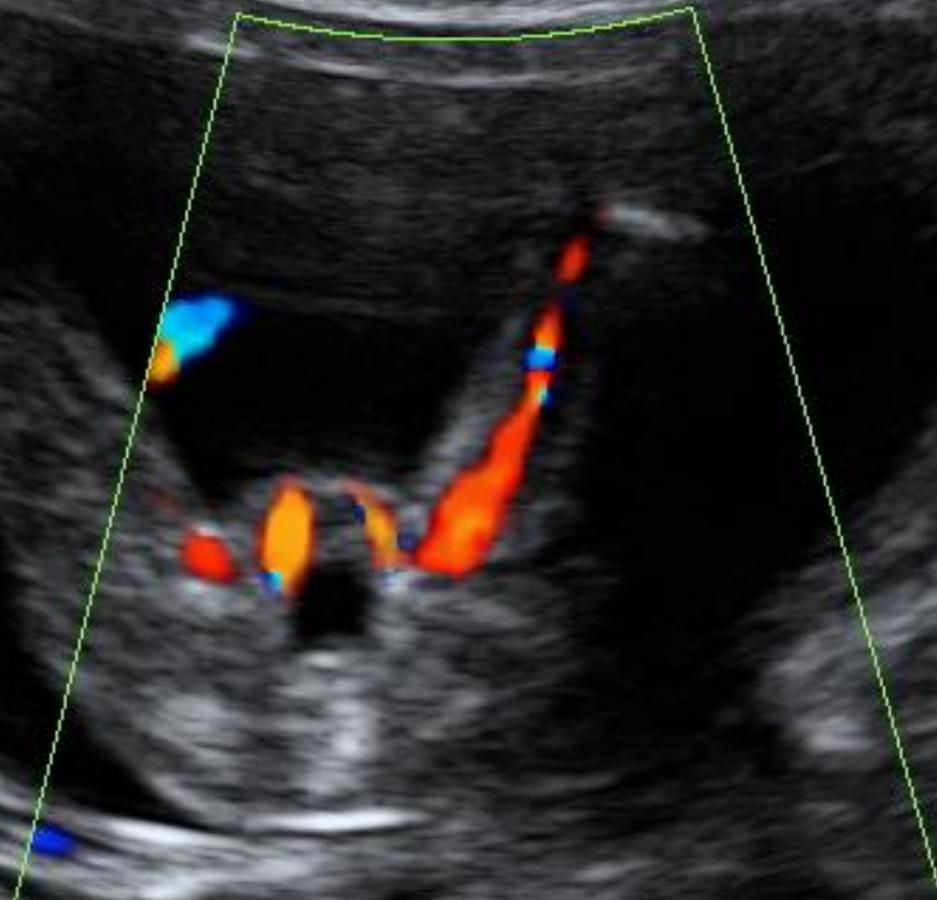
Gn -4.0

Frq mid

Qual norm

WMF low1

PRF 1.3kHz



Voluson



MFM0811016P

AB2-7-D/OB

MI 0.9

8.8cm / 1.5 / 42Hz

TIs 0.1

12.08.2008

01:22:05 PM

Routine
Har-low
Pwr 92 %
Gn -2
C6 / M7
P3 / E3
SRI II 3



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

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Voluson



EB
MFM0810983N

AB2-7-D/OB

MI 1.0

7.1cm / 1.4 / 98Hz

TIs 0.3

12.08.2008 01:43:23 PM

Fet. Cardio

Har-high

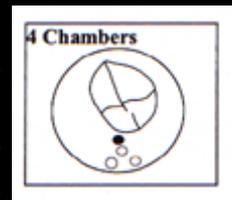
Pwr 100 %

Gn -5

C8 / M6

E2

SRI II 3 / CRI 1



Voluson



k3759210

AB2-7-D/OB

MI 0.9

7.8cm / 1.0 / 114Hz

TIs 0.2

14.08.2008 10:12:39 AM

Fet. Cardio

Har-low

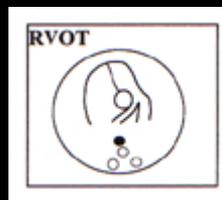
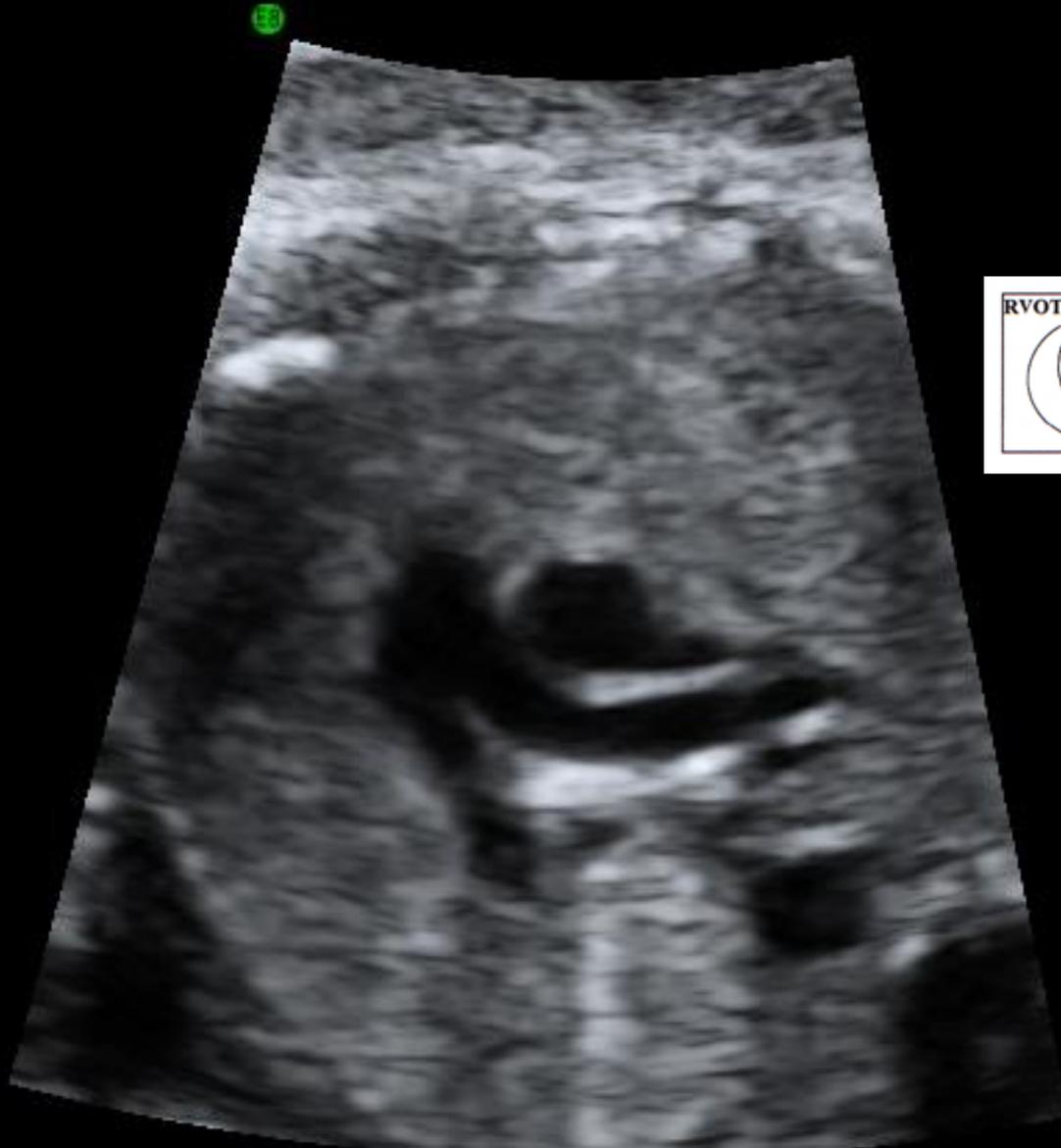
Pwr 100 %

Gn 3

C8 / M4

E2

SRI II 2 / CRI 1



Voluson



k3759210

AB2-7-D/OB

MI 0.9

7.8cm / 1.0 / 114Hz

TIs 0.2

14.08.2008

10:11:22 AM

Fet. Cardio

Har-low

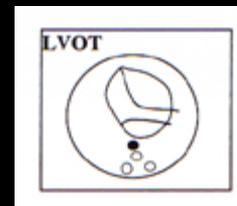
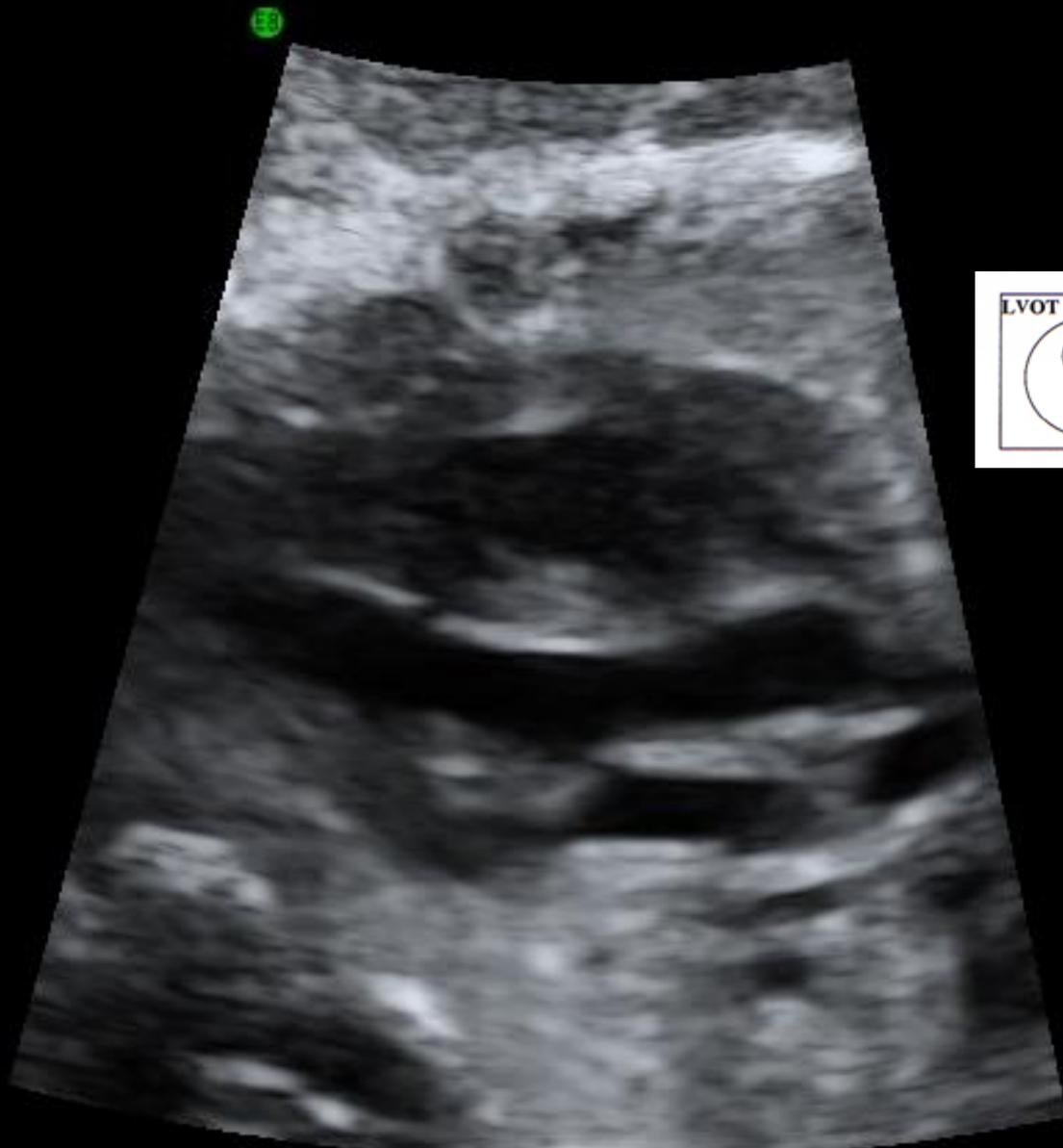
Pwr 100 %

Gn 3

C8 / M4

E2

SRI II 2 / CRI 1



Voluson



k3759210

AB2-7-D/OB

MI 0.9

7.8cm / 1.0 / 114Hz

TIs 0.2

14.08.2008

10:12:58 AM

Fet. Cardio

Har-low

Pwr 100 %

Gn 3

C8 / M4

E2

SRI II 2 / CRI 1



Voluson



k3759210

AB2-7-D/OB

MI 1.0

10.4cm / 1.7 / 90Hz

TIs 0.2

14.08.2008 10:15:32 AM

Fet. Cardio

Har-low

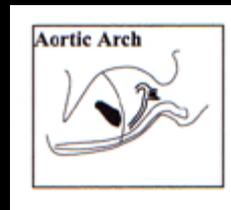
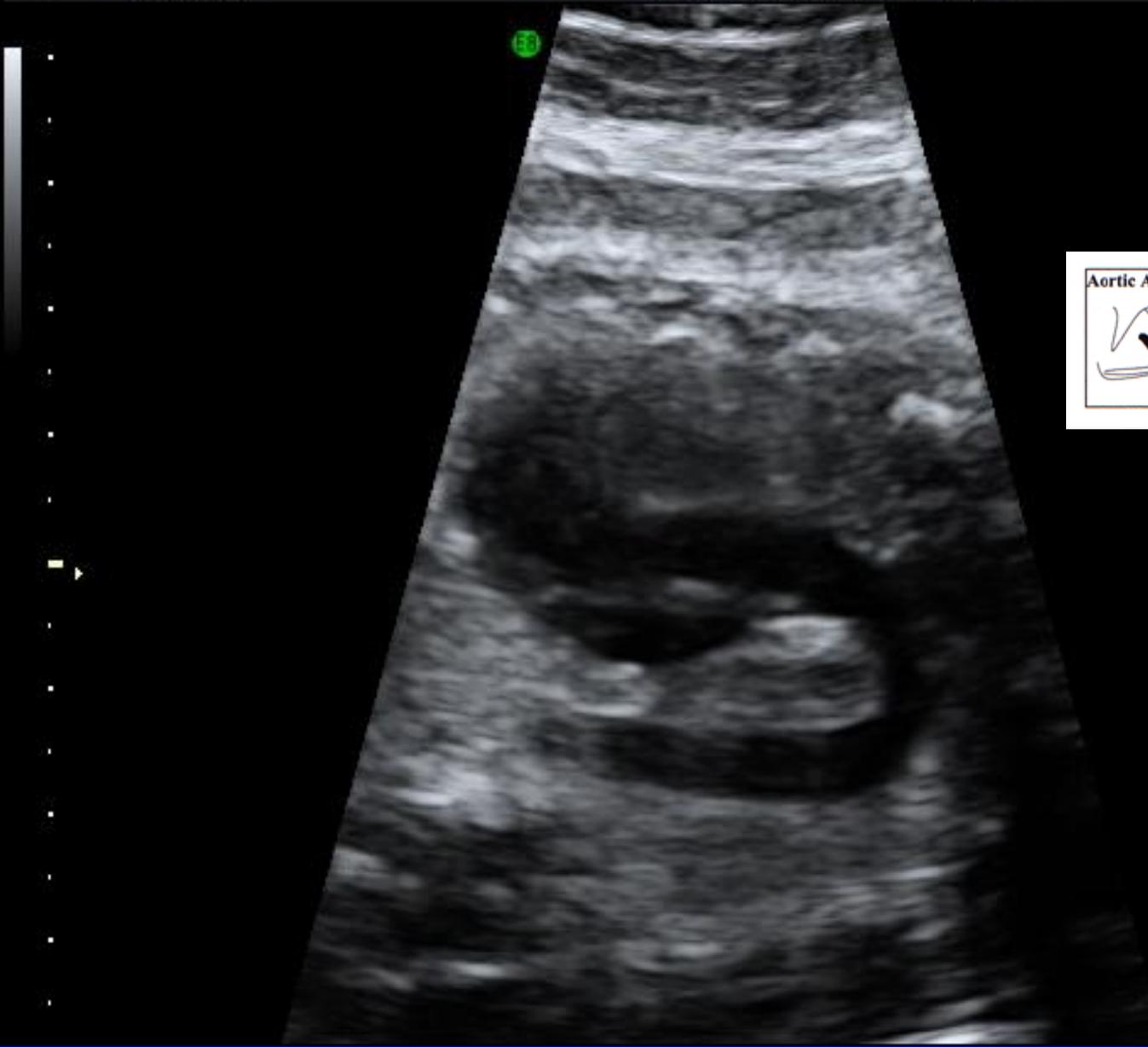
Pwr 100 %

Gn 0

C7 / M4

E2

SRI II 2 / CRI 1



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

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Renal pelvis (<5 mm AP measurement)**

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(diaphragm/bladder)**

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Cardiac outflow tracts

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Legs - three bones and foot (not counting toes)

Voluson



MFM0811016P

AB2-7-D/OB

MI 0.9

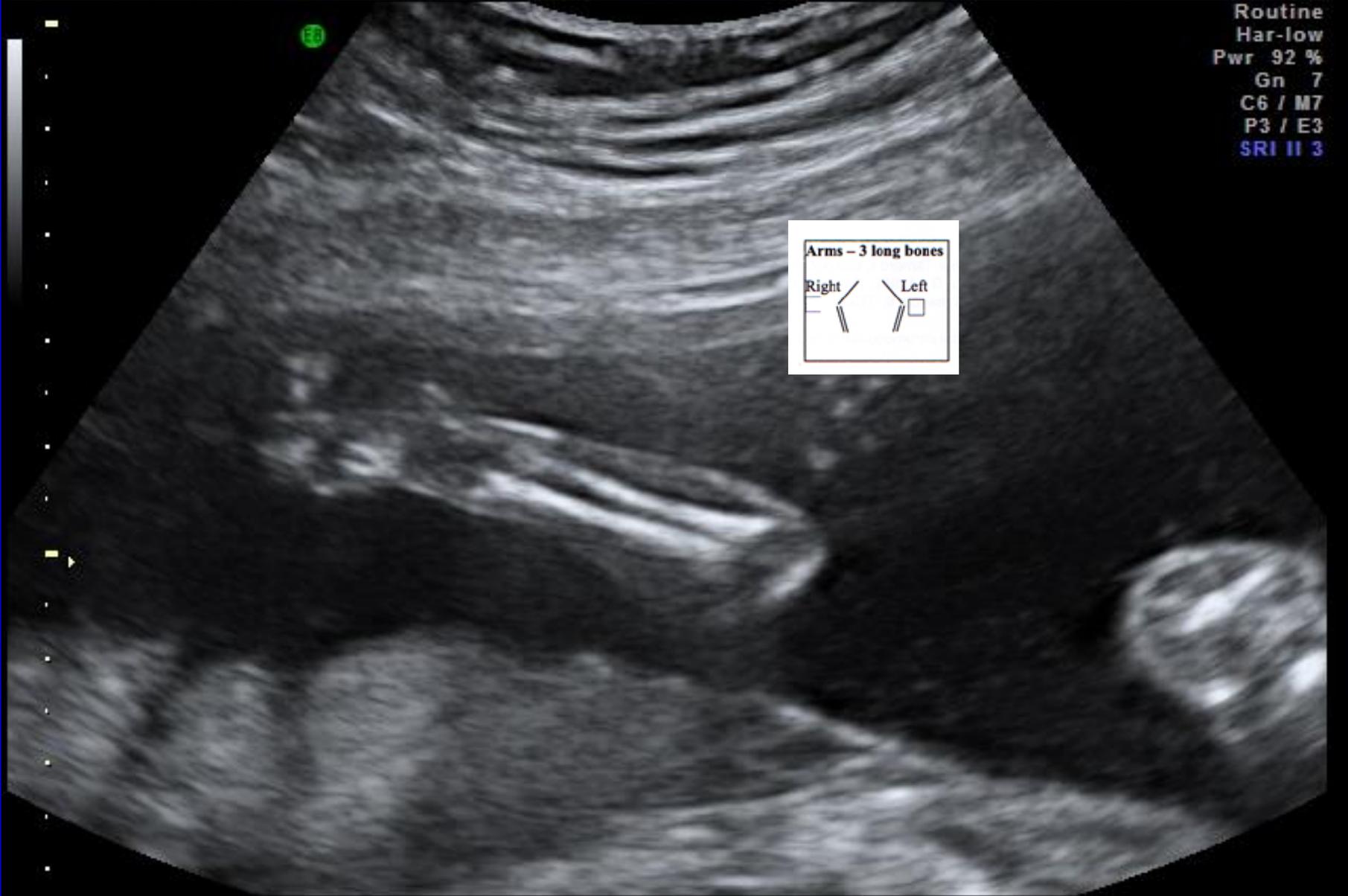
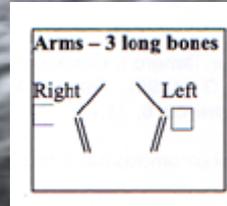
8.8cm / 1.5 / 42Hz

TIs 0.1

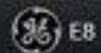
12.08.2008

01:26:09 PM

Routine
Har-low
Pwr 92 %
Gn 7
C6 / M7
P3 / E3
SRI II 3



Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

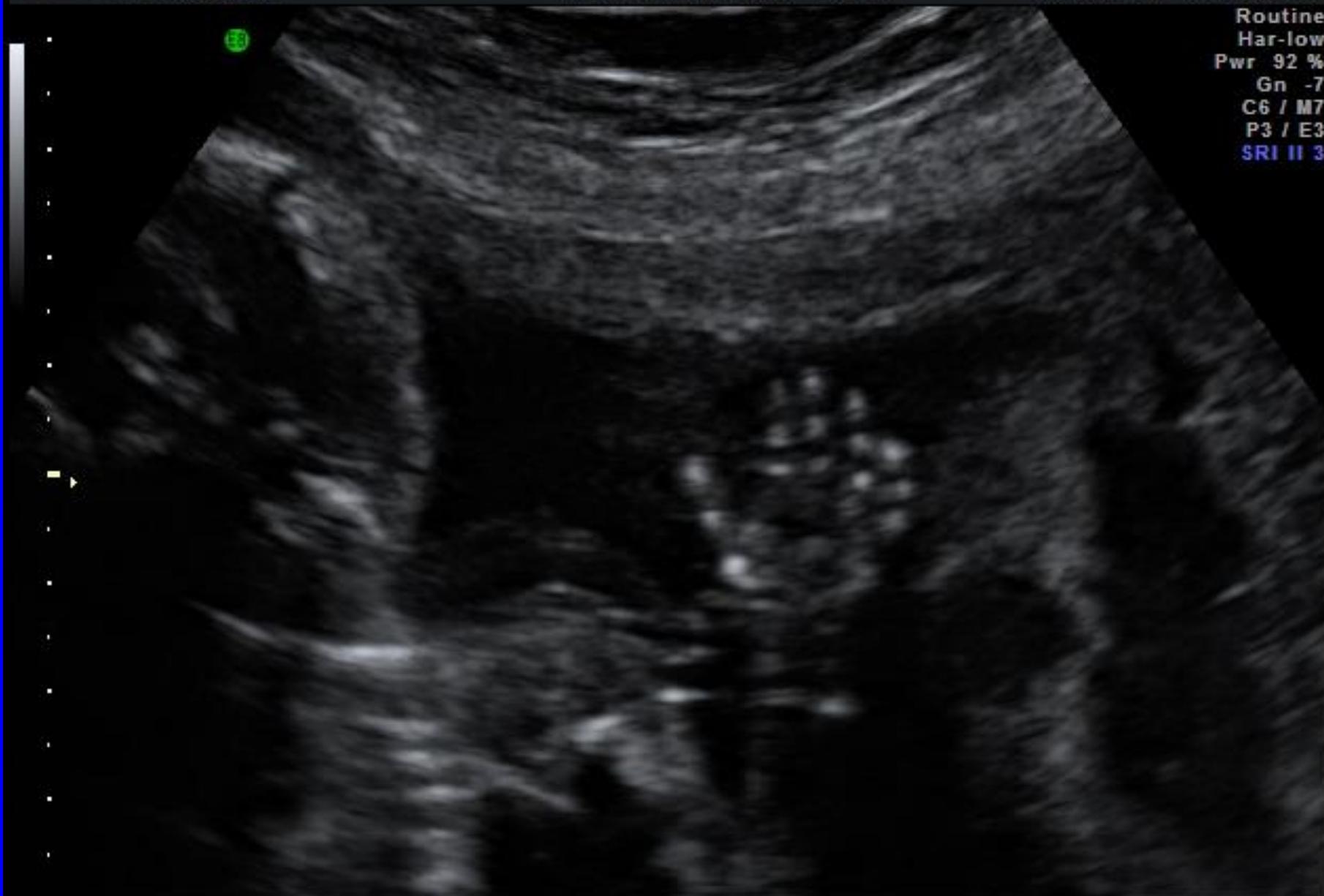
10.4cm / 1.8 / 38Hz

TIs 0.1

12.08.2008

12:49:55 PM

Routine
Har-low
Pwr 92 %
Gn -7
C6 / M7
P3 / E3
SRI II 3



Head shape + internal structures, cavum pellucidum, cerebellum, ventricular size at atrium (<10 mm)

Face & lips

Spine: longitudinal and transverse

Abdominal shape and content at level of stomach

**Abdominal shape and content at level of kidneys and umbilicus
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Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

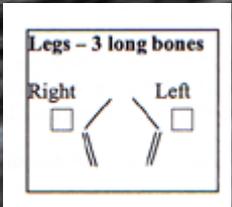
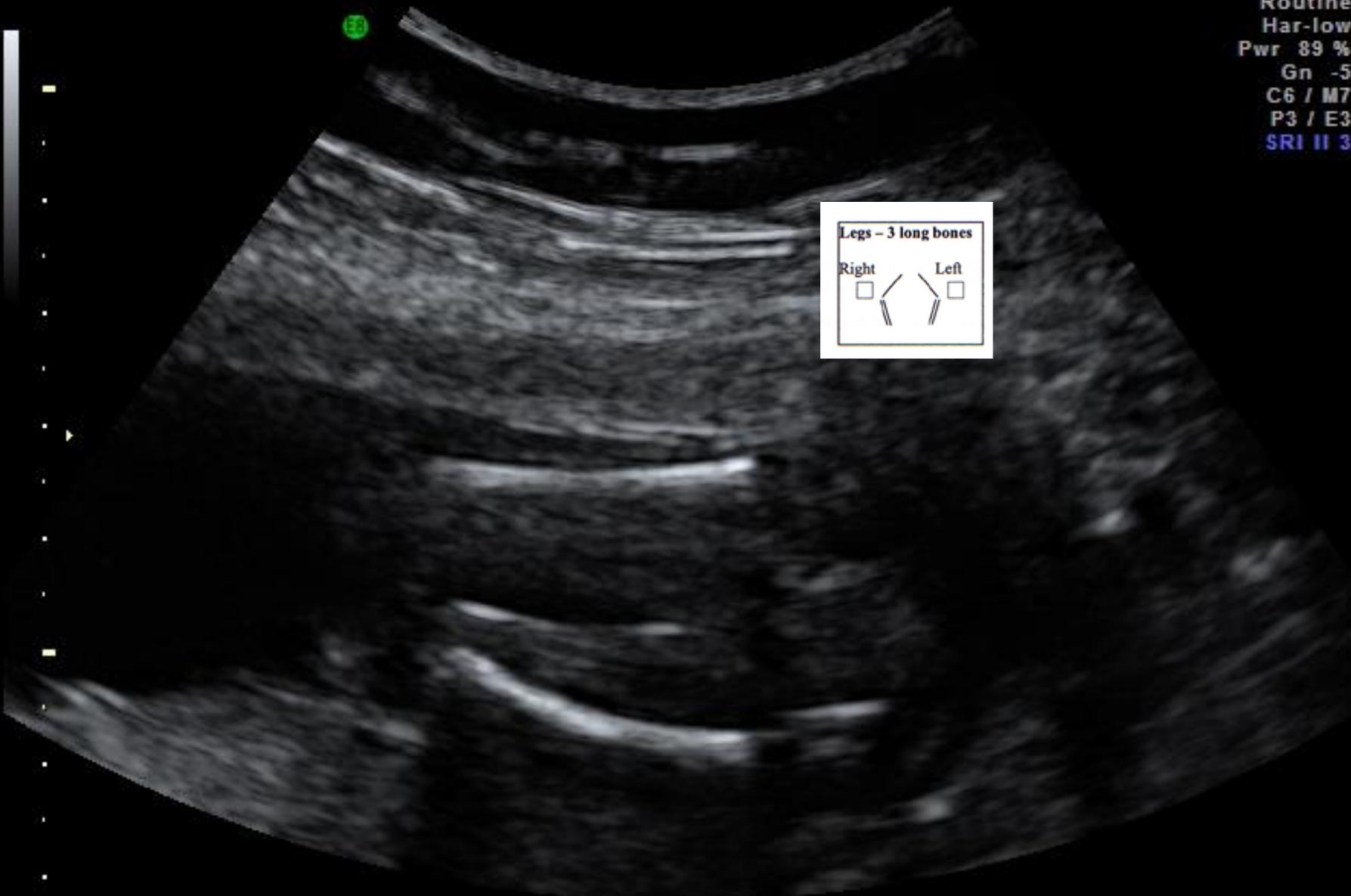
7.2cm / 1.3 / 47Hz

TIs 0.1

12.08.2008

12:43:11 PM

Routine
Har-low
Pwr 89 %
Gn -5
C6 / M7
P3 / E3
SRI II 3



Voluson



MFM0810983N

AB2-7-D/OB

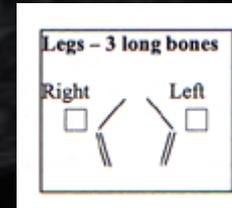
MI 0.9

10.4cm / 1.8 / 38Hz

TIs 0.1

12.08.2008 01:41:56 PM

Routine
Har-low
Pwr 92 %
Gn -2
C6 / M7
P3 / E3
SRI II 3



Voluson



MFM0811016P

AB2-7-D/OB

MI 0.9

8.8cm / 1.5 / 42Hz

TIs 0.1

12.08.2008

01:27:11 PM

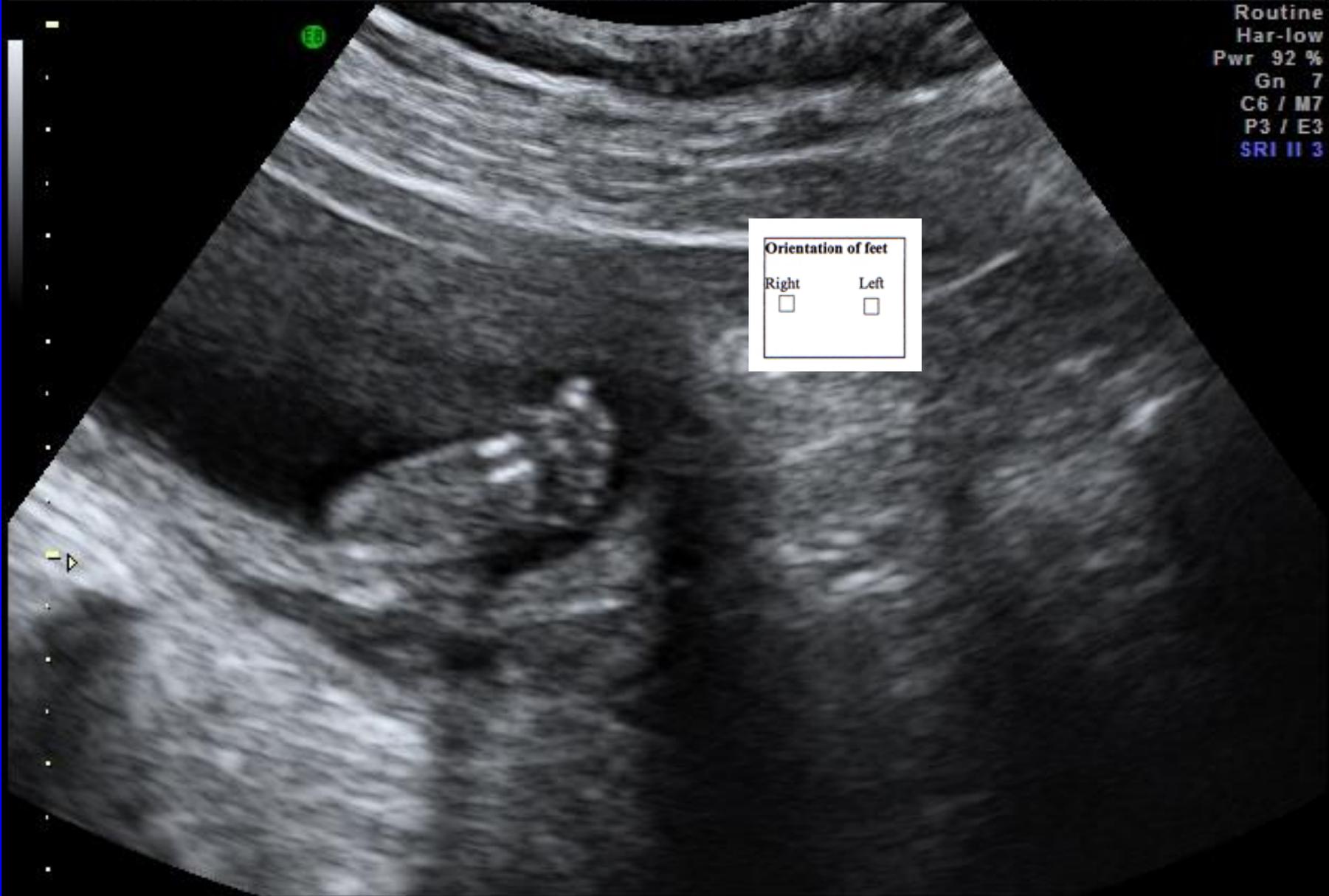
Routine
Har-low
Pwr 92 %
Gn 7
C6 / M7
P3 / E3
SRI II 3

Orientation of feet

Right



Left



Voluson



MFM 0810947G

AB2-7-D/OB

MI 0.9

8.8cm / 1.1 / 42Hz

TIs 0.1

12.08.2008

12:53:22 PM

Routine

Har-low

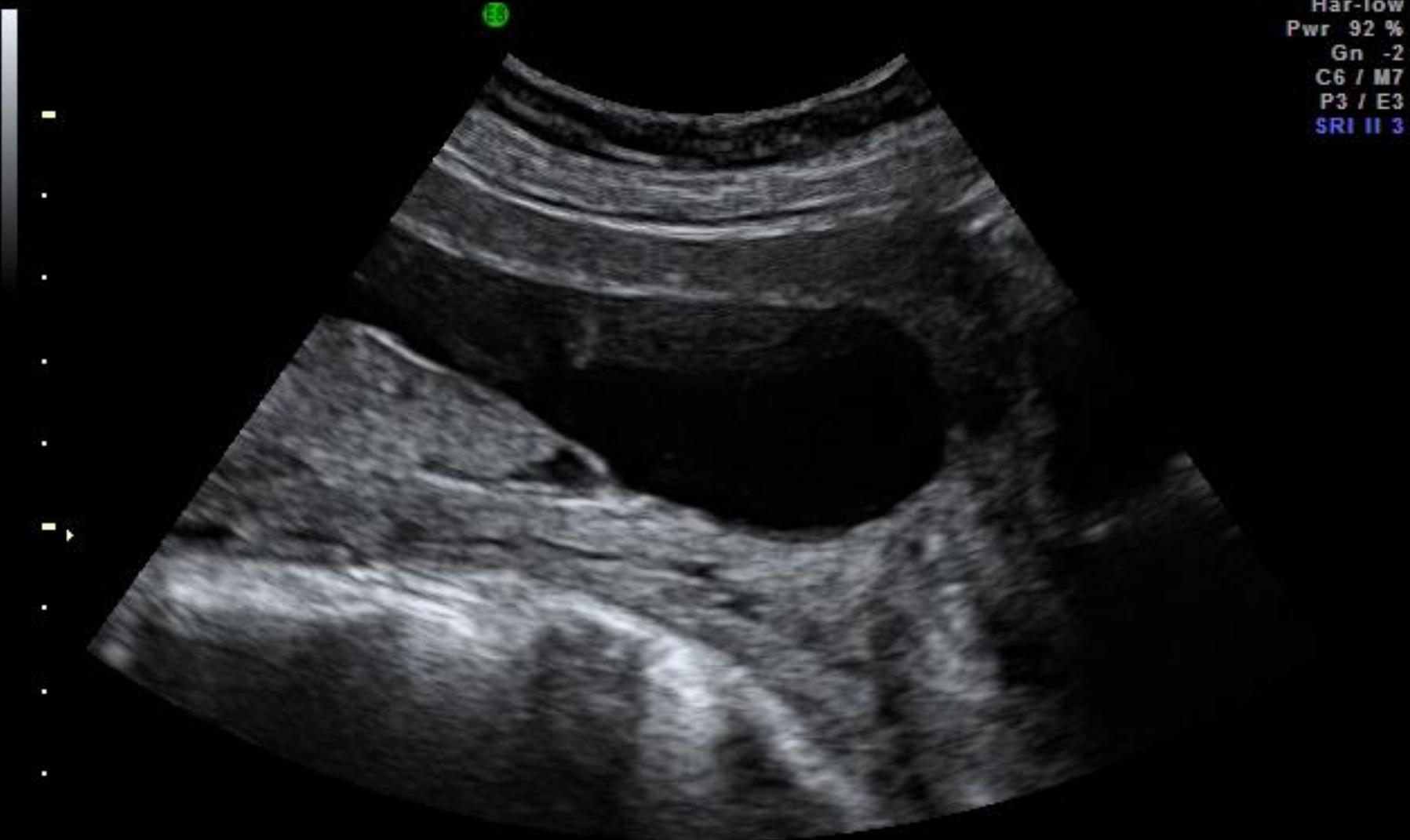
Pwr 92 %

Gn -2

C6 / M7

P3 / E3

SRI II 3



Sonographic "markers" for aneuploidy

Choroid plexus cyst

Ventriculomegaly (> 10 mm at the atrium)

Echogenic bowel (equivalent to bone density)

Head shape

Nuchal pad (> 5 mm at 20 weeks)

Cysterna magna

Echogenic foci in heart

Dilated renal pelvis (> 5 mm AP)

Short femur/humerus

Talipes

Sandal gap

Clinodactyly

Clenched hand

Two vessel cord

Evaluation of Routine Obstetric Ultrasound Examination in detecting Fetal Structural Abnormalities in Low Risk Pregnancies

WC Leung, CP Lee, MHY Tang

Department of Obstetrics & Gynaecology, Tsan Yuk Hospital, The University of Hong Kong, Hong Kong, China

Objective:

To evaluate routine obstetric ultrasound examination in detecting fetal structural abnormalities in low risk pregnancies.

Method:

A prospective study of the results of routine obstetric ultrasound examination during the first 19 months after the introduction of this service in a local teaching hospital was performed.

Results:

3288 women had routine ultrasound examination. Pregnancy outcome could be traced in 3187 women. Fetal ultrasound abnormalities were suspected in 73 cases (2.3%). Follow-up scans showed the same abnormalities in 26 cases (0.8%). These were confirmed after delivery or abortion in 21 cases (0.7%). The most common fetal abnormality detected by routine ultrasound was **dilated renal pelvis** (10/21= 47.6%). Major abnormalities detected included: hydrocephalus (2), encephalocele (1), holoprosencephaly with complex congenital heart disease (1), cystic hygroma (1), truncus arteriosus (1), hypoplastic right heart (1) and diaphragmatic hernia (1). Fetal structural abnormalities were missed by routine ultrasound in 45 cases (1.4%). Majority were cardiac abnormalities (19/45 = 42.2%).

Conclusion:

The sensitivity of routine ultrasound in detecting fetal structural abnormalities was 31.8%. The specificity was 99.8%. 47 women (1.5%) were potentially subjected to unnecessary anxiety because of suspected fetal abnormalities which were not confirmed or were assessed as insignificant on subsequent scan.

(HKJGOM 2000; 1:28-32)

Evaluation of Routine Obstetric Ultrasound Examination in detecting Fetal Structural Abnormalities in Low Risk Pregnancies

WC Leung, CP Lee, MHY Tang

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Objective:

To evaluate routine obstetric ultrasound examination in detecting fetal structural abnormalities in low risk pregnancies.

Method:

A prospective study was conducted in a tertiary level hospital from August 1998 to August 1999, 19 months after the introduction of routine obstetric ultrasound examination.

Results:

3288 women had obstetric ultrasound examination. 3288 women had obstetric ultrasound examination. Fetal ultrasound examination detected 127 fetal structural abnormalities in 267 women. The most common fetal abnormalities were cardiac abnormalities (10/21 = 47.6%). Major abnormalities detected included: anencephaly with occipital encephalocele (1), prosencephaly with complex congenital heart disease (1), hypoplastic right heart (1) and diaphragmatic hernia (1). Fetal structural abnormalities were missed by routine ultrasound in 45 cases (1.4%). Majority were cardiac abnormalities (19/45 = 42.2%).

Conclusion:

The sensitivity of routine ultrasound in detecting fetal structural abnormalities was 31.8%. The specificity was 99.8%. 47 women (1.5%) were potentially subjected to unnecessary anxiety because of suspected fetal abnormalities which were not confirmed or were assessed as insignificant on subsequent scan.

(HKJGOM 2000; 1:28-32)

Outdated

Voluson



MFM 0811172M

AB2-7-D/OB

MI 1.0

7.8cm / 1.2 / 22Hz

TIs 0.2

12.08.2008

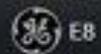
12:30:16 PM

1. Trim.
Har-high
Pwr 95 %
Gn -4
C6 / M7
P3 / E3
SRI II 3



CRL 6.06cm
GA 12w4d

Voluson



MFM 0811172M

AB2-7-D/OB

MI 1.0

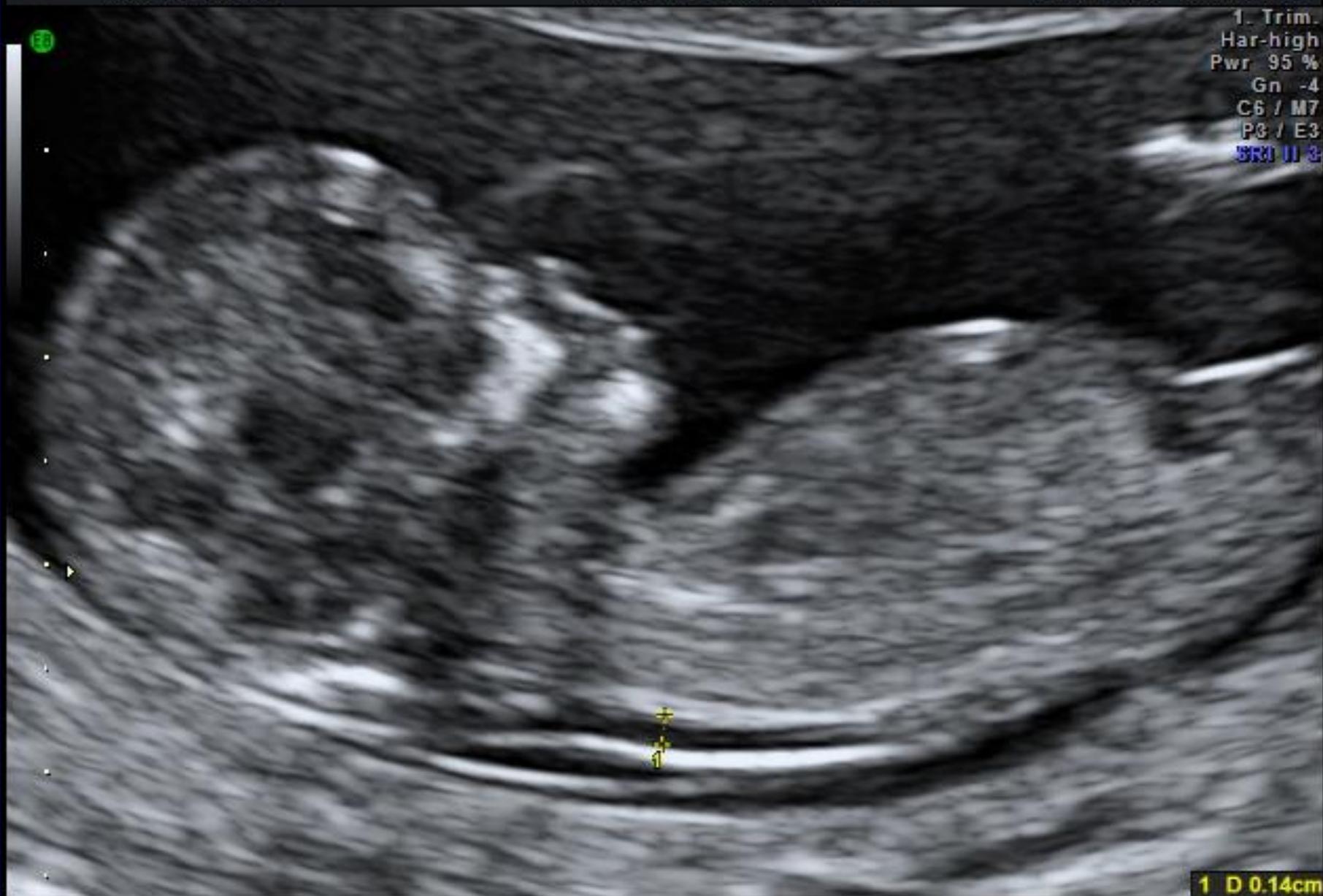
7.8cm / 1.7 / 22Hz

TIs 0.2

12.08.2008

12:31:43 PM

1. Trim.
Har-high
Pwr 95 %
Gn -4
C6 / M7
P3 / E3
SR11 3



1 D 0.14cm

Voluson



MFM 0811151J

AB2-7-D/OB

MI 1.0

7.9cm / 1.6 / 26Hz

TIs 0.2

12.08.2008 01:10:52 PM

1. Trim.
Har-high
Pwr 95 %
Gn -4
C6 / M7
P3 / E3
SRI II 3

2

1

1 D 0.14cm
2 D 0.18cm



Comparison of nuchal and detailed morphology ultrasound examinations in early pregnancy for fetal structural abnormality screening: a randomized controlled trial

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OBJECTIVE: To compare the effectiveness of a nuchal scan at 10 to 14 + 6 weeks and a detailed morphology scan at 12 to 14 + 6 weeks in screening for fetal structural abnormalities.

METHODS: From March 2001 to November 2004, 8811 pregnant women were randomized into either the control group (10 to 14 + 6-week nuchal scan followed by routine 16-23-week scan) or the study group (10 to 14 + 6-week nuchal scan and 12 to 14 + 6-week detailed scan followed by routine 16-23-week scan).

RESULTS: We analyzed **7642** cases of singleton pregnancies with viable fetuses at first-trimester ultrasound examination and with known pregnancy outcome. In the control group, the detection rate of structural abnormalities in the first trimester was **32.8%** (21/64; 95% CI, 21.6-45.7%) and the overall detection rate was **64.1%** (41/64; 95% CI, 51.1-75.7%). In the study group, the detection rate in the first trimester was **47.6%** (30/63; 95% CI, 34.9-60.6) and the overall detection rate was **66.7%** (42/63; 95% CI, 53.7-78.0%). The overall detection rate in the control group did not differ significantly from that in the study group ($P > 0.05$).

CONCLUSIONS: When the nuchal scan is offered, a basic anatomical survey can be done in conjunction with nuchal translucency thickness measurement. A detailed ultrasound examination at this early gestational age may not be superior to the nuchal scan in screening for fetal abnormalities in the low-risk population. Though a wide range of abnormalities can be detected at 10 to 14 + 6 weeks, the routine 16-23-week scan cannot be abandoned.

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Expectation and knowledge of pregnant women undergoing first and second trimester ultrasound examination in a Chinese population

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Objective To evaluate expectation and knowledge on obstetric ultrasound examination in the first and second trimester in a Chinese population.

Method A cross-sectional survey was conducted in a university obstetric clinic in Hong Kong. Chinese pregnant women who underwent the first trimester early scan sessions, or the second trimester anomaly scan sessions were invited to complete a self-administered questionnaire, which contained items on their knowledge, expectation, and sociodemographic characteristics.

Results In all 276 eligible pregnant women (117 in the first trimester and 159 in the second trimester) were recruited. Although 249 women (90.2%) claimed they understood the indication of the ultrasound examination, only 93 of them were correct (33.7%). The median perceived overall-detection rate for structural abnormalities was 66.5%. Living in Hong Kong for more than 7 years was significantly associated with higher knowledge level and expectation from ultrasound examination. Attaining tertiary education level was also significantly associated with higher knowledge level. Over 90% of the pregnant women studied wished to know the fetal gender from the anomaly scan examination.

Conclusion Knowledge of Chinese pregnant women on ultrasound was generally unsatisfactory. Understanding their limitation of knowledge and expectations helps to devise appropriate education in the local setting.

**Shall we talk
during
routine anomaly scan?**

We only find what we look for.

We only look for what we know.

We only know what we understand.