

Munasarjamuutosten ultraäänidiagnostiikka .

Dos. Bruno Cacciatore

Sidonnaisuudet

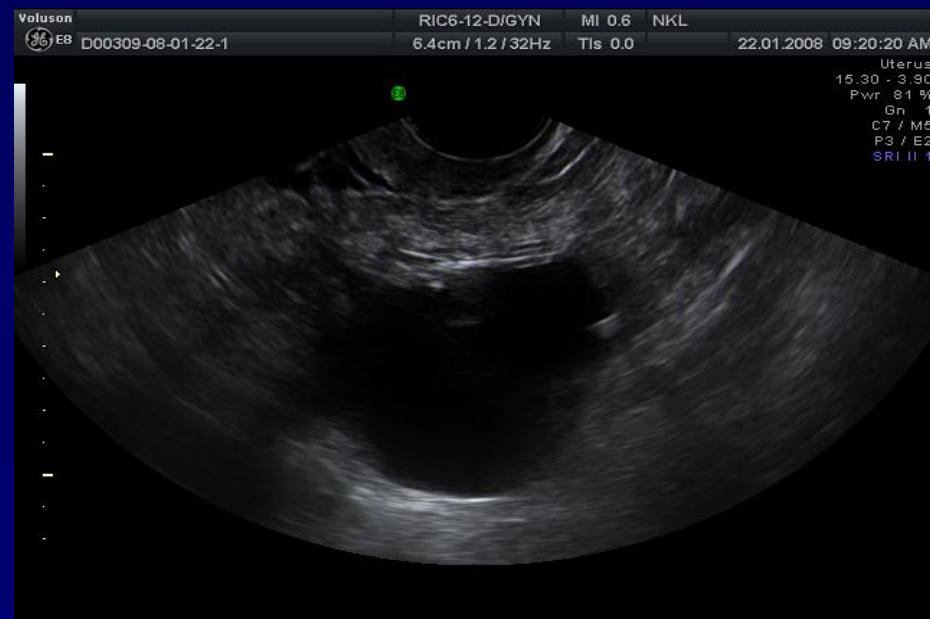
- Dosentti, naistentautien erikoislääkäri
- **Päätoimi**
 - HUS, NKL erikoislääkäri
- **Sivutoimet**
 - yksityislääkäri , Femeda, Mehiläinen.
- **Luottamustoimet terveydenhuollon alalla**
 - Ei ole
- **Toiminta terveydenhuollon ohjaukseen pyrkivissä hankkeissa**
 - Ei ole
- **Muut sidonnaisuudet**
 - Cosultant for Samsung Medison
 - Osakkeen omistaja Femedan lääkäriasema Oy.

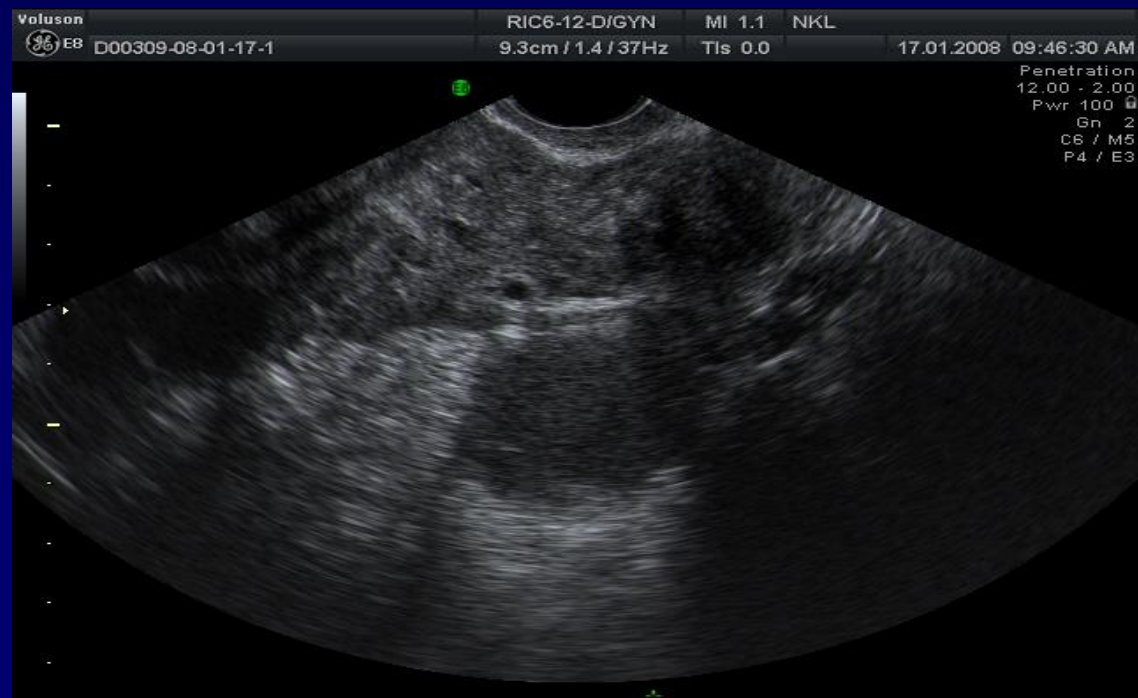
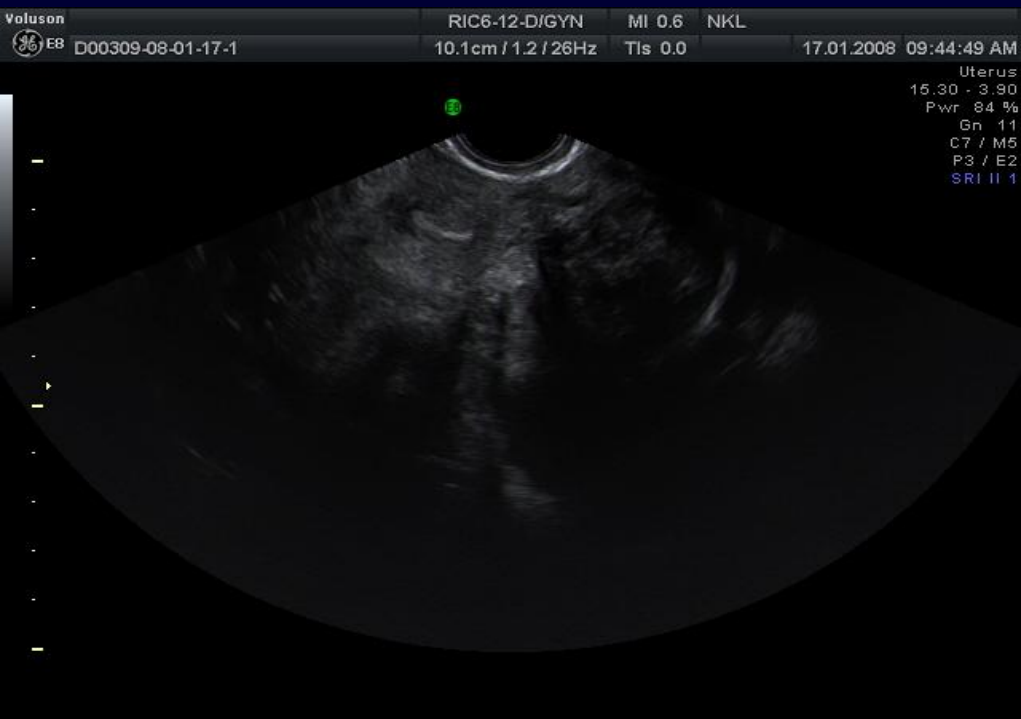
Adnexal Tumor

- •Anovulation
- •Appendiceal tumor
- •Benign ovarian tumor (teratoma)
- •Bowel/omental adhesions
- •Corpus luteum
- •Ectopic Pregnancy
- •Embryologic remnants
- •Endometriosis
- •Fecal impaction
- •Hydrosalpinx/pyosalpinx
- •Metastatic gastrointestinal carcinoma
- •Ovarian Cyst
- •Ovarian torsion
- •Paraovarian cyst
- •Pelvic abscess
- •Pelvic Inflammatory Disease
- •Pelvic kidney
- •Peritoneal Cancer
- •Peritoneal cyst
- •Physiologic cyst
- •Polycystic ovary syndrome
- •Rectal Cancer
- •Retroperitoneal mass
- •Urachal cyst
- •Uterine myoma

UÄ-tutkimuksen check-list

- oikeat asetukset
- oikea tekniikka
- oikea kuvan tulkinta





UÄ-kuvan tulkinta: Pattern Recognition

- Käsitys lantion UÄ-anatomiasta
 - Postmenop munasarjojen lokalisaatio !
- Anamneesin ja klinisen kuvan huomio
- Tarvittaessa abdominaalisen UÄ
- Kokemus
- “in-vivo” patologian tieto
- Intuiitio (?)

UÄ-kuvan tulkinta

- Onko tuumori gynekologinen?
- Onko ovario-, tuuba-, tai kohtuperäinen
- Onko toiminnallinen/tulehduksellinen tai persistoiva?
- Onko enemmän kuin yksi tuumori? (esim kysta+sacto?)
- Onko benigni tai maligni?
 - markerit ym. scoring systems vastaa nyt!

Rule out first

- Complex functional ovarian cysts
- Endometriosis
- Tubal benign pathology
- Peritoneal cyst/adhesions
- Subserous or pedunculated fibroids

Voluson



RIC6-12-D/GYN

MI 1.2 NKL

D00309-08-07-30-1

6.4cm / 1.5 / 32Hz

TIs 0.0

30.07.2008

10:06:02

Uterus

15.30 - 3.90

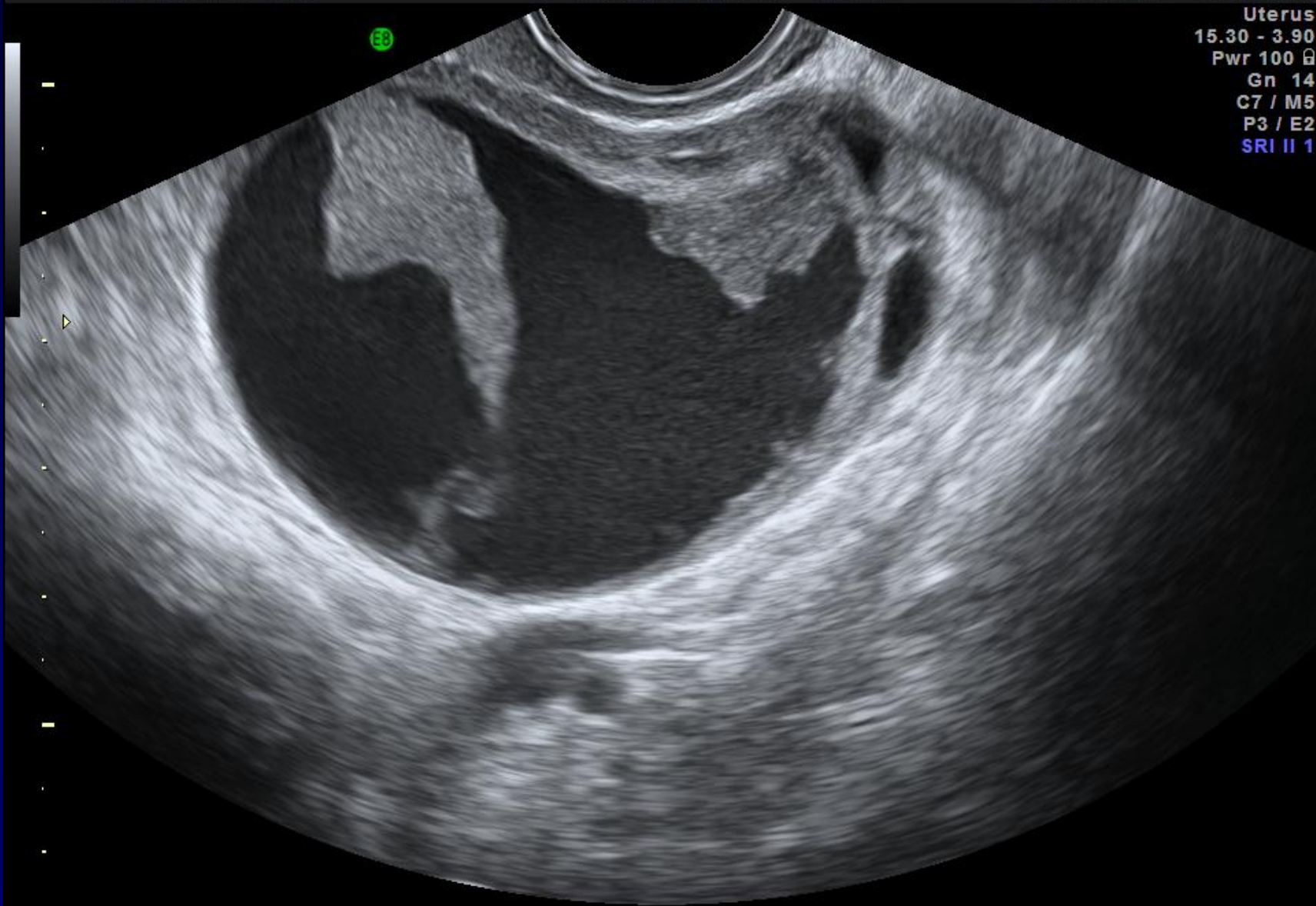
Pwr 100 dB

Gn 14

C7 / M5

P3 / E2

SRI II 1



Voluson



EB

D00309-08-01-22-2

RIC6-12-D/GYN

MI 0.6

NKL

4.2cm / 1.3 / 33Hz

TIs 0.0

23.01.2008 10:04:22 AM

Uterus

15.30 - 3.90

Pwr 84 %

Gn 15

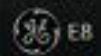
C7 / M5

P3 / E2

SRI II 1



Voluson



COMP

D00309-10-03-10-3

IC5-9-D/GYN

MI 1.0 NKL

7.7cm / 1.8 / 37Hz

Tls 0.1

11.03.2010 09:05:14 AM

Uterus

10.00 - 3.20

Pwr 100

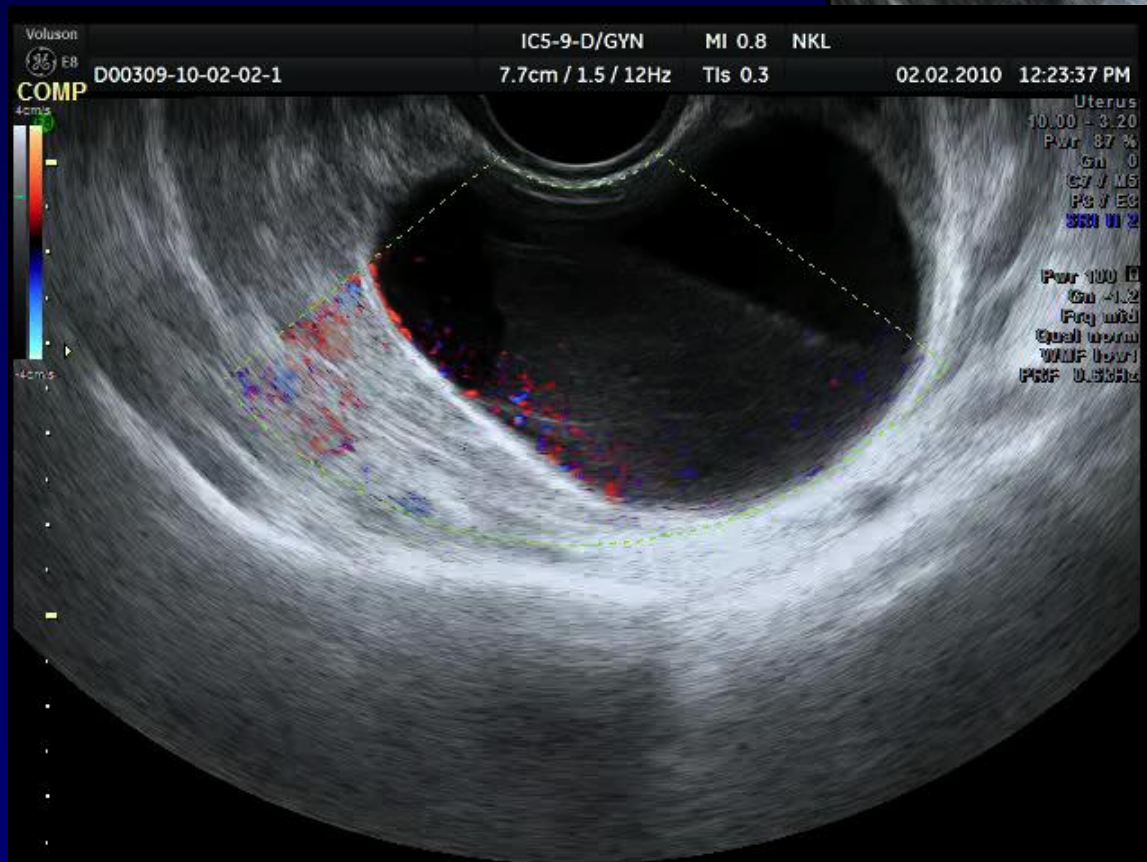
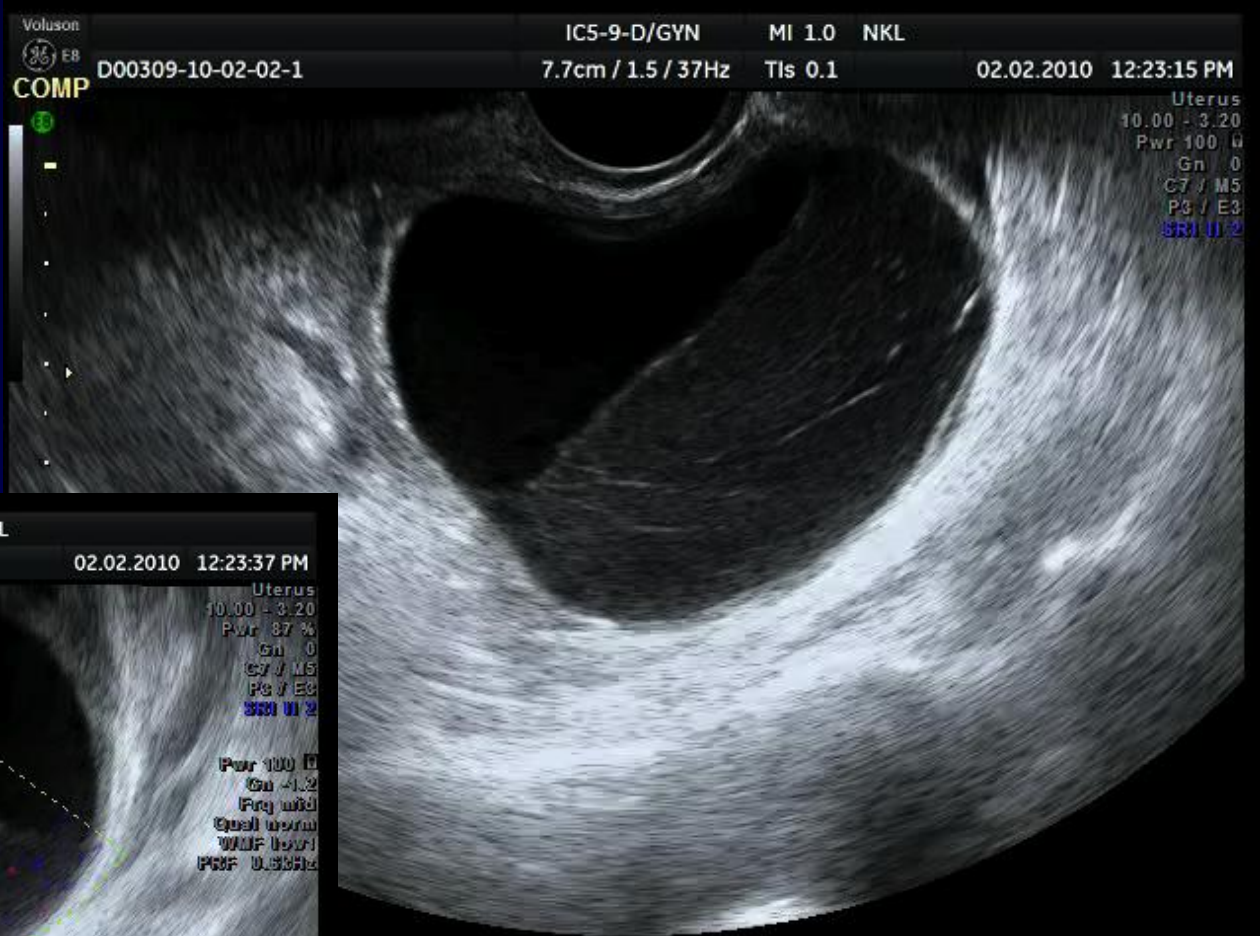
Gn -1

C7 / M5

P3 / E3

SR1 II 2





Ovarian endometrioma: Common findings



1. Round shape
2. Hypoechoic, homogeneous content
3. Parietal hyperechoic foci
4. Thick, well defined wall
5. No papillary projections

Voluson™ IC5-9-D/GYN MI 0.9 NKL
E8 6.5cm / 1.4 / 29Hz TIs 0.2 07.02.2013 10:06:07
Exp

COMP

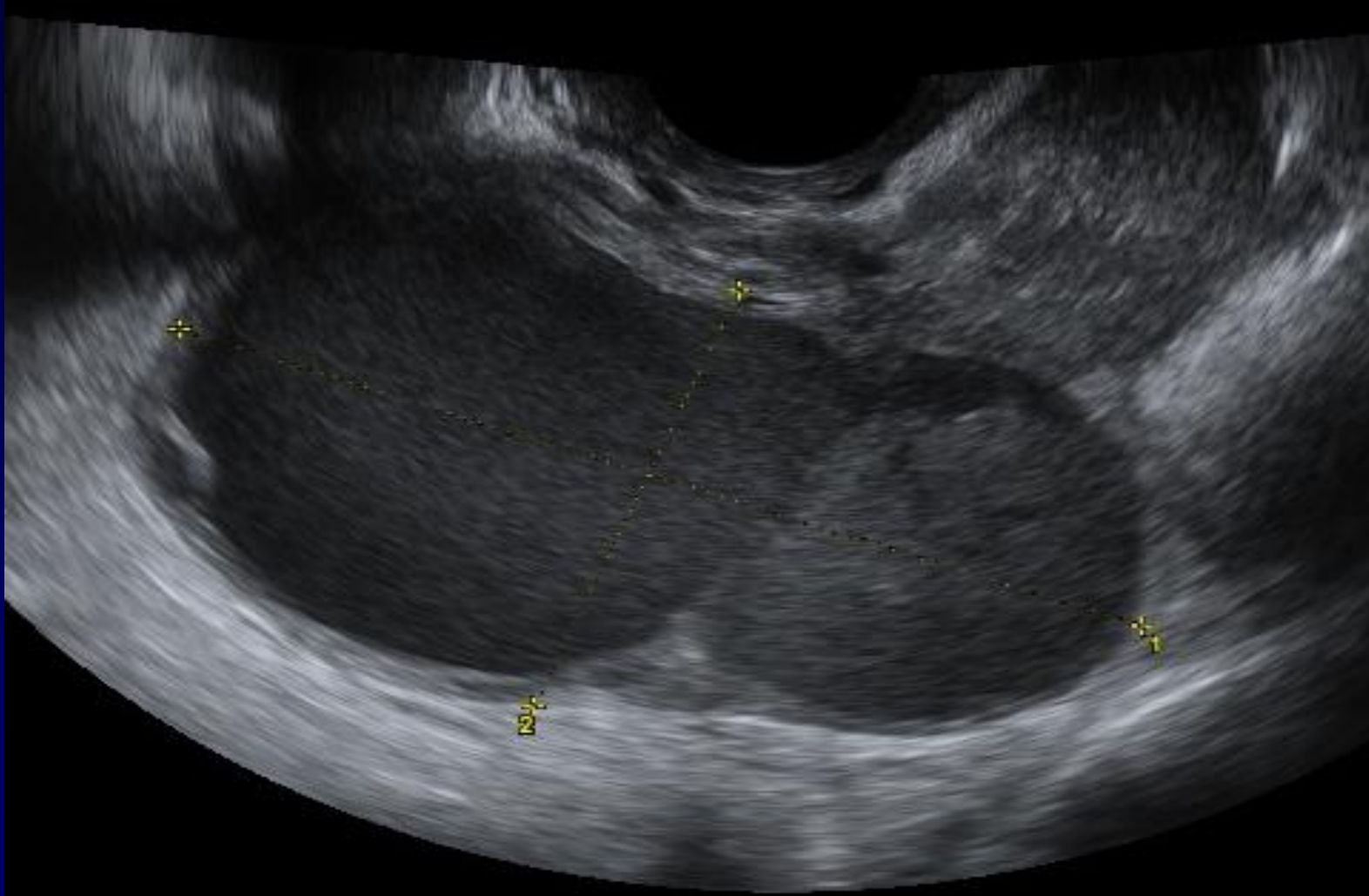


Penetration
8.10 - 2.10
Pwr 100 W
Gn -6
C7 / M5
P2 / E1
SRI II 3





Endometrioma

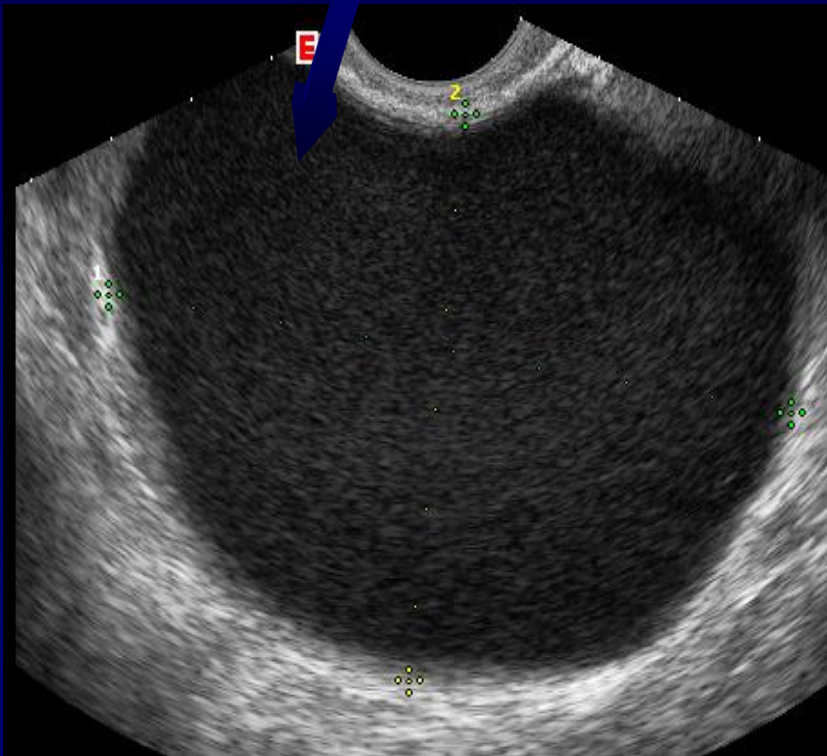


Generally surrounded by normal ovarian tissue

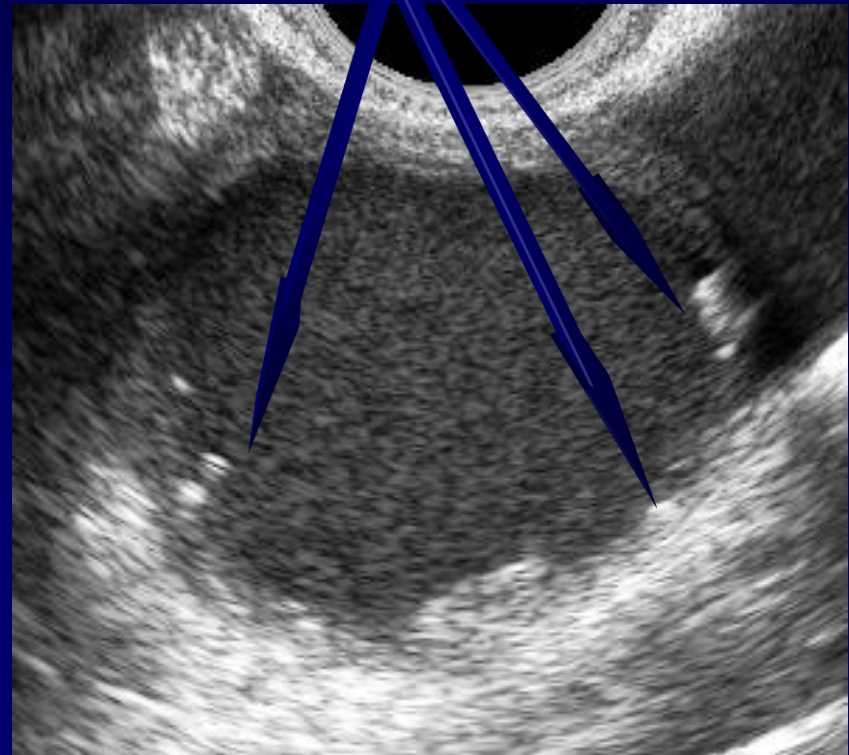
Ovarian endometrioma

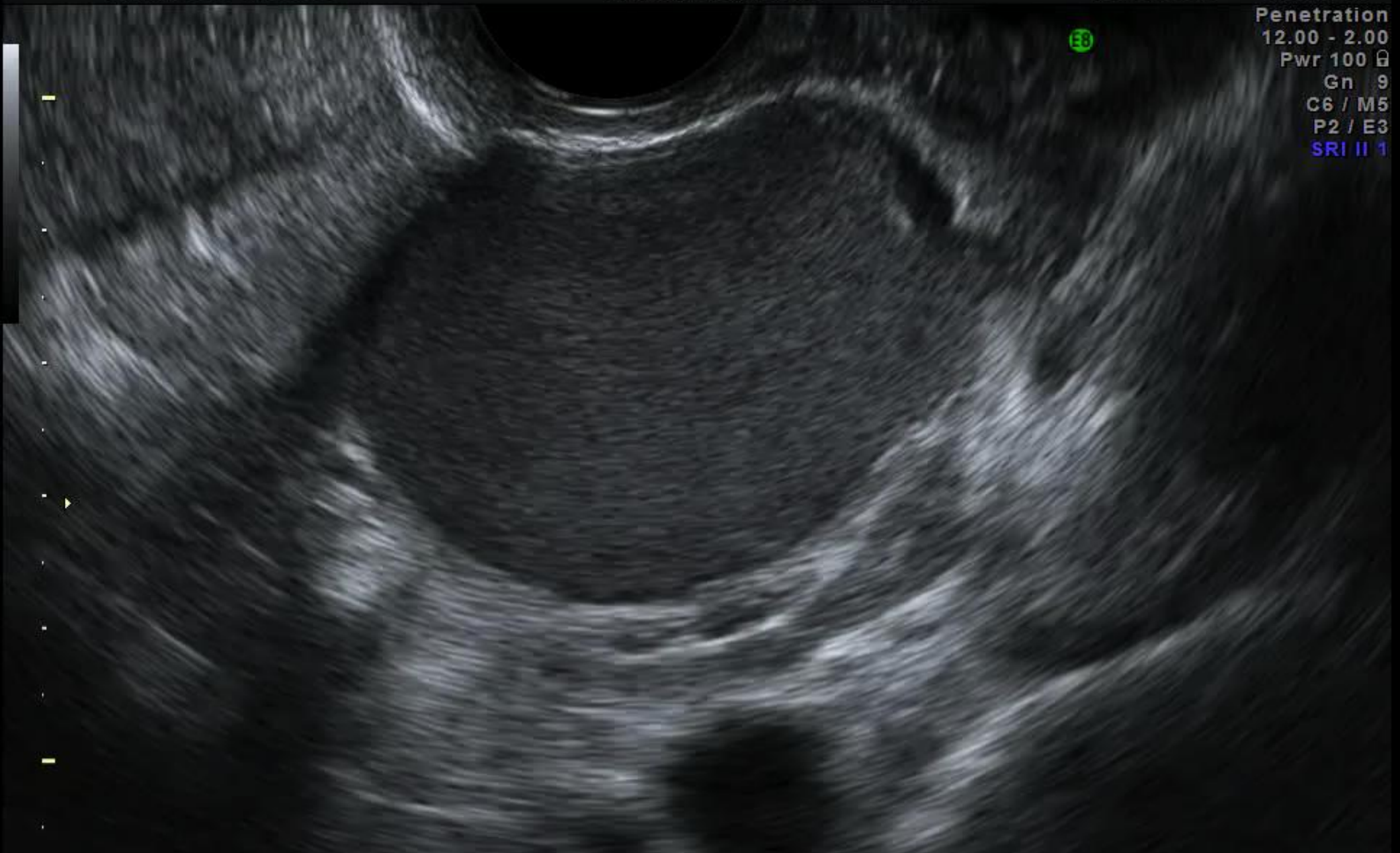
Common findings

“Ground glass” appearance



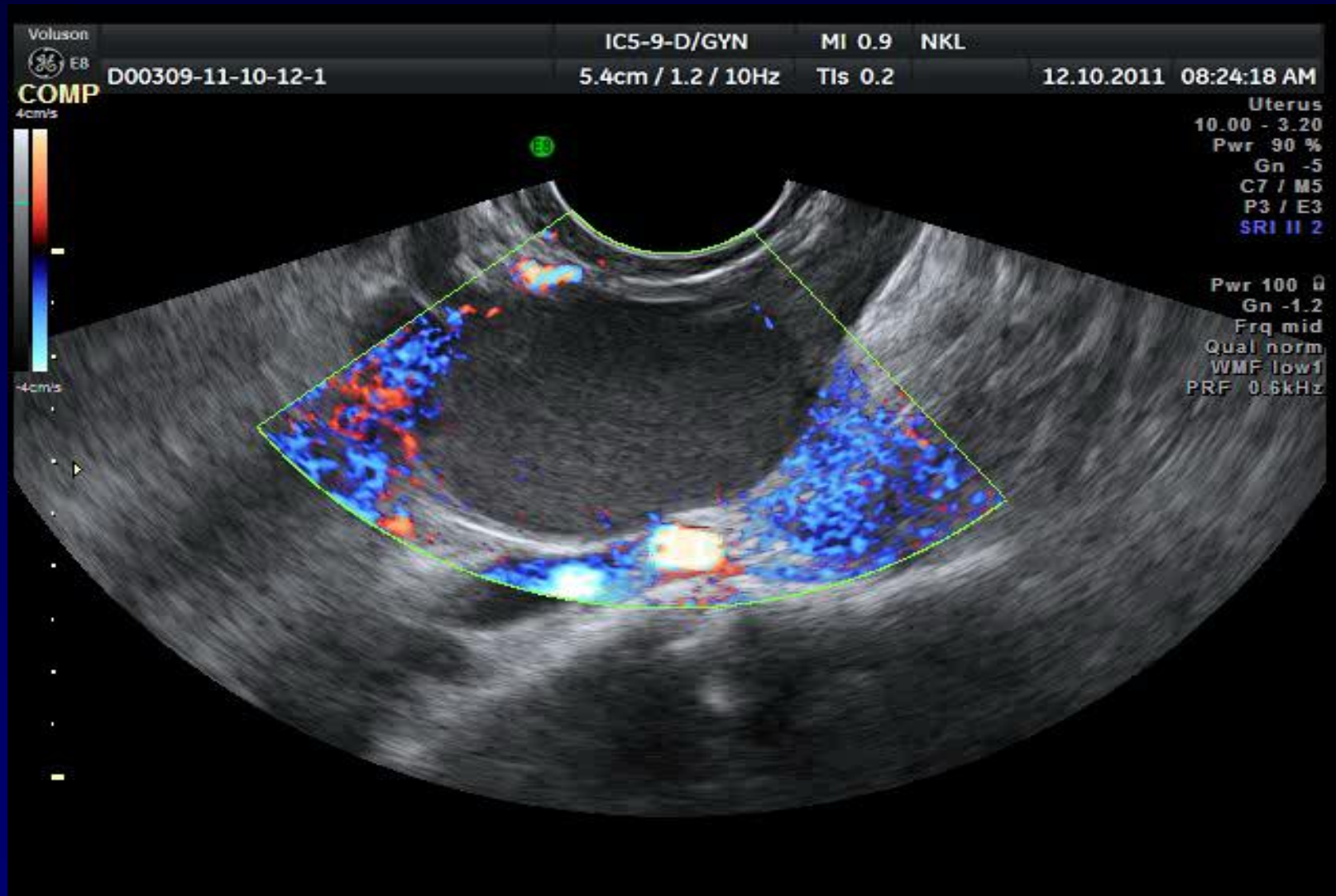
“Hyperechogenic foci”





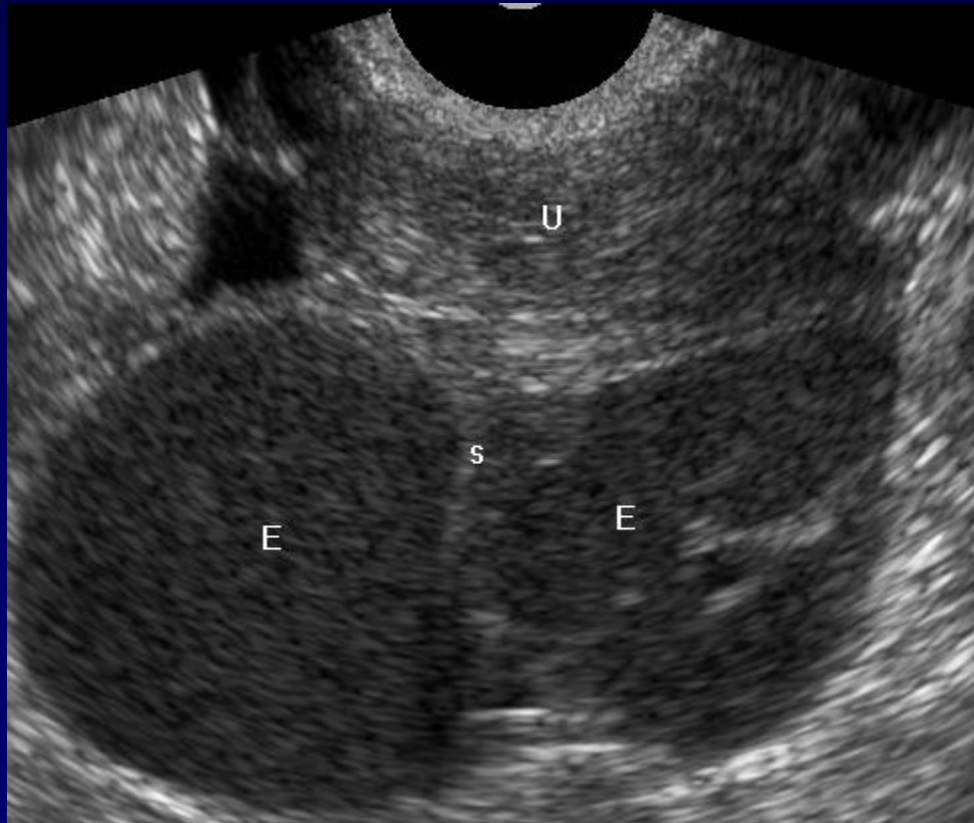
Penetration
12.00 - 2.00
Pwr 100 dB
Gn 9
C6 / M5
P2 / E3
SRI II 1

Endometrioma



Sonomorphology of endometriomas

Uncommon findings

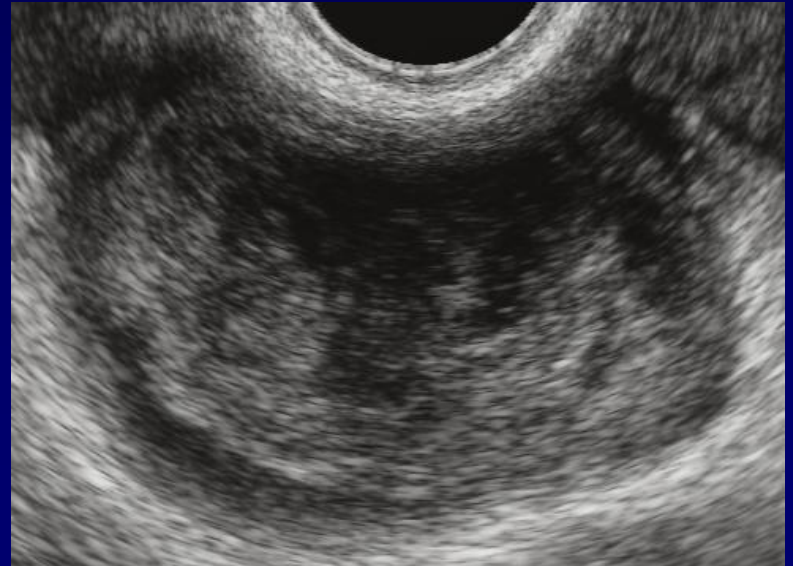
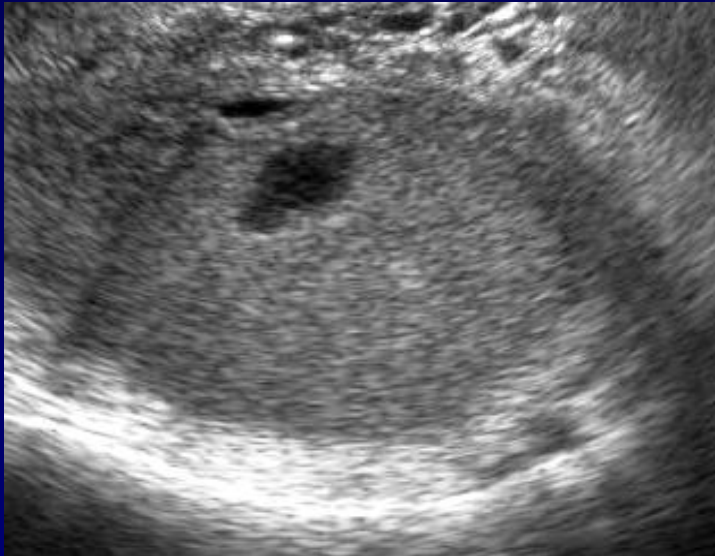


1. Septations
2. Dyshomogeneous content
3. Irregular wall
4. Echogenic projections/
pseudopapillas

Ovarian endometrioma

Uncommon findings

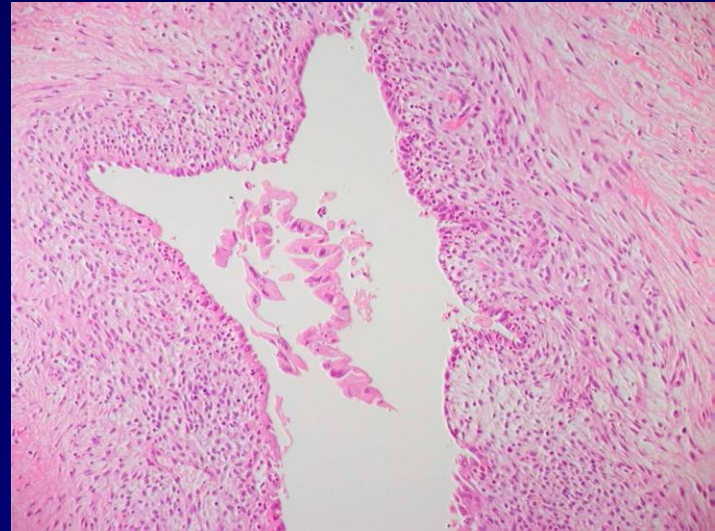
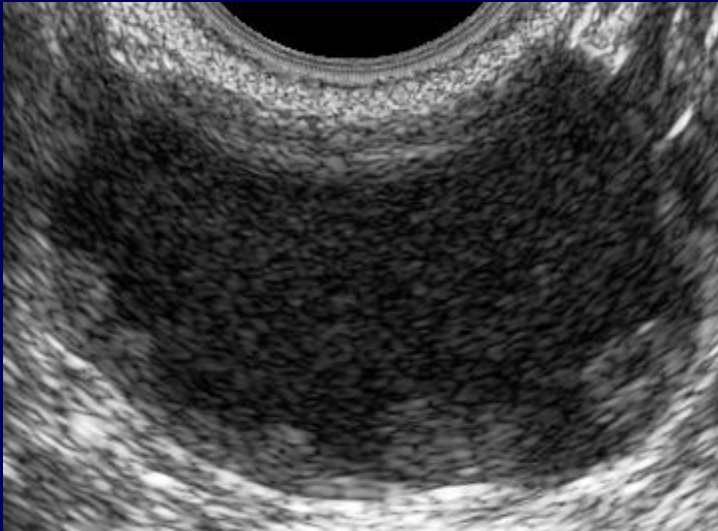
2. Heterogeneous content



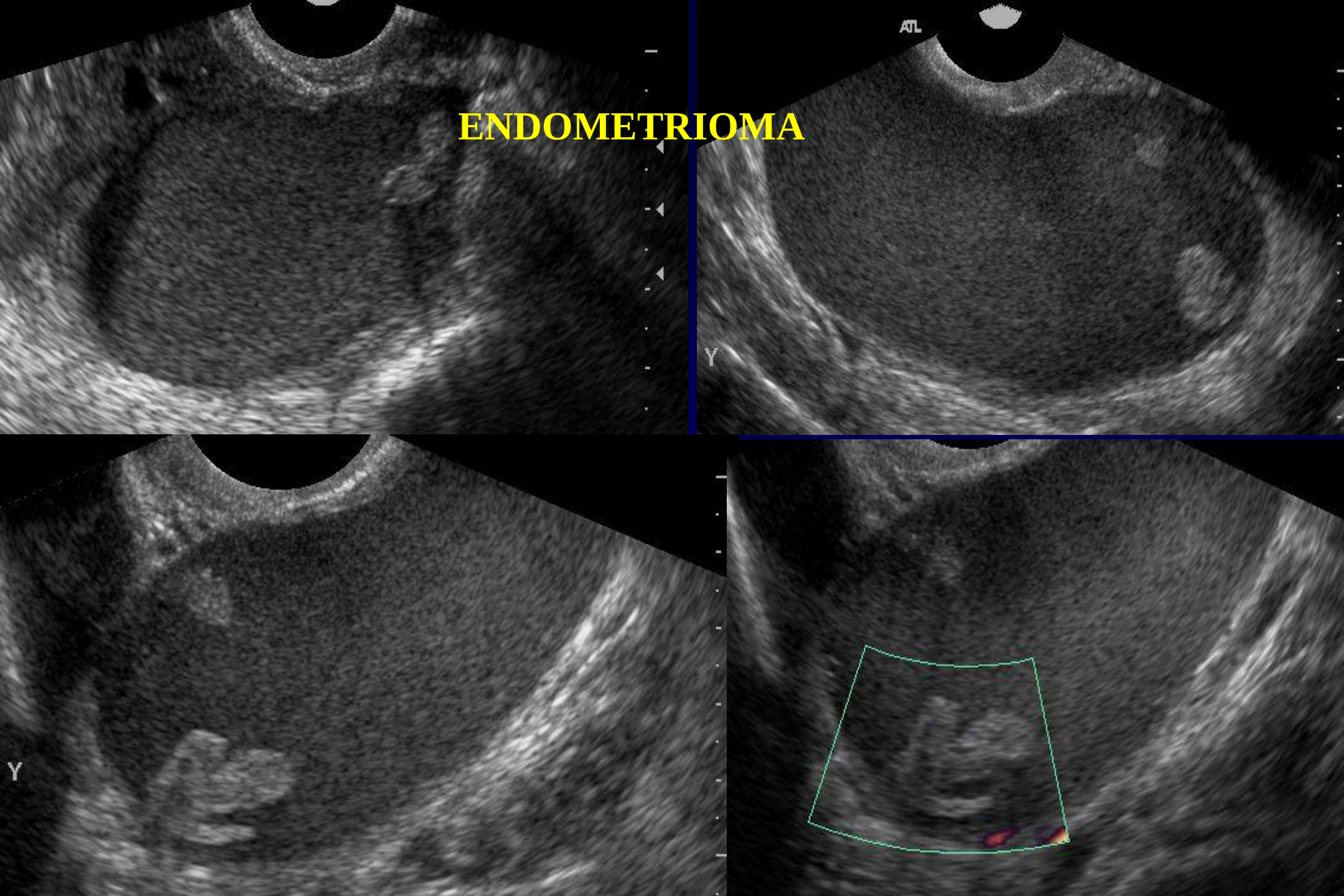
Ovarian endometrioma

Uncommon findings

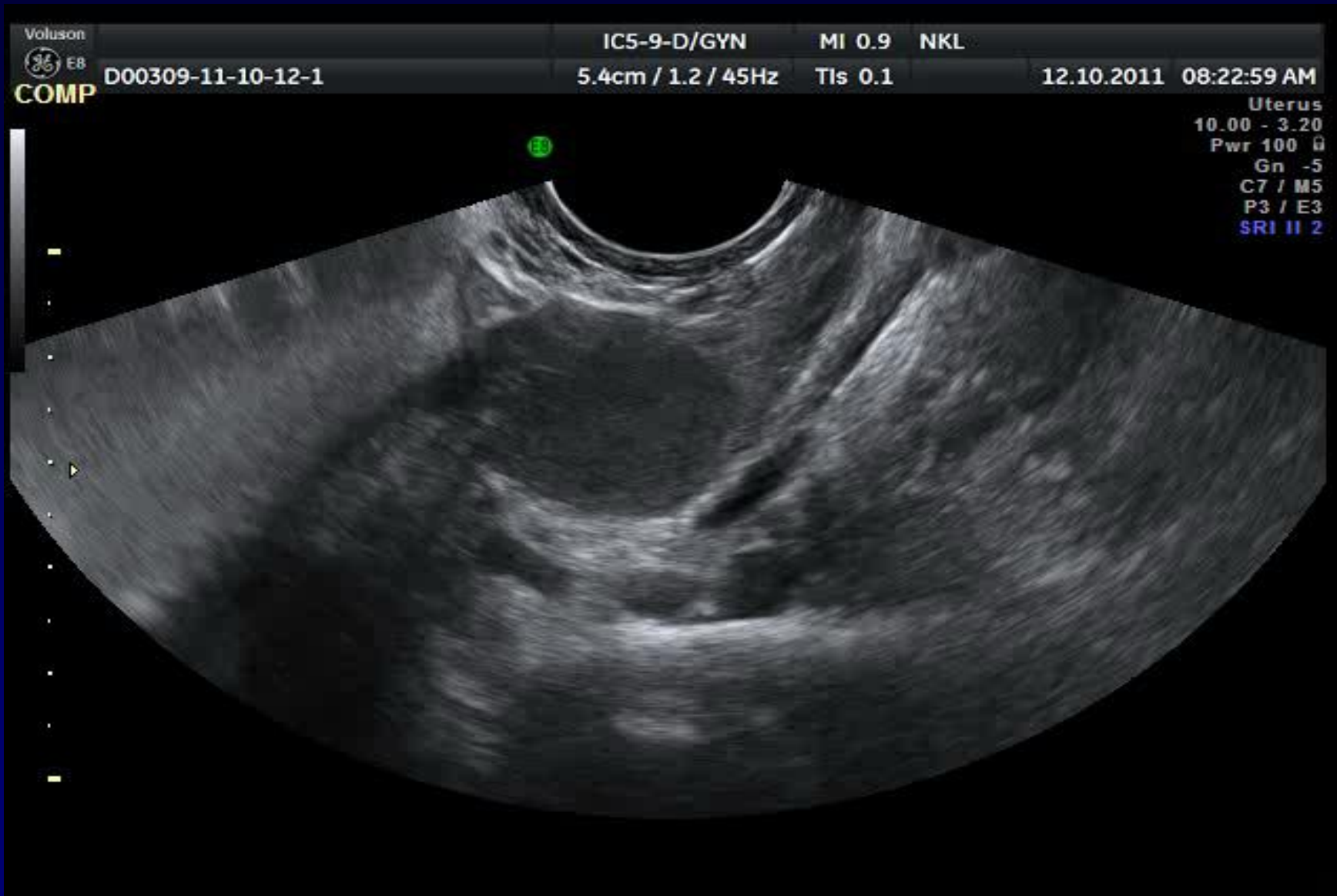
3. Irregular wall



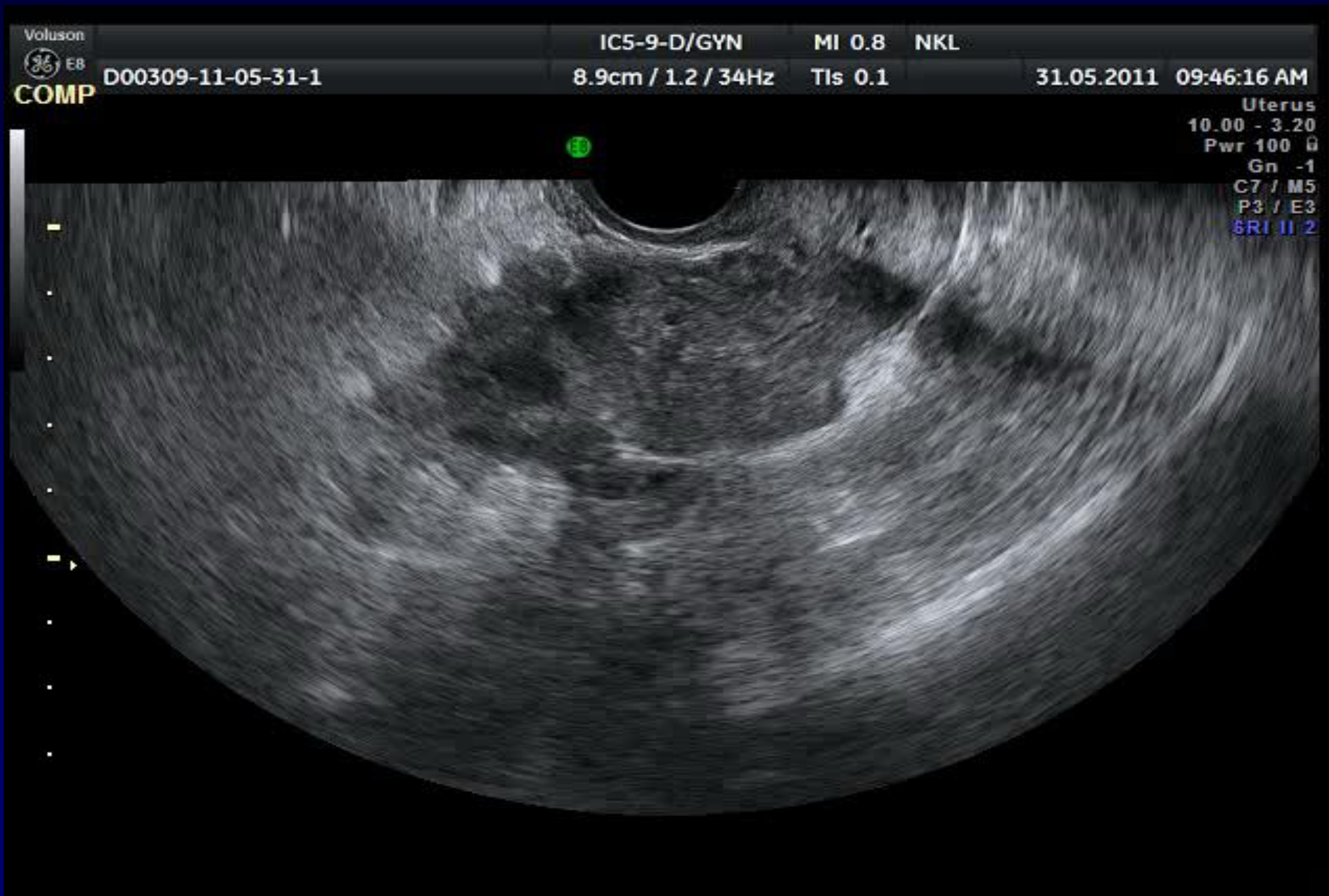
ENDOMETRIOMA



Endometrioma: internal projections



Deep endometriosis



Voluson



EB

COMP

D00309-11-05-31-1

IC5-9-D/GYN

MI 0.8 NKL

8.9cm / 1.2 / 34Hz

Tls 0.1

31.05.2011 09:45:49 AM

Uterus

10.00 - 3.20

Pwr 100

Gn -1

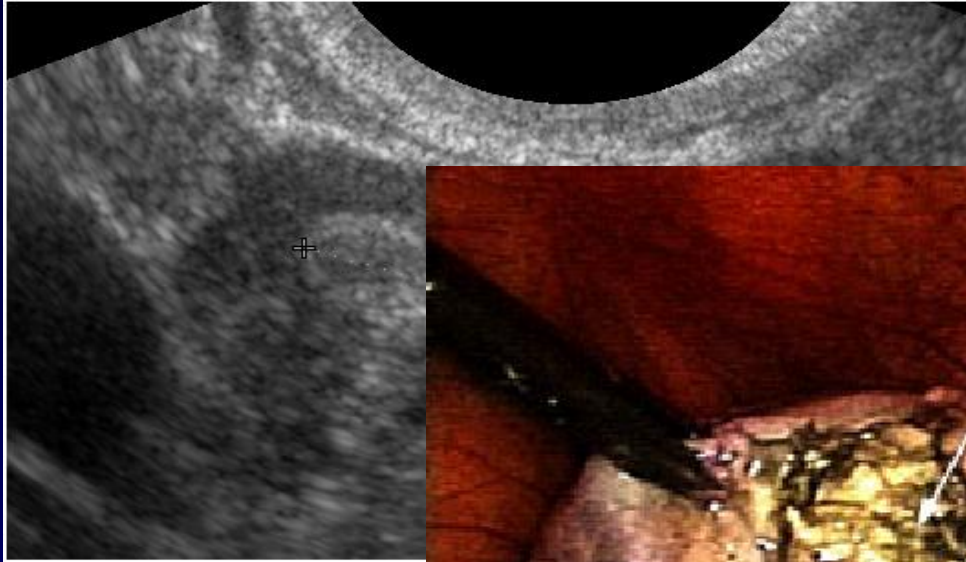
C7 / M5

P3 / E3

SRI II 2



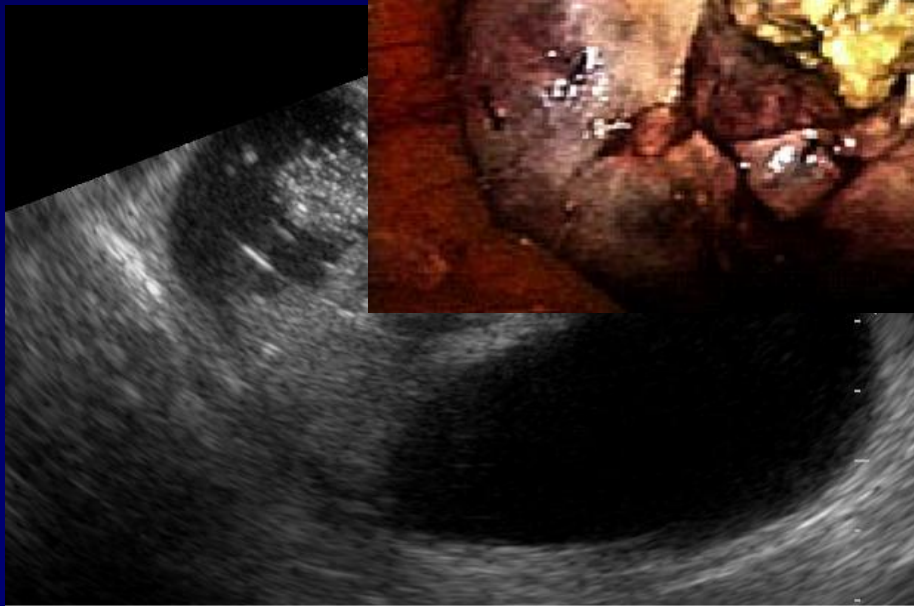
Dermoids



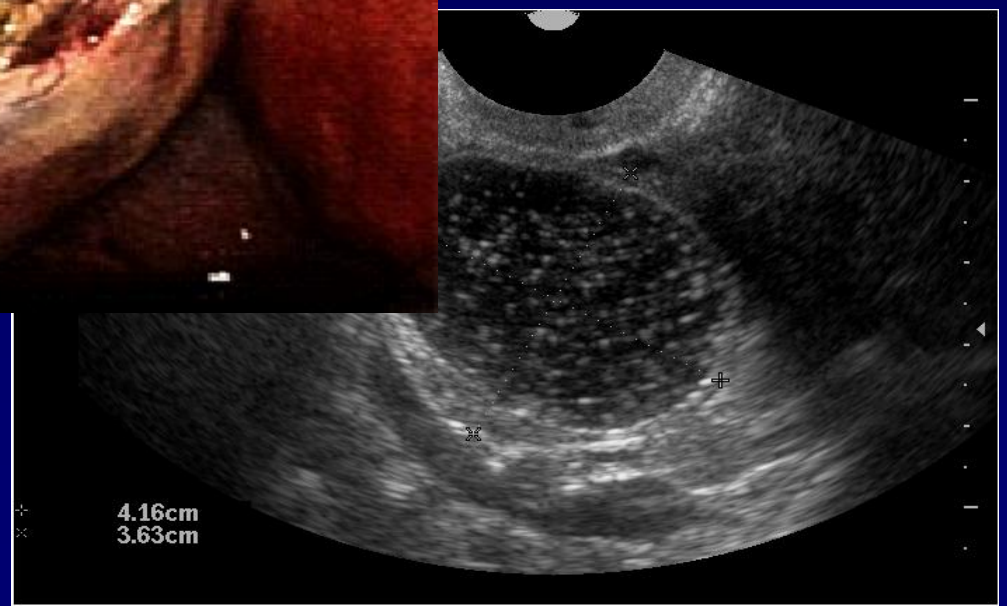
Map 3
150dB/C4
Persist Med
Fr Rate Med
2D Opt:Gen

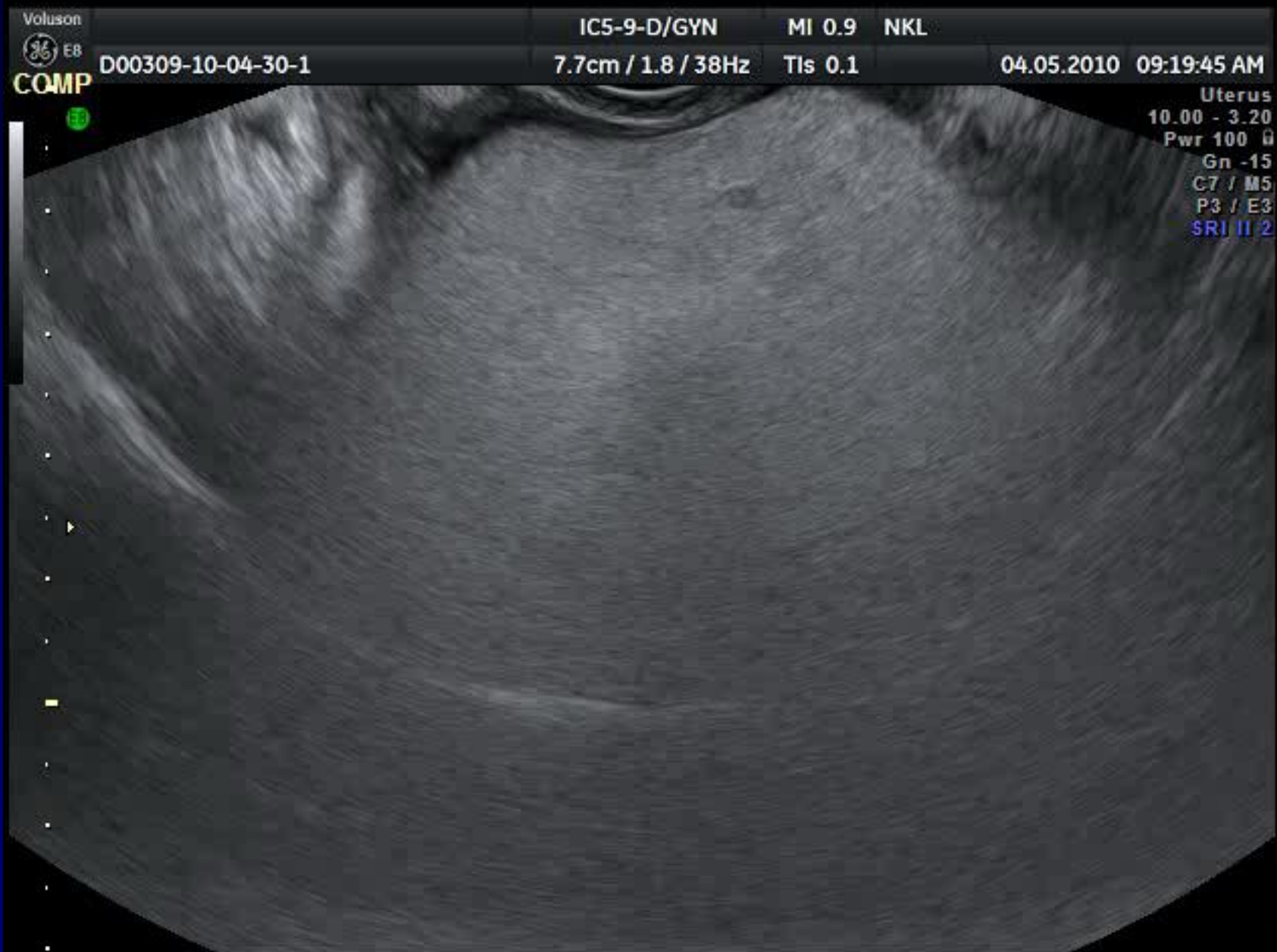
ATL

cono d'ombra



4.16cm
3.63cm





TVS of ovarian endometriosis

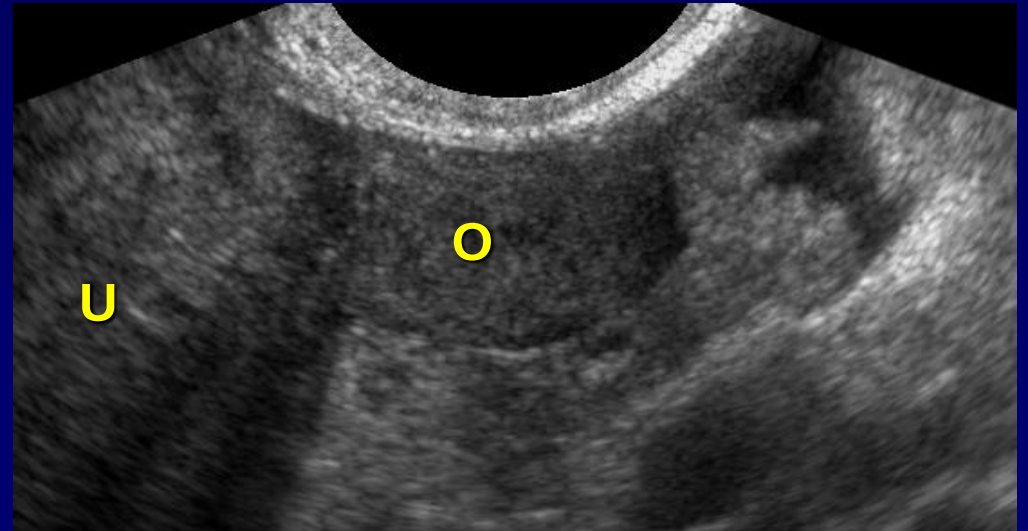
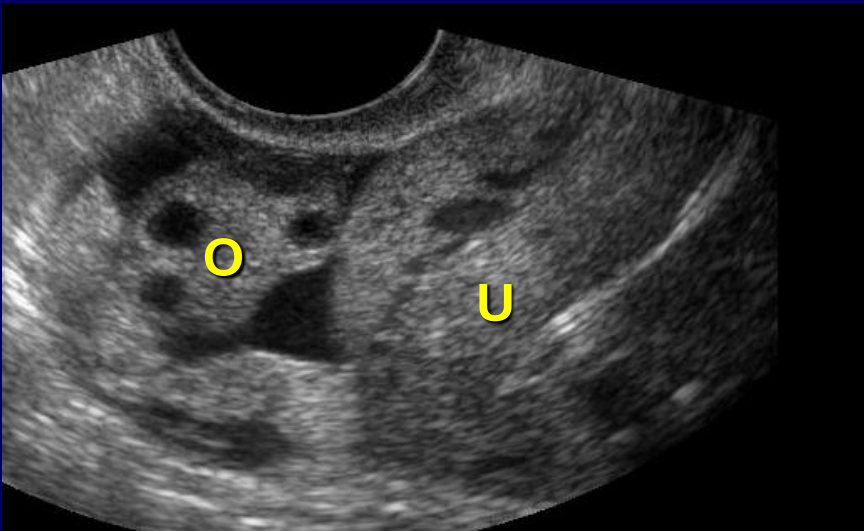
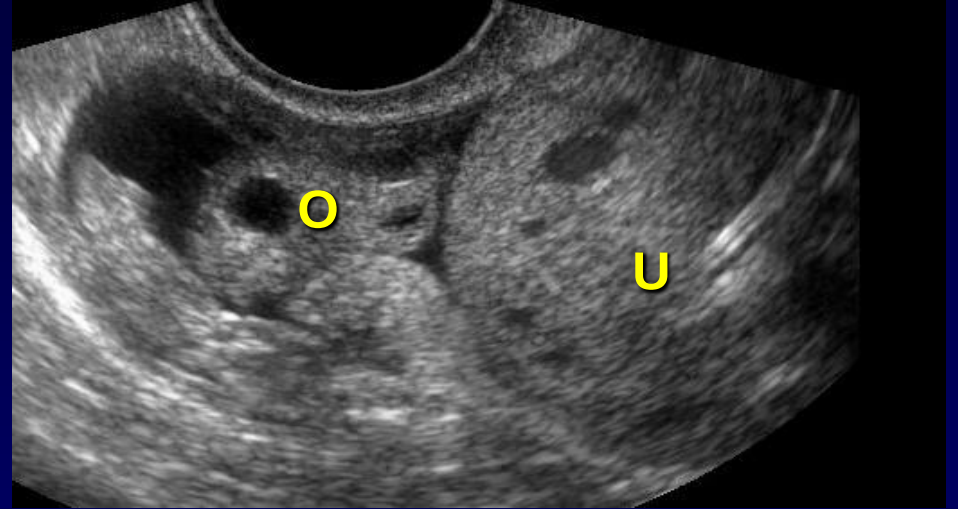
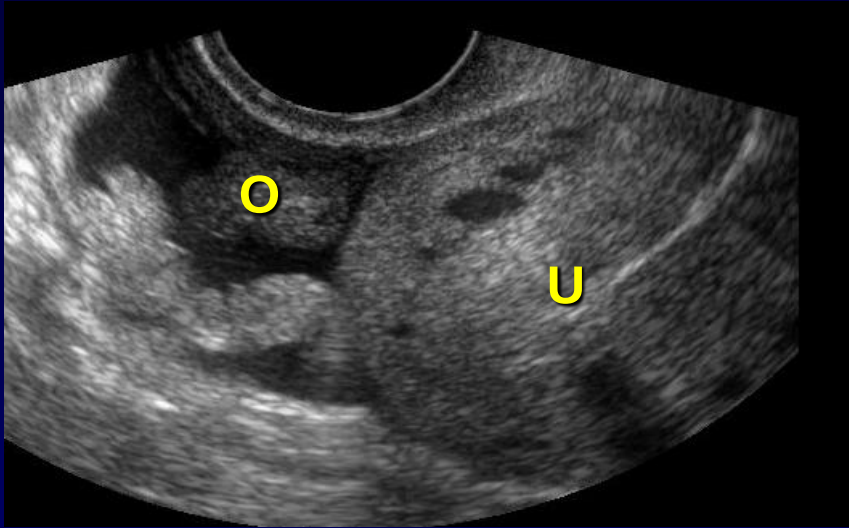
Criteria for differential diagnosis

Cacciatore, unpublished

	Endometrioma CL		Cystadenoma	Dermoid
Ground glass	Yes	No	Rare (muc)	Rare
Septations	Rare	No	Often	Rare
Ecogenic areas	Rare	Yes	Rare	Yes
Shadowing	No	No	No	Yes
Hyper. foci	Yes	No	No	No

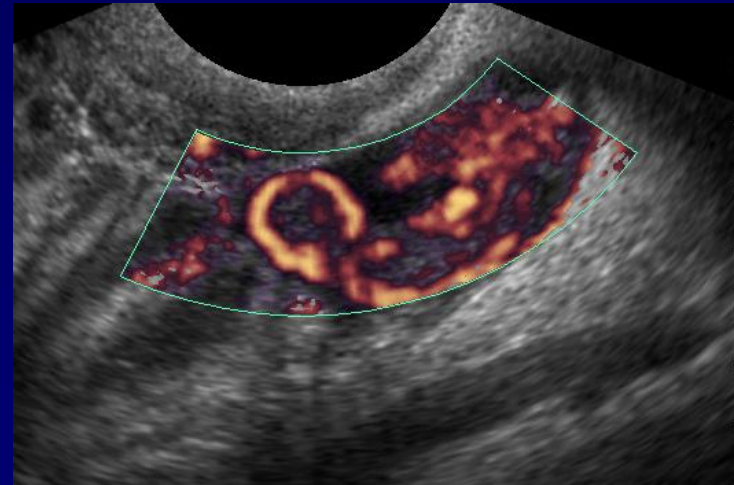
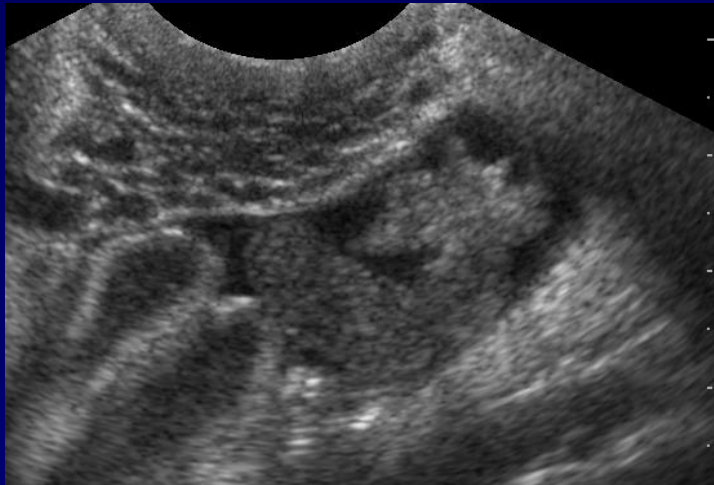
Fallopian tube

Usually visible only if pelvic fluid is present.



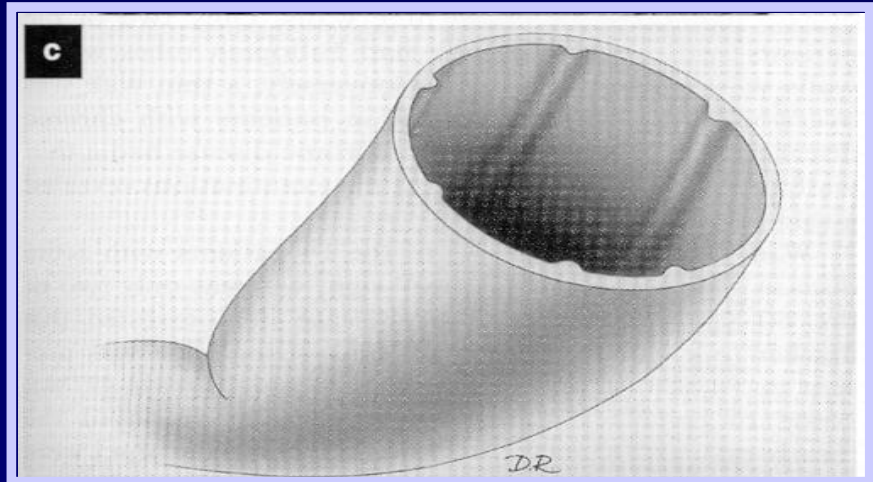
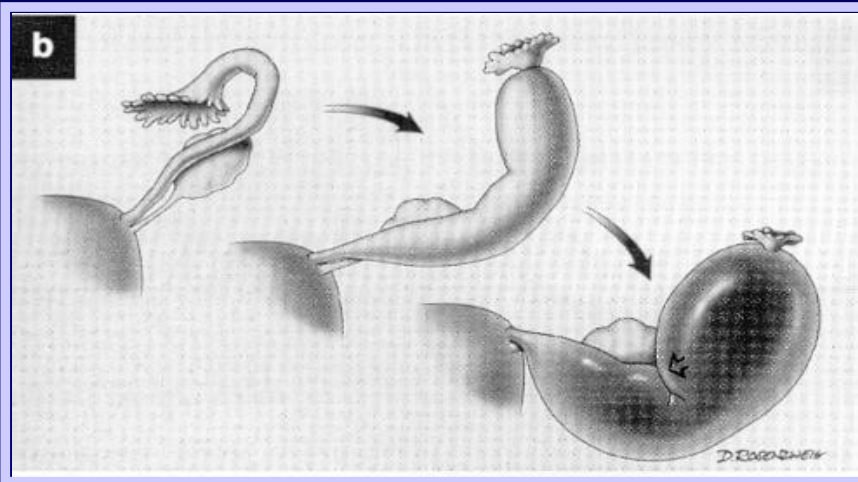
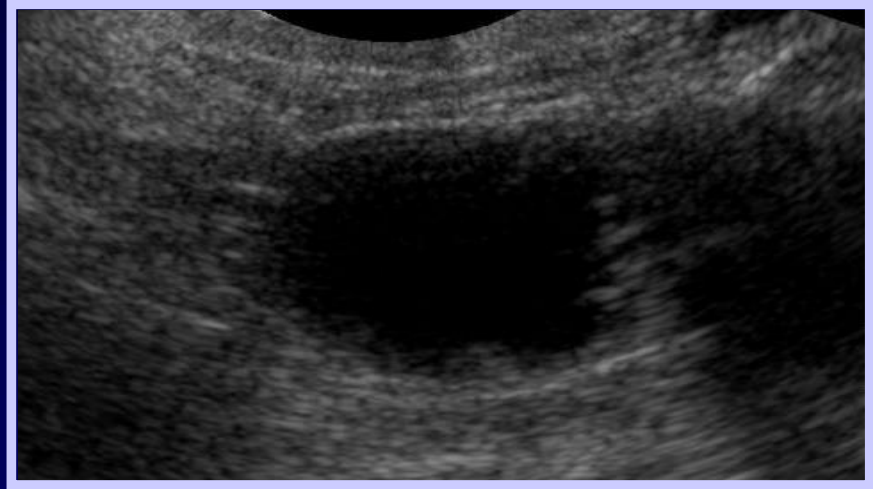
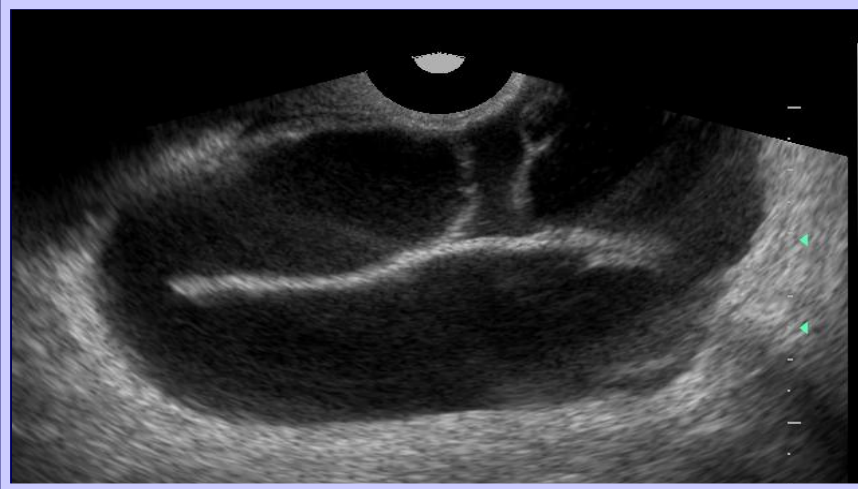
Acute salpingitis

- Salpingitis on TVS: not earlier described
 - absence of intraluminal fluid - no typical landmarks!!
 - power Doppler extremely useful!



Sonographic markers of PID

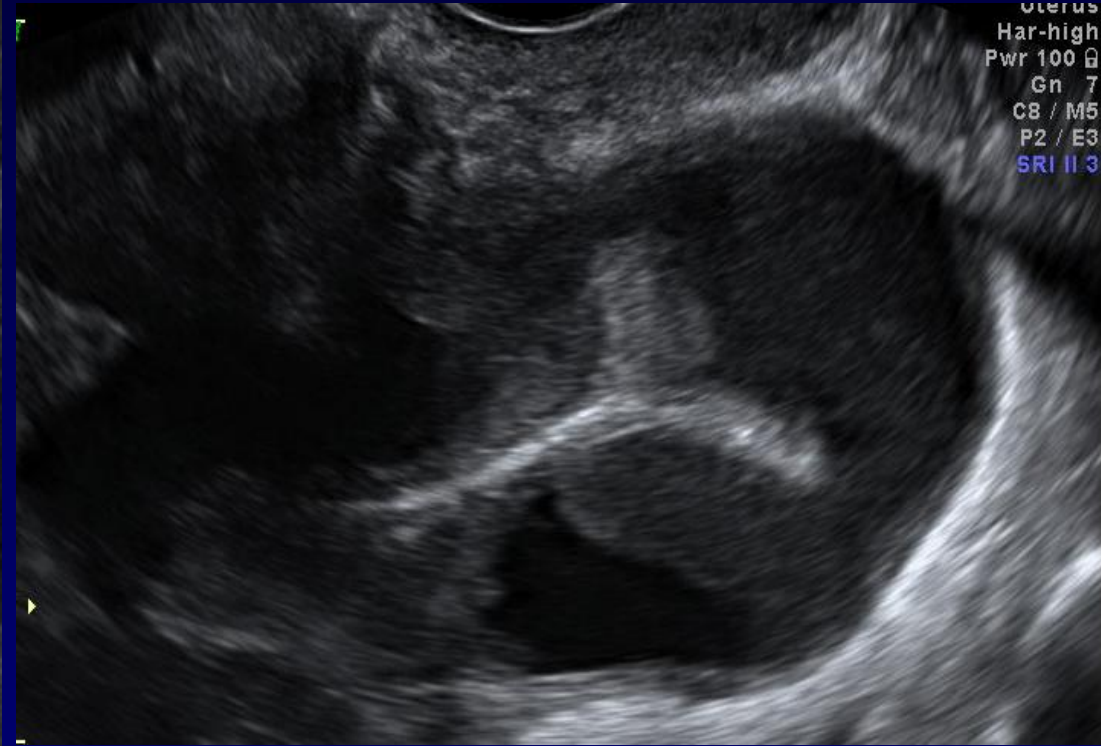
Chronic hydrosalpinx



Fallopian tube



Hydrosalpinx



Pyosalpinx

Voluson



COMP

D00309-11-08-17-1

IC5-9-D/GYN

MI 1.0

NKL

10.1cm / 1.8 / 19Hz

TIs 0.1

17.08.2011

12:28:34 PM

Penetration

8.10 - 2.10

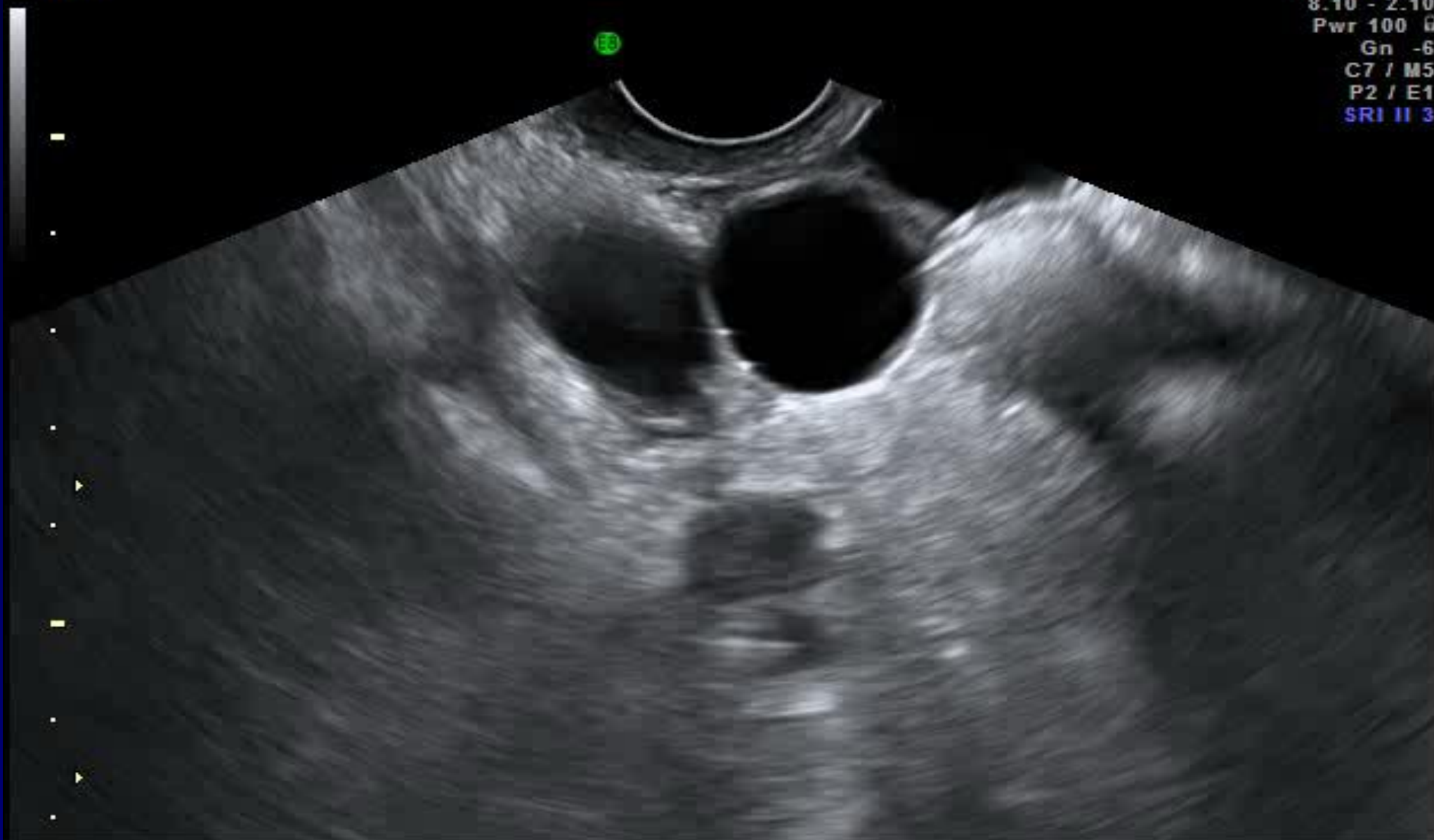
Pwr 100 dB

Gn -6

C7 / M5

P2 / E1

SRI II 3



Voluson



E8

COMP

D00309-10-01-19-1

RIC6-12-D/GYN

MI 1.2 NKL

6.4cm / 1.2 / 28Hz

TIs 0.0

19.01.2010 09:31:32 AM

Uterus

15.30 - 3.90

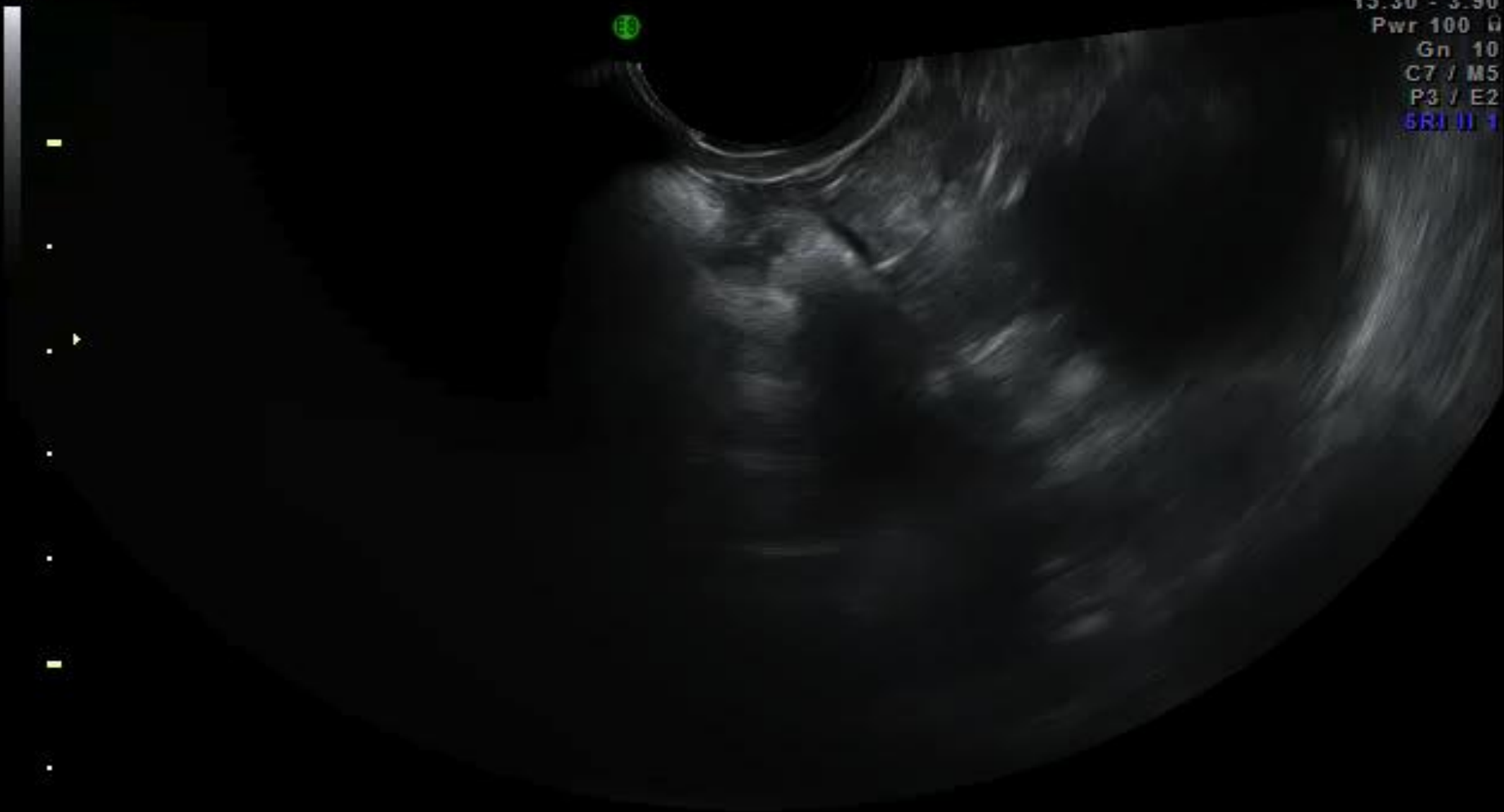
Pwr 100 Q

Gn 10

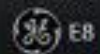
C7 / M5

P3 / E2

5RI II 1



Voluson



EB

COMP

D00309-10-03-25-1

IC5-9-D/GYN

MI 0.9 NKL

6.5cm / 1.2 / 40Hz

TIs 0.1

25.03.2010

12:12:25 PM

Uterus

10.00 - 3.20

Pwr 100 Q

Gn -11

C7 / M5

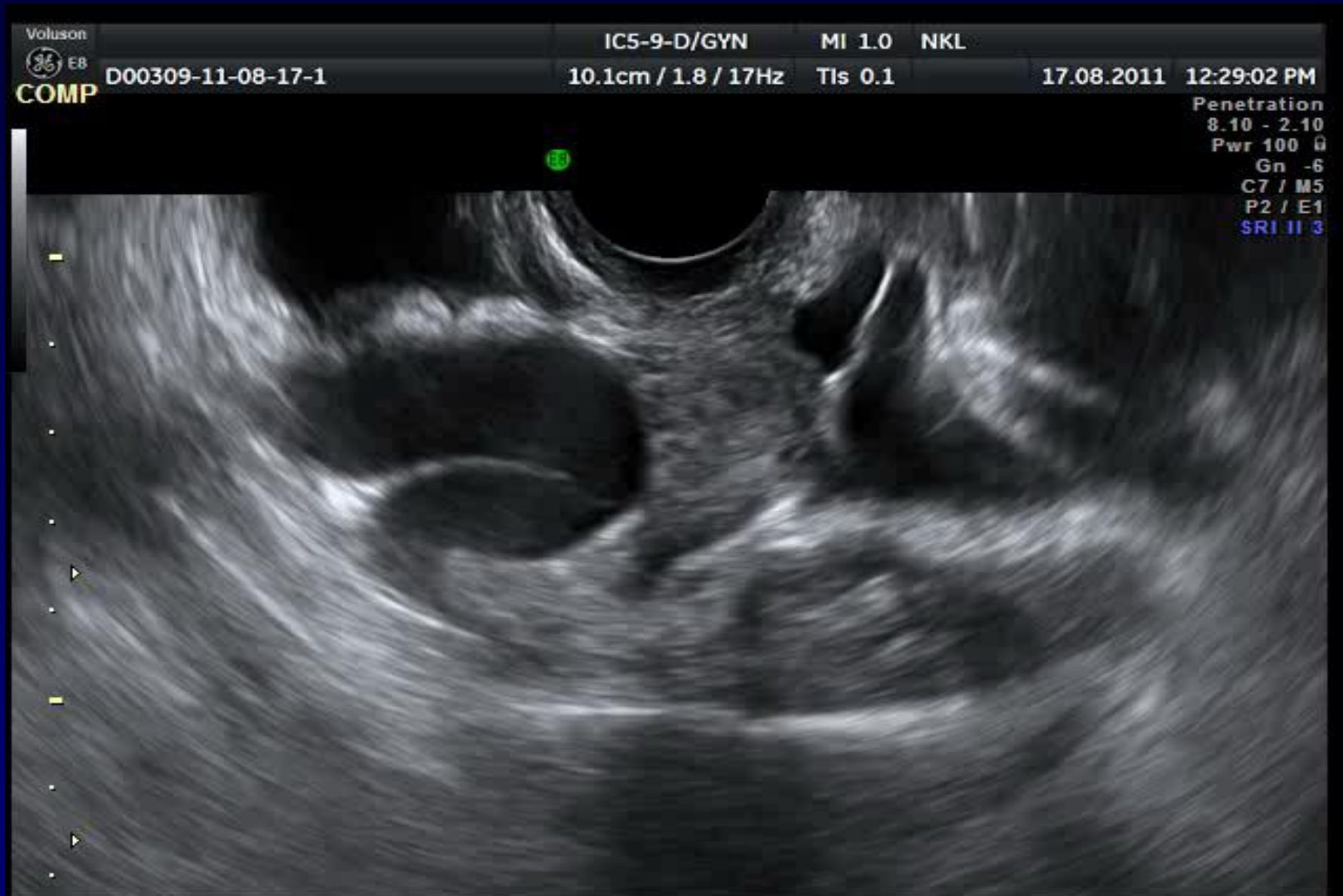
P3 / E3

SRI II 2

EB



Sacto + trapped ovary



Voluson



E8

COMP

D00309-11-08-17-1

IC5-9-D/GYN

MI 1.0

NKL

10.1cm / 1.8 / 17Hz

TIs 0.1

17.08.2011

12:29:38 PM

Penetration

8.10 - 2.10

Pwr 100

Gn -6

C7 / M5

P2 / E1

SRI II 3

E8



Voluson



E8

COMP

D00309-11-05-12-1

IC5-9-D/GYN

MI 1.0

NKL

5.4cm / 1.3 / 23Hz

TIs 0.1

12.05.2011

08:40:24 AM

Penetration

8.10 - 2.10

Pwr 100 0

Gn -6

C7 / M5

P2 / E1

SRI II 3





RIC 5-9/Gynaecology

Centro Clinico Diagnostico

9341-05-03-18-3

18.03.2005

15:34:05



RIC 5-9/Gynaecology

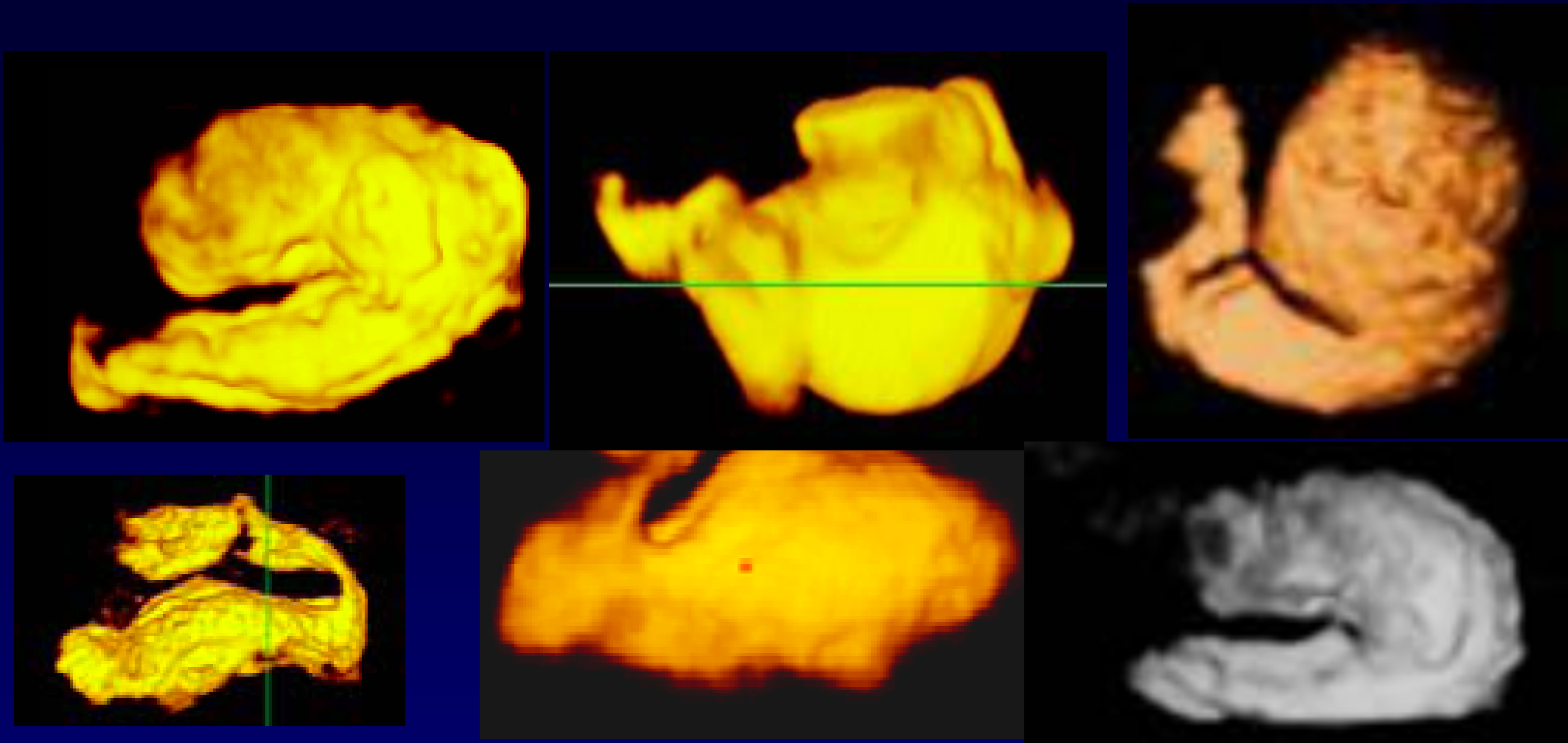
Centro Clinico Diagnostico

9341-05-03-18-3

18.03.2005

15:34:05





Three-dimensional ultrasound inversion rendering technique facilitates the diagnosis of hydrosalpinx.

Timor-Tritsch IE, Monteagudo A, Tsymbal T.

J Clin Ultrasound; 2010 ;38:372-6.

Voluson



EB

D00309-10-01-19-1

RIC6-12-D/GYN

MI 0.8 NKL

3.8cm / 1.0 / 85Hz

TIs 0.0

19.01.2010 09:26:48 AM

Default

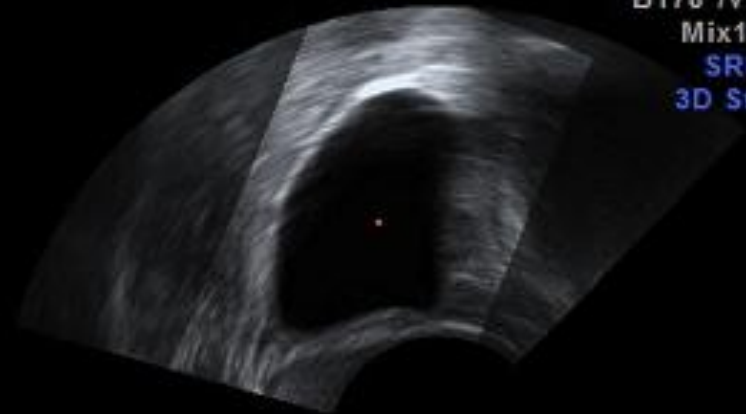
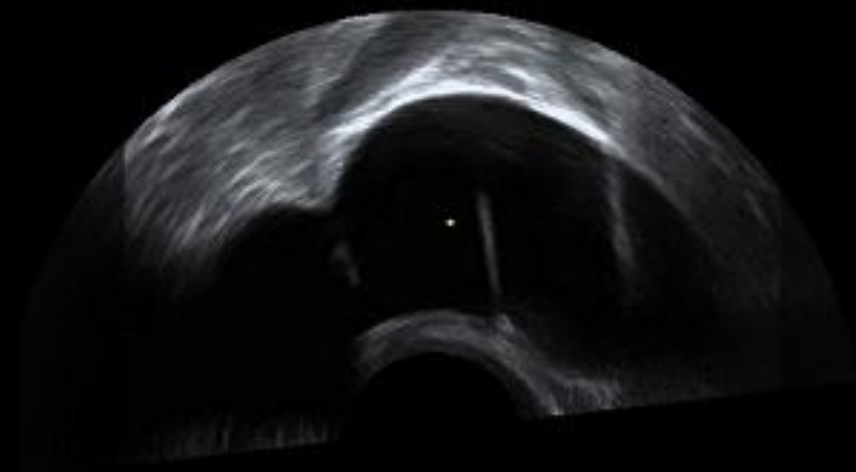
Th20/Qual mid2

B178°/V120°

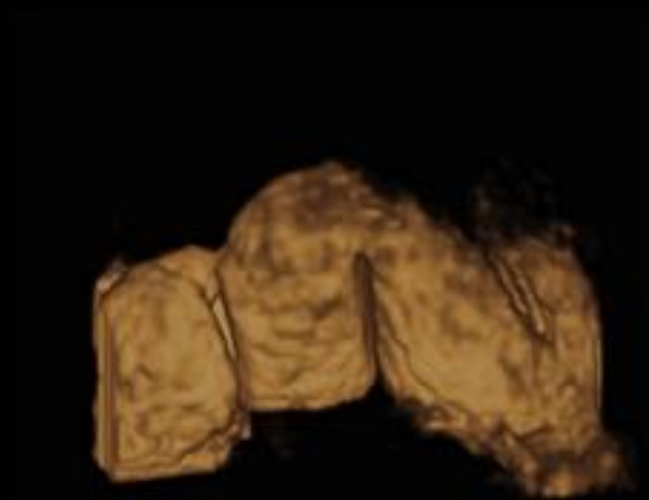
Mix100/0

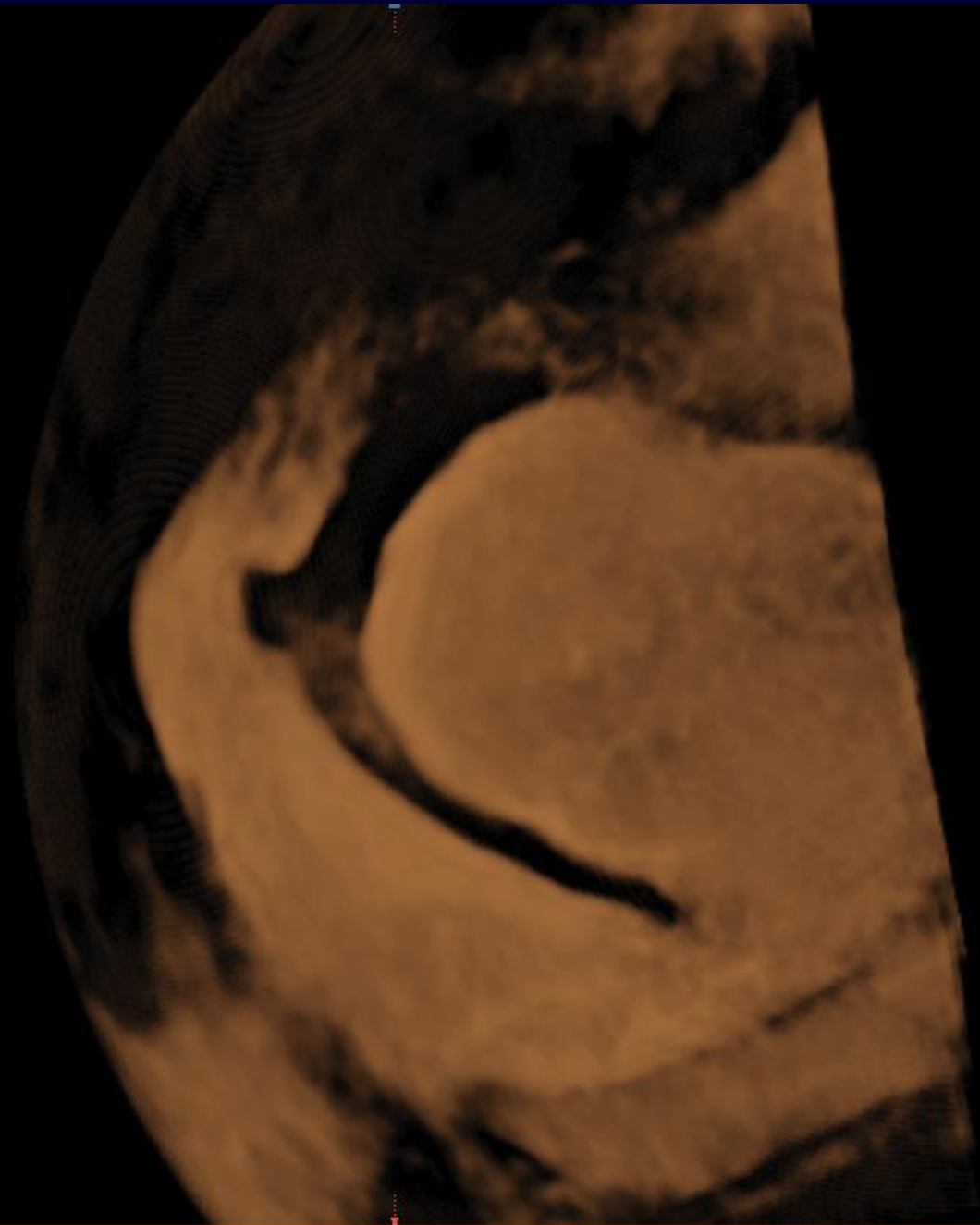
SRI II 1

3D Static



A | B
C | 3D





Voluson



COMP

D00309-10-03-02-1

IC5-9-D/GYN

MI 0.9

NKL

6.5cm / 1.2 / 40Hz

TIs 0.1

02.03.2010

12:15:59 PM

Uterus

10.00 - 3.20

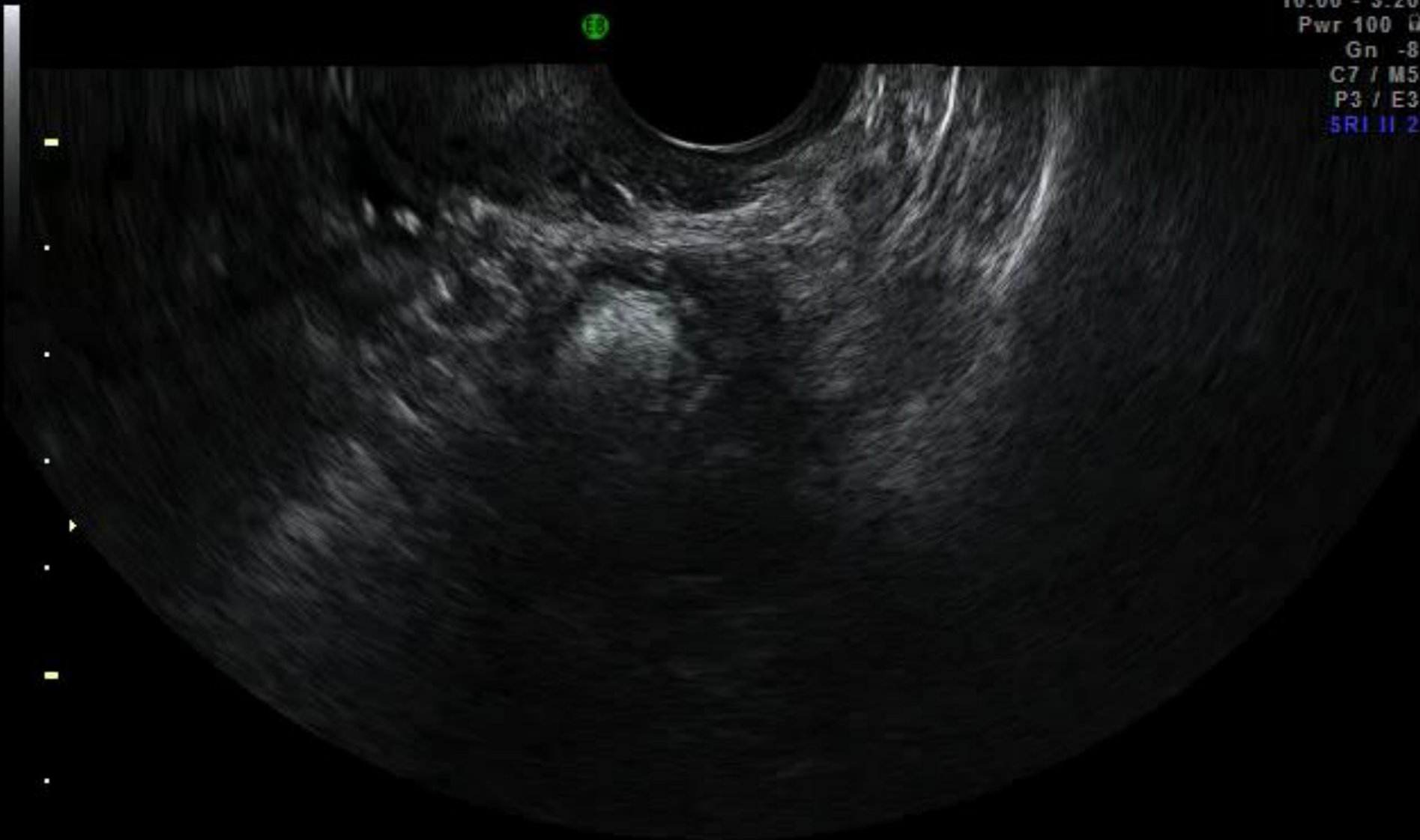
Pwr 100

Gn -8

C7 / M5

P3 / E3

5RI II 2



Voluson



E8

COMP

D00309-10-03-02-1

IC5-9-D/GYN

MI 0.9 NKL

6.5cm / 1.2 / 40Hz

TIs 0.1

02.03.2010 12:16:33 PM

Uterus

10.00 - 3.20

Pwr 100 0

Gn -8

C7 / M5

P3 / E3

5RI II 2



Voluson



EB

COMP

D00309-11-09-29-1

IC5-9-D/GYN

MI 0.9 NKL

6.5cm / 1.2 / 41Hz

TIs 0.1

29.09.2011 09:07:18 AM

Uterus

10.00 - 3.20

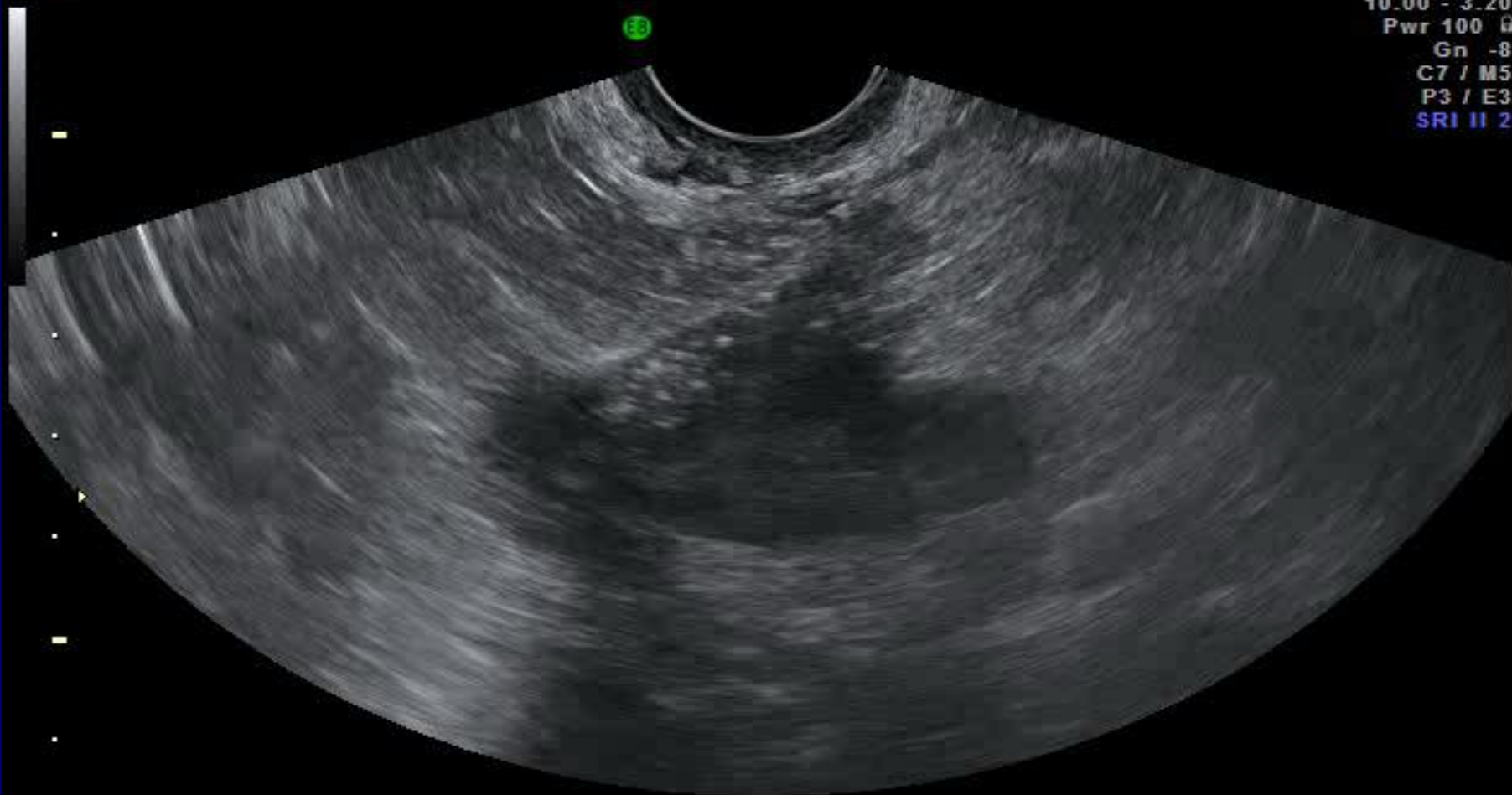
Pwr 100 dB

Gn -8

C7 / M5

P3 / E3

SRI II 2



Voluson
E8
COMP

D00309-11-08-17-1

IC5-9-D/GYN

10.1cm / 1.8 / 17Hz

MI 1.0

NKL

TIs 0.1

17.08.2011

12:32:57 PM

Penetration

8.10 - 2.10

Pwr 100

Gn -6

C7 / M5

P2 / E1

SRI II 3

13



Voluson

GE E8

COMP

D00309-11-06-13-1

IC5-9-D/GYN

MI 0.8

NKL

11.3cm / 1.7 / 31Hz

TIs 0.1

14.06.2011 09:09:36 AM

Uterus

10.00 - 3.20

Pwr 100 G

Gn -8

C7 / M5

P3 / E3

ERI 11 2



Voluson

GE E8

COMP

D00309-11-10-13-1

IC5-9-D/GYN

6.5cm / 1.2 / 41Hz

MI 0.9

TIs 0.1

NKL

13.10.2011 08:22:43 AM

Uterus

10.00 - 3.20

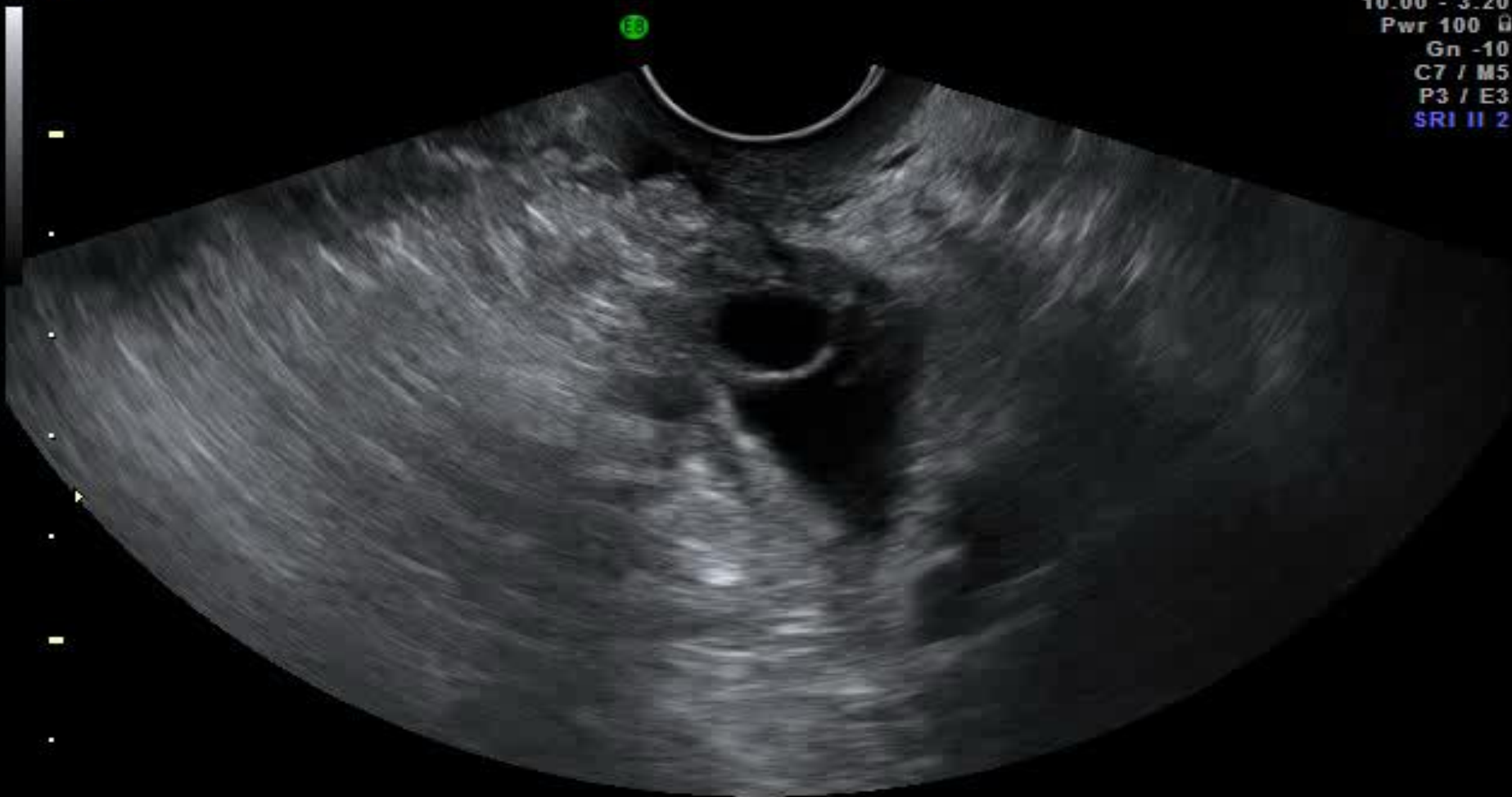
Pwr 100

Gn -10

C7 / M5

P3 / E3

SRI II 2



Voluson



E8

COMP

D00309-11-10-13-1

IC5-9-D/GYN

MI 0.9

NKL

6.5cm / 1.2 / 41Hz

TIs 0.1

13.10.2011 08:22:18 AM

Uterus

10.00 - 3.20

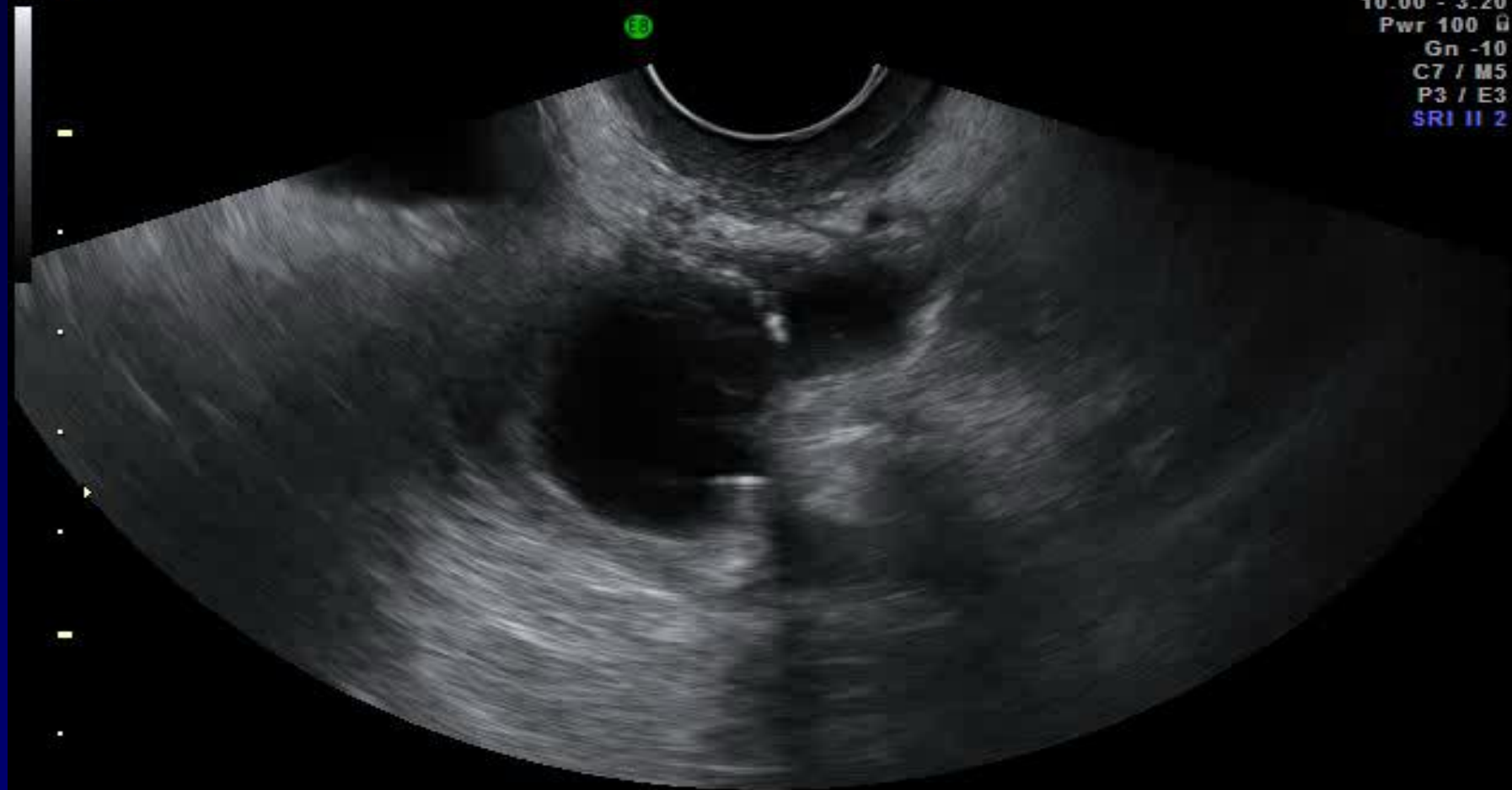
Pwr 100

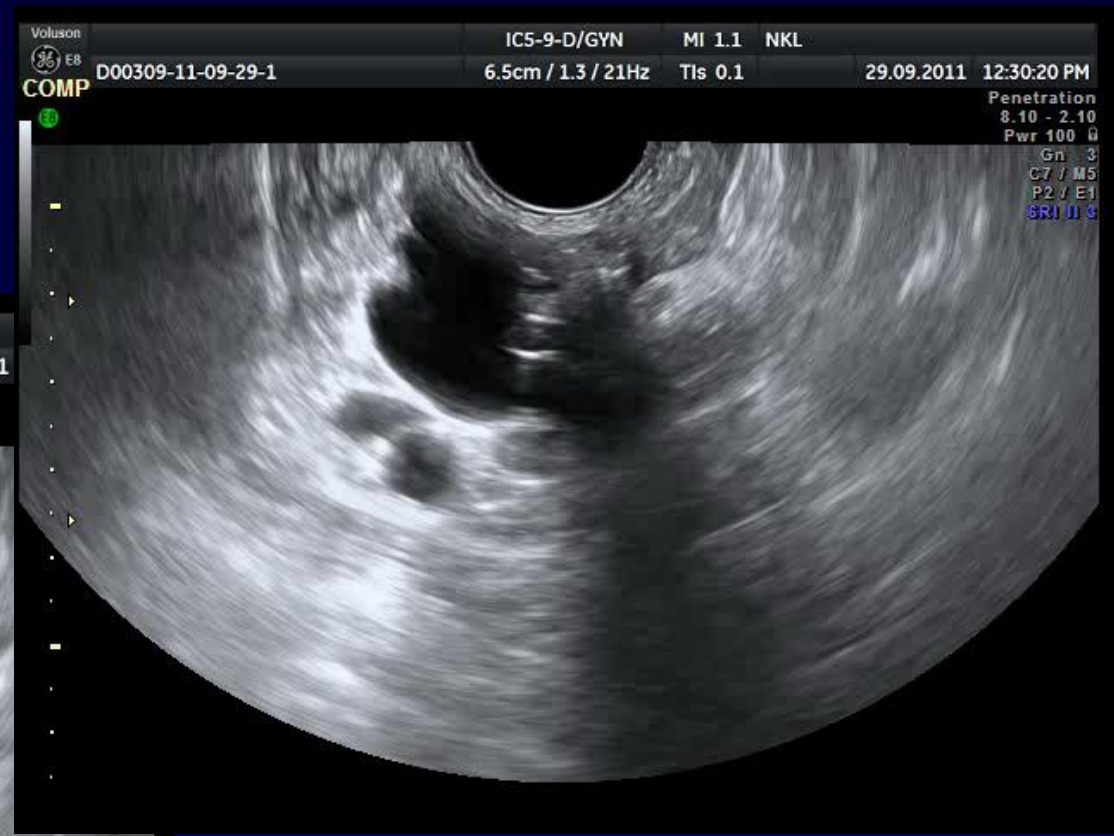
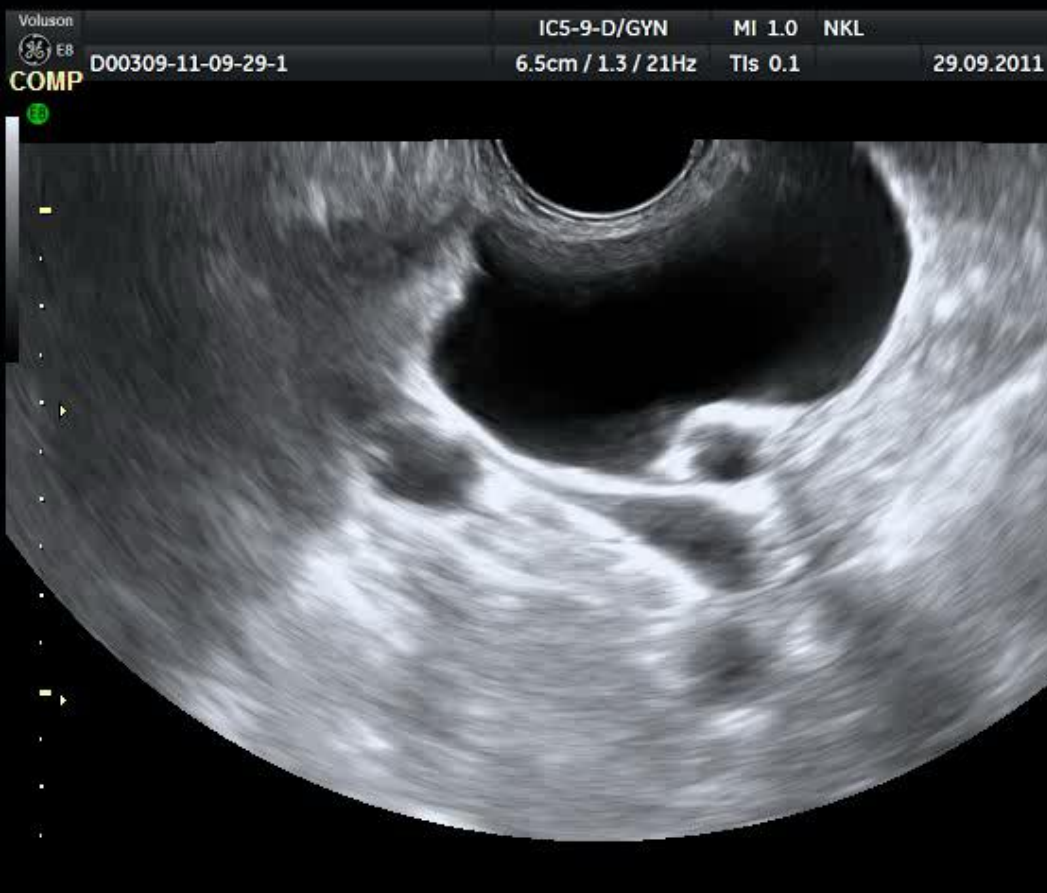
Gn -10

C7 / M5

P3 / E3

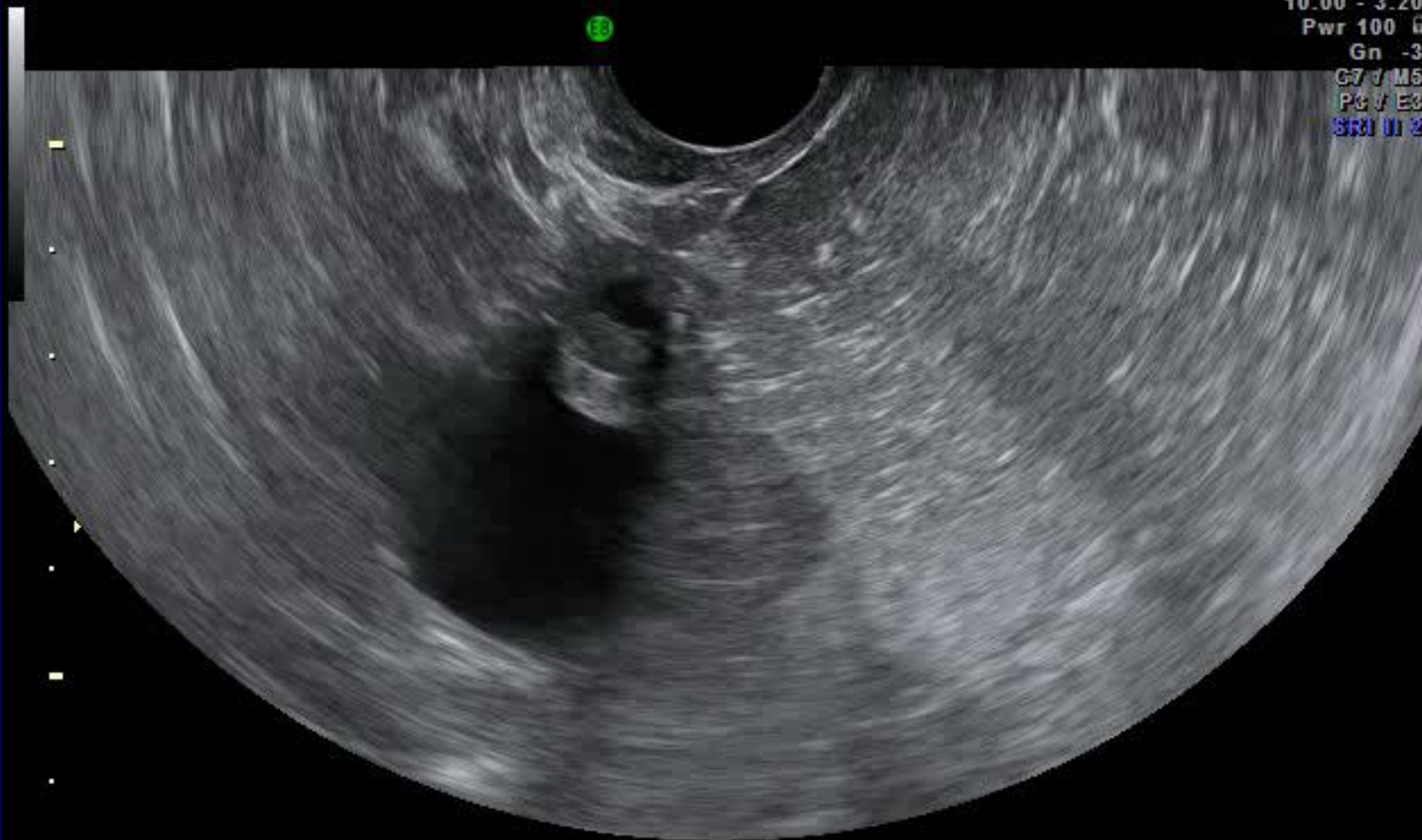
SRI II 2





Voluson
E8
COMP
D00309-11-08-24-2
IC5-9-D/GYN
6.5cm / 1.2 / 40Hz
MI 0.9
NKL
TIs 0.1
24.08.2011 12:20:38 PM

Uterus
10.00 - 3.20
Pwr 100 Q
Gn -3
G7 / M5
PG / E8
SER 01 2



Voluson



E8

COMP

D00309-11-06-13-1

IC5-9-D/GYN

MI 0.8

NKL

11.3cm / 1.7 / 31Hz

TIs 0.1

14.06.2011 09:09:17 AM

Uterus

10.00 - 3.20

Pwr 100

Gn -8

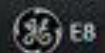
C7 / M5

PC / E3

350 UI 3



Voluson



E8

COMP



D00309-11-04-12-2

IC5-9-D/GYN

MI 1.0 NKL

7.7cm / 1.3 / 19Hz

Tls 0.1

12.04.2011 11:52:13 AM

Penetration

8.10 - 2.10

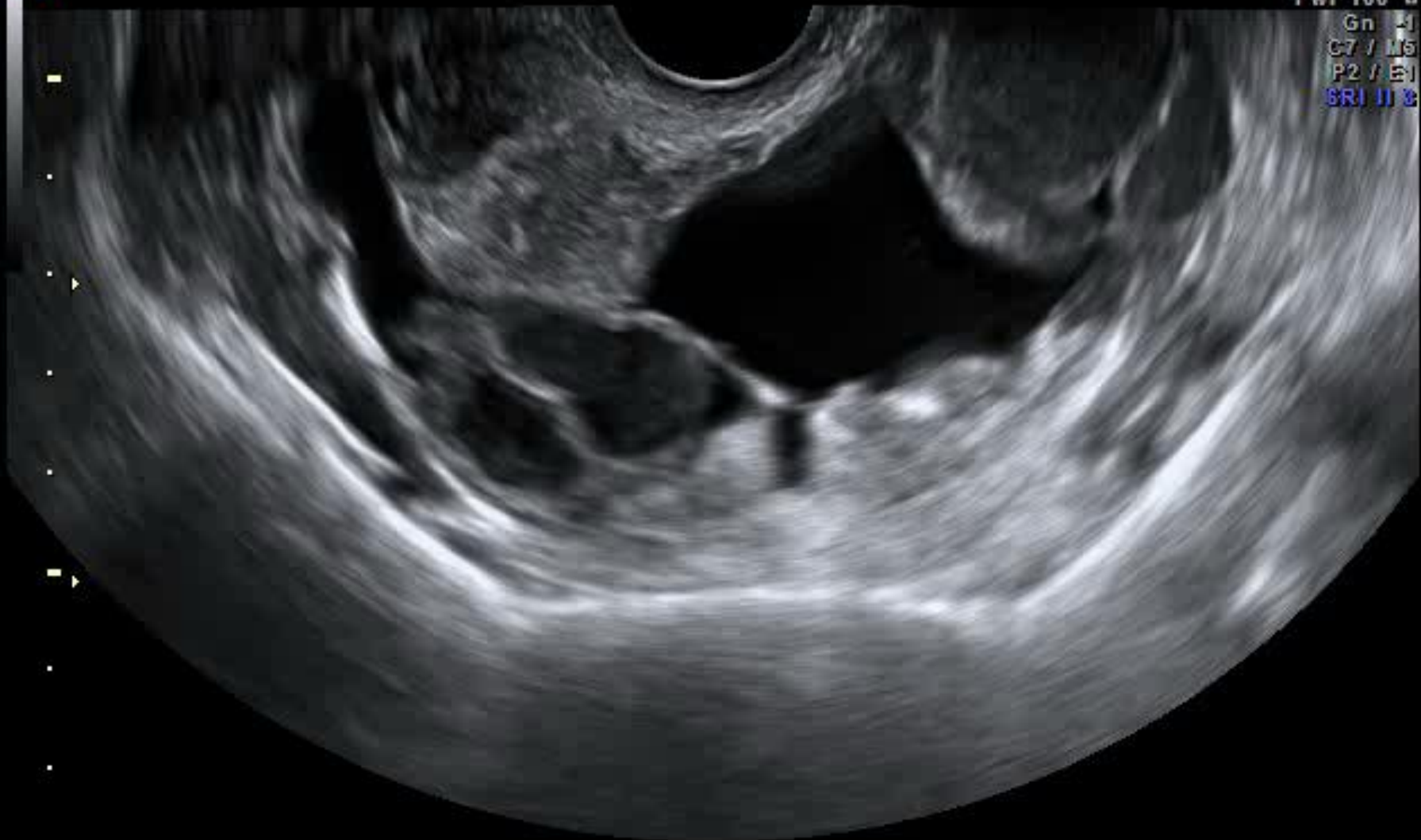
Pwr 100 0

Gn -1

C7 / MS

P2 / E1

SRI II 3



Voluson



EB

COMP

D00309-11-09-13-1

IC5-9-D/GYN

MI 1.0

NKL

10.1cm / 1.3 / 17Hz

TIs 0.1

13.09.2011 09:41:05 AM

Penetration

8.10 - 2.10

Pwr 100 Q

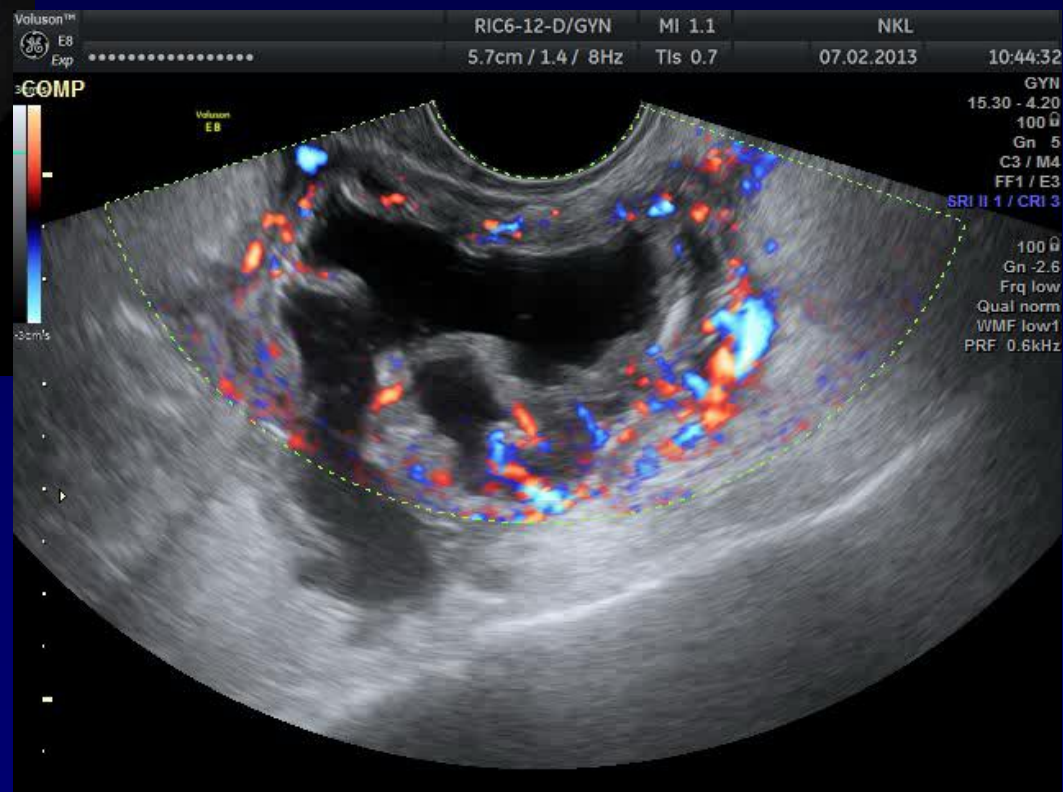
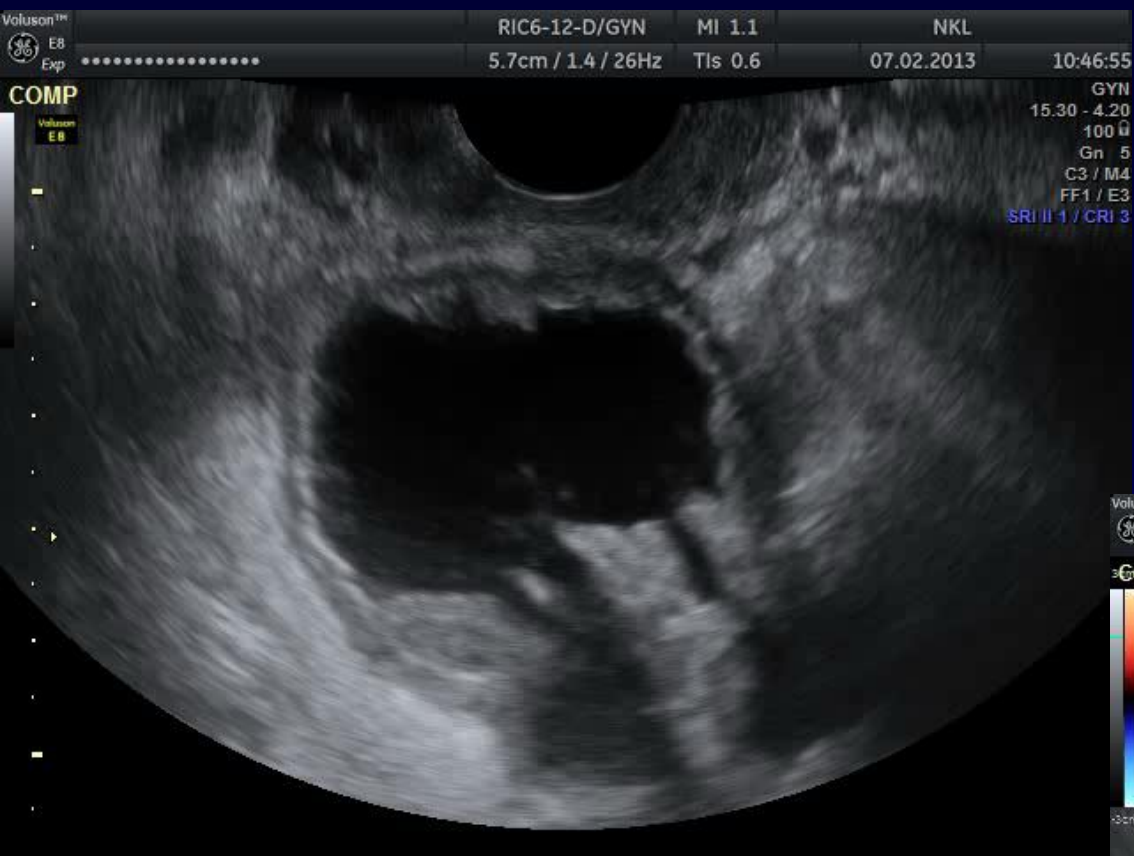
Gn -6

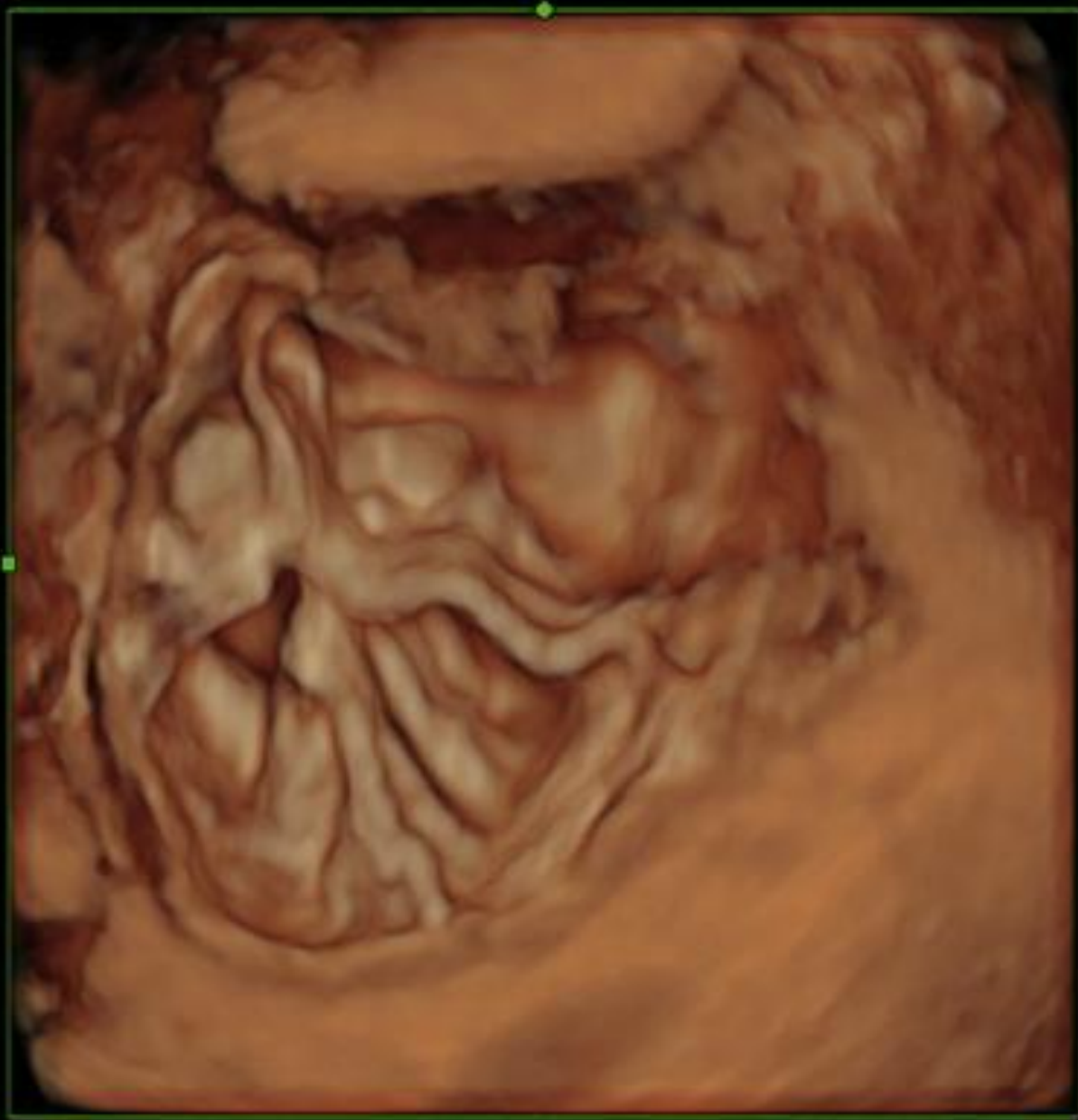
C7 / M5

P2 / E1

SRI II 3







Voluson
E8
COMP

D00309-11-09-28-1

IC5-9-D/GYN

MI 1.1 NKL

7.7cm / 1.3 / 19Hz

TIs 0.1

28.09.2011 08:22:05 AM

Penetration
8.10 - 2.10
Pwr 100 G
Gn -6
C7 / M5
P2 / E1
SRI II 3



Voluson

EB

COMP

8cm/s

8cm/s

8cm/s

8cm/s

8cm/s

8cm/s

8cm/s

8cm/s

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8cm/s

8cm/s

8cm/s

IC5-9-D/GYN

MI 0.8

NKL

D00309-11-09-28-1

7.7cm / 1.3 / 19Hz

TIs 0.2

28.09.2011 08:21:21 AM

Penetration

8.10 - 2.10

Pwr 92 %

Gn -6

C7 / M5

P2 / E1

SRI II 3

Pwr 100 %

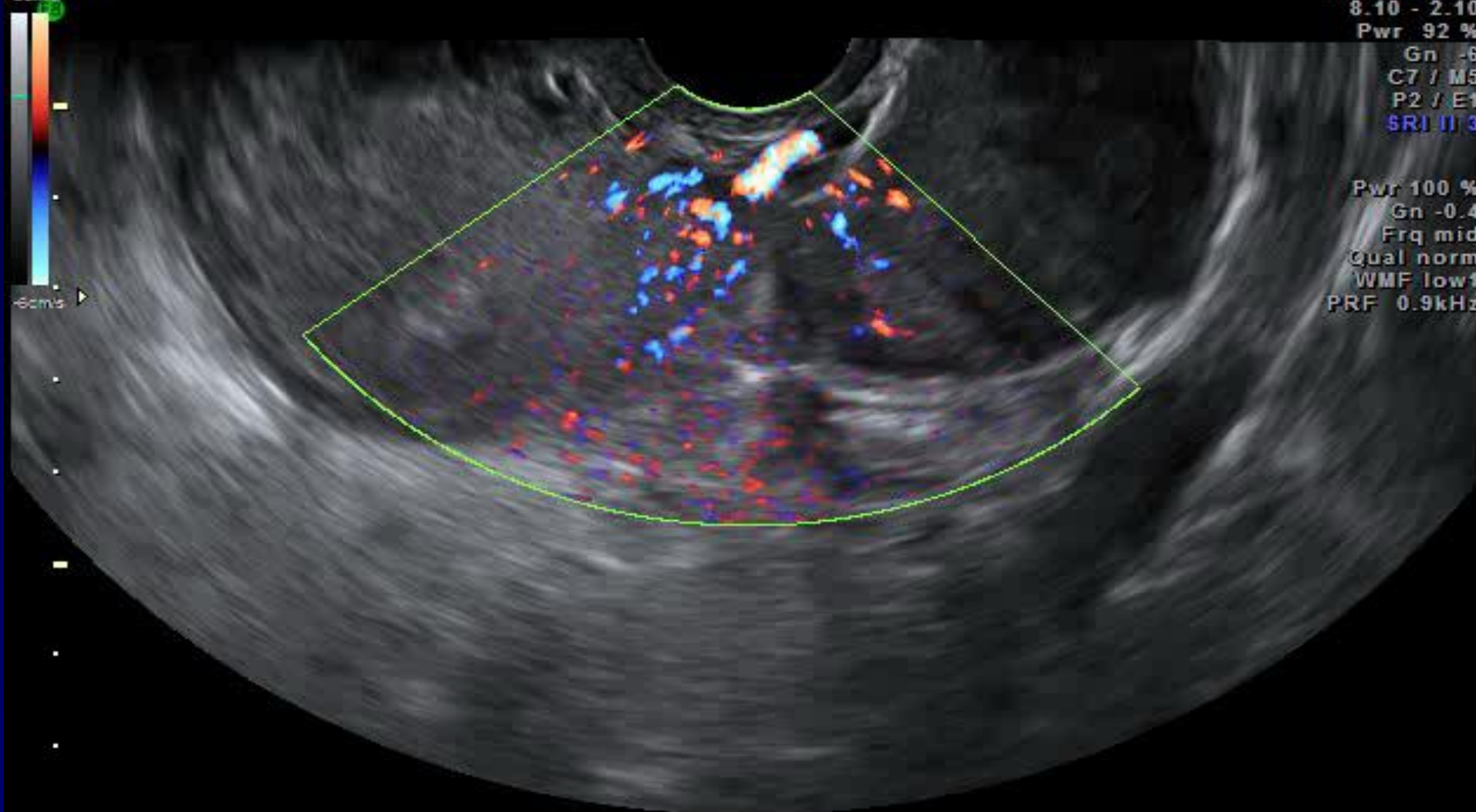
Gn -0.4

Frq mid

Qual norm

WMF low1

PRF 0.9kHz



Voluson

GE E8

COMP

D00309-11-09-06-2

IC5-9-D/GYN

MI 1.0

NKL

7.7cm / 1.2 / 37Hz

TIs 0.1

06.09.2011 12:20:58 PM

Uterus

10.00 - 3.20

Pwr 100 G

Gn 3

G7 / M5

P3 / E3

SRI II 2



Voluson



D00309-10-03-25-1

IC5-9-D/GYN

6.5cm / 1.2 / 40Hz

MI 1.0 NKL

TIs 0.1

25.03.2010 08:27:06 AM

Uterus

10.00 - 3.20

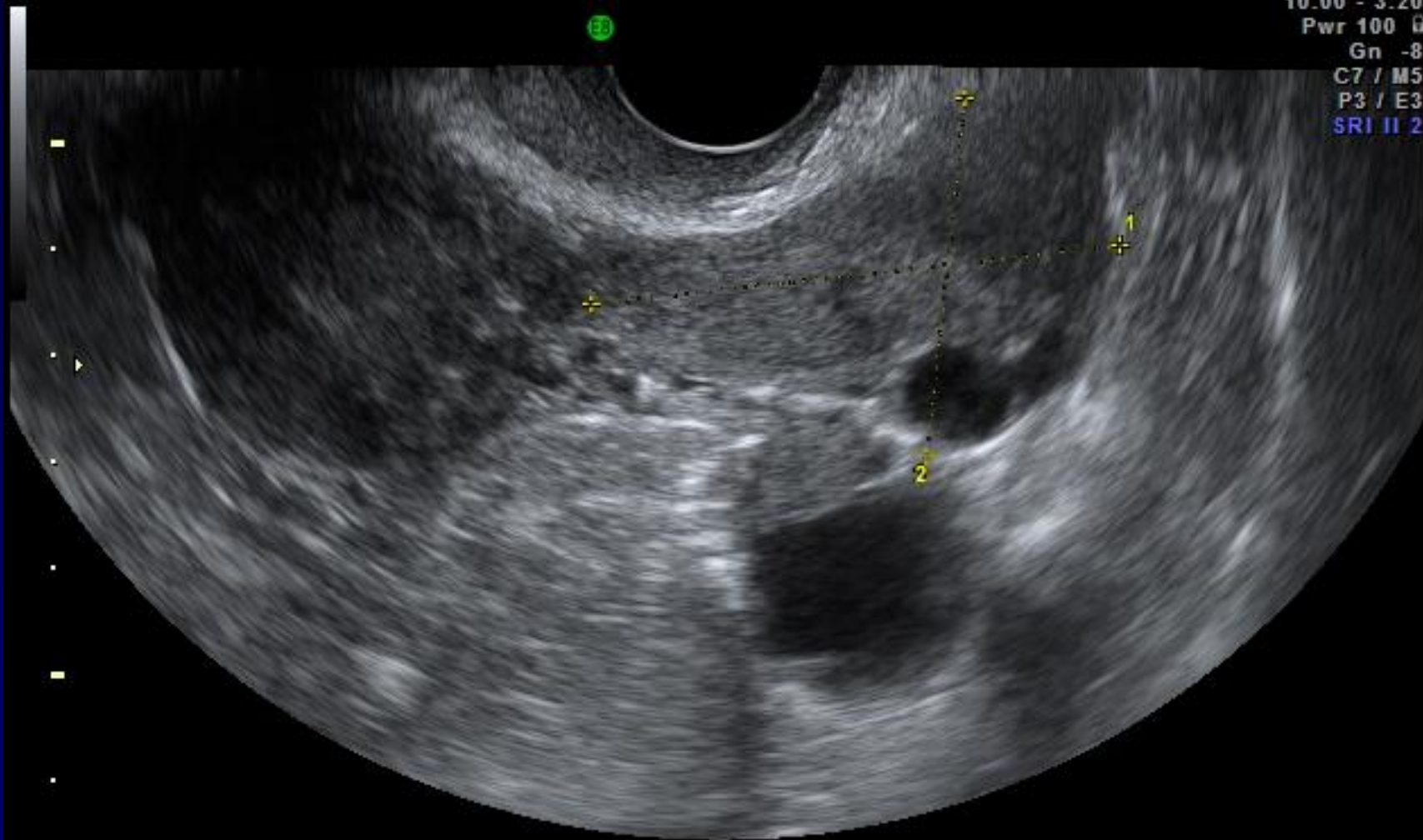
Pwr 100

Gn -8

C7 / M5

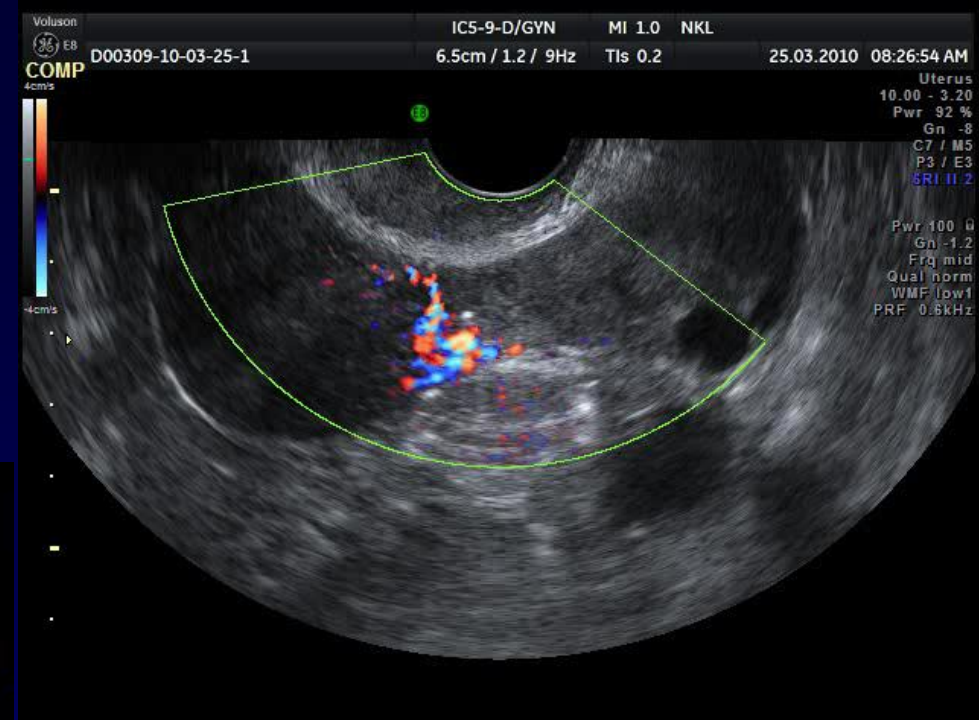
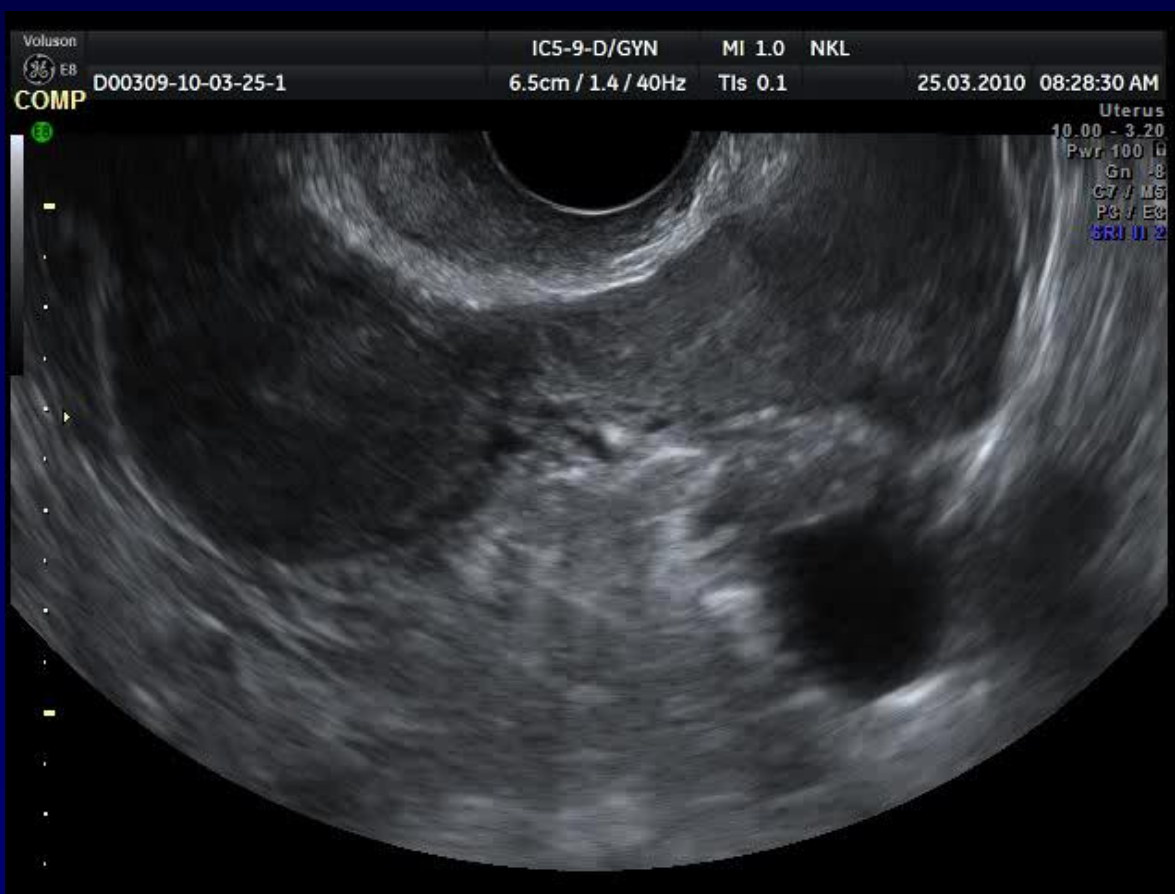
P3 / E3

SRI II 2

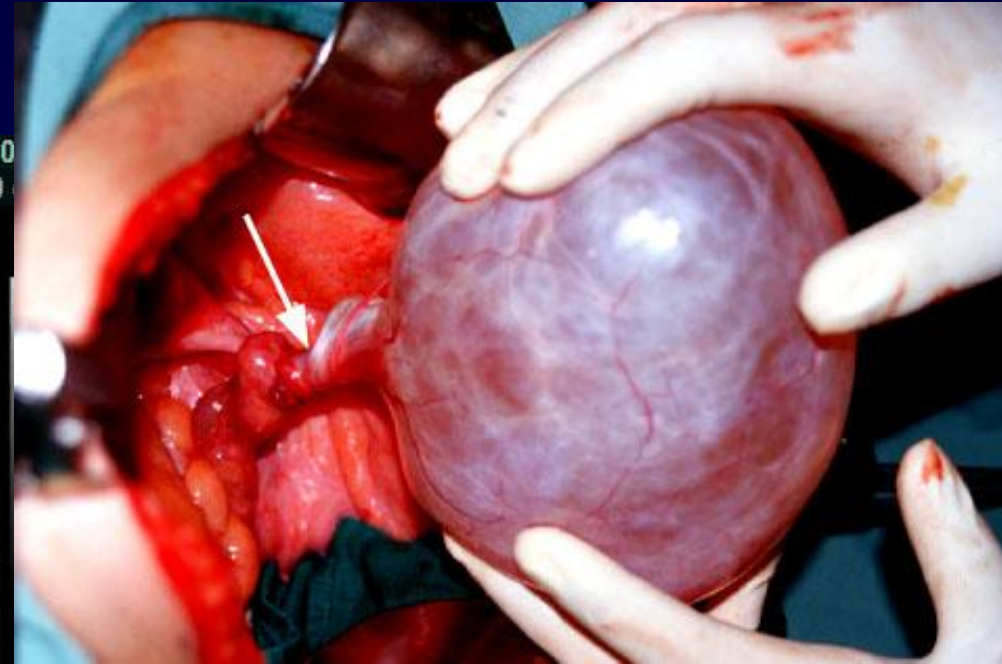


1 D 5.00cm

2 D 3.41cm



Ovarian torsion

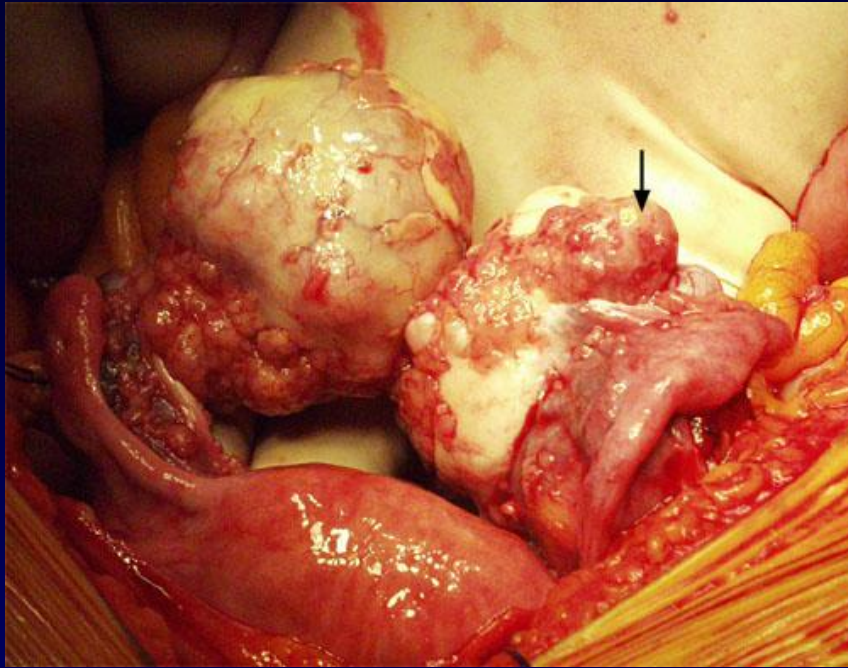


Qualitative classification of adnexal masses (IOTA 2000)

- Unilocular cyst
- Unilocular-solid cyst
- Multilocular cyst
- Multilocular-solid cyst
- Solid tumor
- Not classifiable

Sonomorphology of ovarian tumors

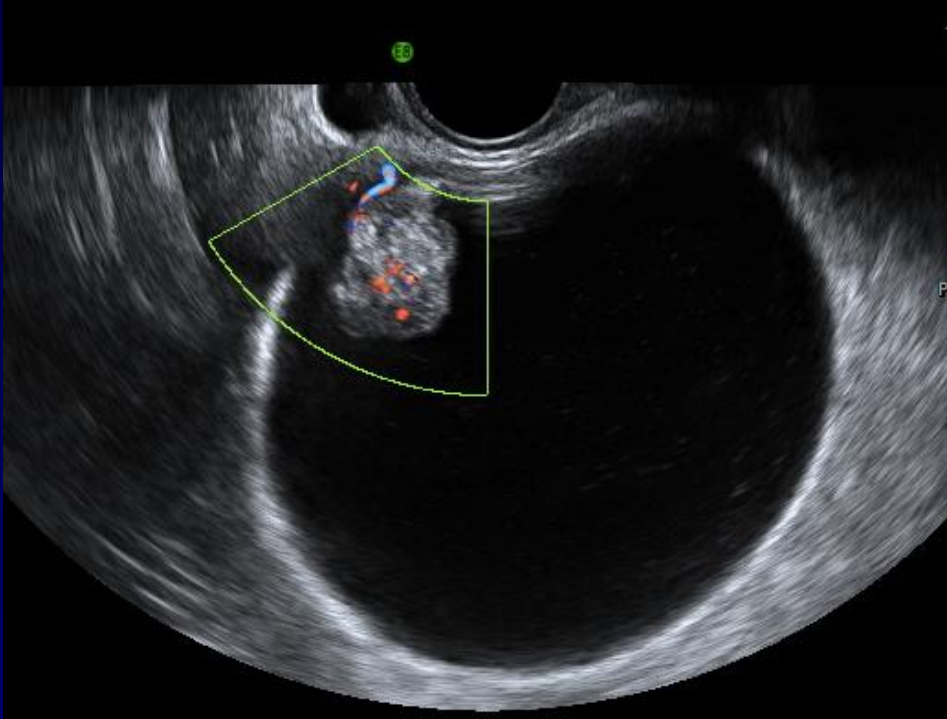
- Unilocular cystic solid, multilocular cystic solid and solid tumours have more than 50% risk for malignancy.
- Unilocular cystic are benign.
- Multilocular cystic tumours with few septations are very likely to be benign too.
 - Cacciatore 2000



Papillary projections are
an important
sign of malignancy



Unilocular solid cyst

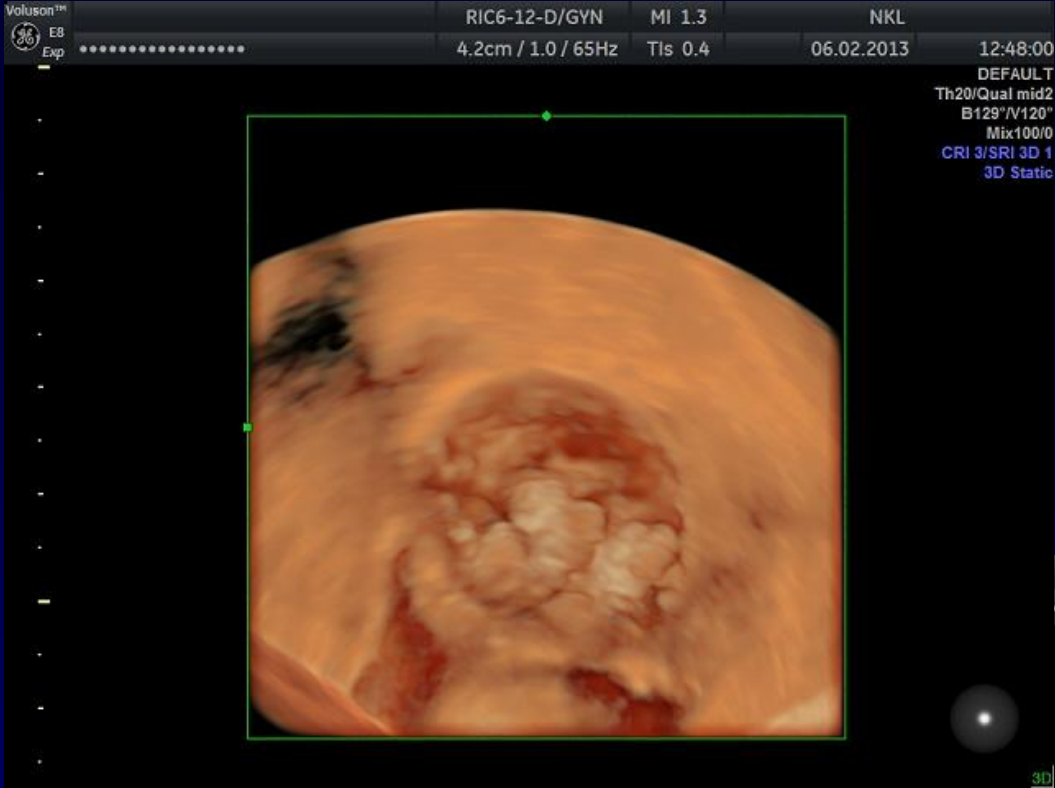


Borderline



Invasive Ca

Solid to cystic ratio is important !



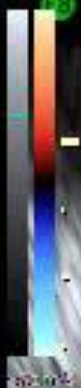
Voluson



E8

COMP

7cm/s



D00309-11-06-09-1

IC5-9-D/GYN

6.5cm / 1.3 / 25Hz

MI 0.9 NKL

TIs 0.2

09.06.2011 09:16:26 AM

Penetration

8.10 - 2.10

Pwr 97 %

Gn -6

C7 / M5

P2 / E1

SRI II 3

Pwr 100 %

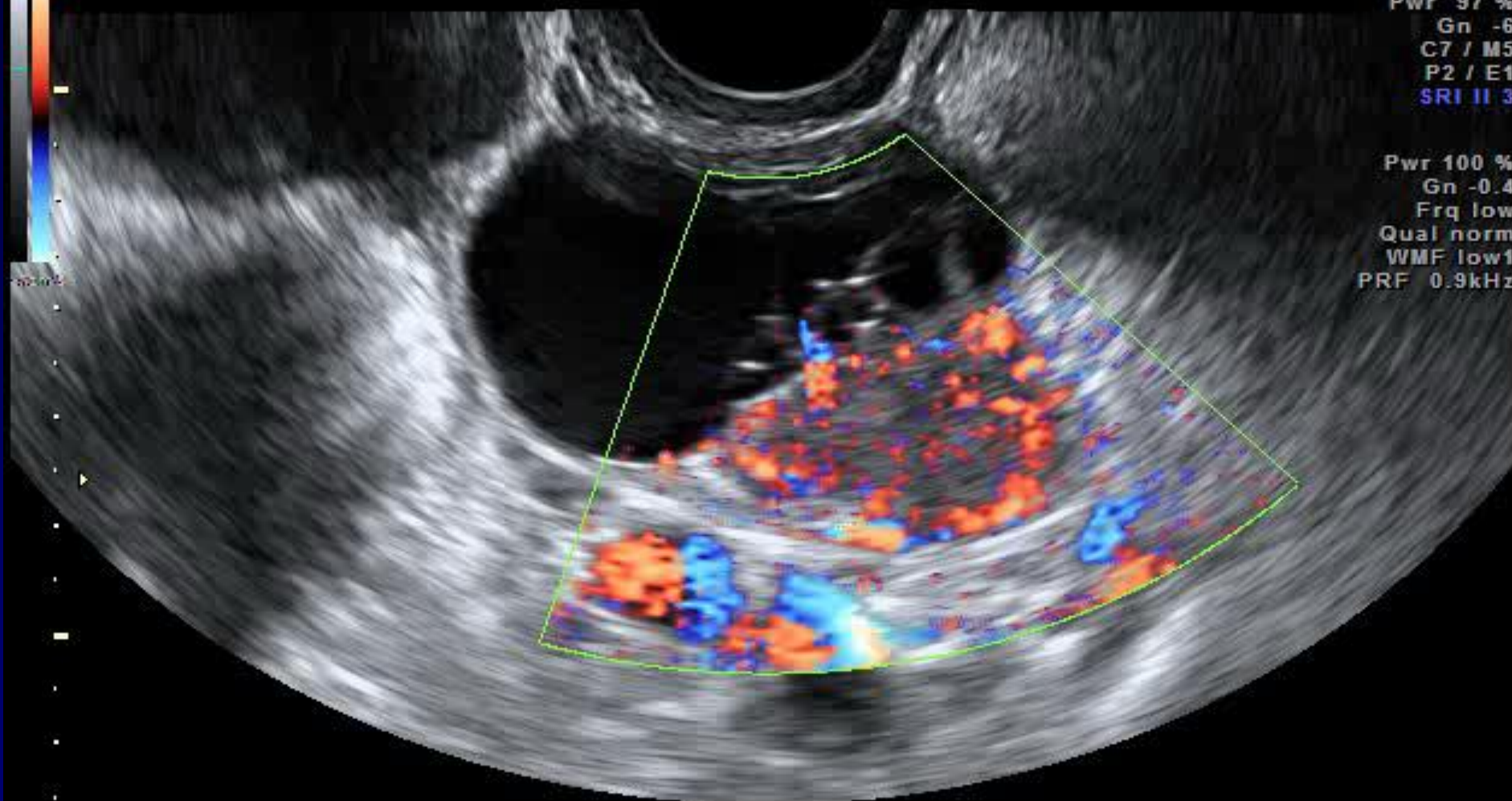
Gn -0.4

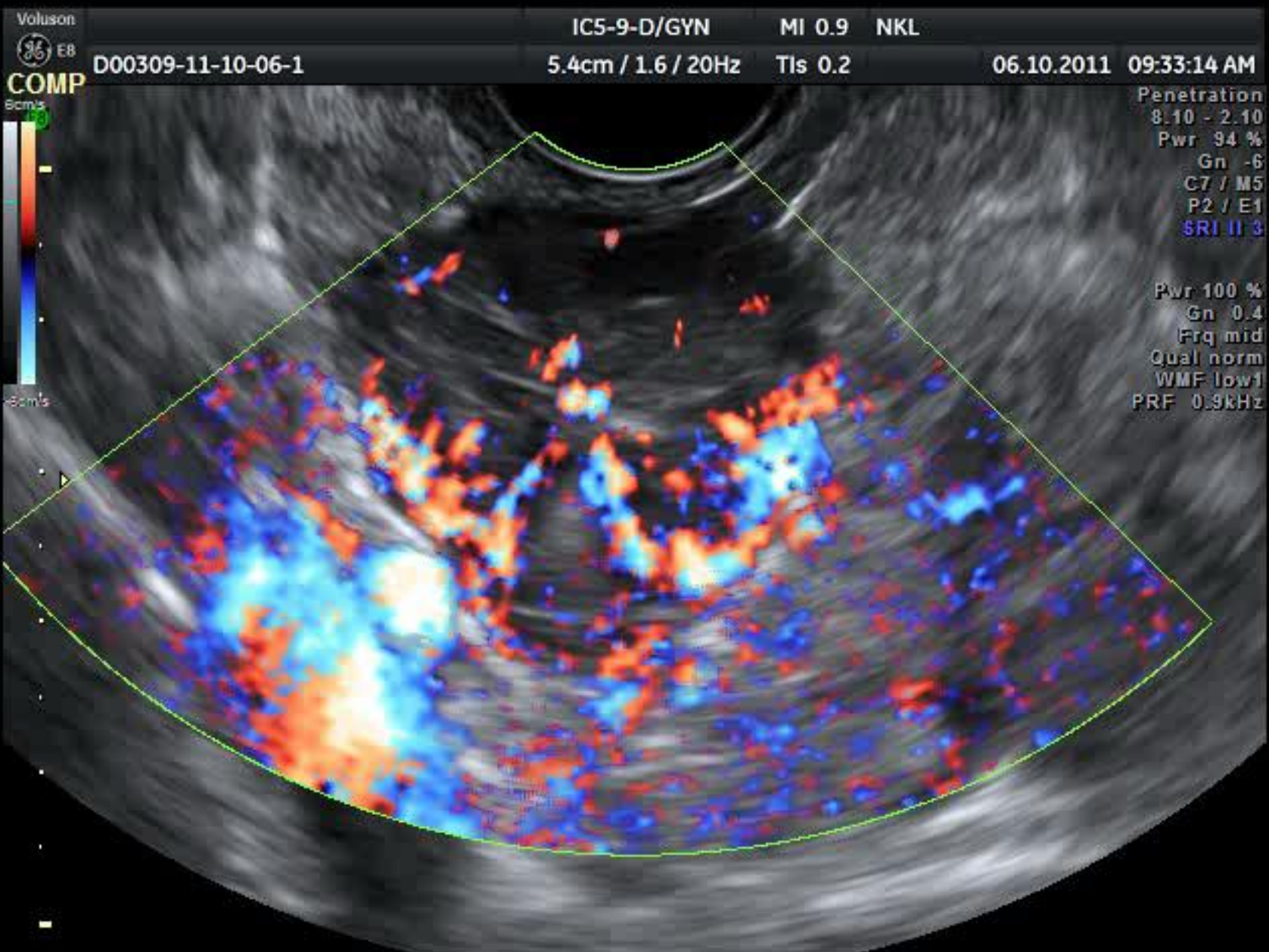
Frq low

Qual norm

WMF low1

PRF 0.9kHz





Voluson



E8

COMP

4cm/s

D00309-11-05-04-2

IC5-9-D/GYN

MI 0.9 NKL

6.5cm / 1.2 / 10Hz

TIs 0.2

04.05.2011 09:27:54 AM

Uterus

10.00 - 3.20

Pwr 92 %

Gn -8

C7 / M5

P3 / E3

SRI II 2

Pwr 100 %

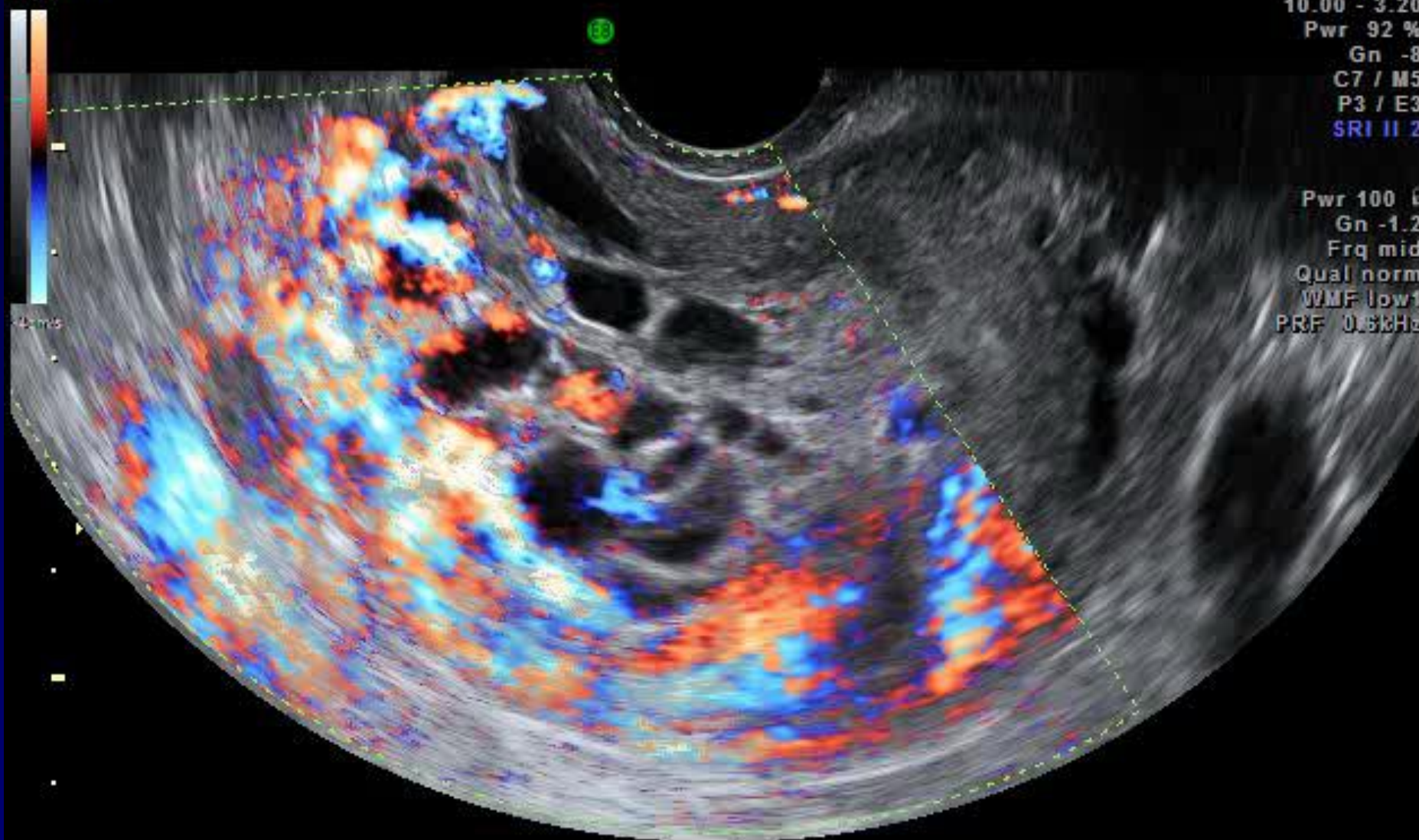
Gn -1.2

Frq mid

Qual norm

VMF low1

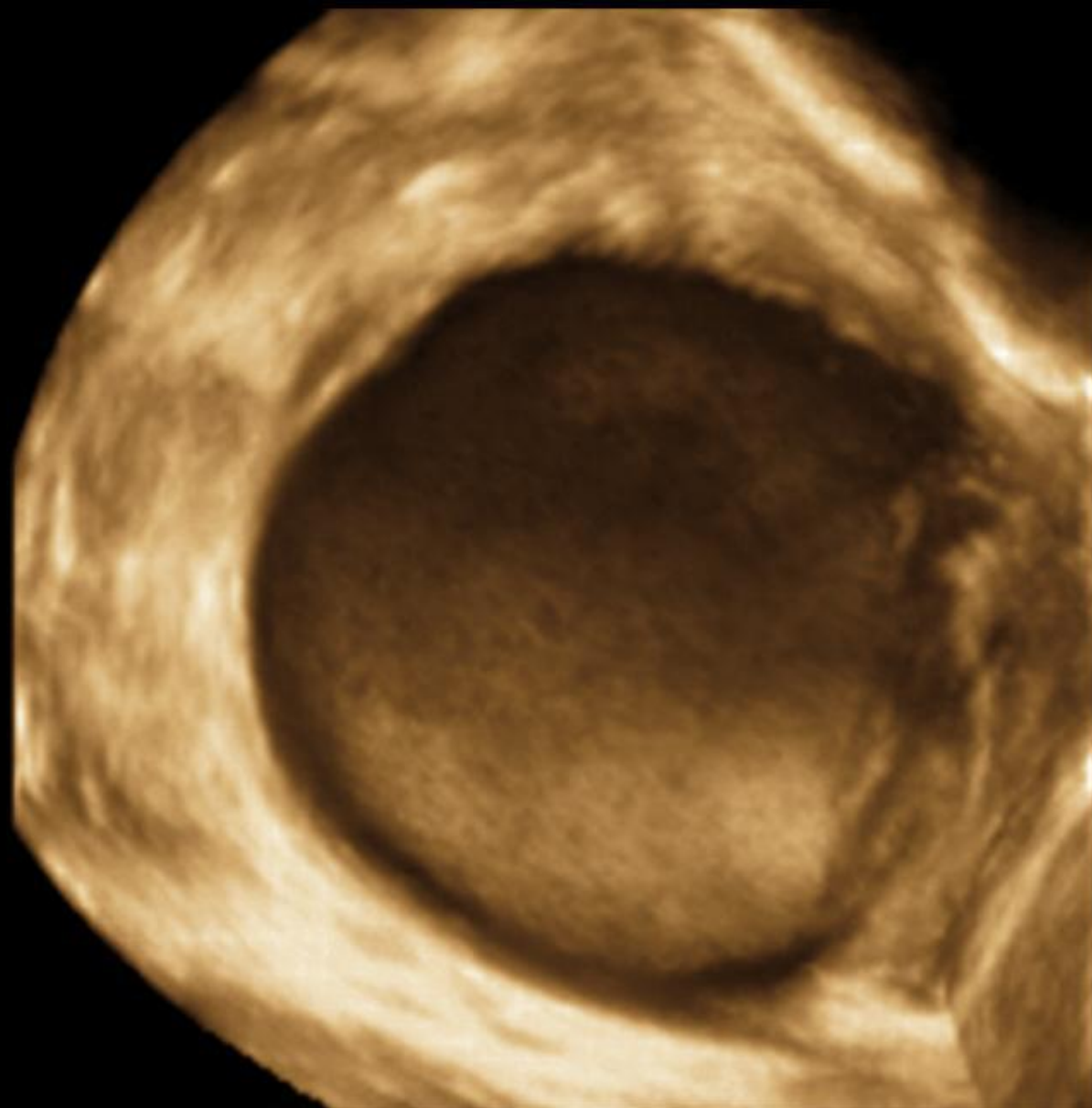
PRF 0.6kHz

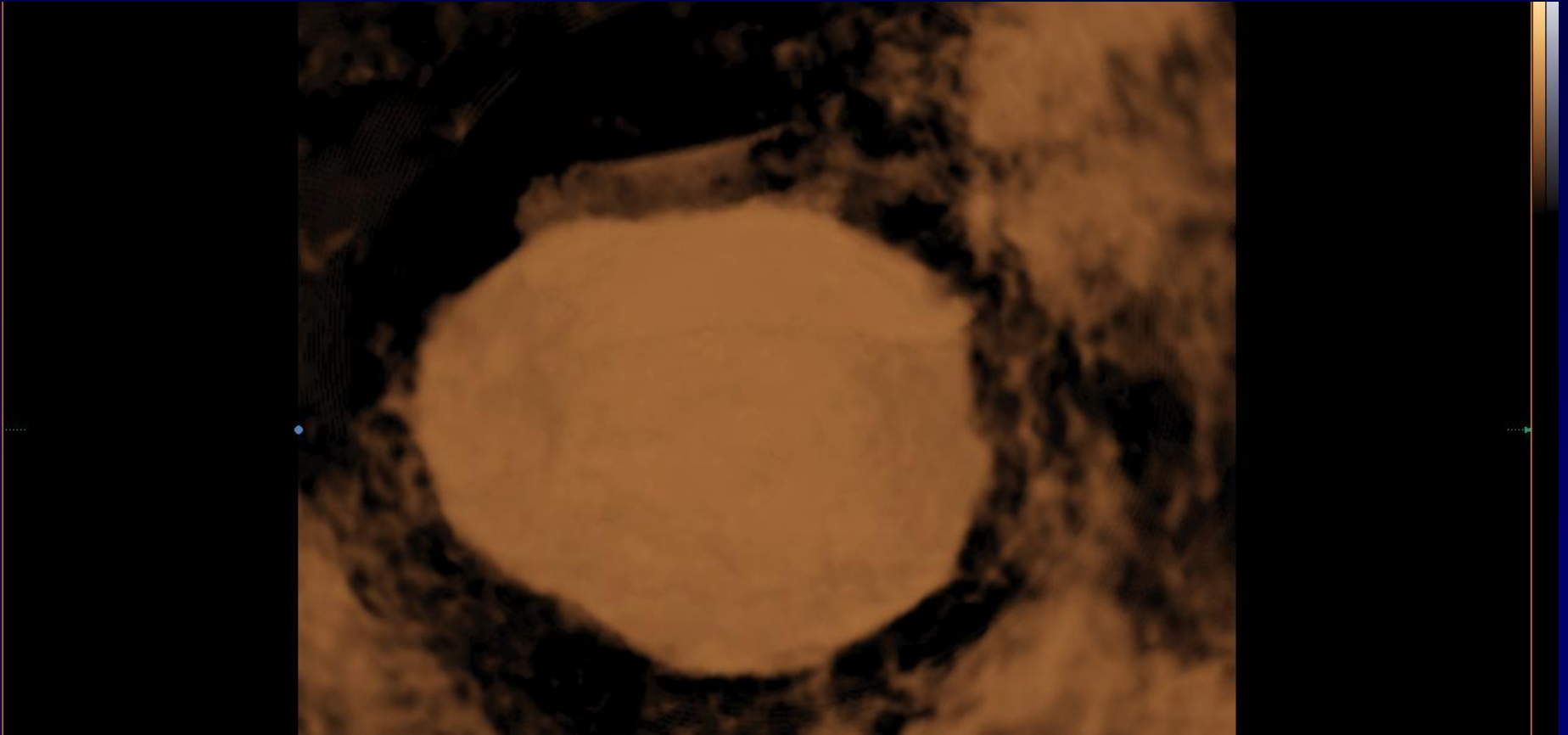


Unilocular simple cyst: risk of malignancy <1%
(11 of 1148)

Malignant unilocular cysts more often in women
with previous OvCa (18% vs 0.6) or BreastCa (18%
vs 2%)

Haemorrhagic content more often in malignant cyst
In 7 of the 11 malignant unilocular cysts papillary
projections were found at surgery!!

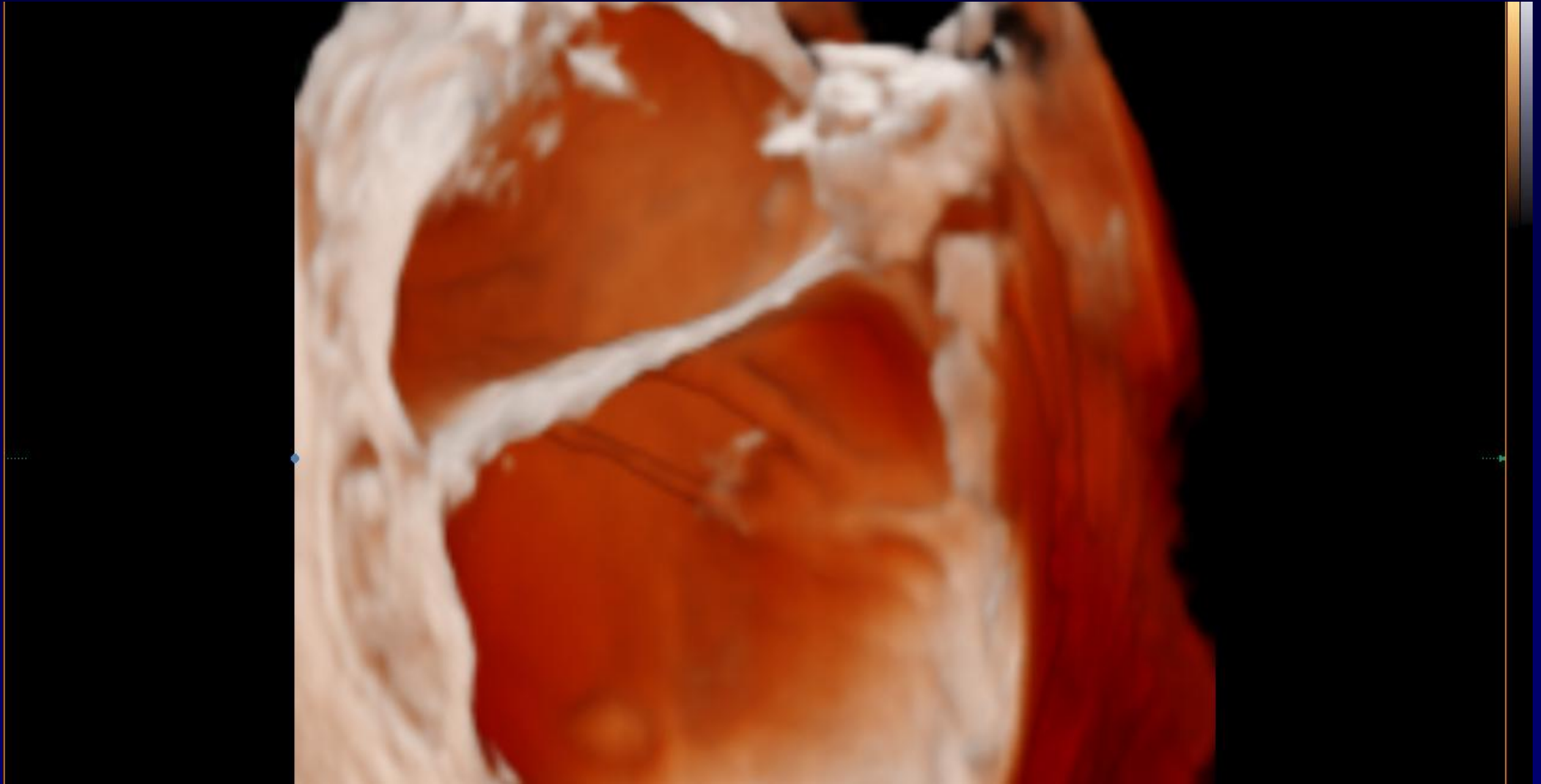


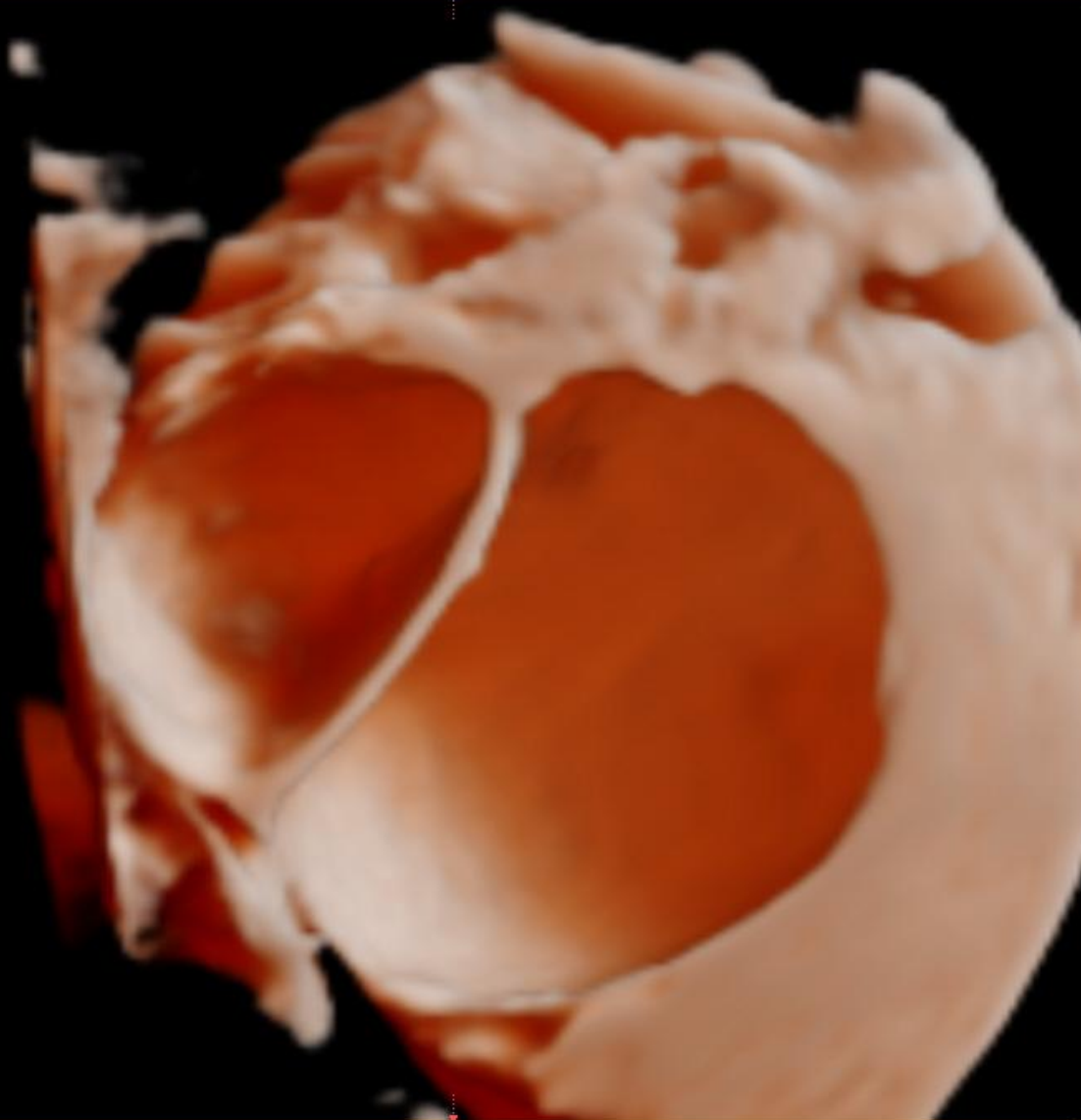


Simple septated cystic ovarian tumor <10cm in diameter

Rarely, if ever, neoplastic and do not require surgical removal

- Saunders et al.: Risk of malignancy in sonographically confirmed septated cystic ovarian tumors. Gynecol Oncol. 2010;118:278-282







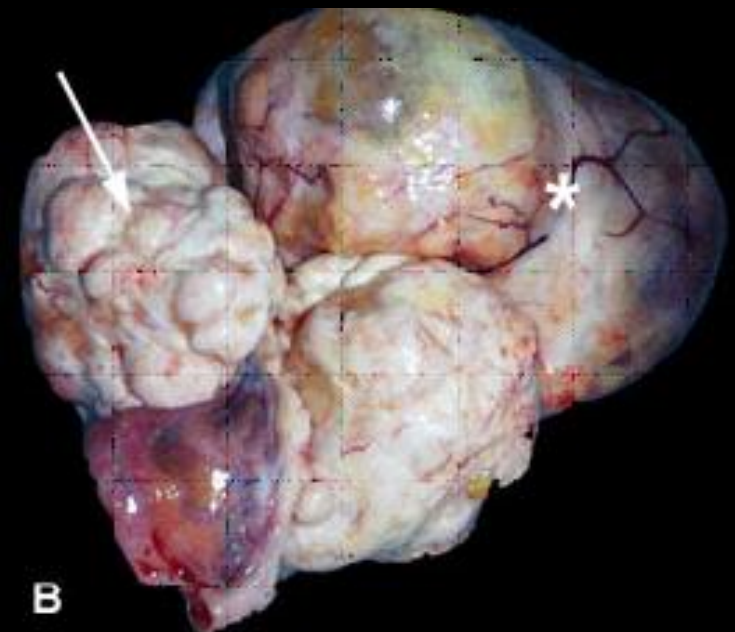
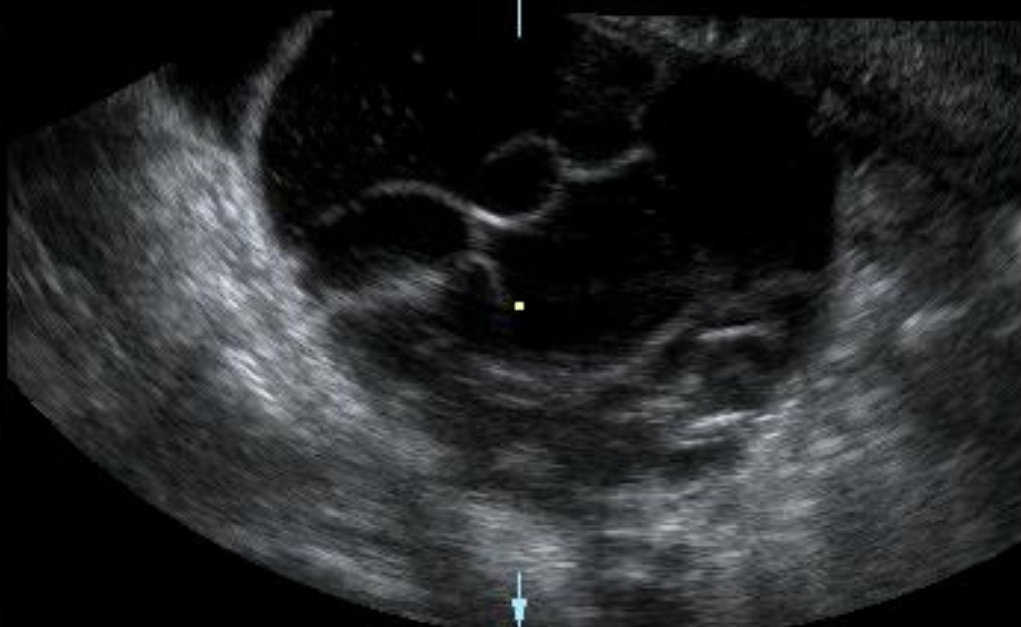
Adenofibroma

12.04.2005

10:02:32

--- 3D/4D ---
Gyn.
Qual high1
B127°/V90°
3D Static

--- 2D ---
Uterus
14.00 - 3.20
Pw: 100
G1 - 1
G7 / M5
P2 / E2



B

Pattern recognition

- An experienced and skilful operator can correctly distinguish benign and malignant masses on the basis of subjective evaluation of the gray-scale ultrasound with or without the added information of color/power Doppler findings
- Performance high: Sensitivity 88-98%, Specificity 83-96%

Subjective evaluation (pattern recognition) by an experienced examiner improves specificity and is better than either CA 125 alone or mathematical logistic regression models in discriminating between benign and malignant adnexal masses

Timmerman et al, *BMJ* 2010; **341**:
c6839

Improving strategies for diagnosing ovarian cancer: a summary of the International Ovarian Tumor Analysis (IOTA) studies

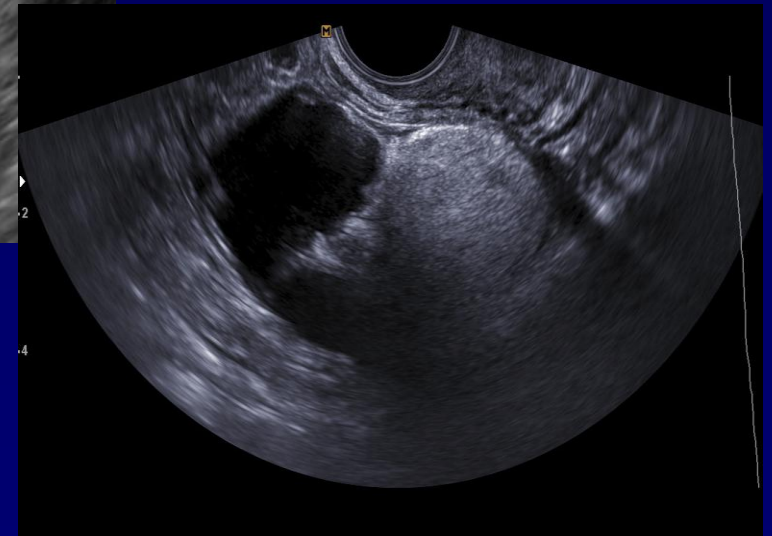
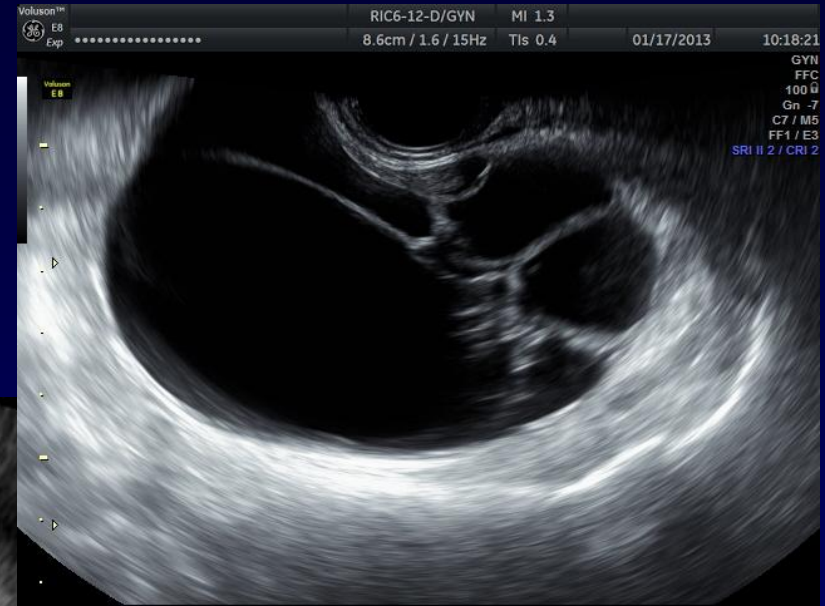
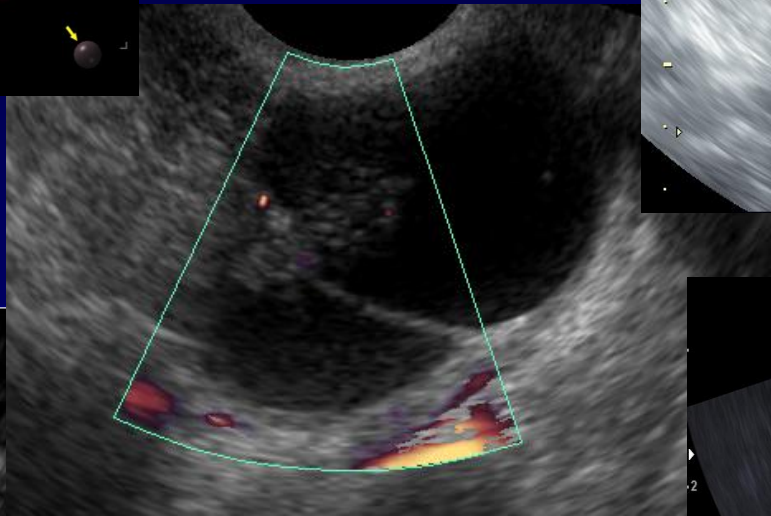
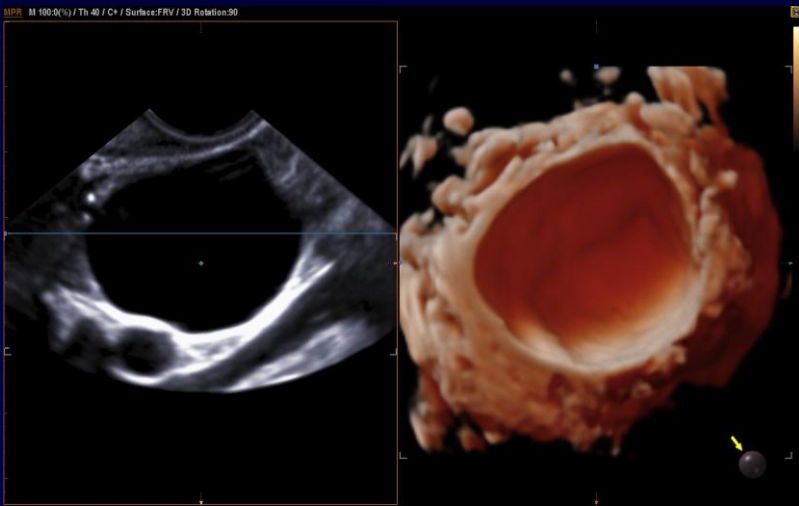
J Kaijse, T Bourne, L Valentin, A Sayasneh, C Van
Holsbeke, J Vergote, AC Testa, D Franchi, B Van
Calster and D Timmerman
Ultrasound Obstet Gynecol 2013;41:9-20

IOTA simple rules for identifying a benign or malignant tumor

- B1 Unilocular
- B2 Presence of solid components where the largest diameter < 7 mm
- B3 Presence of acoustic shadows
- B4 smooth multilocular tumor with largest diameter < 10 cm
- B5 No blood flow (color score 1)

IOTA simple rules: benign

IOTA, 2000.

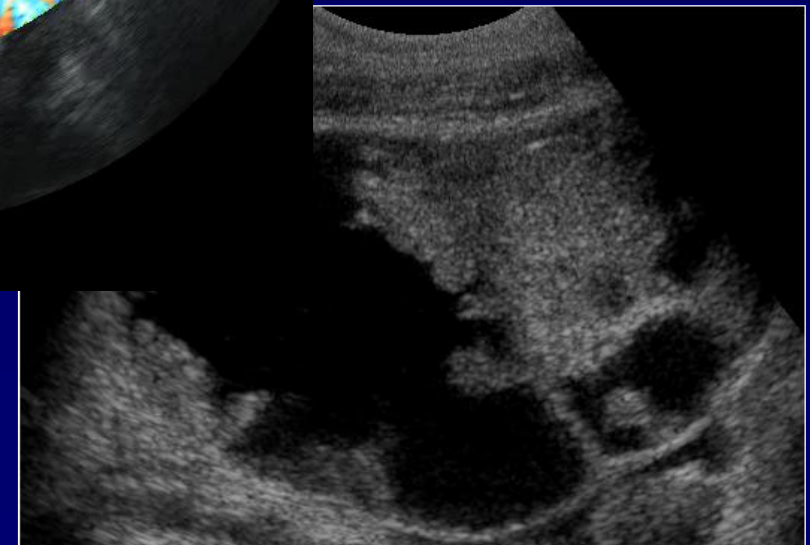
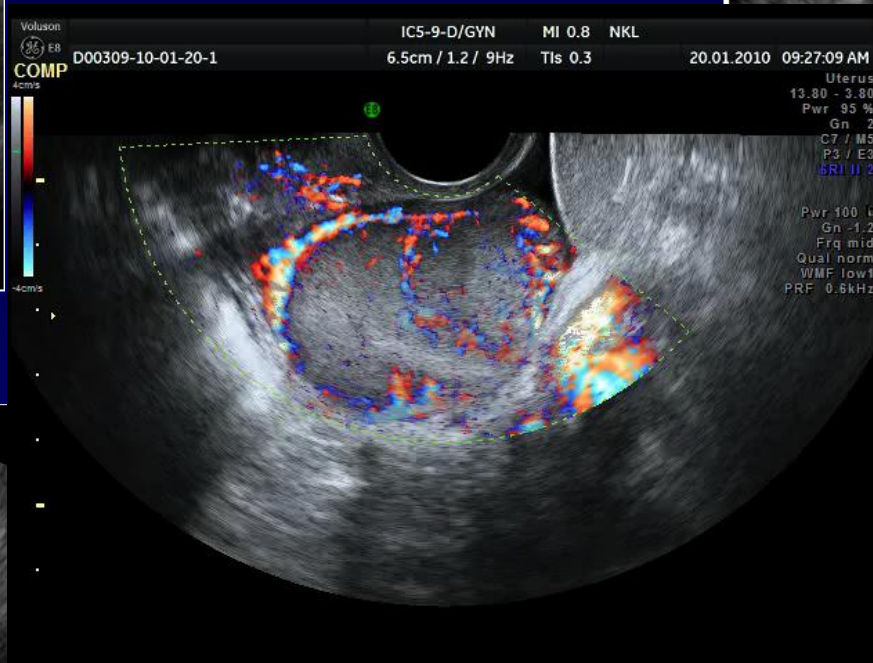
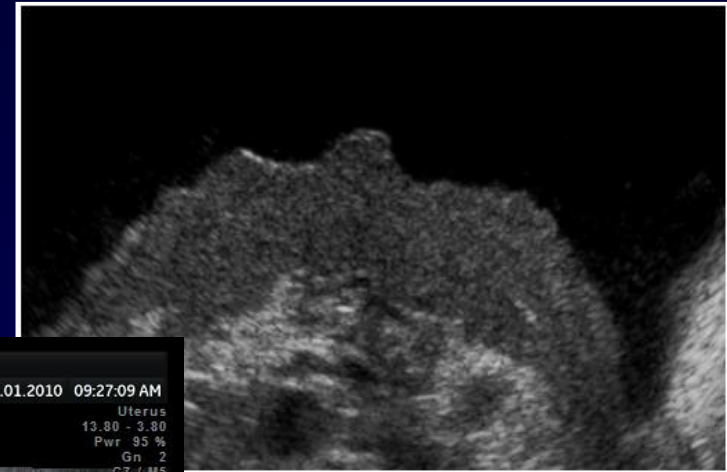
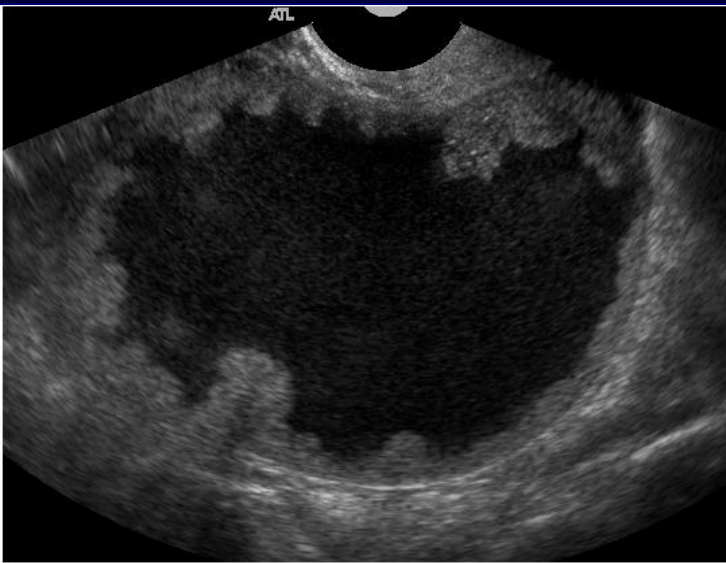


IOTA simple rules for identifying a benign or malignant tumor

- M1 Irregular solid tumor
- M2 Presence of ascites
- M3 At least 4 papillary structures
- M4 Irregular multilocular solid tumor with largest diameter >10 cm
- M5 Very strong blood flow (color score 4)

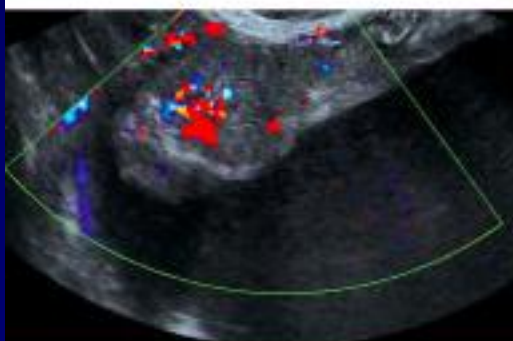
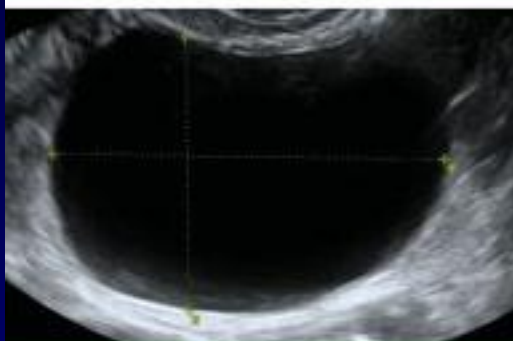
IOTA simple rules: malignant

IOTA, 2000.



Instant intuitive diagnosis: instant descriptors

- About 50% of all tumors, 98% accuracy
- Typical endometrioma
- Typical dermoid
- Large stage ovarian cancer
- Unilocular cyst < 10 cm
- Haemorrhagic cyst



IOTA simple rules for identifying a benign or malignant tumor

- **Rule 1** If one or more M-features apply in the absence of a B feature the mass is classified as malignant
- **Rule 2** If one or more B features apply in the absence of an M features the mass is classified as benign
- **Rule 3** If both M and B features or no features apply the mass cannot be classified

IOTA LR2

- Age
- Ascites
- Blood flow within a solid papillary projection
- Maximal diameter of the solid component
- Irregular internal cyst walls
- Acoustic shadows

False negatives for malignancy (IOTA)

- LR2 10% 59 (8.6%)
- Simple rules 59 (8.6%)
- RMI >200 212 (30.9%)
- CA 125 189 (27.6%)
 - N = 754-1066

Kaijser et al Ultrasound Obstet Gynecol 2013;41:9-20

IOTA 1999-2012

Over 20 centers in different countries

Largest study in the literature

- 1) Pattern recognition of the ultrasound features of an adnexal mass by an experienced clinician is the BEST way of characterizing ovarian pathology.
- 2) Papillary projections/ small proportion of solid tissue are characteristic of borderline tumors and Stage I epithelial ovarian cancer.
- 3) Serum CA 125 does not improve the diagnostic performance

IOTA recommendation 2013

- 4. “Measurements of serum CA 125 are not necessary for the characterization of ovarian pathology in premenopausal women and are unlikely to improve the performance of experienced ultrasound examiners even in post menopausal group.”

Kaijser et al Ultrasound Obstet Gynecol 2013;41:9-20

Risk of malignancy index (RMI)

.Score of 1 for multilocular cyst and 3 for cysts with solid areas, metastasis, ascites and bilaterality.

- Menopausal status: score of 1 for pre- and 3 for postmenopausal status.
- With RMI cut-off level of 200, sensitivity for ovarian cancer= 85%; Specificity= 97%.
- $RMI < 25$ = low risk (risk of cancer <3%)
- $RMI = 25-250$ moderate risk (risk of cancer 20%)
- $RMI > 250$ = high risk (risk of cancer 75%)

Four multimodality approaches to predict risk of ovarian cancer: ultrasound, CA125, menopausal status. RMI is the product of an ultrasound morphology score, CA 125 level and menopausal status. (RMI2-4 modifies original RMI criteria; RMI4 adds tumor size) Sensitivity (for early stage) 50-79% Valid in post-menopause only

About 7% of adnexal masses that are considered appropriate for surgical removal cannot be classified as benign or malignant by experienced ultrasound examiners using subjective assessment: 16% invasive Ca, 13,5% borderline, 71% benign

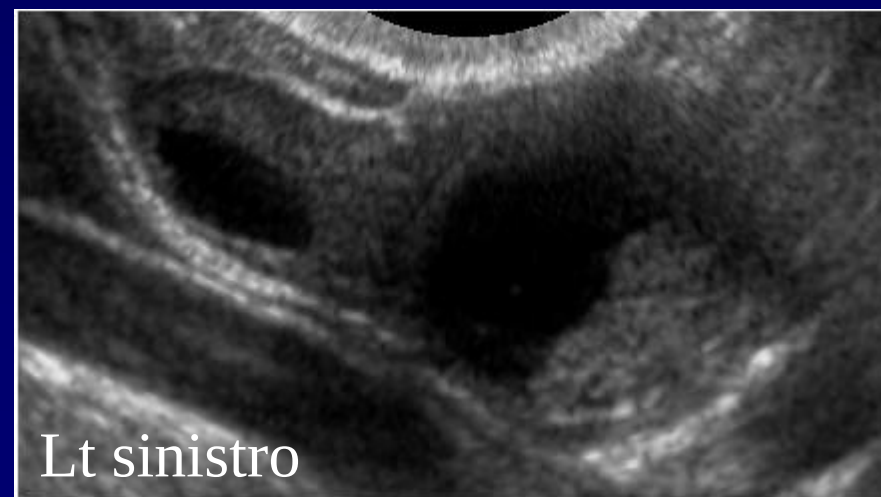
Logistic regression models to estimate the risk of malignancy, CA 125 measurements and the RMI are not helpful in these masses.

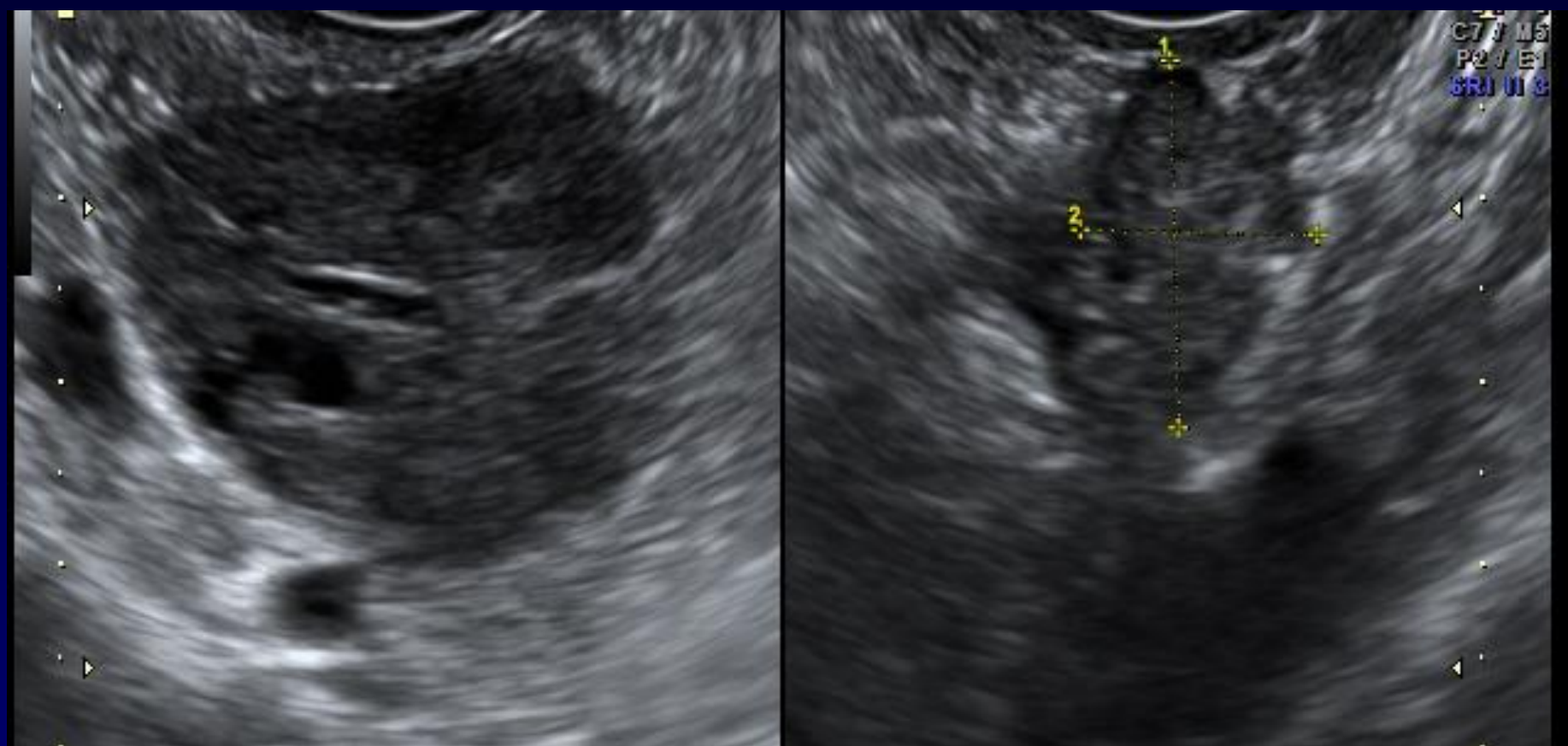
Valentin et al. : Adnexal masses difficult to classify as benign or malignant using subjective assessment of gray-scale and Doppler ultrasound findings: logistic regression models do not help. Ultrasound Obstet Gynecol. 2011 Oct;38(4):456-65

CISTOADENOCARCINOMA SIEROSO PAPILLIFERO

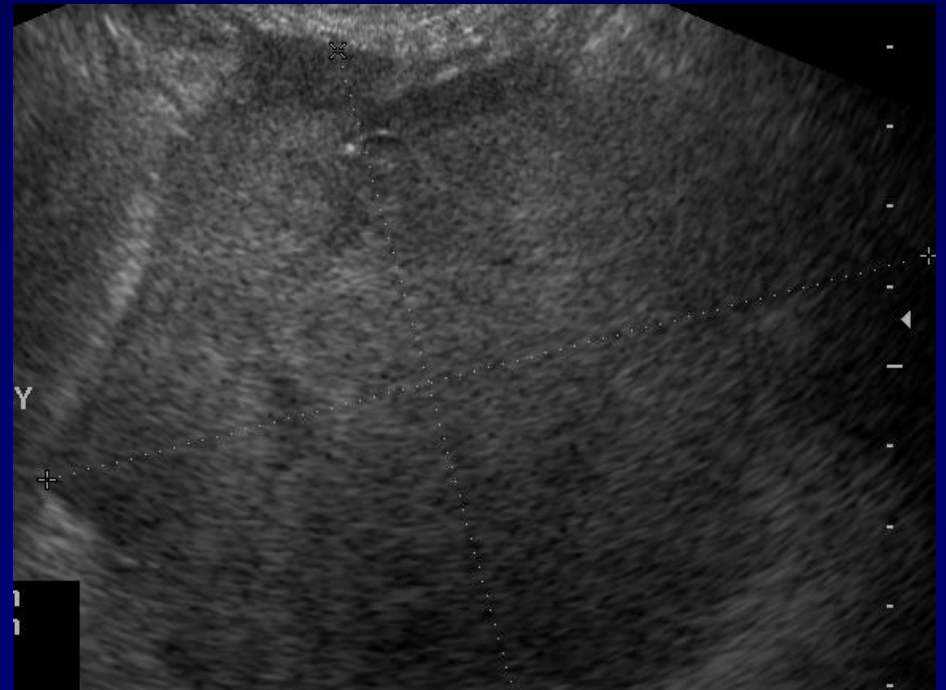
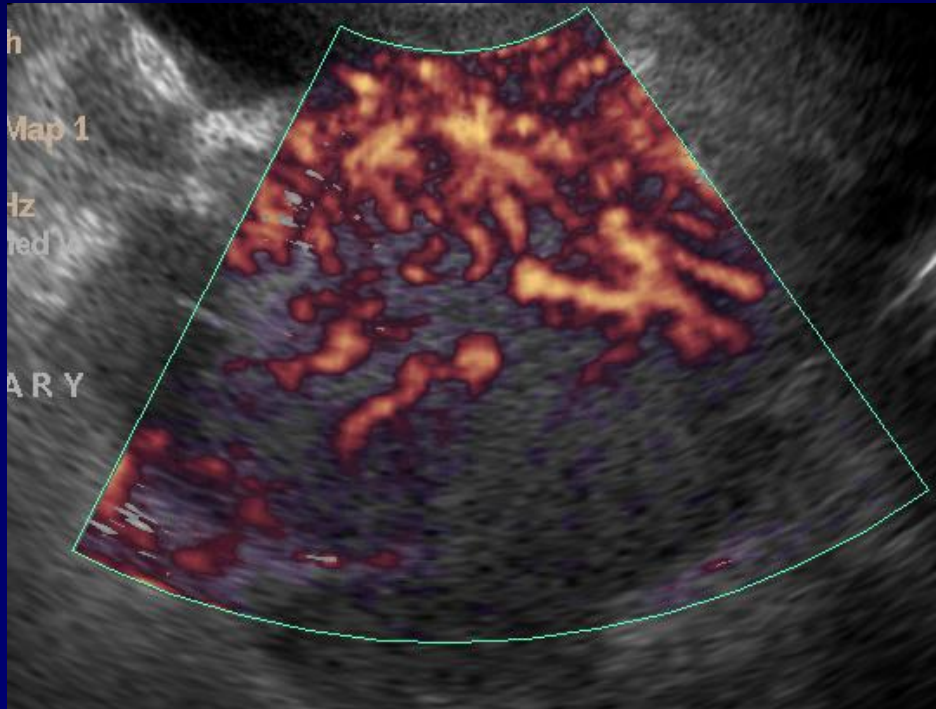
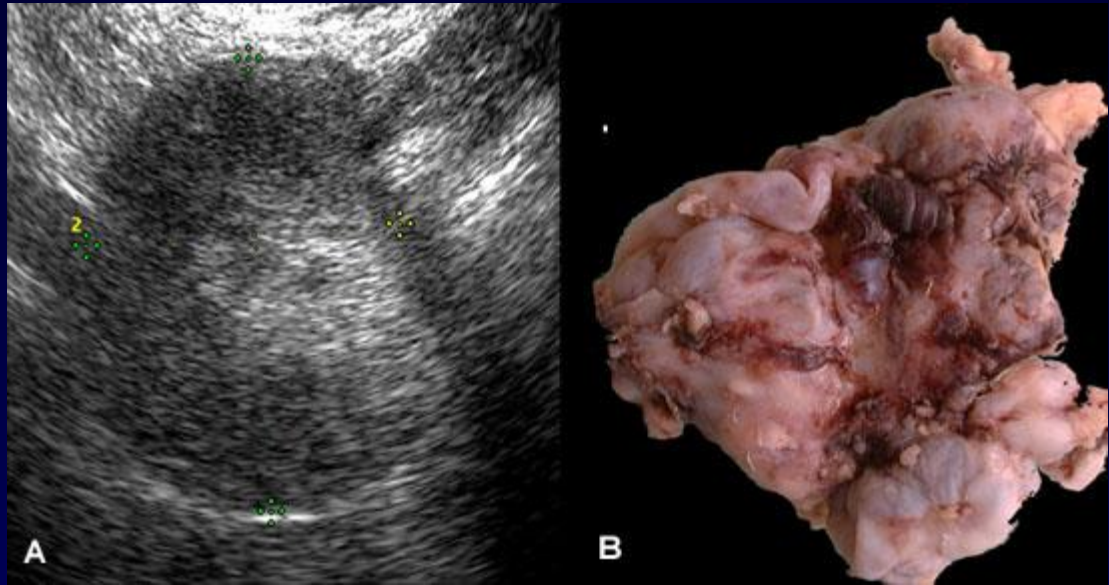


Ca 125: 27 UI/L

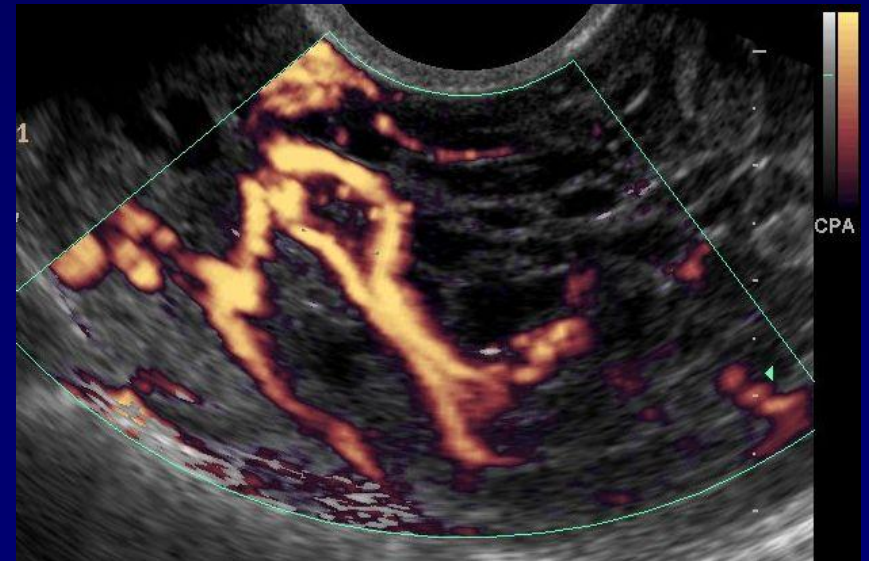
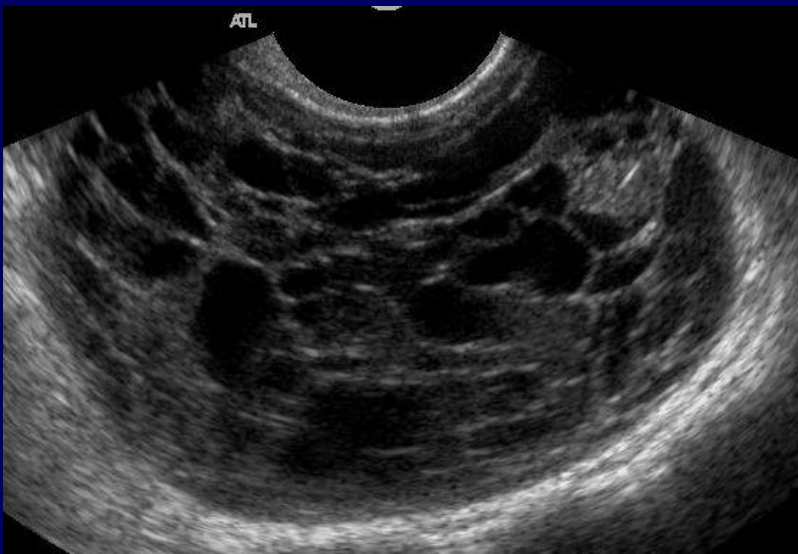
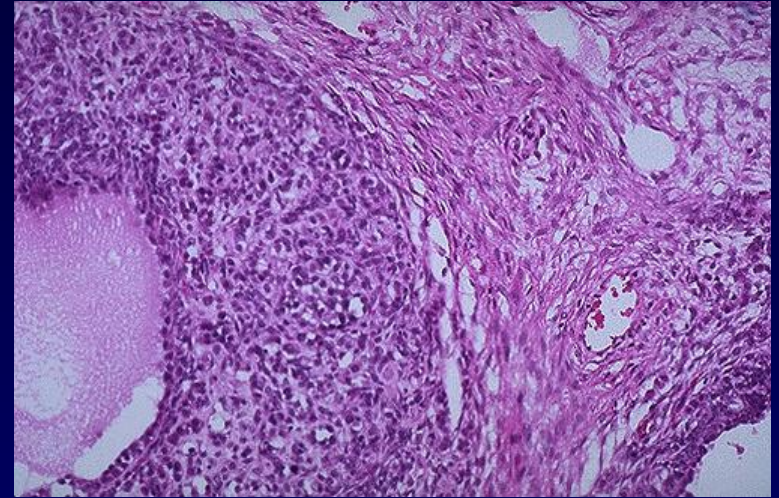




Ovarian metastasis



Granulosa cell tumors



Voluson



E8

COMP

4cm/s



-4cm/s

IC5-9-D/GYN

MI 0.8 NKL

D00309-10-01-20-1

6.5cm / 1.2 / 9Hz

TIs 0.3

20.01.2010 09:27:09 AM

Uterus

13.80 - 3.80

Pwr 95 %

Gn 2

C7 / M5

P3 / E3

ERI II 2

Pwr 100 %

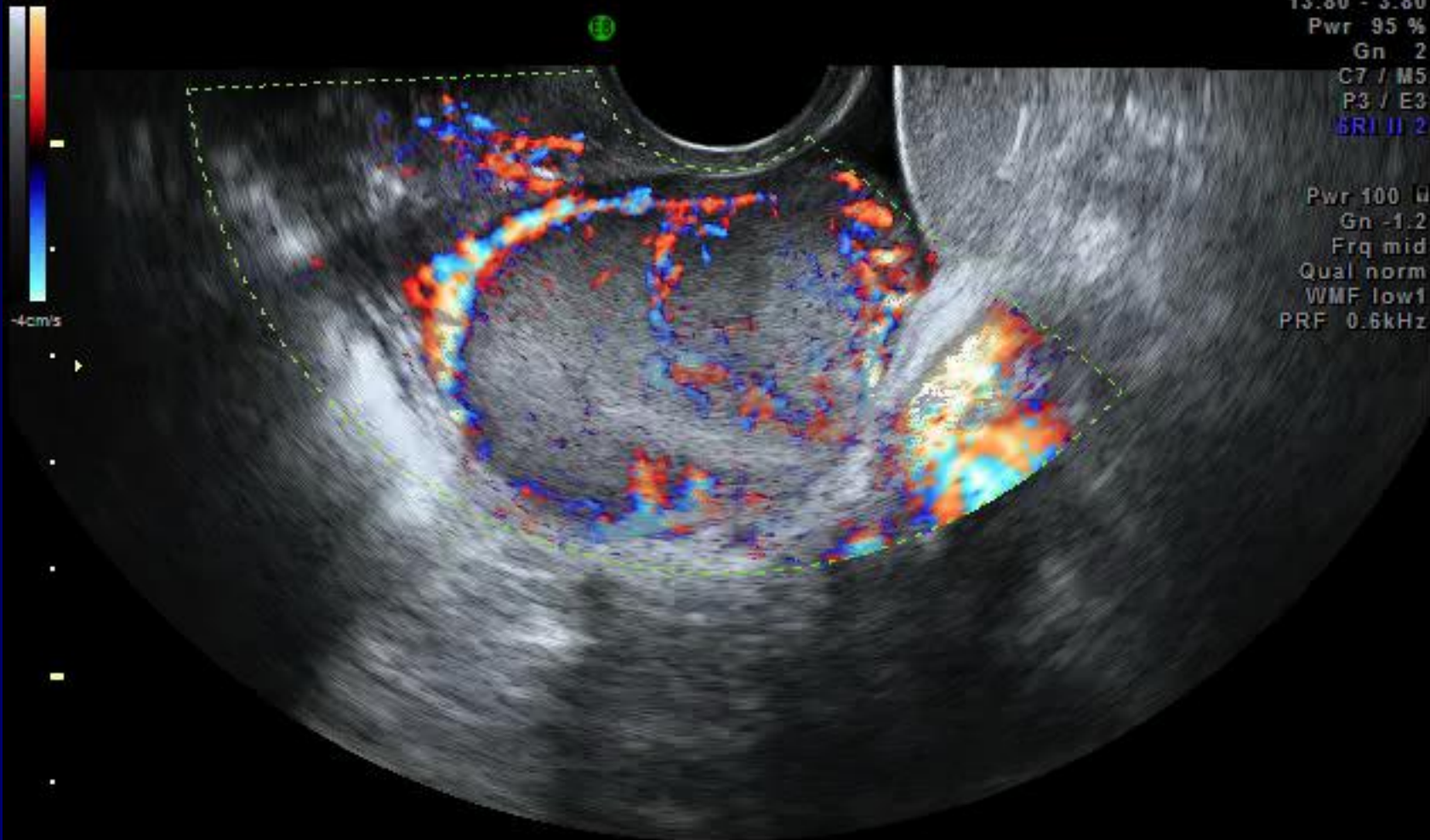
Gn -1.2

Frq mid

Qual norm

WMF low1

PRF 0.6kHz



- Human Epididymis 4 (HE4)
- Risk of malignancy algorithm (ROMA): CA125 + HE4
- Premenopause: specificity=75%; sensitivity=76%
- Postmenopause: specificity=75% ;sensitivity=92%

ROMA not better than CA125 in detecting malignancy

A comparison between an ultrasound based prediction model (LR2) and the Risk of Ovarian Malignancy Algorithm (ROMA) to assess the risk of malignancy in women with an adnexal mass

Jeroen Kaijser Toon Van Gorp , Kirsten Van Hoorde , Caroline Van Holsbeke , Ahmad Sayasneh, Ignace Vergote , Tom Bourne , Dirk Timmerman, Ben Van Calster

Gynecologic Oncology 129 (2013) 377–383

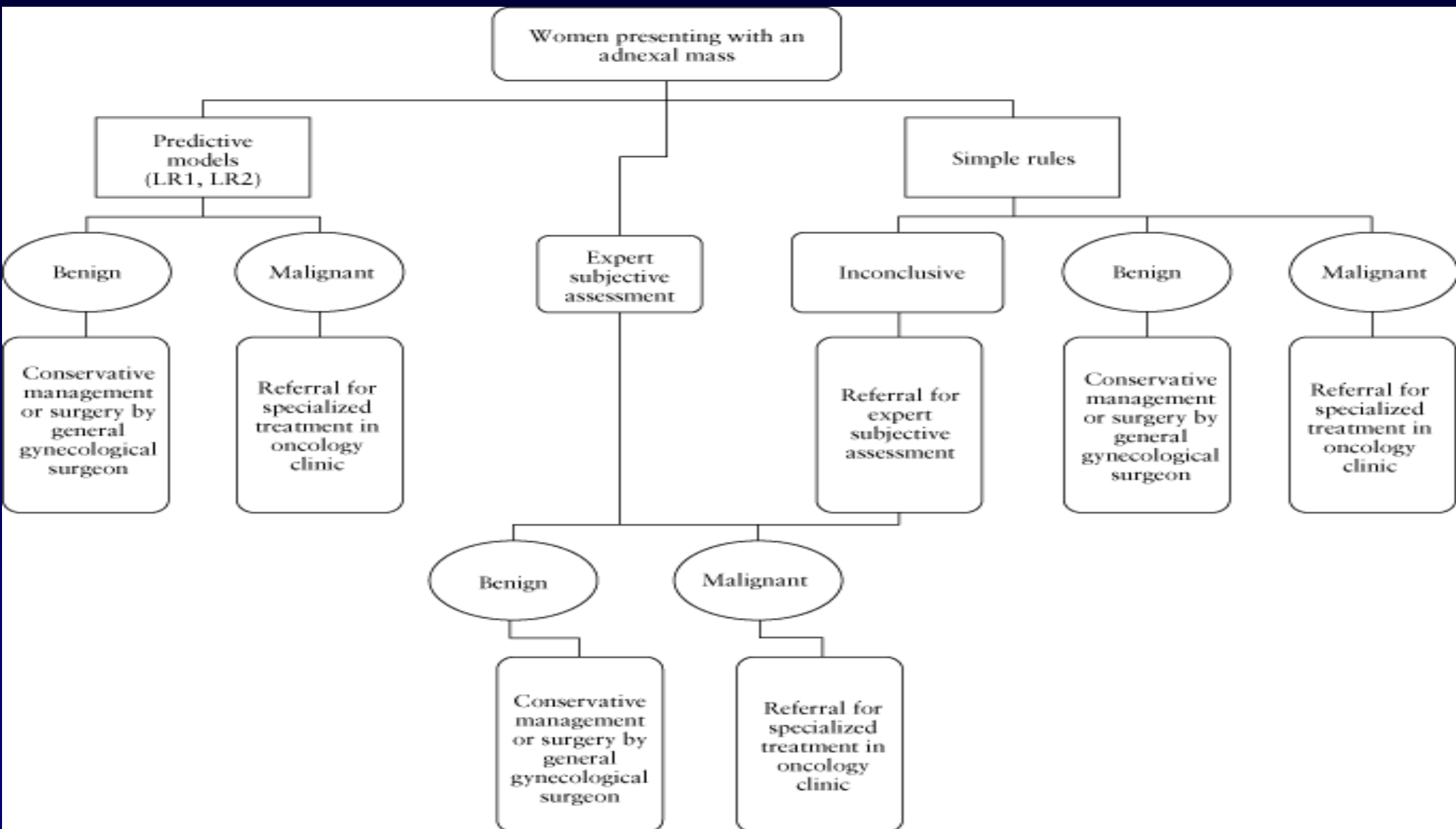
Table 2

Test performance of LR2 and ROMA stratified for menopausal status using their original cut off levels.

Prediction model	Sensitivity(%)	Specificity(%)	LR+	LR–
LR2				
all	93.8	81.9	5.19	0.08
Premenopausal	94.7	88.9	8.53	0.06
Postmenopausal	93.4	70.4	3.15	0.09
ROMA				
all	84.0	80.0	4.22	0.20
Premenopausal	65.8	88.1	5.55	0.39
Postmenopausal	90.6	66.7	2.72	0.14

Abbreviations: LR2: logistic regression model LR2; ROMA: risk of ovarian malignancy algorithm; LR+: positive likelihood ratio; LR–: negative likelihood ratio; DOR: diagnostic odds ratio; AUC: area under receiver operator curve.
a Cut off LR2: 10%; Cut off ROMA: ≥12.5% (premenopausal), ≥14.4% (postmenopausal).

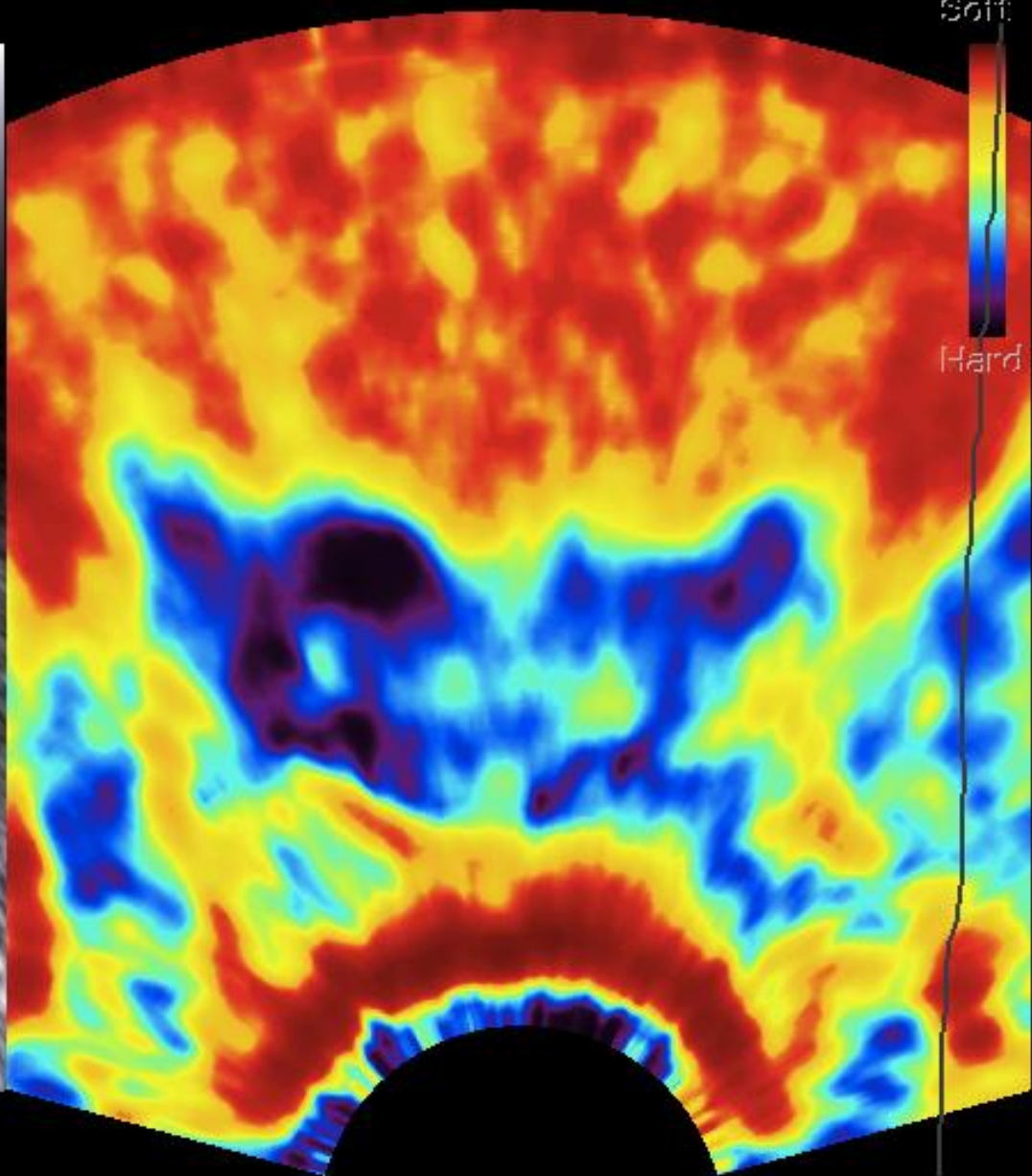
Evaluation of an adnexal mass: IOTA 2013



IOTA algorithms are to be used to triage women for surgery once a decision to operate has been made. All the current algorithms are based on women with ovarian masses who were scheduled for surgery after an expert has already made the subjective decision, based on a prior scan, to schedule the patient for surgery. There is no information as to what percentage of women with masses was triaged for expectant management or as to the outcomes of this group of women.

[2D] G50/94dB/FA9/L90/6.8MHz/FSI 1

5



SRF

Soft

Hard

Ovarian cancer

Pelvic Floor Competence Center Charité – PF3C

