Vaginaler Ultraschall im Praxisalltag

Dr. med. Rebekka Leist

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Zentrum für Reproduktionsmedizin
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München

Vaginaler Ultraschall

Theorie

Anatomie

Stimulation

Schwangerschaft

Pathologie

weitere Anwendung(smöglichkeit)en

Theorie

Keine Angst vor . . . **Physik**

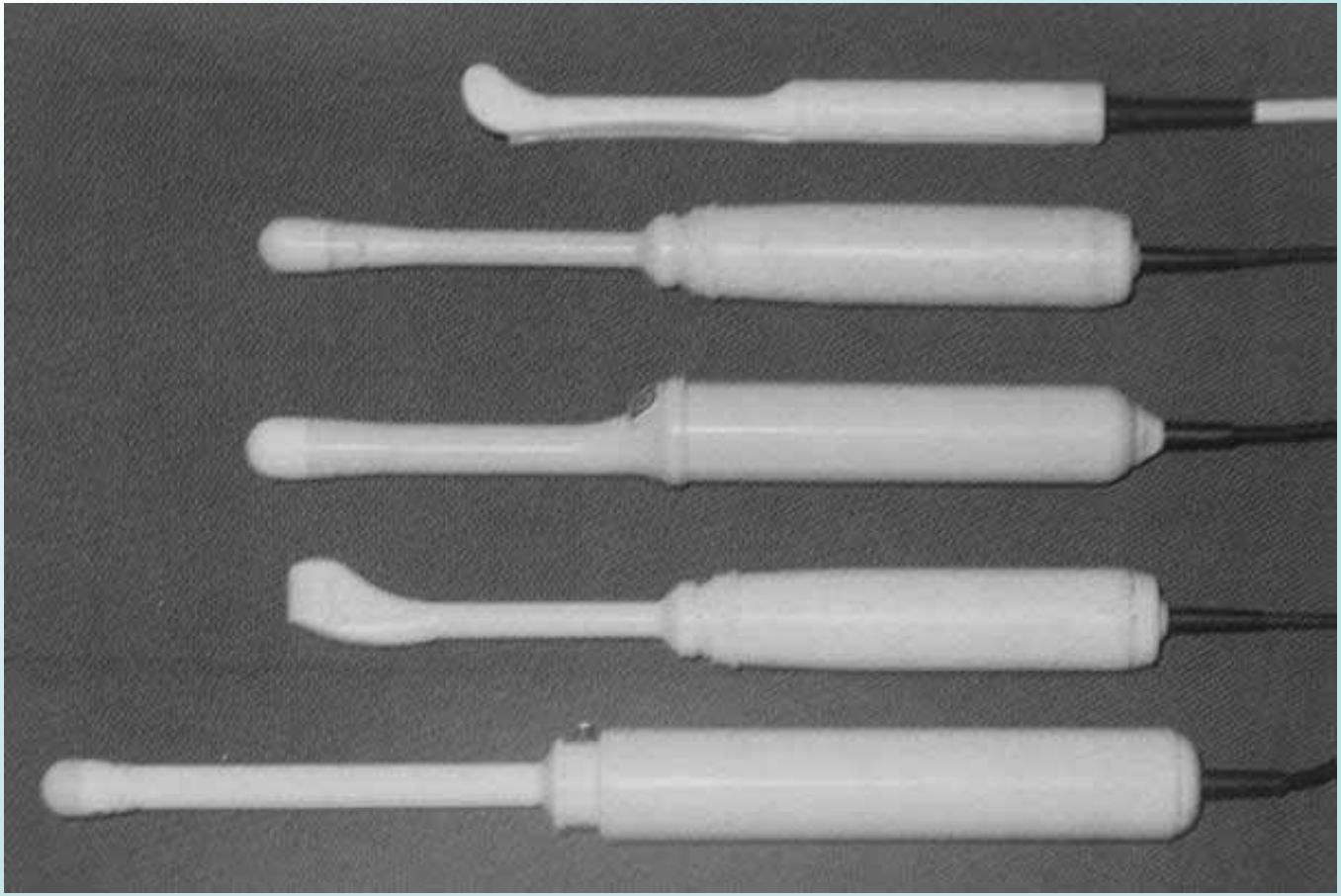
A - Mode

B - Mode

(Farb-) Doppler

Voluson 730

Vaginale Ultraschall - Sonden

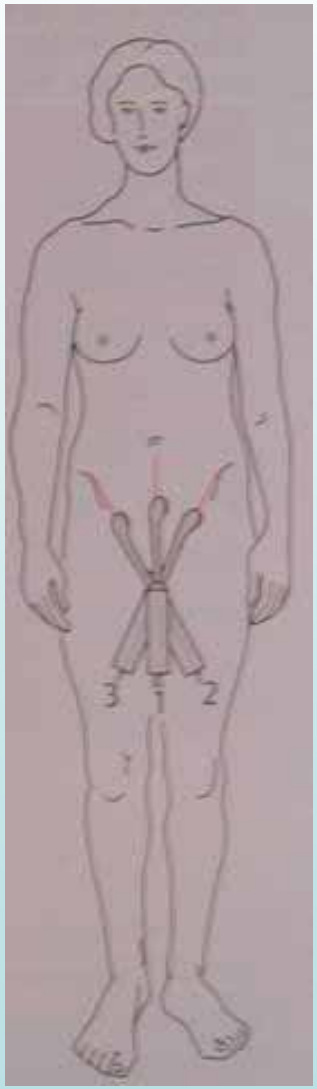


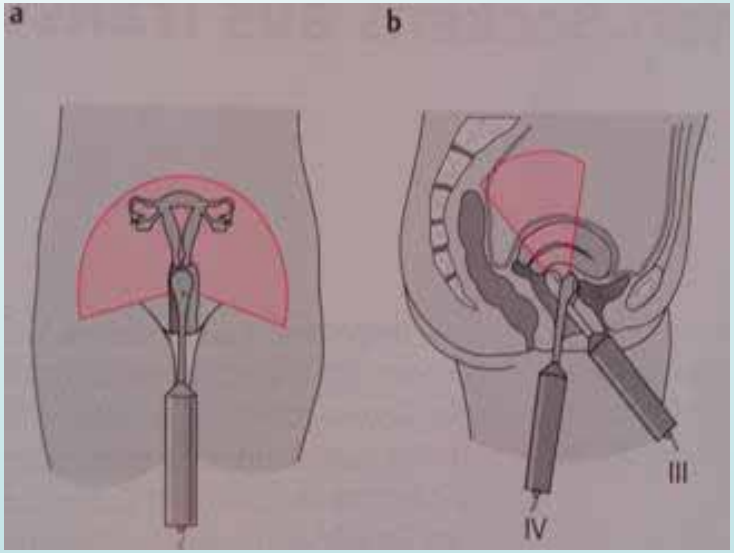
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

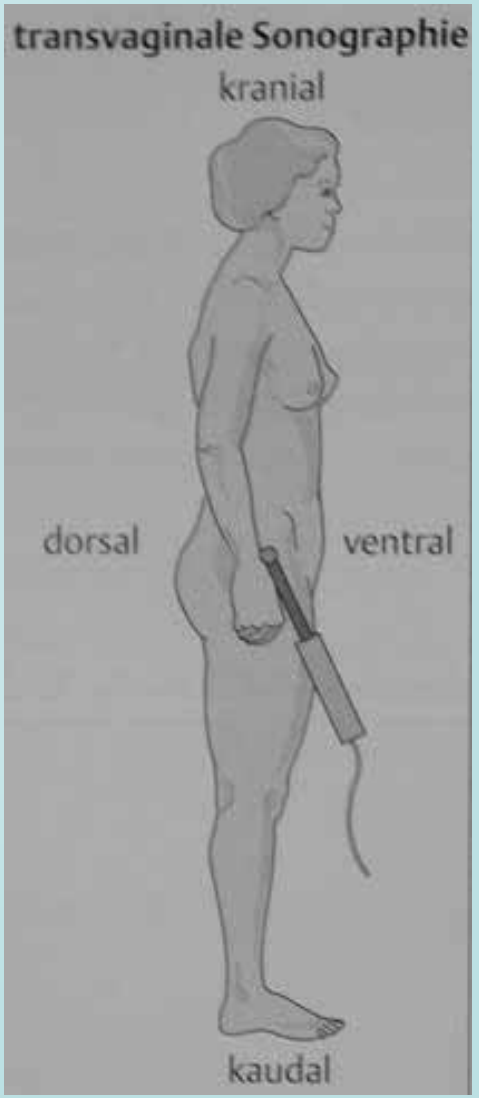
verschiedene US - Ebenen

oder: wie kommt man von 3 Dimensionen

auf 2 Dimensionen ???







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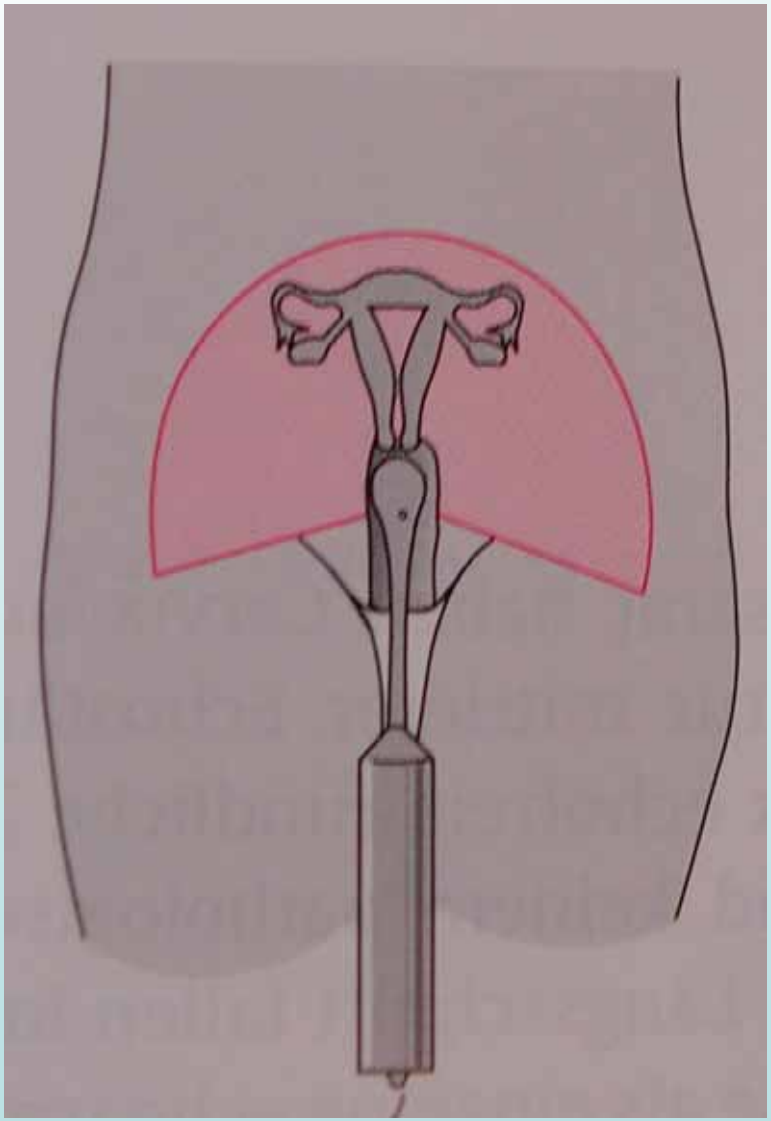
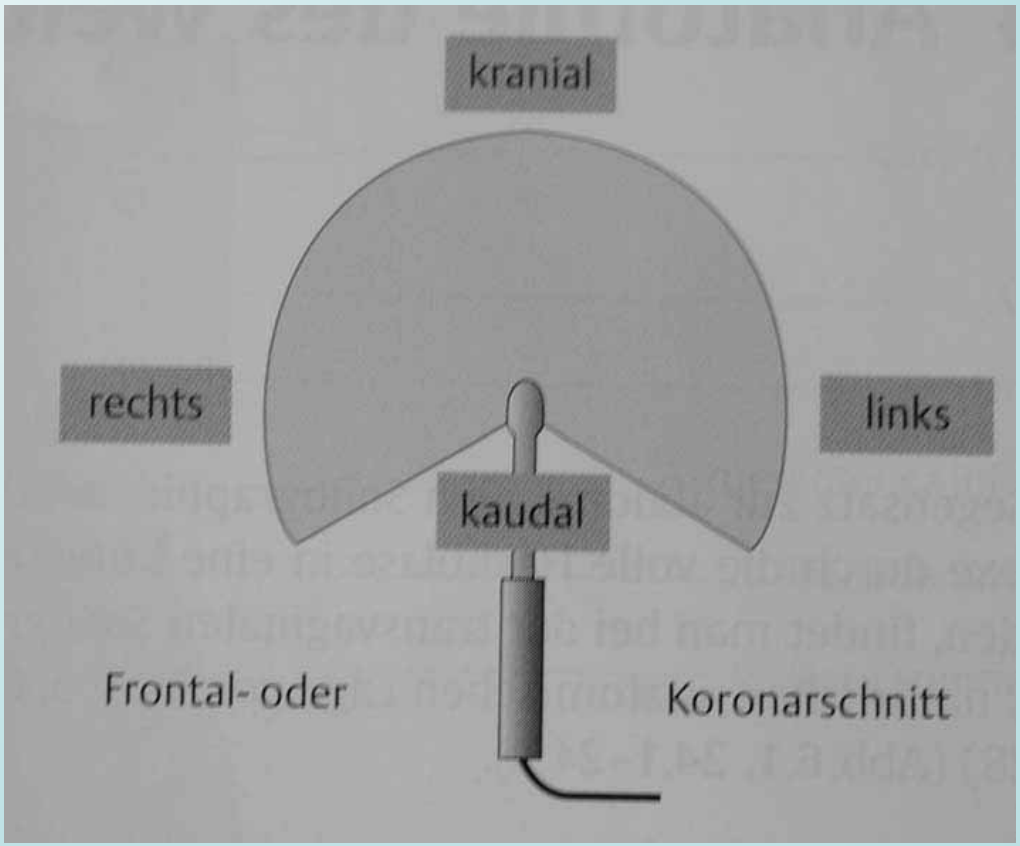
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

verschiedene US - Ebenen

Frontalschnitt





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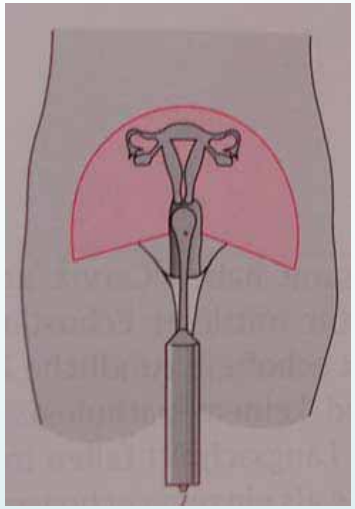
verschiedene US - Ebenen



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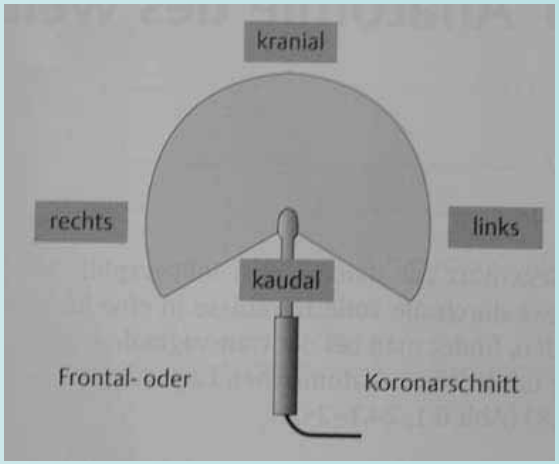
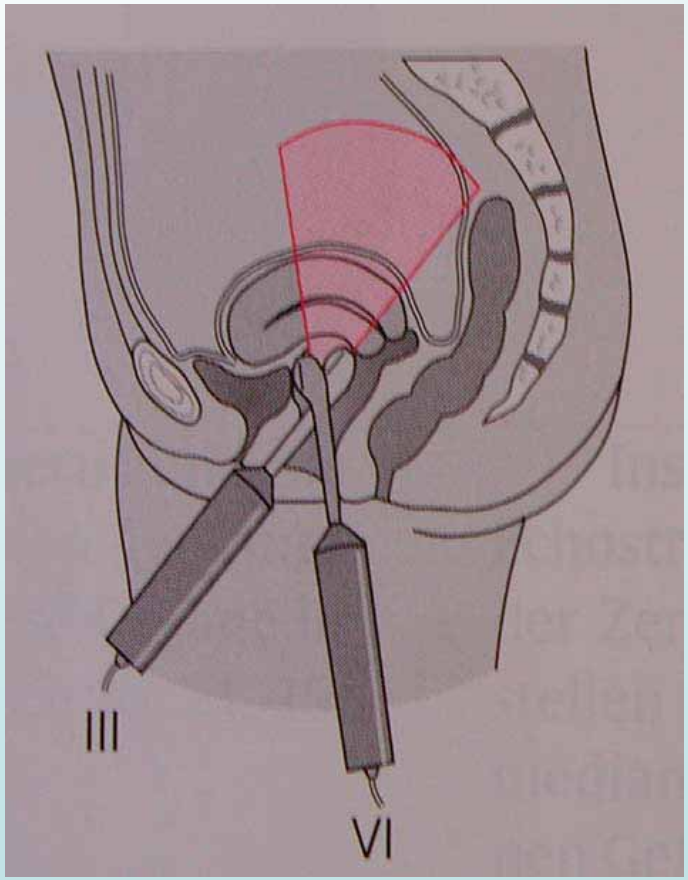
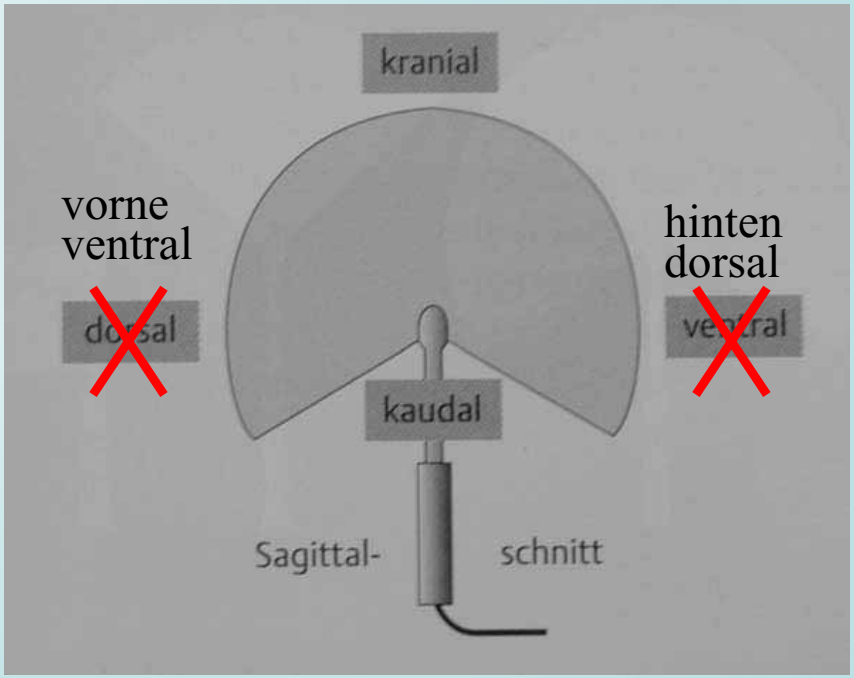


März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

verschiedene US - Ebenen

Sagittalschnitt





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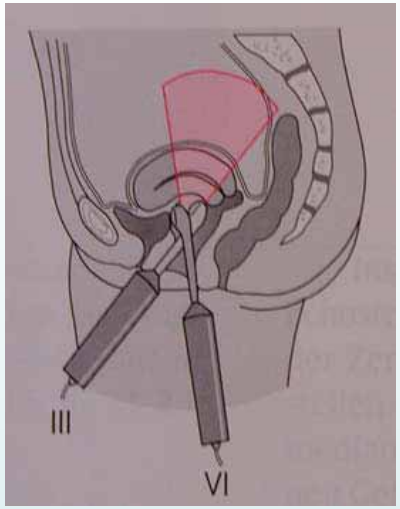
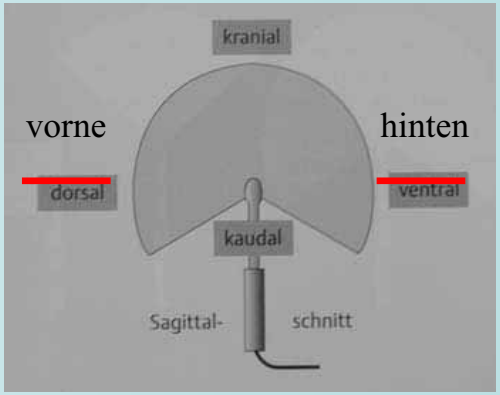
verschiedene US - Ebenen

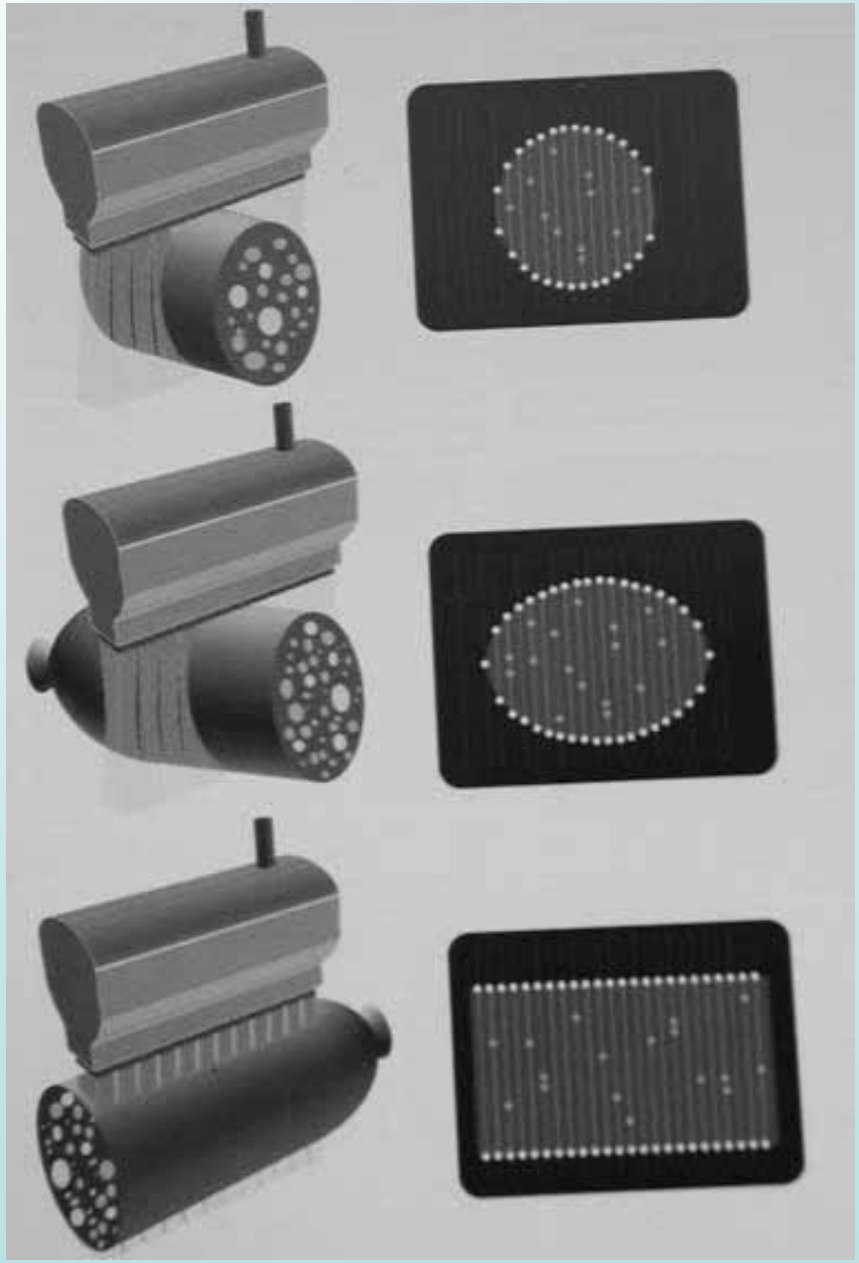
Sagittalschnitt





verschiedene US - Ebenen

Schallwinkel



Vaginaler Ultraschall

Theorie

Anatomie

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weitere Anwendung(smöglichkeit)en

Anatomie

Uterus	Corpus	Gebärmutterkörper
	Endometrium	Schleimhaut
	Cervix	Gebärmutterhals

Ovar

PCO (**p**oly**c**ystische **O**varien)

Corpus luteum Gelbkörper

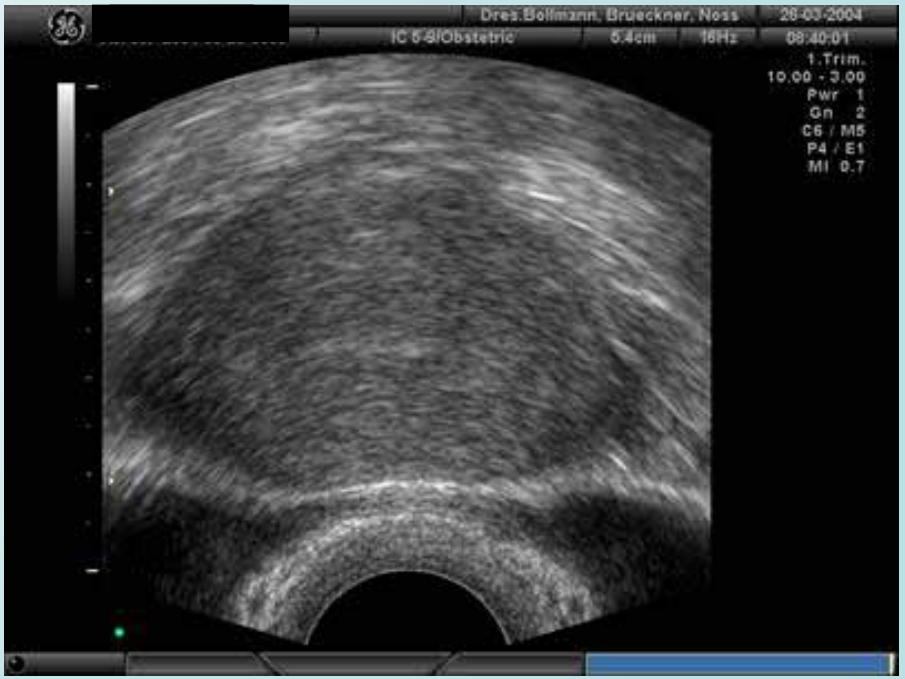
Blase

Douglas

Follikelreifung zyklische Veränderungen

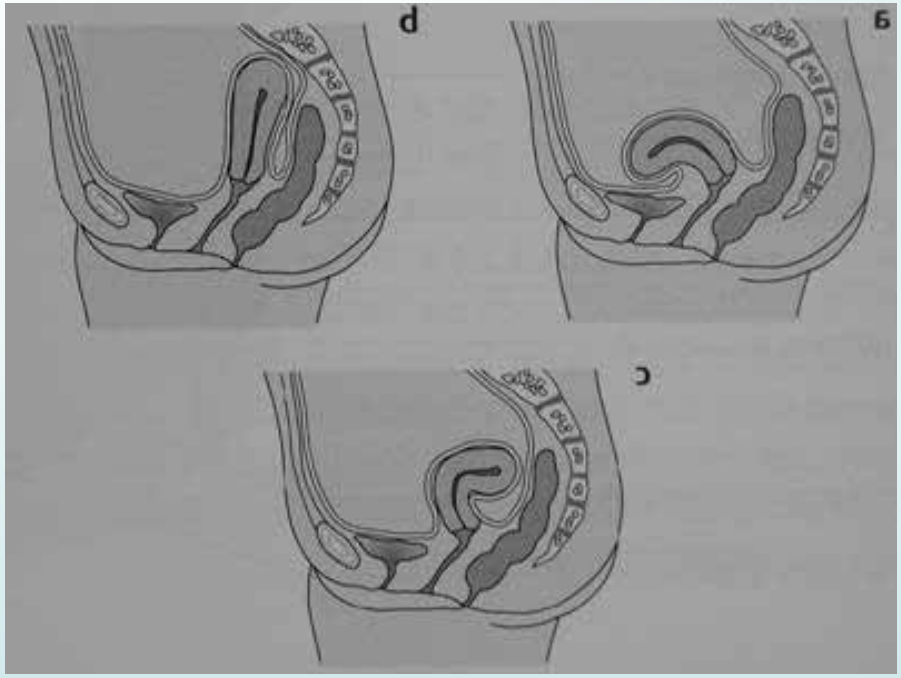
Uterus - Gebärmutter

bis 80 cm lang + bis 40 cm breit



Uterus - Gebärmutter

Uterus - Gebärmutter



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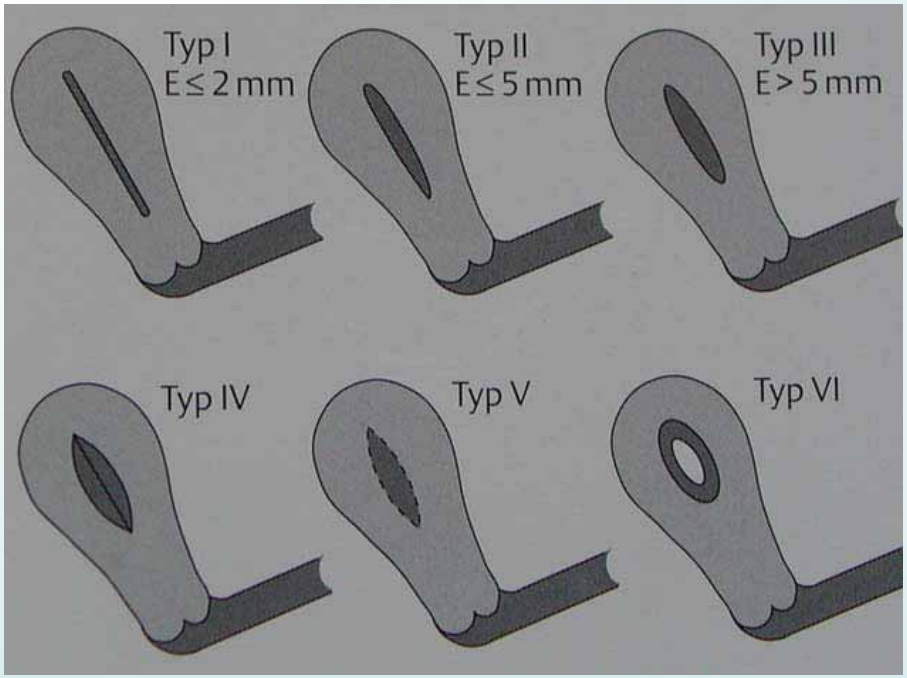
Endometrium - Gebärmutterschleimhaut



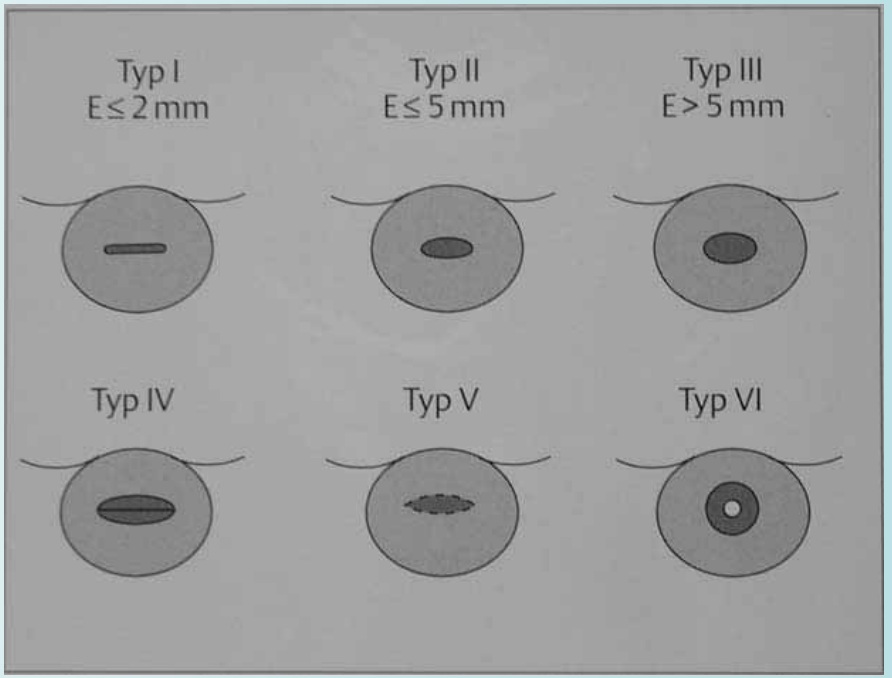


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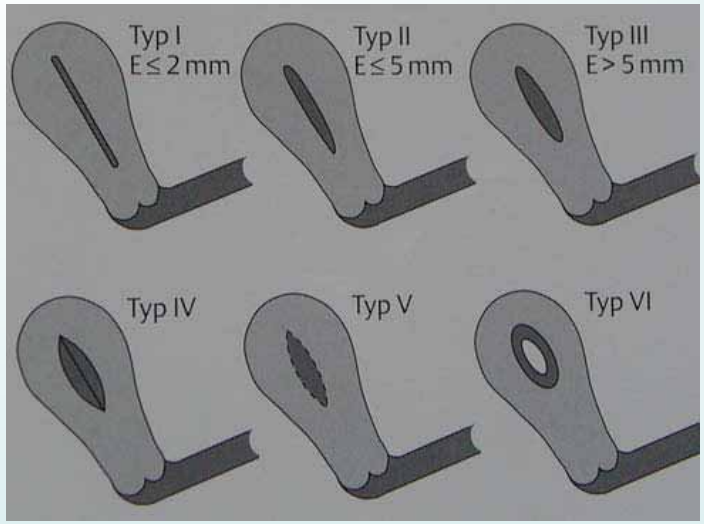
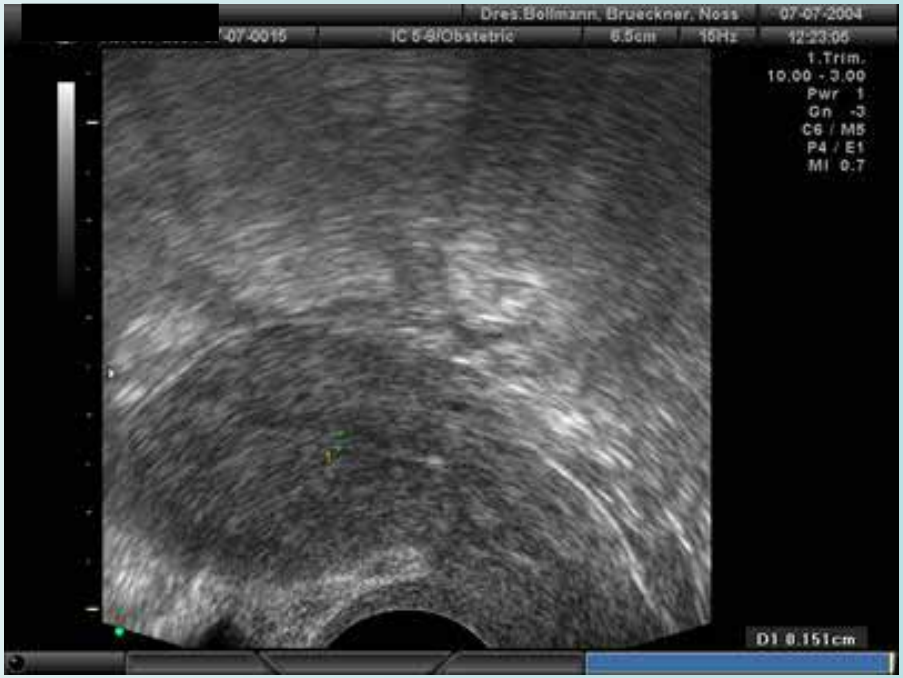
Tabelle 25.1 Endometriumtypen während der ersten Zyklushälfte (nach Bald u. Hackelöer [4])

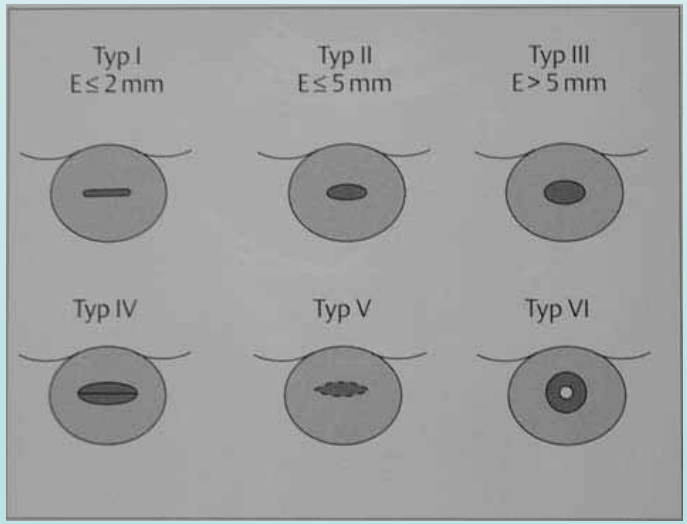
Typ I	dünnes, strichförmiges Endometrium ≤ 2 mm
Typ II	Endometrium 3–5 mm
Typ III	Endometrium > 5 mm
Typ IV	Endometrium mit hyperreflektivem Randsaum und hyperreflektivem Mittelecho bei sonst echoarmer Funktionalis
Typ V	Endometrium ähnlich Typ IV, weitere Abnahme des hyperreflektiven Randsaumes und des hyperreflektiven Mittelechos
Typ VI	auffällige echoreiche Ringstruktur

Endometrium - Gebärmutterschleimhaut

„Bald“ Typ I







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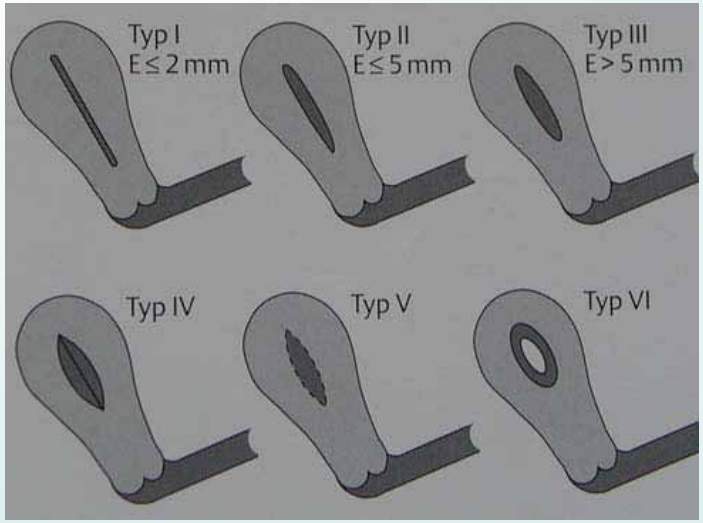
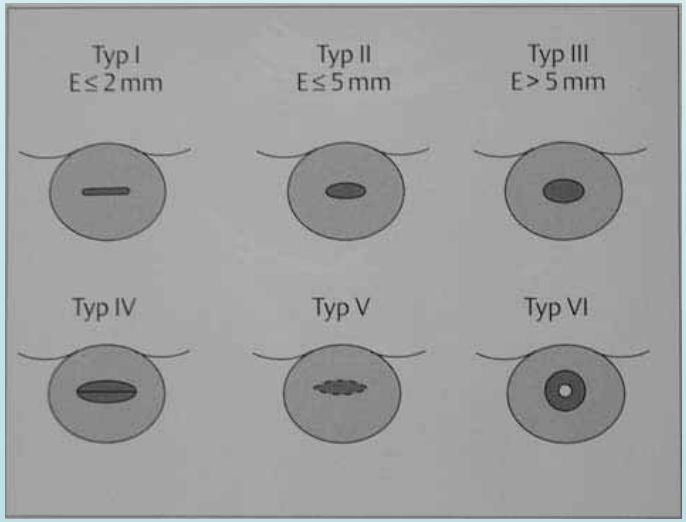
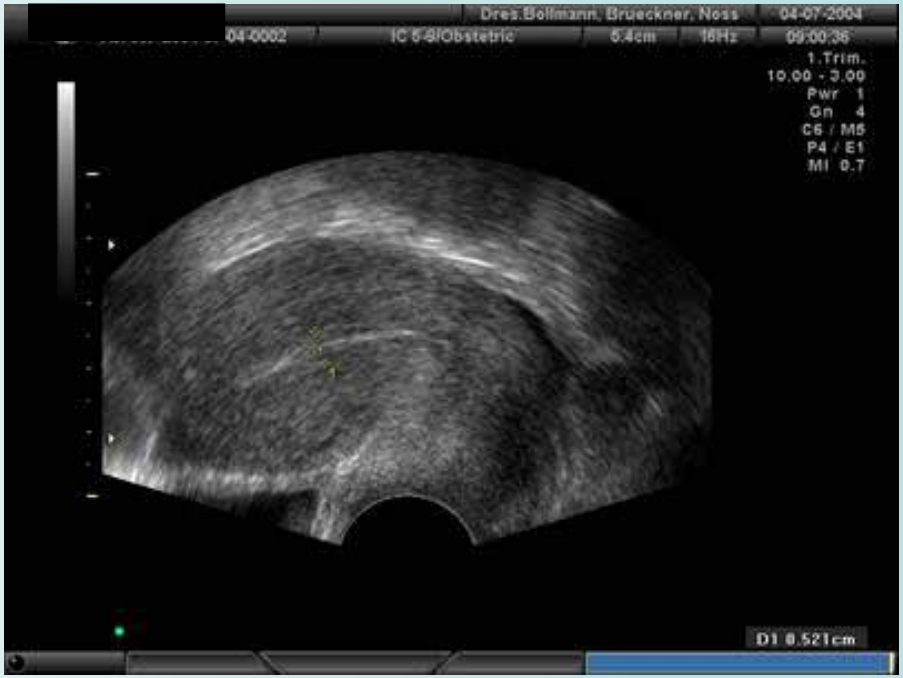
Endometrium - Gebärmutterschleimhaut

„Bald“ Typ II

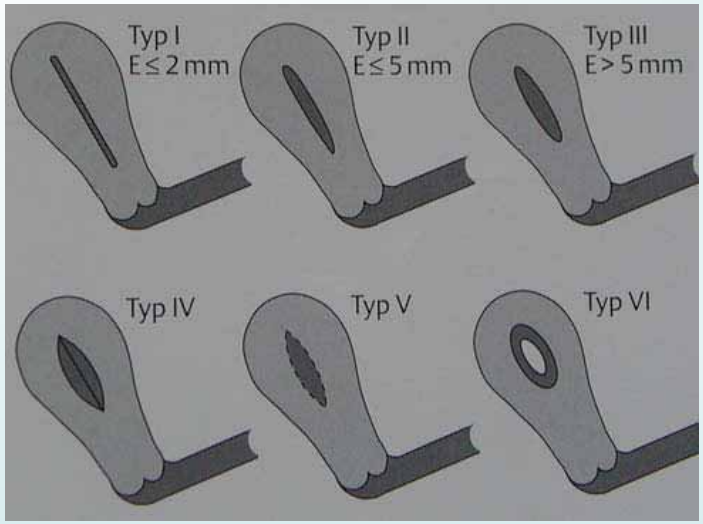


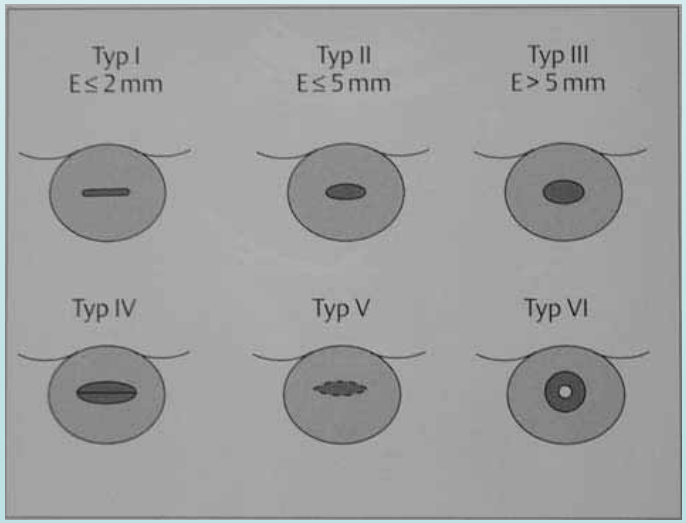




Endometrium - Gebärmutterschleimhaut

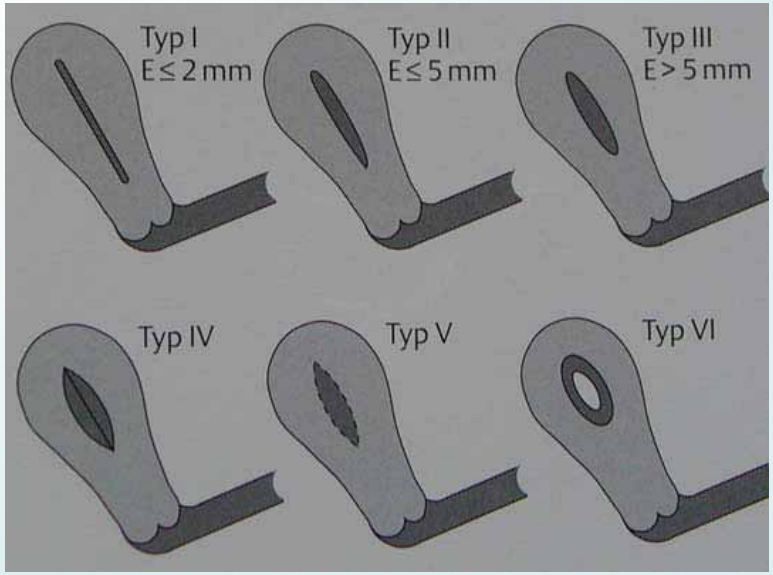
„Bald“ Typ II

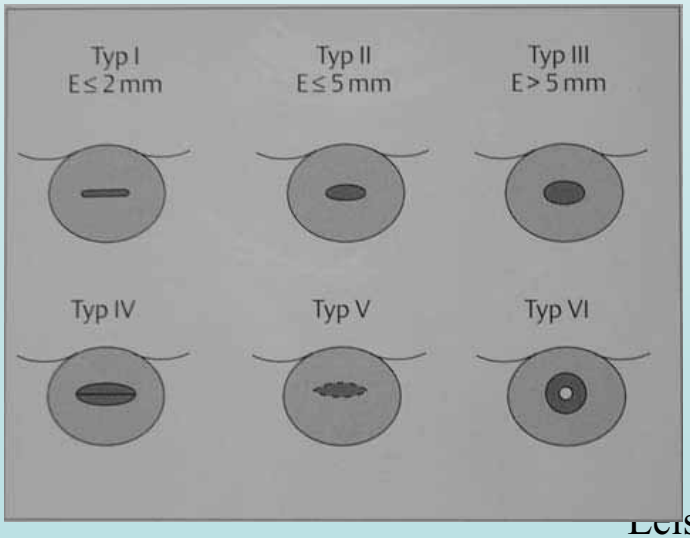




Endometrium - Gebärmutterschleimhaut

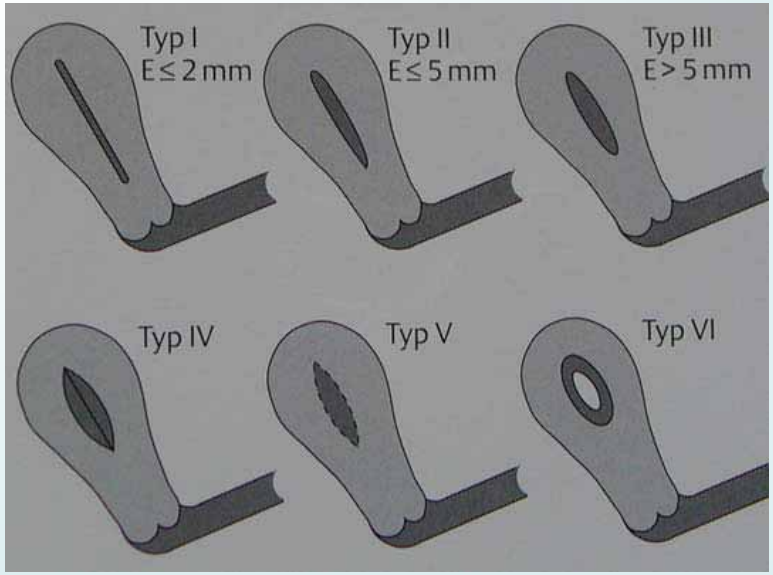
„Bald“ Typ IV

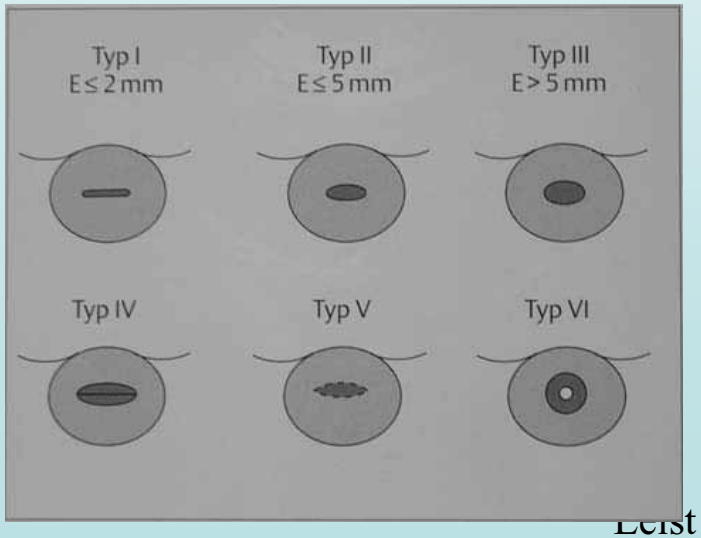




Endometrium - Gebärmutterschleimhaut

„Bald“ Typ IV





Endometrium - Gebärmutterschleimhaut

„Bald“ Typ IV

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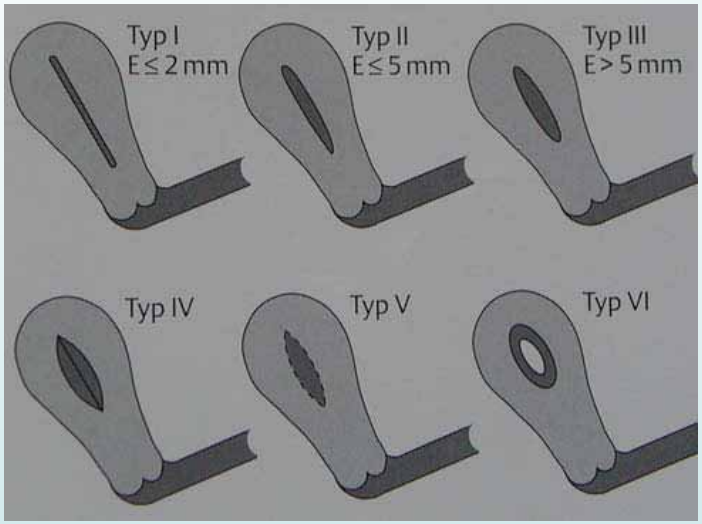
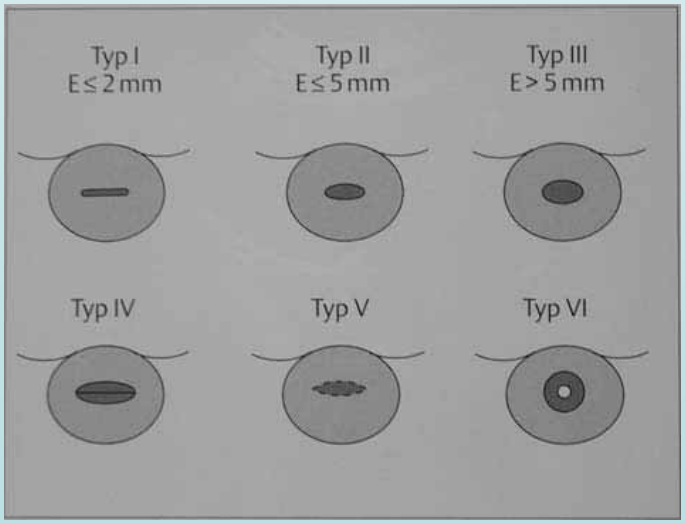
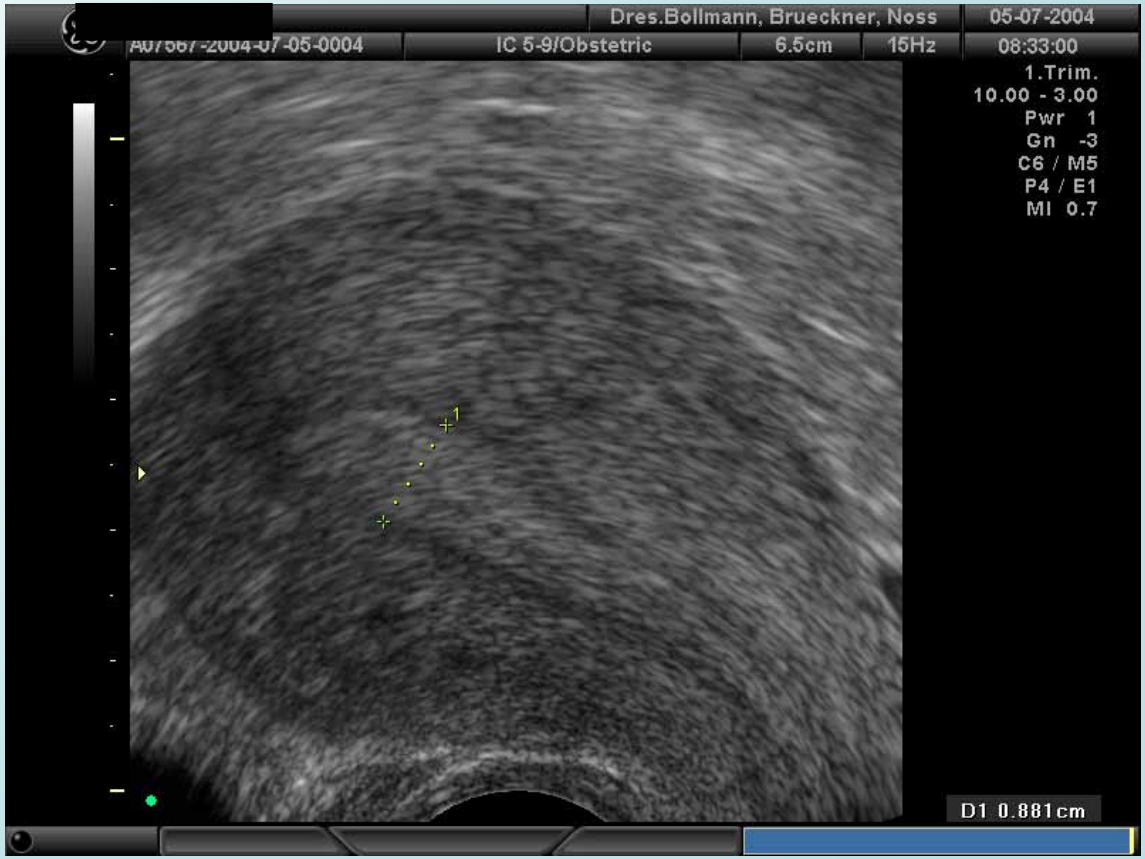
Endometrium - Gebärmutterschleimhaut

„Bald“ Typ V

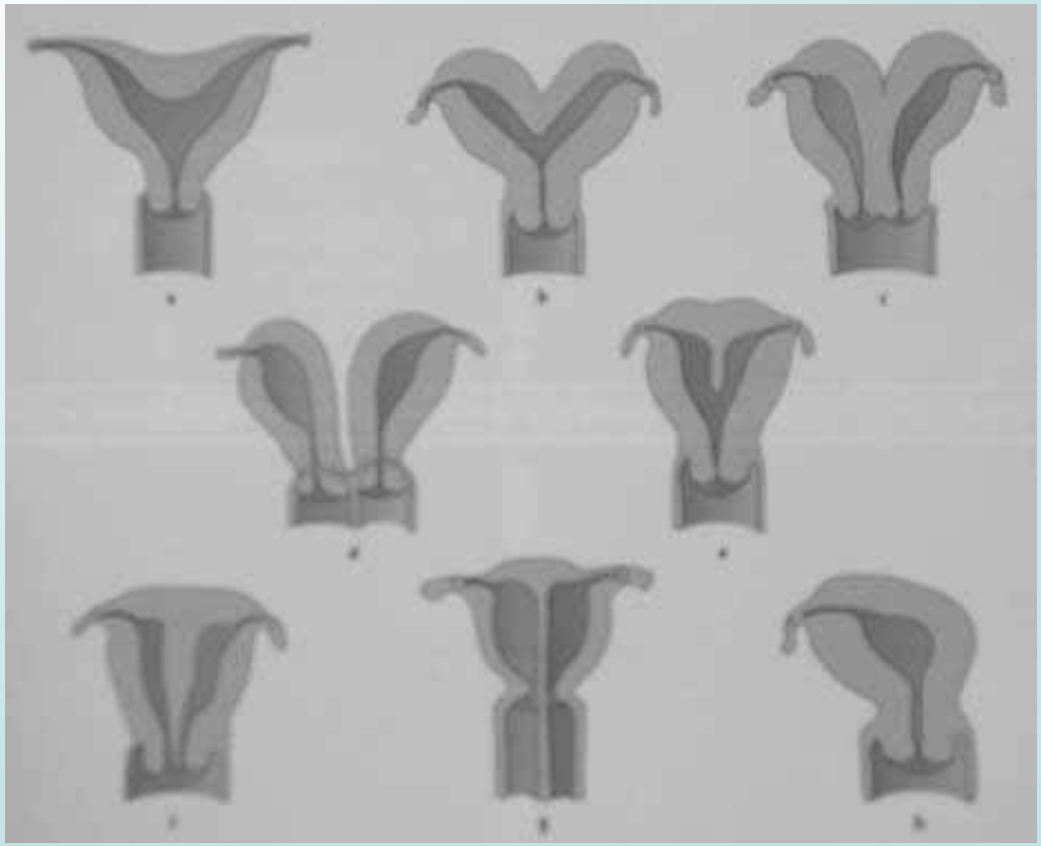






Cervix - Gebärmutterhals

Uterus Fehlbildungen



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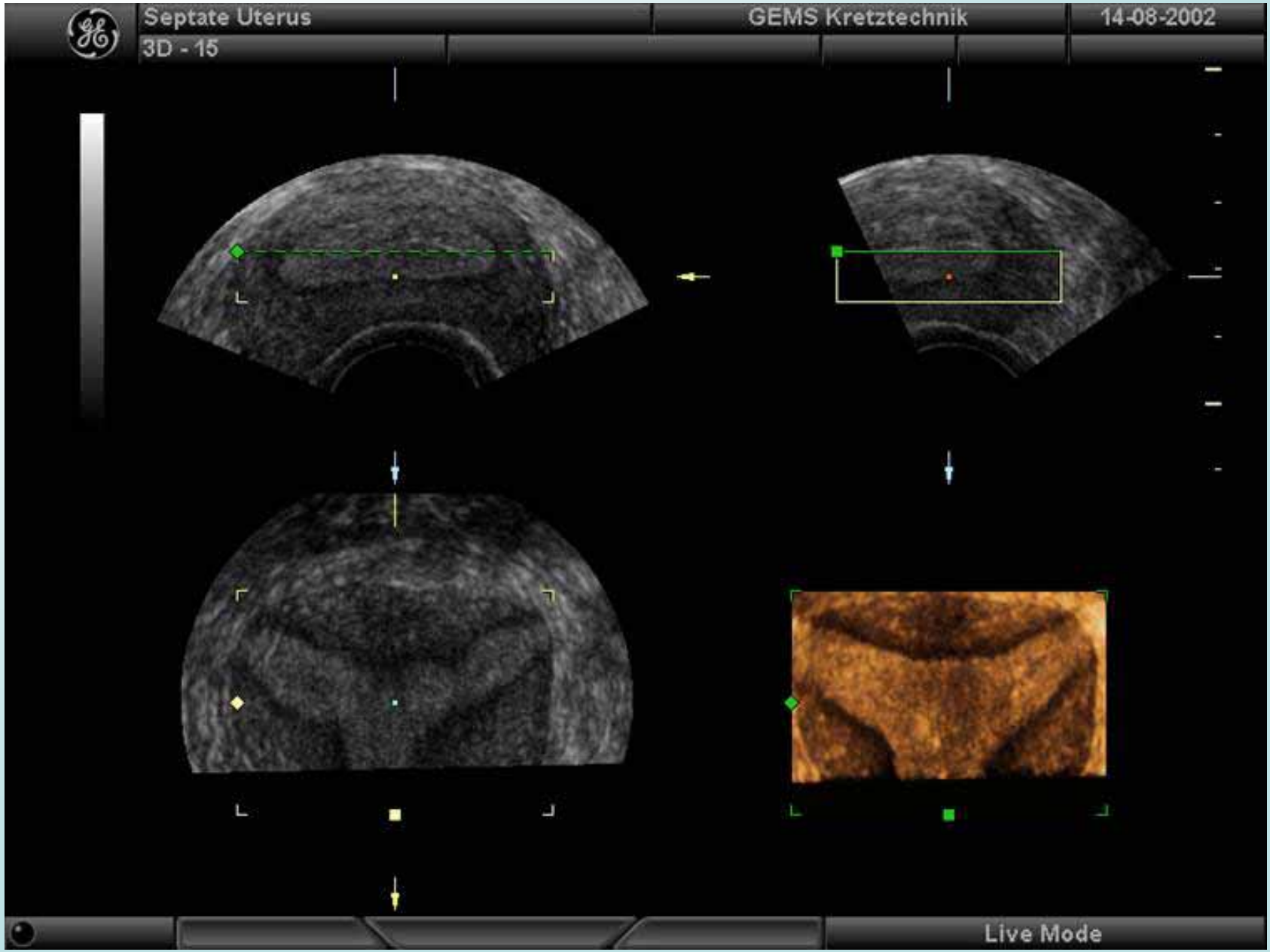
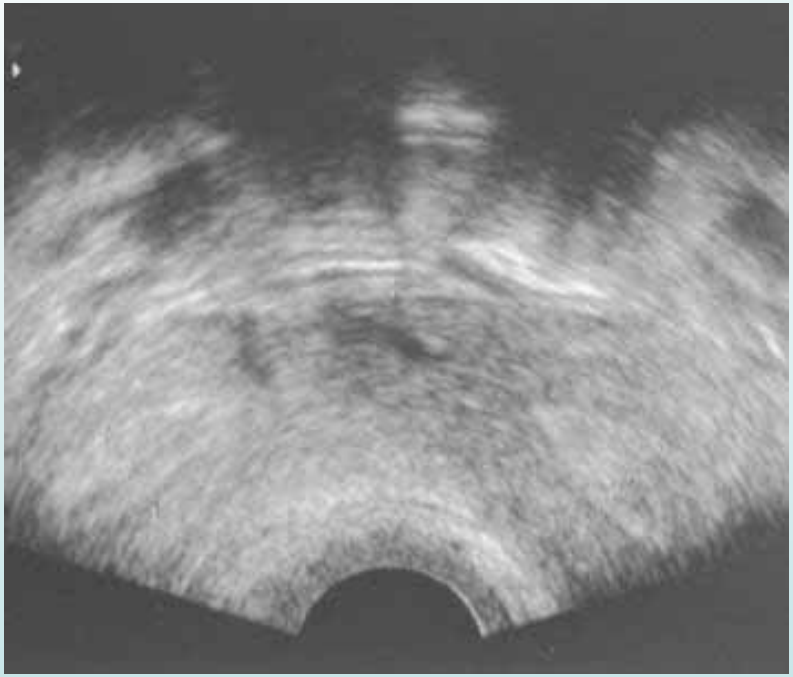
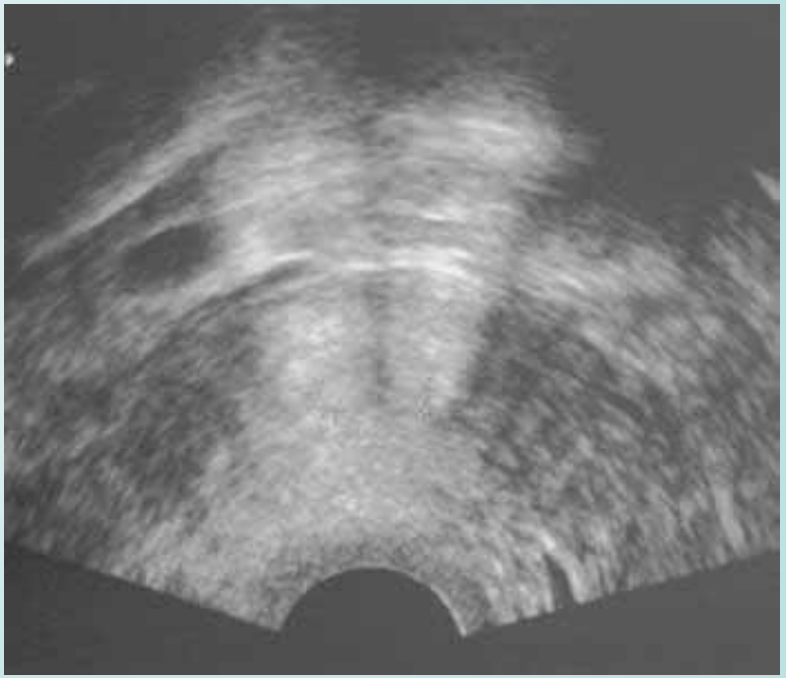
Uterus duplex

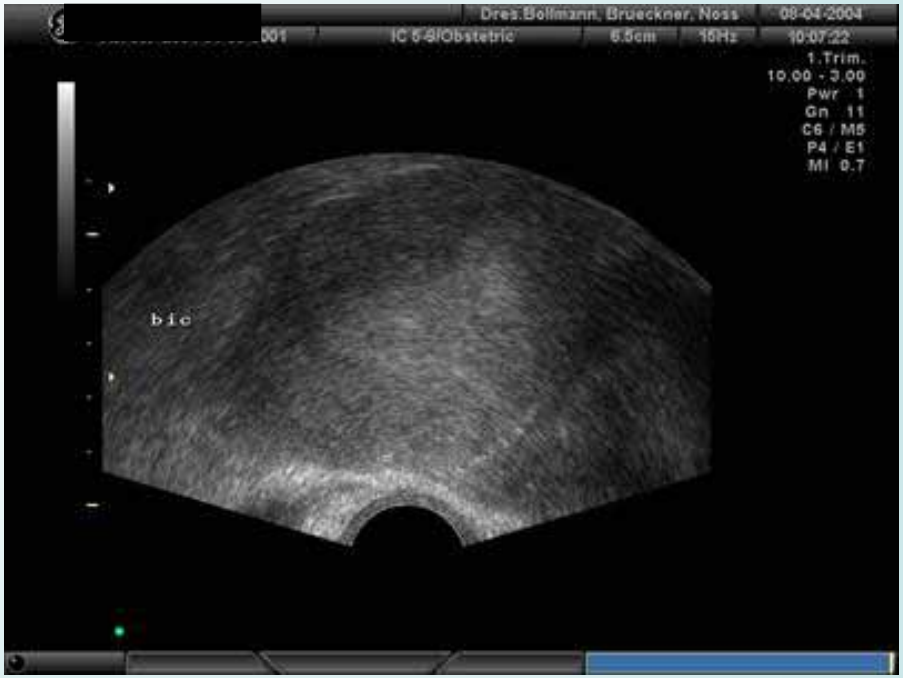


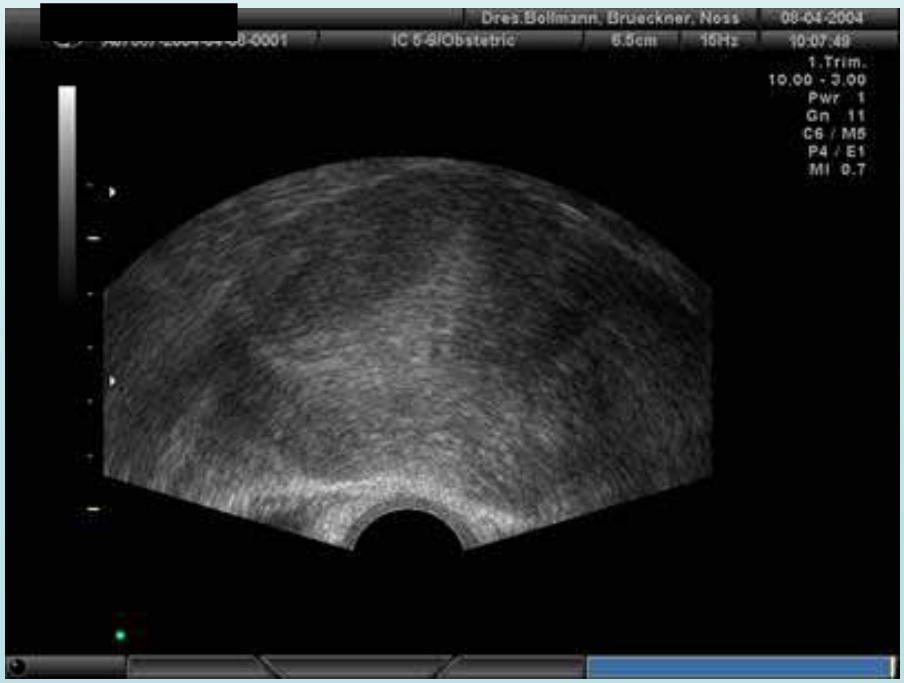
Uterus duplex





Uterus bicornis





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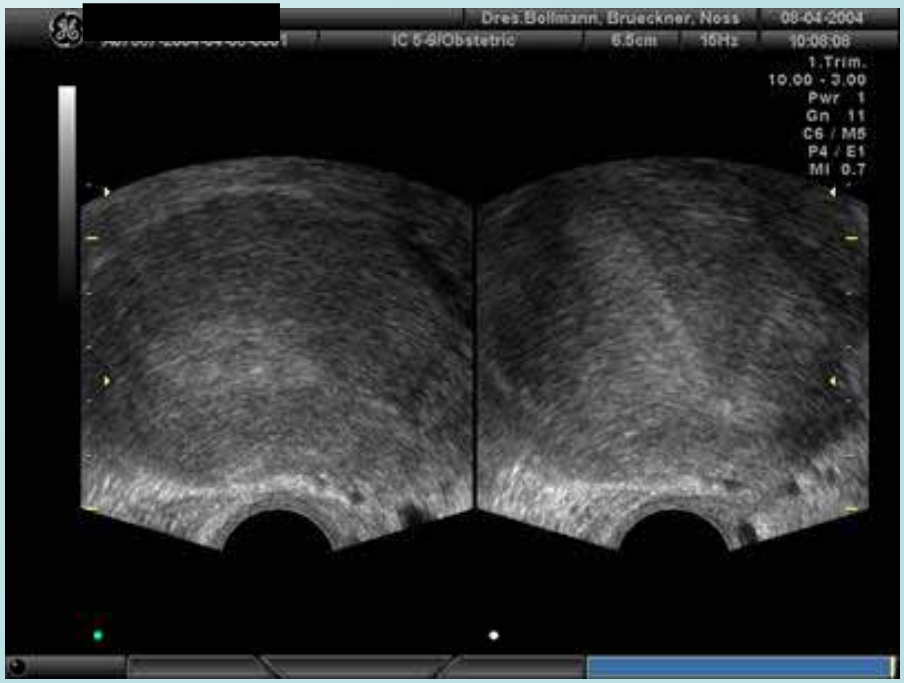
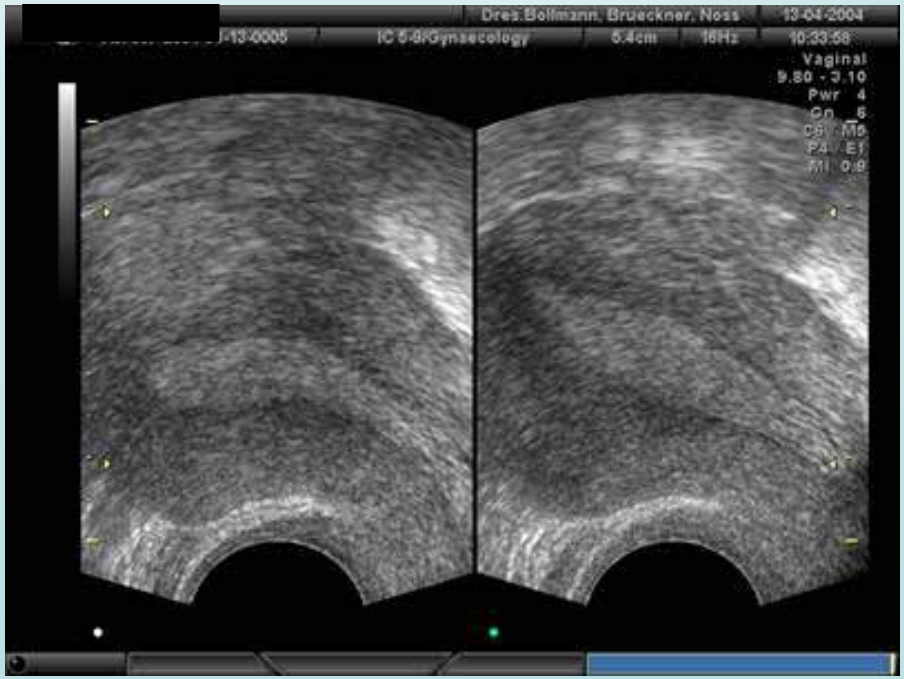


Uterus bicornis

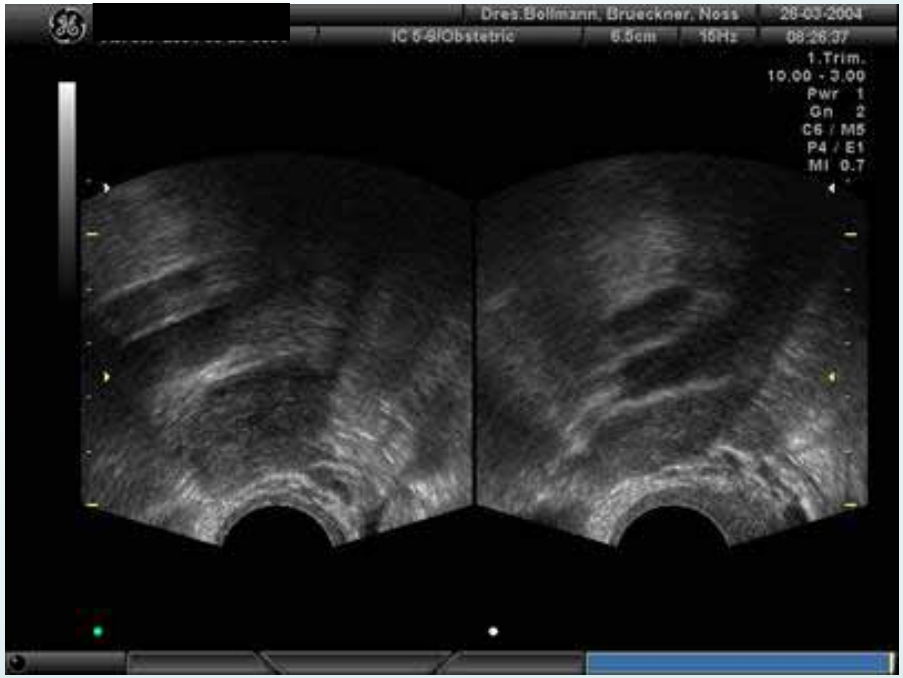


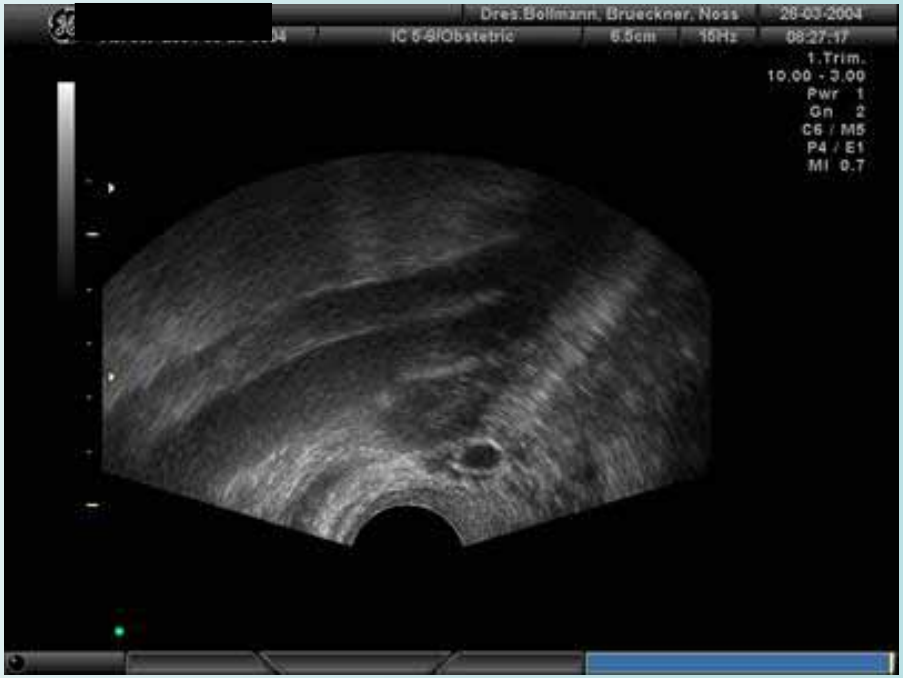
Ovar - Eierstock

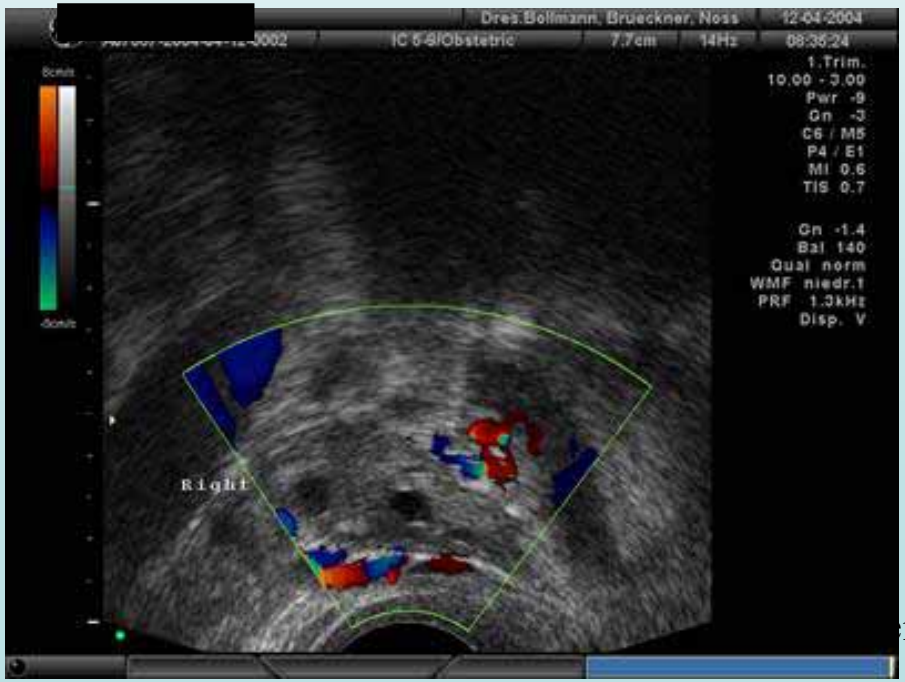
3 - 4,5 cm lang + 2 - 3 cm breit

Ovar - Eierstock

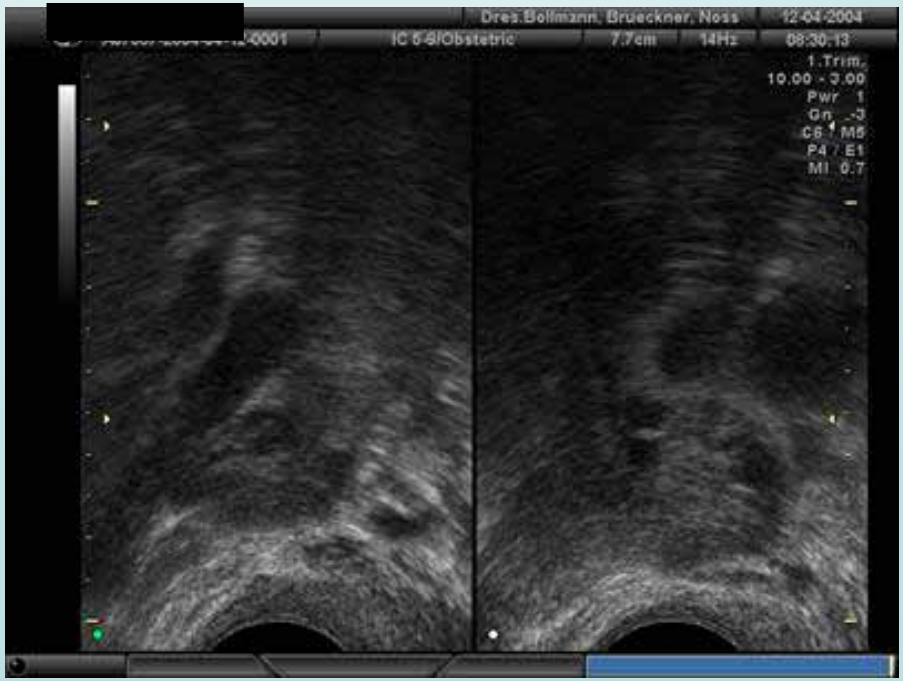
Ovar - Eierstock



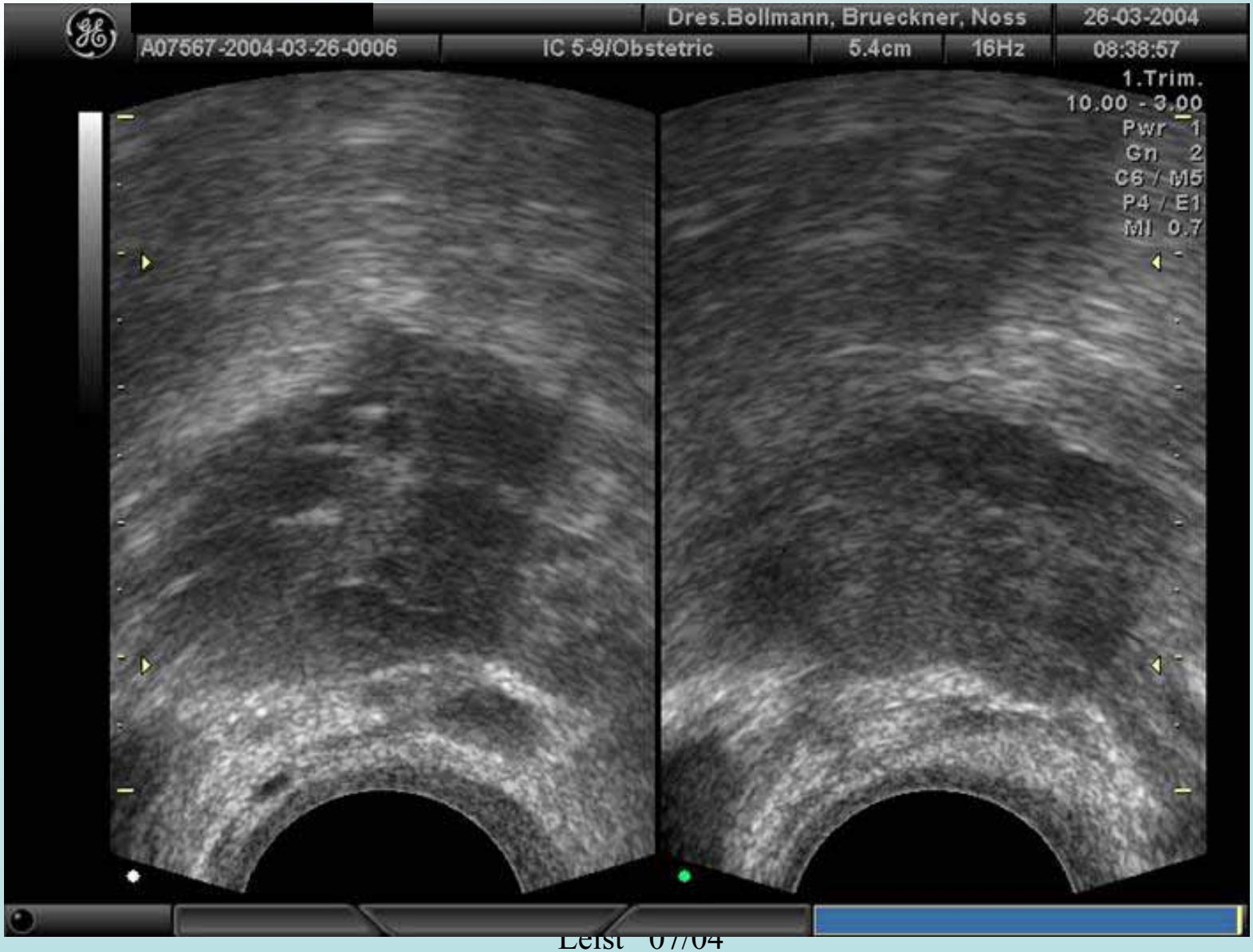




Ovar - Eierstock



Ovar - Eierstock



PCO (polycystische Ovarien)

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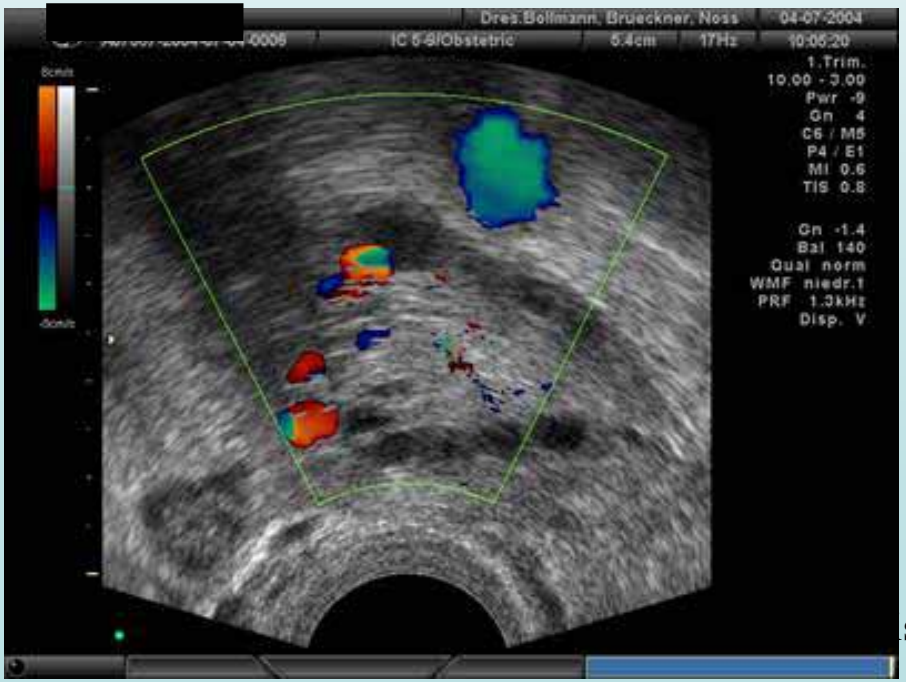
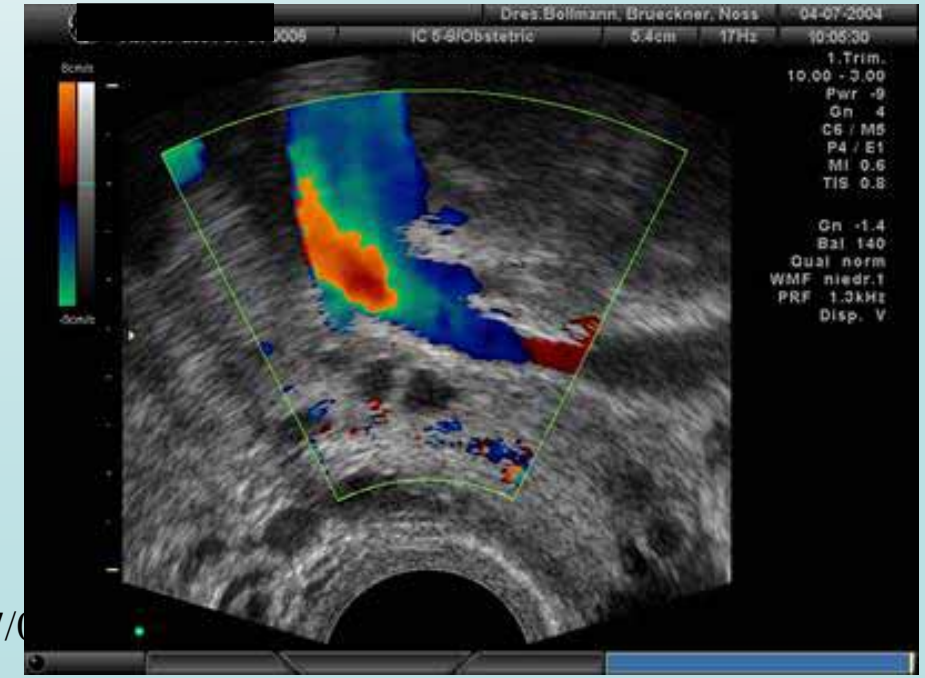
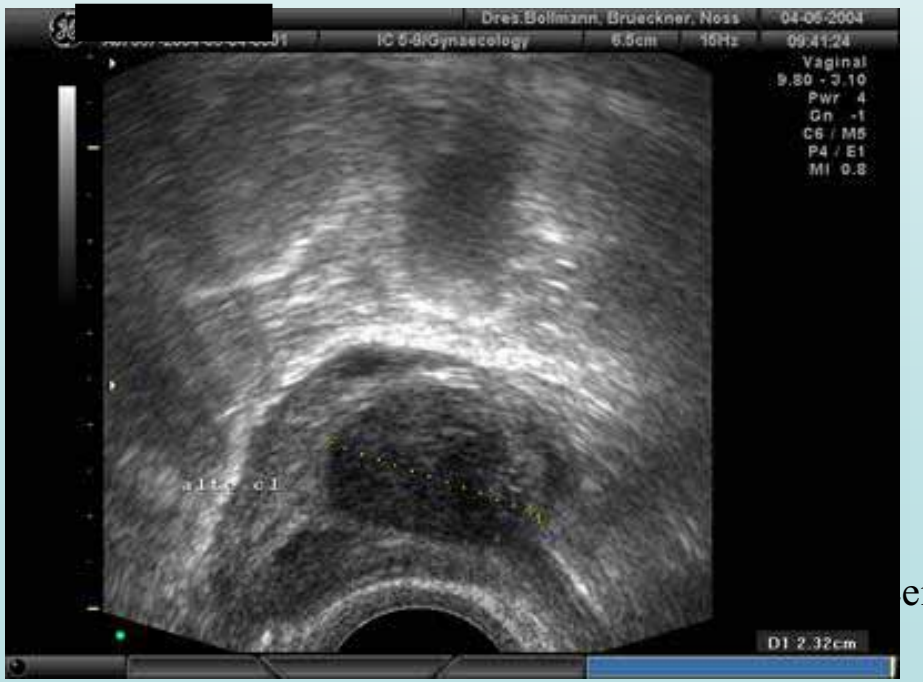
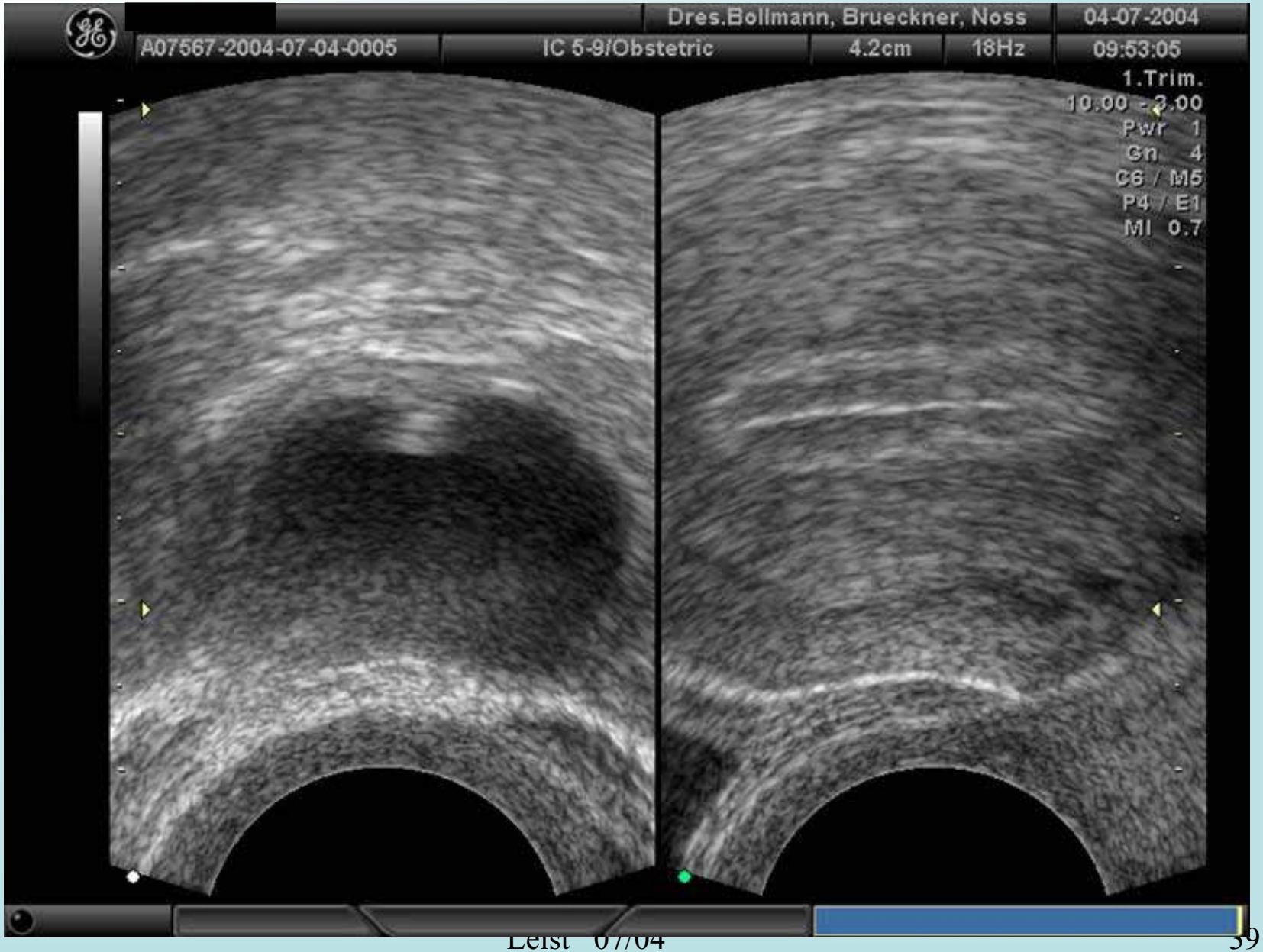




Gelbkörper
Corpus luteum



Gelbkörper
Corpus luteum

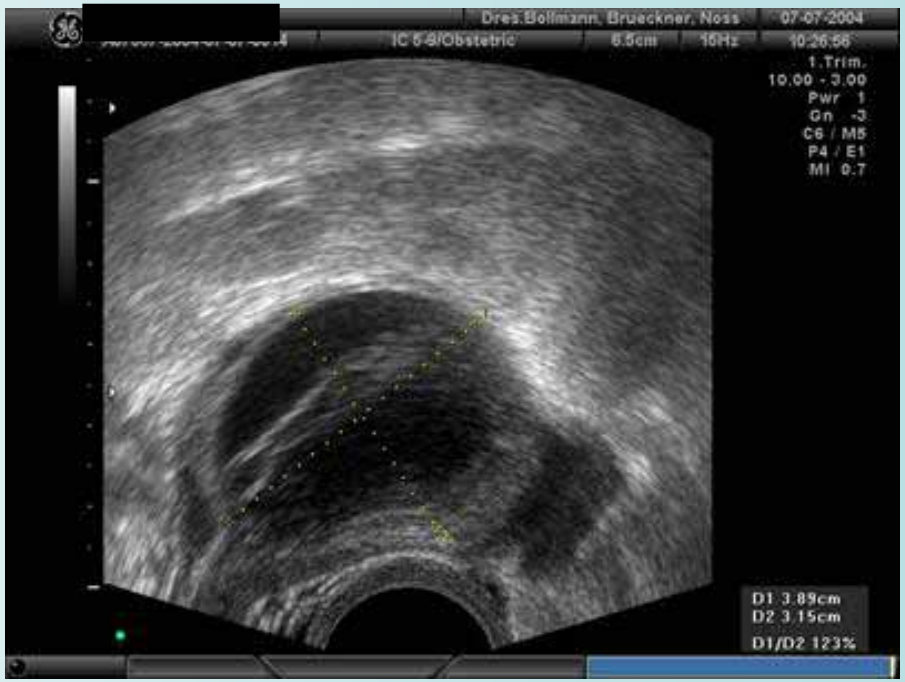


Gelbkörper

Corpus luteum

Gelbkörper

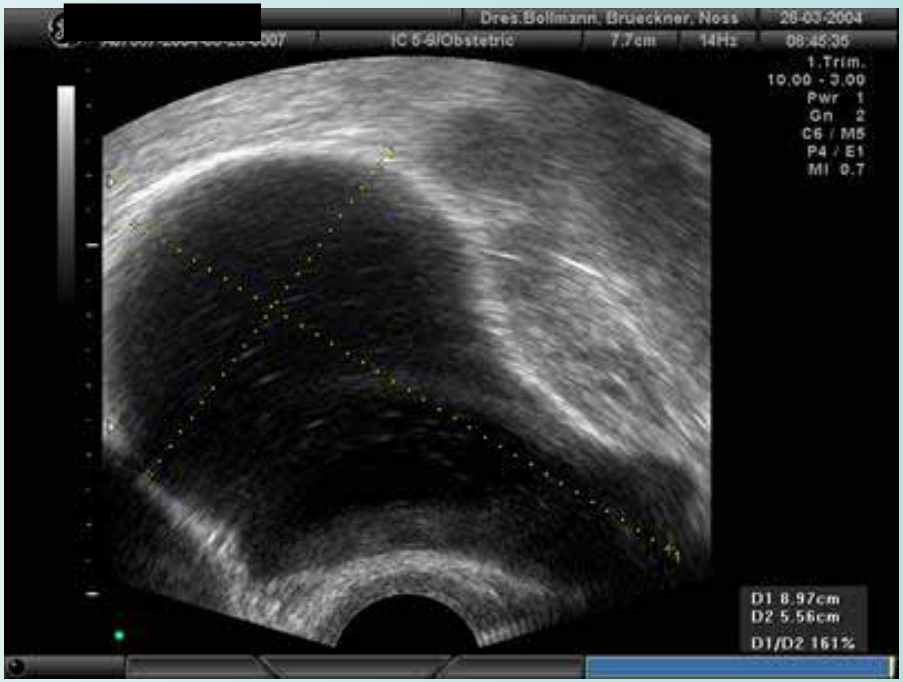
Corpus luteum (D4 midlong)



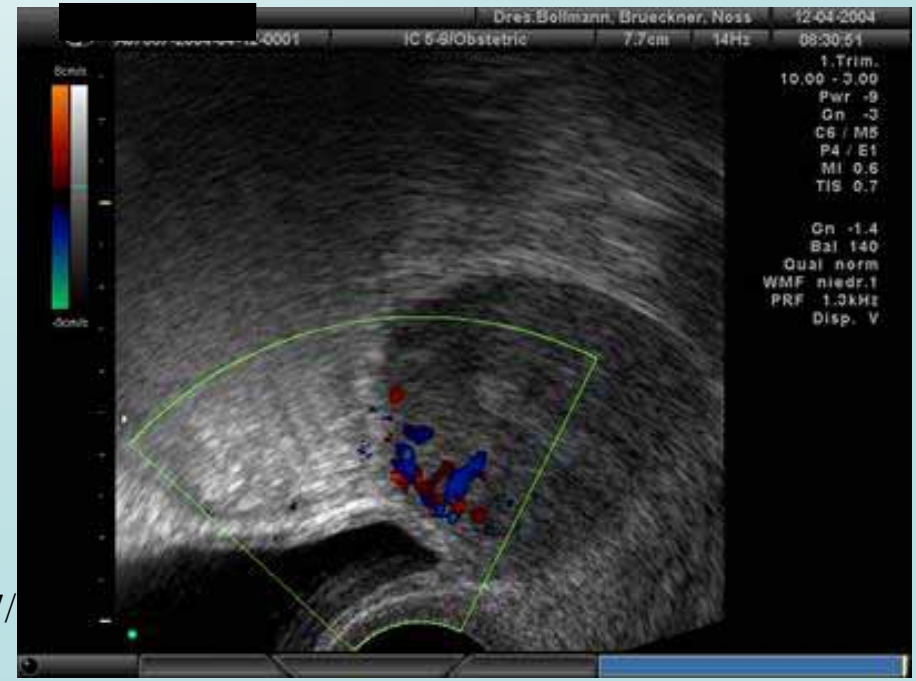
eist 07/04

Blase

Dres.Bollmann, Brueckner, Noss
28-03-2004
IC 5-9/Obstetric
7.7cm
14Hz
08:45:35
1.Trim.
10.00 - 3.00
Pwr 1
Gn 2
C6 / M5
P4 / E1
MI 0.7


Dres.Bollmann, Brueckner, Noss
28-03-2004
IC 5-9/Obstetric
7.7cm
14Hz
08:45:35
1.Trim.
10.00 - 3.00
Pwr 1
Gn 2
C6 / M5
P4 / E1
MI 0.7
D1 8.97cm
D2 5.56cm
D1/D2 161%

Dres.Bollmann, Brueckner, Noss
12-04-2004
IC 5-9/Obstetric
7.7cm
14Hz
08:28:19
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7


Dres.Bollmann, Brueckner, Noss
12-04-2004
IC 5-9/Obstetric
7.7cm
14Hz
08:30:51
1.Trim.
10.00 - 3.00
Pwr -9
Gn -3
C6 / M5
P4 / E1
MI 0.6
TIS 0.7
Gn -1.4
Bal 140
Qual norm
WMF niedr.1
PRF 1.3kHz
Disp. V

Blase

Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
8.9cm
13Hz
08:48:27
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7

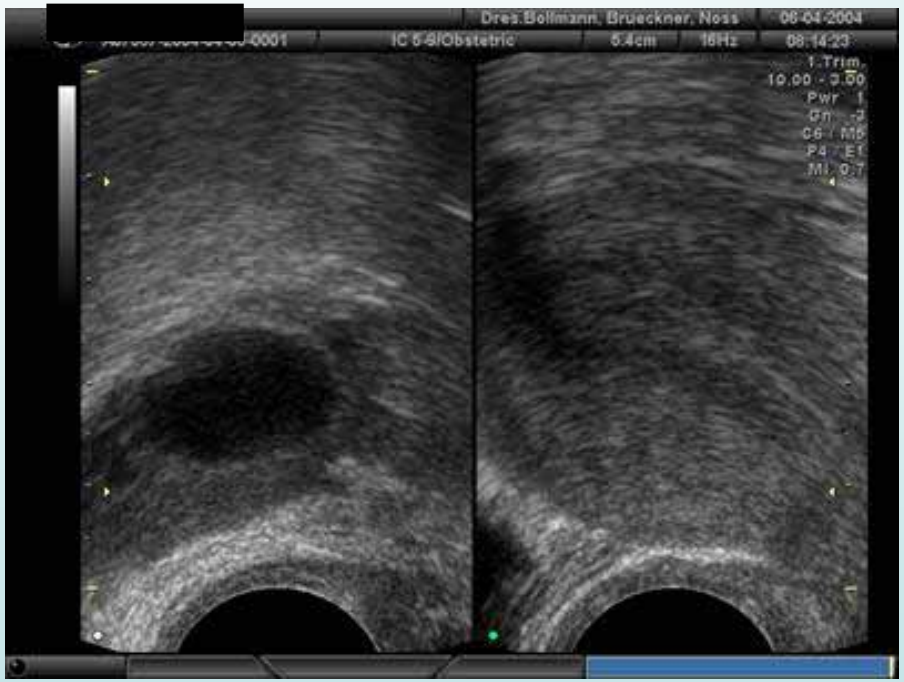
Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
8.9cm
13Hz
08:48:48
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 1.27cm

Douglas

Dres.Bollmann, Brueckner, Noss
28-03-2004
IC 5-9/Obstetric
6.5cm
16Hz
09:32:01
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7

Dres.Bollmann, Brueckner, Noss
28-03-2004
IC 5-9/Obstetric
6.5cm
16Hz
09:32:01
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 4.54cm
D2 2.22cm
D1/D2 205%

zyklische Veränderungen - Follikelreifung



Follikelreifung

Vaginaler Ultraschall

Theorie

Anatomie

Stimulation

Schwangerschaft

Pathologie

weitere Anwendung(smöglichkeit)en

hormonelle Stimulation

midlong

short / Antagonist

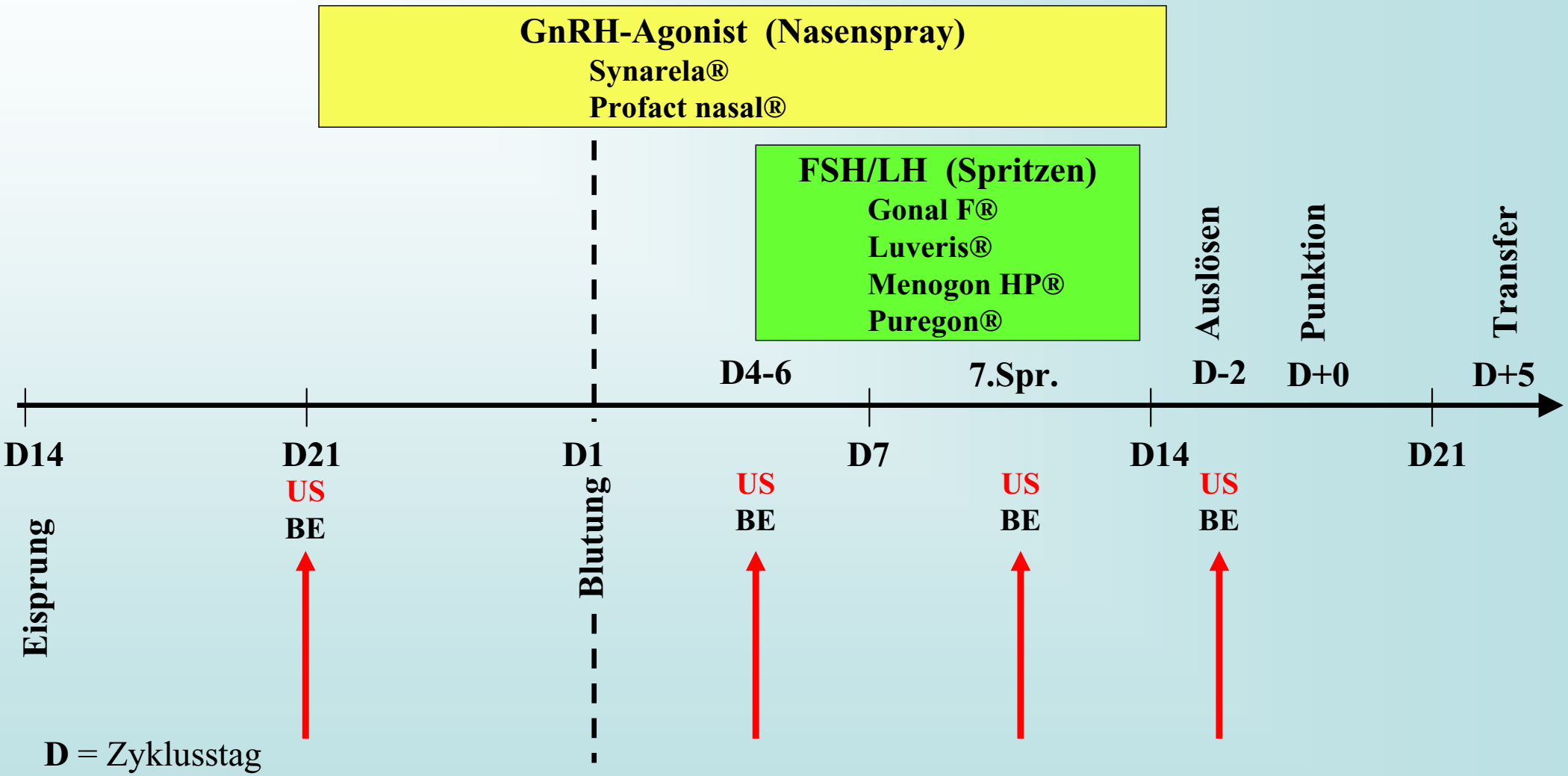
low - dose

Überstimulation

Kryo - Progynova

mittel - langes Protokoll

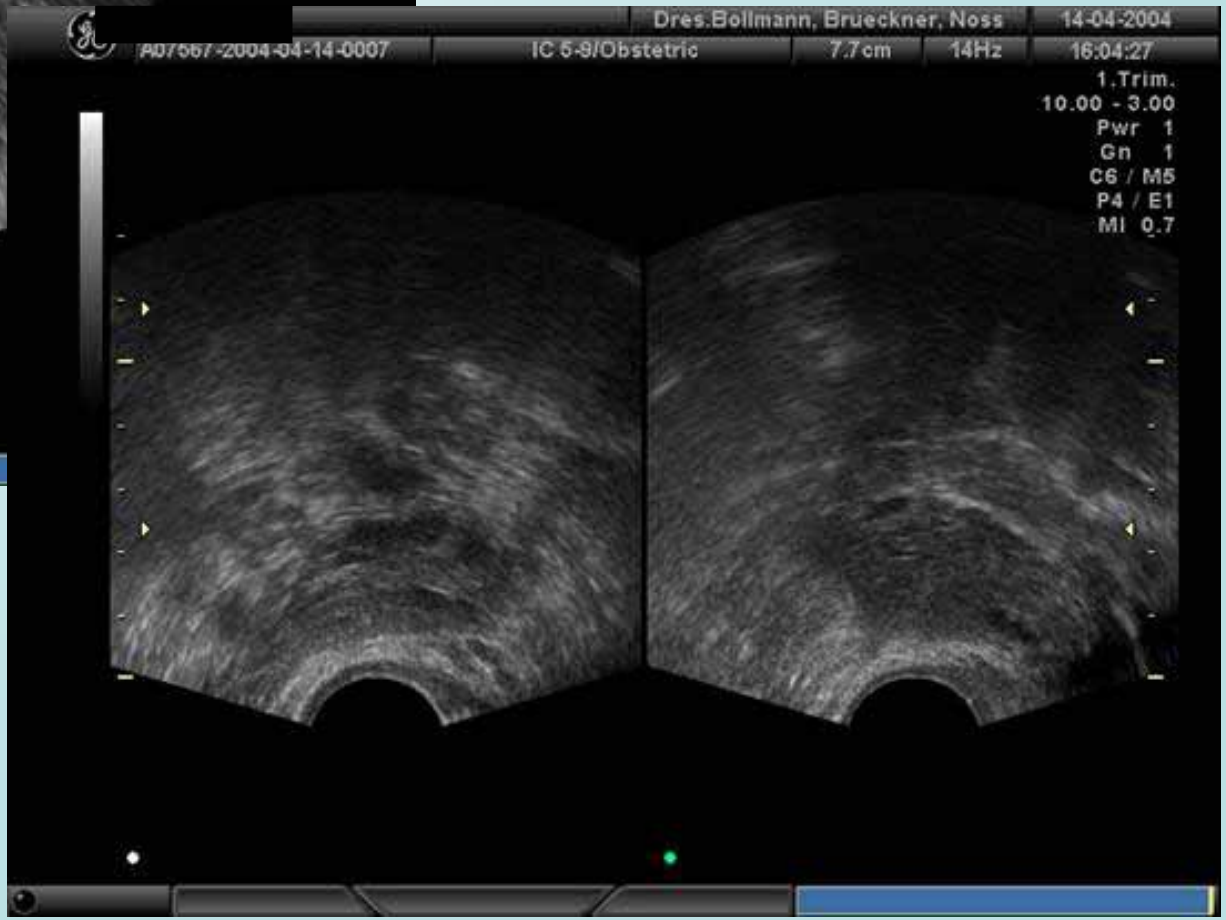
„midlong“



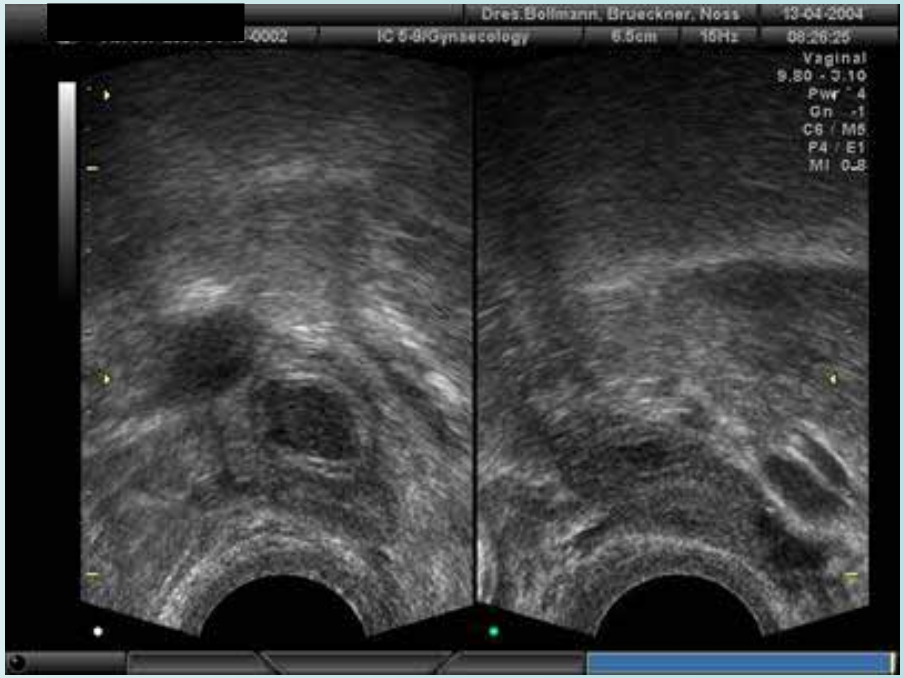
D = Zyklusstag
D + = Tage nach Punktion
Spr. = Spritzentag
US = Ultraschall
BE = Blutentnahme

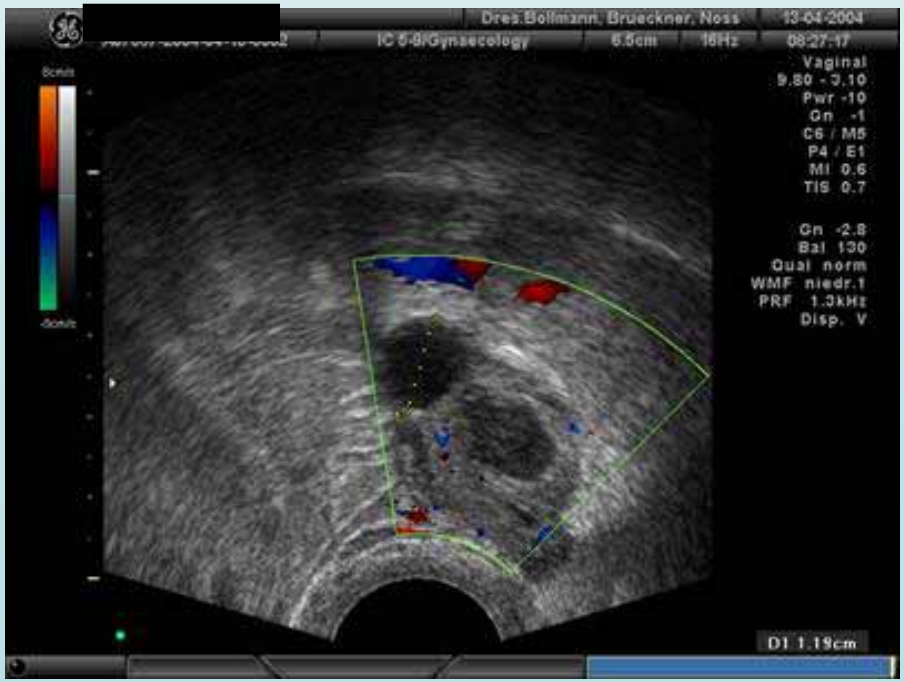
„midlong“
D 4 - 6

Dres.Bollmann, Brueckner, Noss
14-04-2004
A07567-2004-04-14-0007
IC 5-9/Obstetric
7.7cm
14Hz
16:03:32
1.Trim.
10.00 - 3.00
Pwr 1
Gn 1
C6 / M5
P4 / E1
MI 0.7


Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Obstetric
7.7cm
14Hz
16:04:27
1.Trim.
10.00 - 3.00
Pwr 1
Gn 1
C6 / M5
P4 / E1
MI 0.7

„midlong“
D 4 - 6





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„midlong“

7. Spritzentag

„midlong“

9. Spritzentag

Leist 07/04

„midlong“

9. Spritzentag

Leist 07/04

„midlong“

Auslösen 11. Spritzentag

„midlong“
Auslösen

st 07/

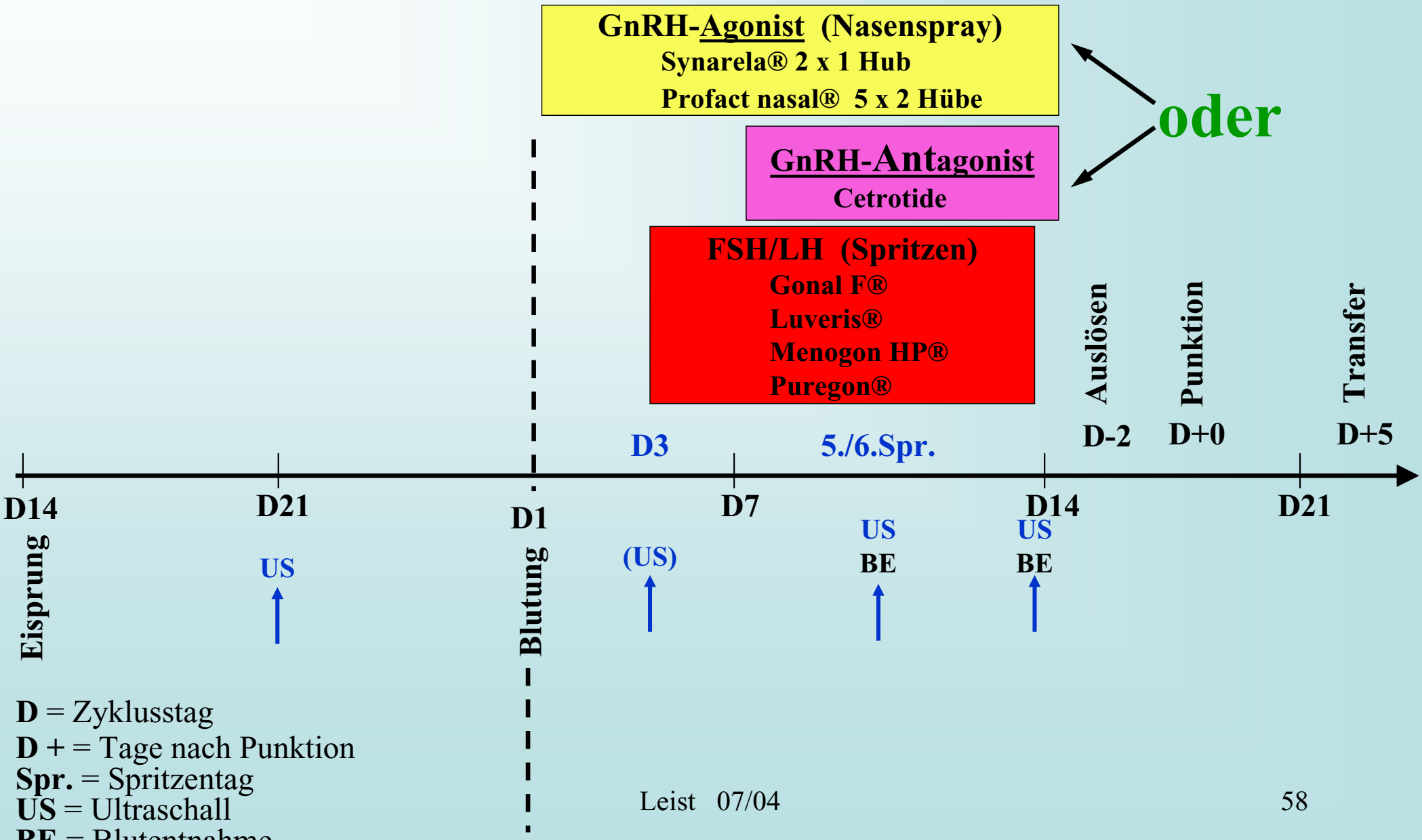
„midlong“

Auslösen 10. Spritzentag

eist 07/04

kurzes / Antagonisten Protokoll

„short“



D = Zyklusstag
D + = Tage nach Punktion
Spr. = Spritzentag
US = Ultraschall
BE = Blutentnahme

hormonelle Stimulation

Antagonist 10. Spritzentag

Leist 07/04

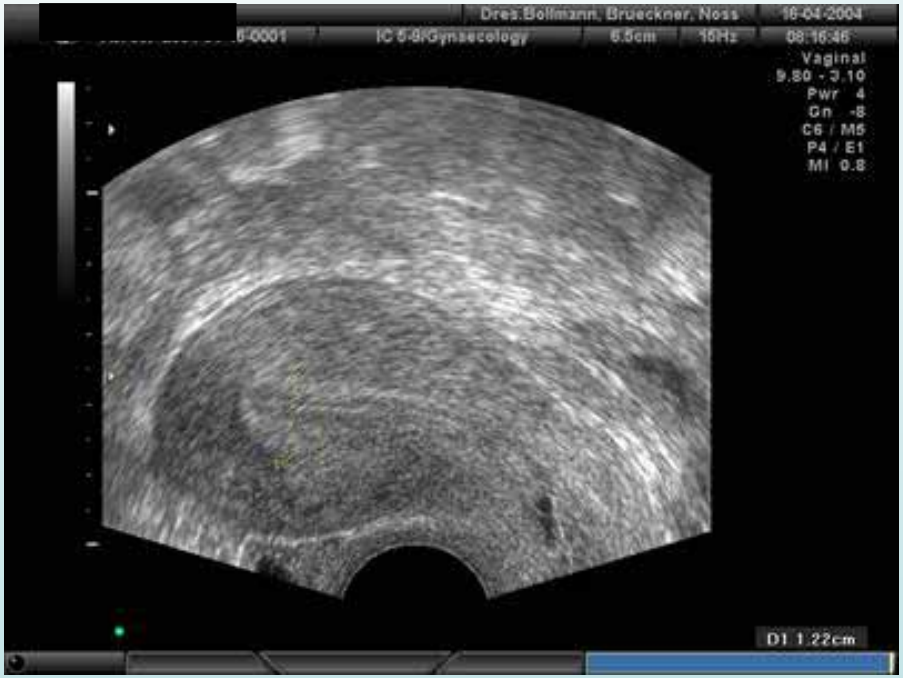
hormonelle Stimulation

Antagonist Auslösen

Leist 07/04

hormonelle Stimulation

Antagonist Auslösen



hormonelle Stimulation

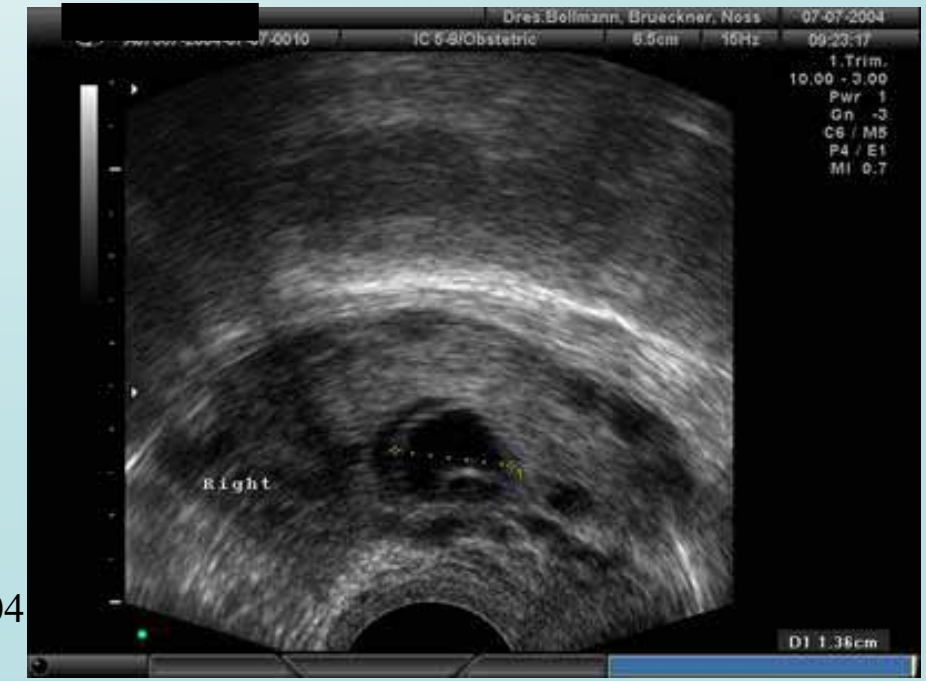
Antagonist 10. Spritzentag

hormonelle Stimulation

low – dose

9. Spritzentag (50 IE/d)

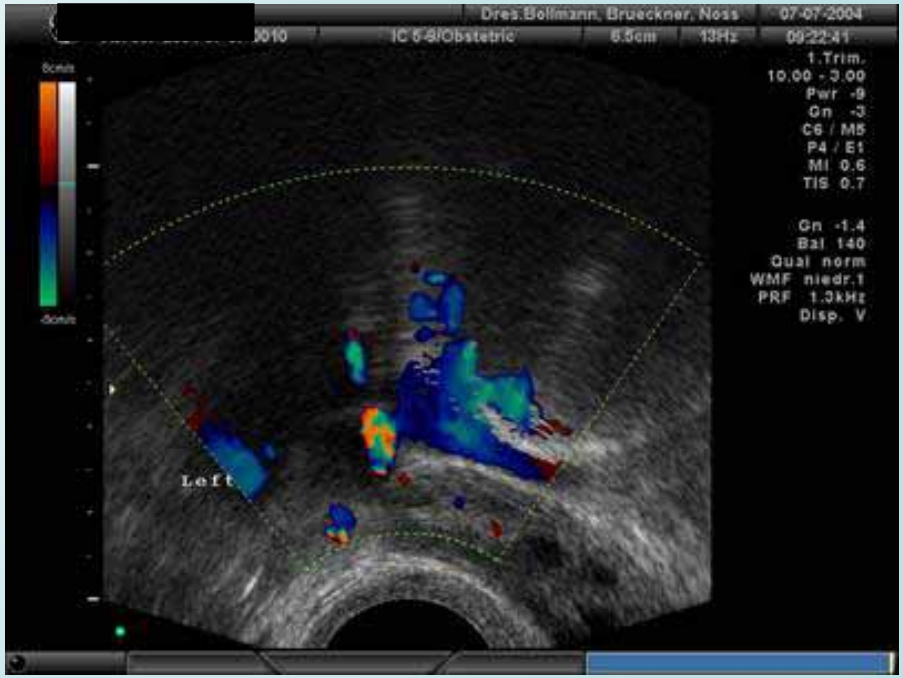
eist 07/04



hormonelle Stimulation

low – dose

9. Spritzentag (50 IE/d)



Überstimulation

D + 13

33 Jahre

03/04 ICSI (Synarela midlong Menogon HP 3 3 2 2 2 2)

8EZ / 5 x VK / 2 Blastozysten

D + 11 HCG 49

D + 13 re Ovar 6.7cm

li Ovar 5,6cm

freie Flüssigkeit 4,9 x 1,5

D + 14 HCG 237

D + 21 HCG 2326

Fruchthöhle 5mm

D + 30 HCG 14.317

SSL 4,1mm HA +

hormonelle Stimulation

Kryo - Progynova

hormonelle Stimulation

Kryo - Progynova

Leist 07/04

Vaginaler Ultraschall

Theorie

Anatomie

Stimulation

Schwangerschaft

Pathologie

weitere Anwendung(smöglichkeit)en

Schwangerschaft

Schwangerschaftsverlauf

Mehrlinge

Nackenödem

Cervixlänge

Abort

Schwangerschaftsverlauf

D + 21

D + 30

8. - 10. SSW

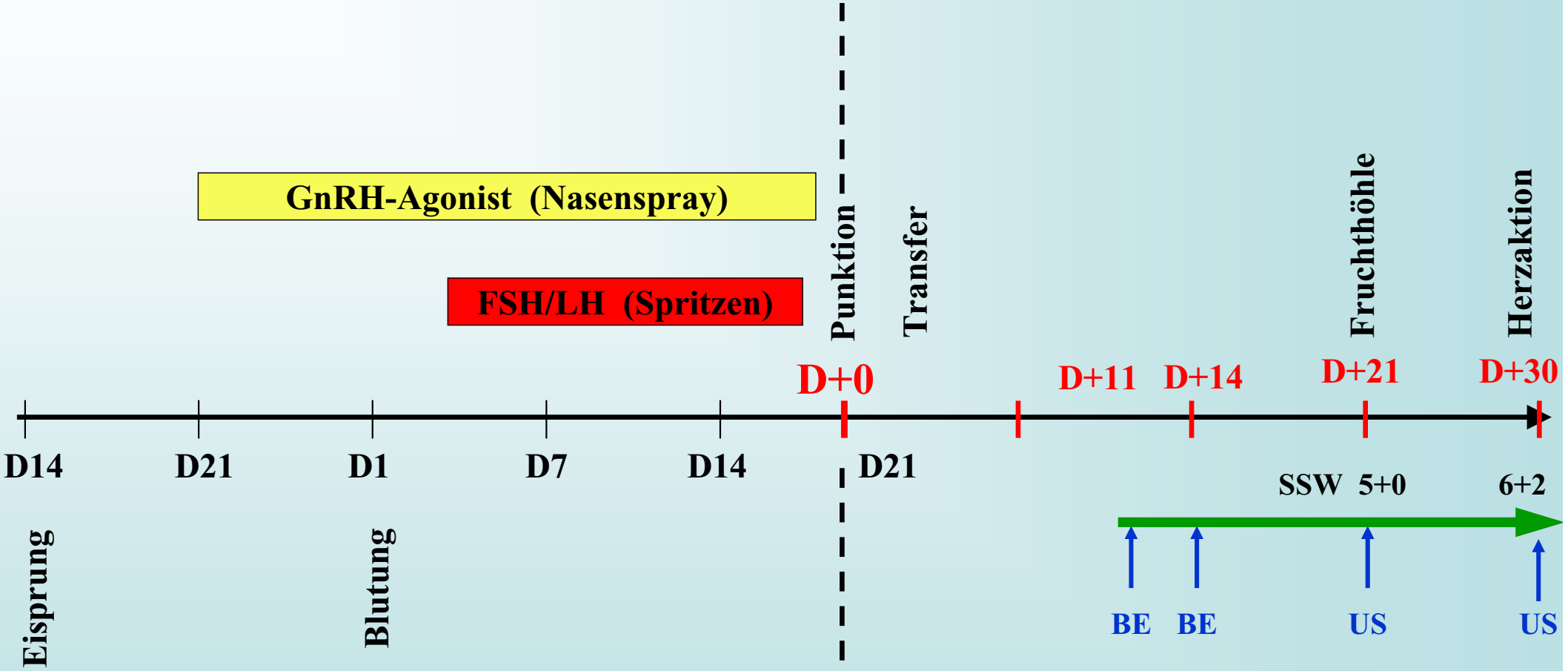
Nackenödem

ab 14. SSW

Cervixlänge

Plazenta praevia

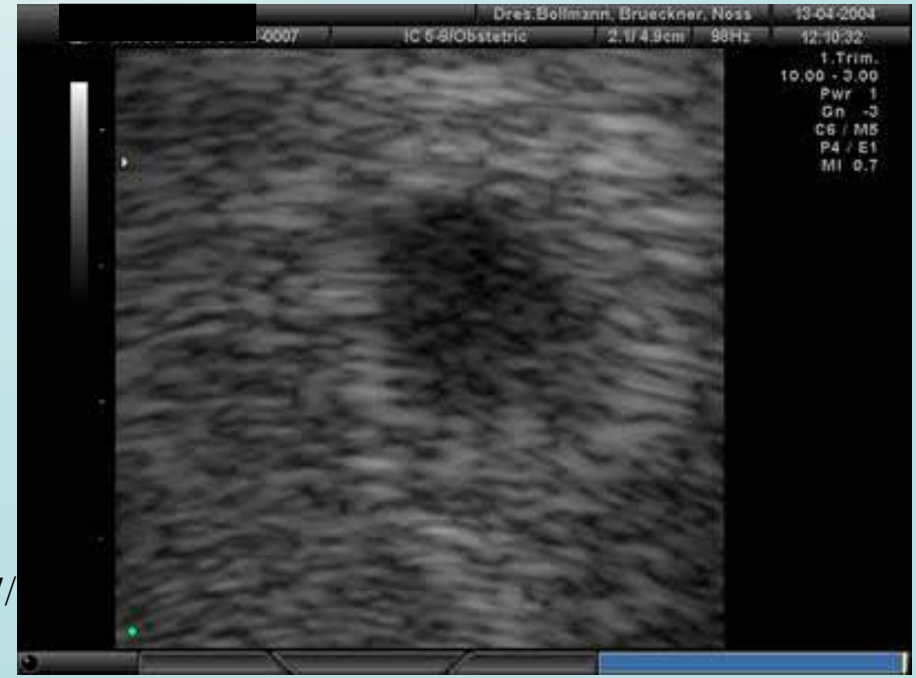
zeitlicher Ablauf IVF / ICSI
+ Schwangerschaft



BE = Blutentnahme
D = Zyklusstag
D + = Tage nach Punktion
Spr. = Spritzentag
SSW = Schwangerschaftswochen
US = Ultraschall

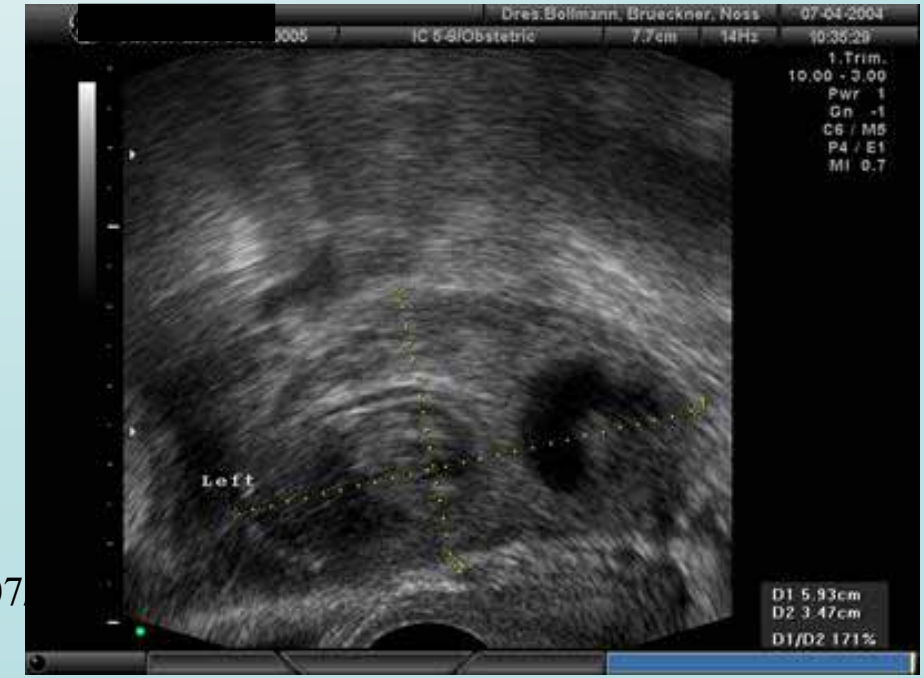
Schwangerschaft

D + 21 ☐ 5+0 SSW



Schwangerschaft

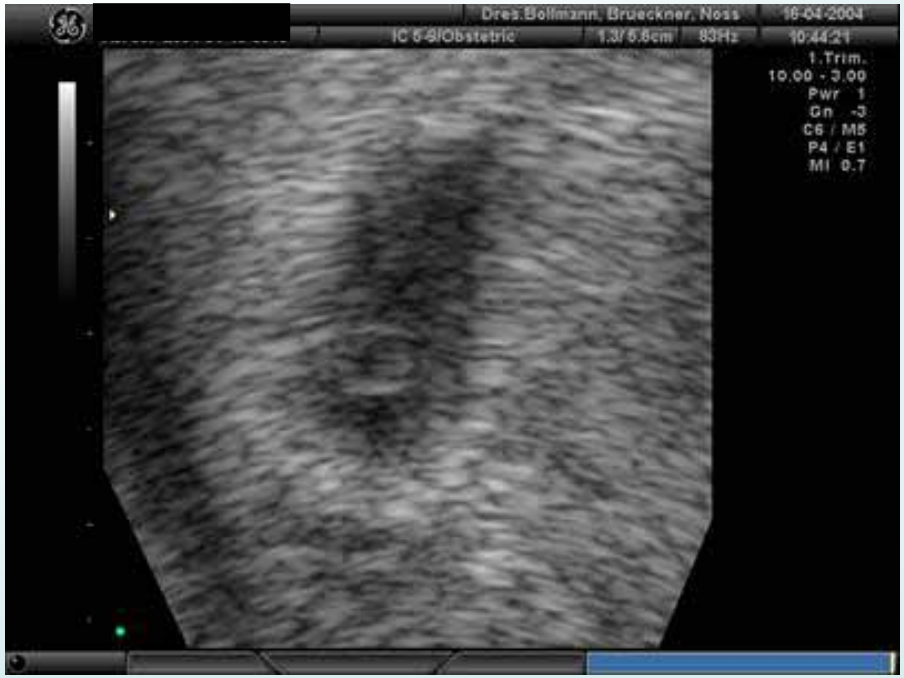
D + 21 [redacted] 5+0 SSW

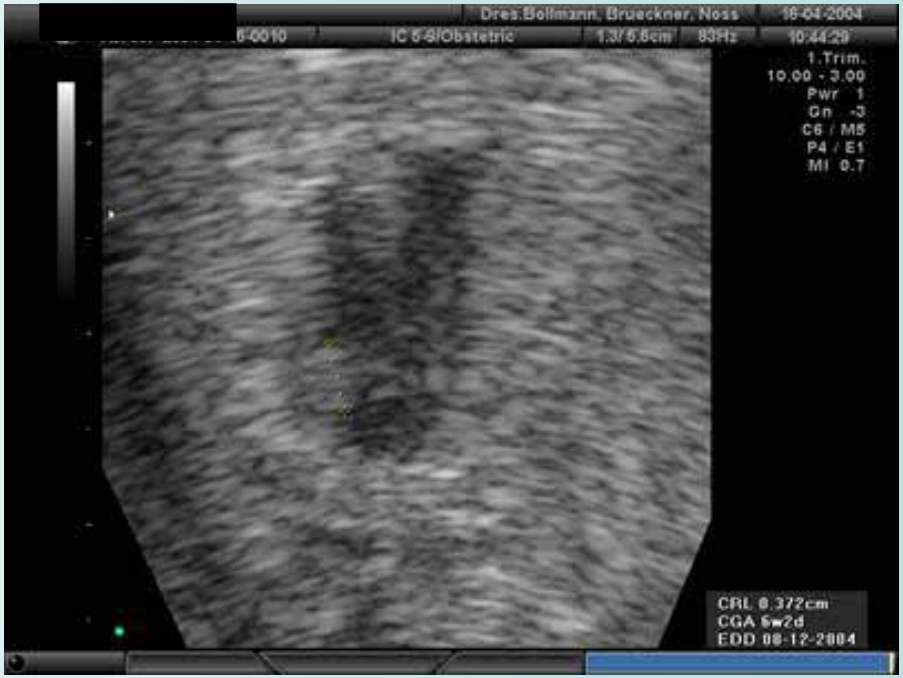


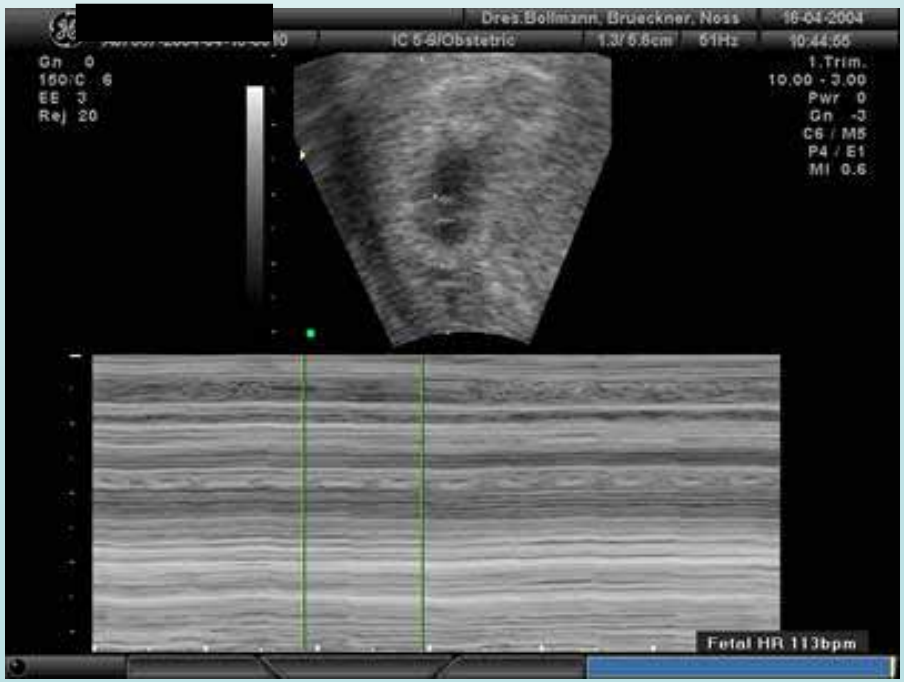
t 07

Schwangerschaft

D + 31 ☨ 6+3 SSW







Schwangerschaft

D + 31 = 6+3 SSW

Schwangerschaft

7. SSW

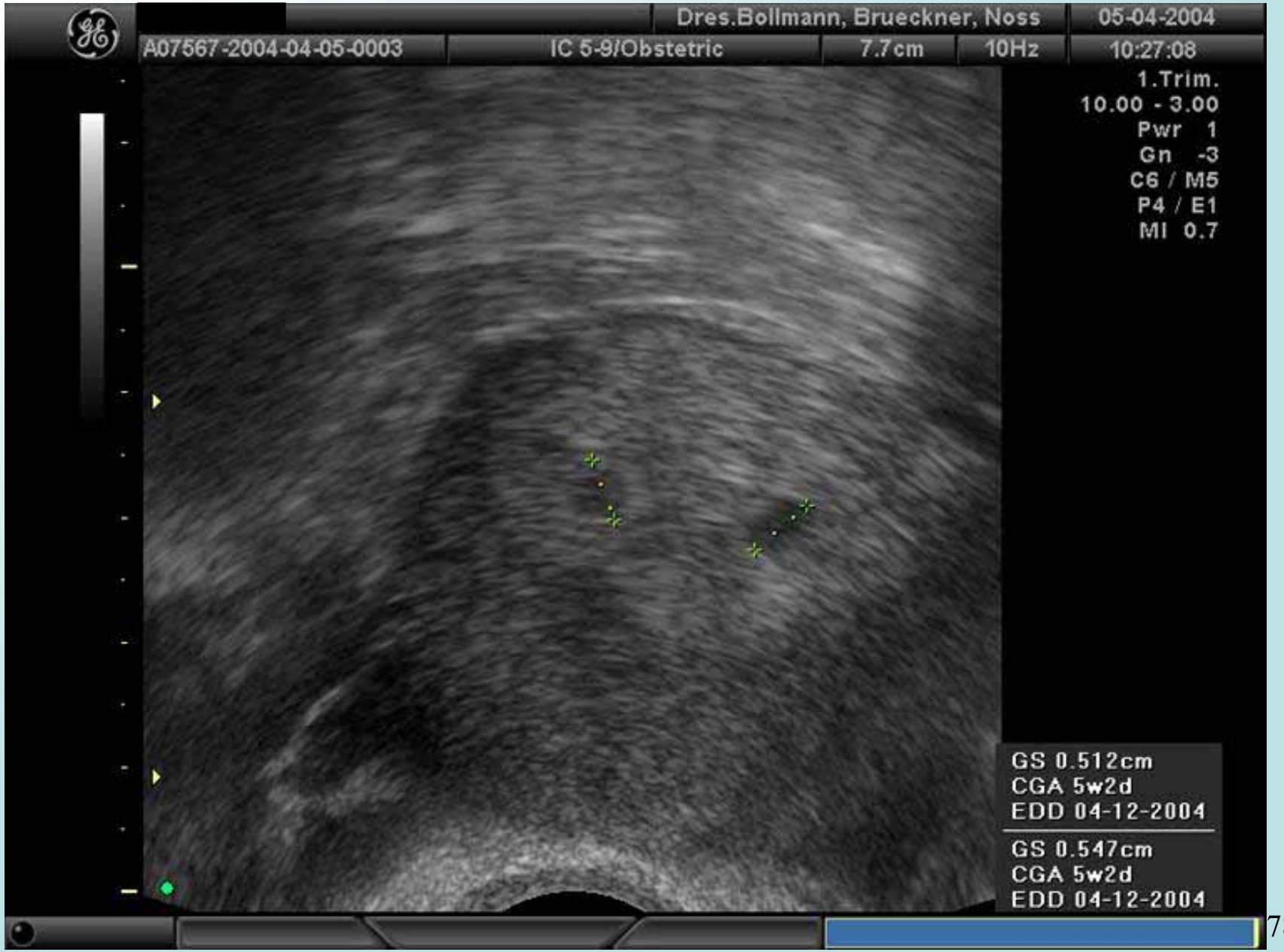
Nilsson: Ein Kind entsteht

Gemini / Zwillinge

D + 23 ♂ 5 + 2 SSW

Gemini

D + 23 ☐ 5 + 2 SSW



Gemini

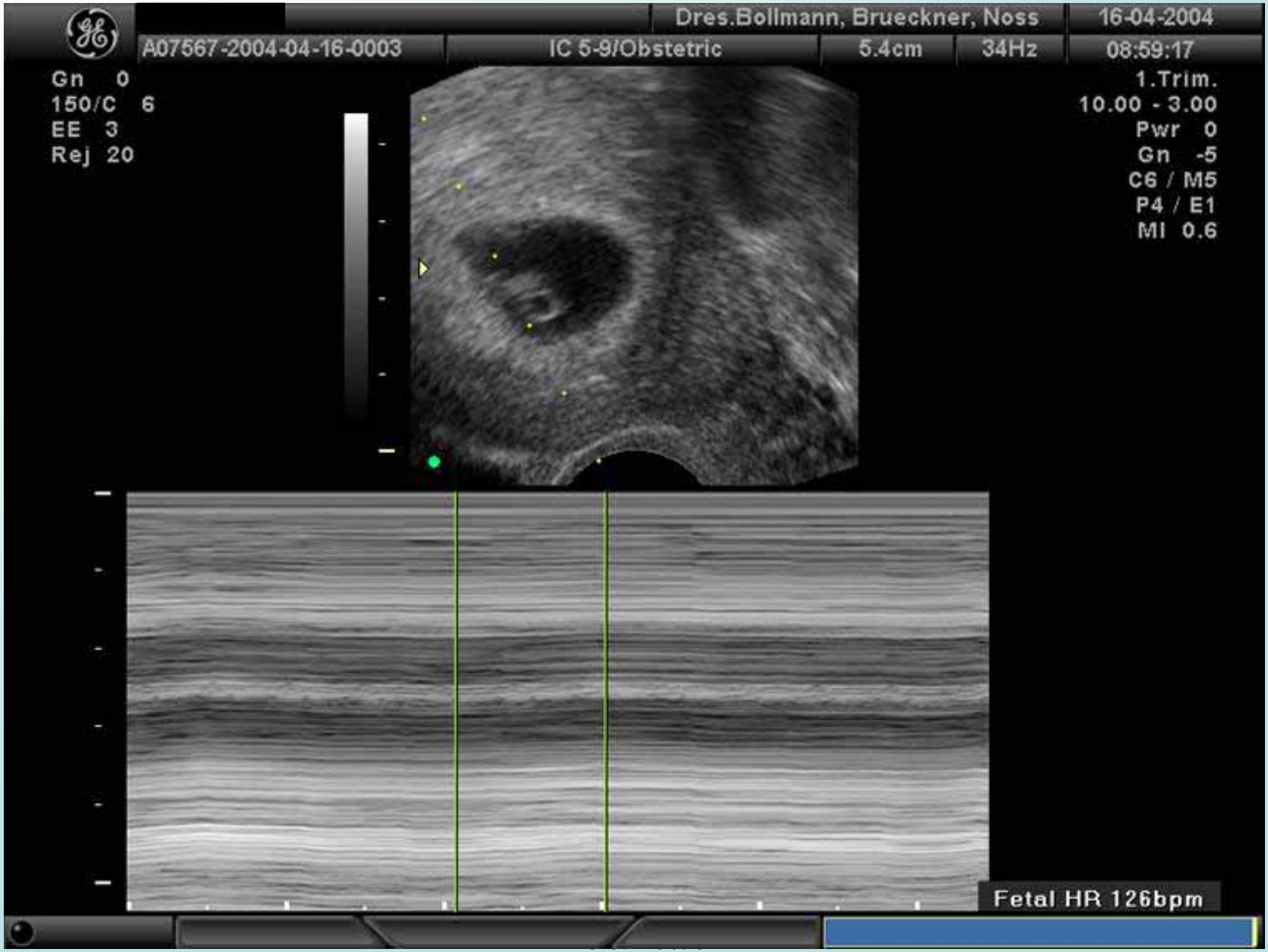
D + 34 ☐ 6 + 6 SSW

Gemini

D + 34 🖬 6 + 6 SSW

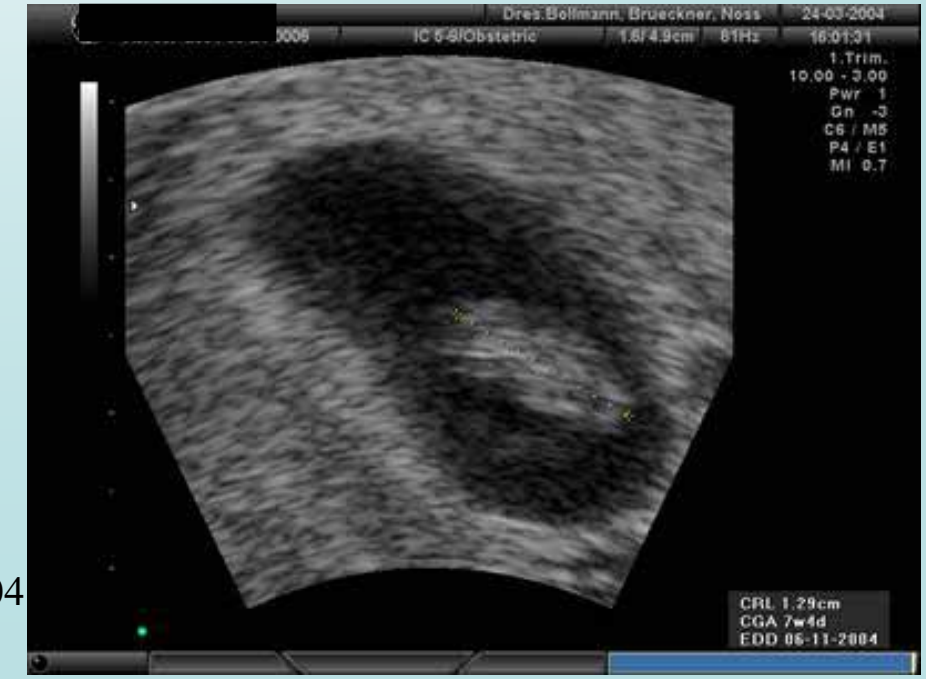
Gemini

D + 34 ≙ 6 + 6 SSW



Schwangerschaft

7 + 4 SSW



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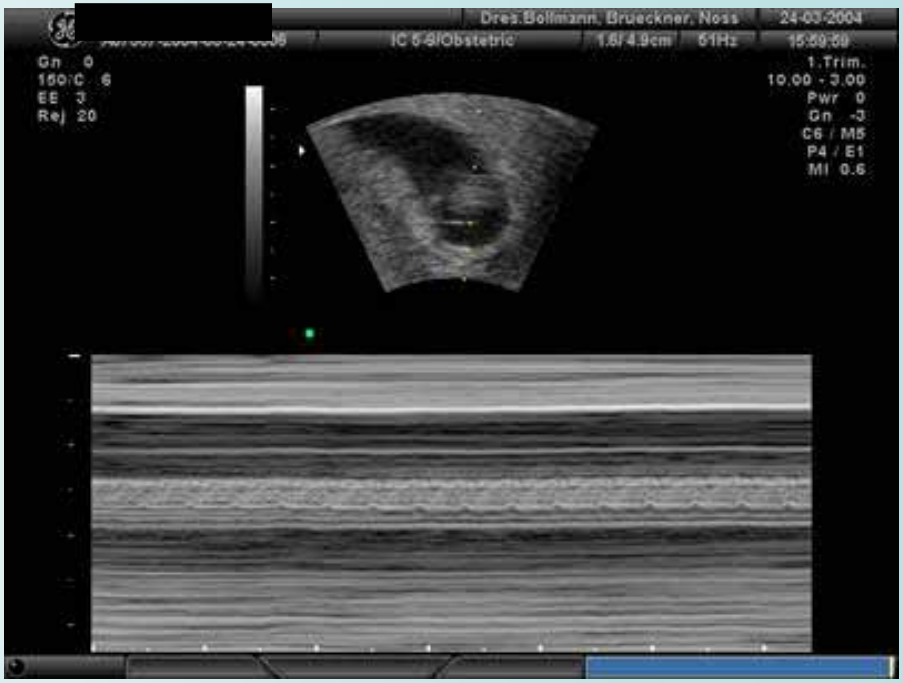
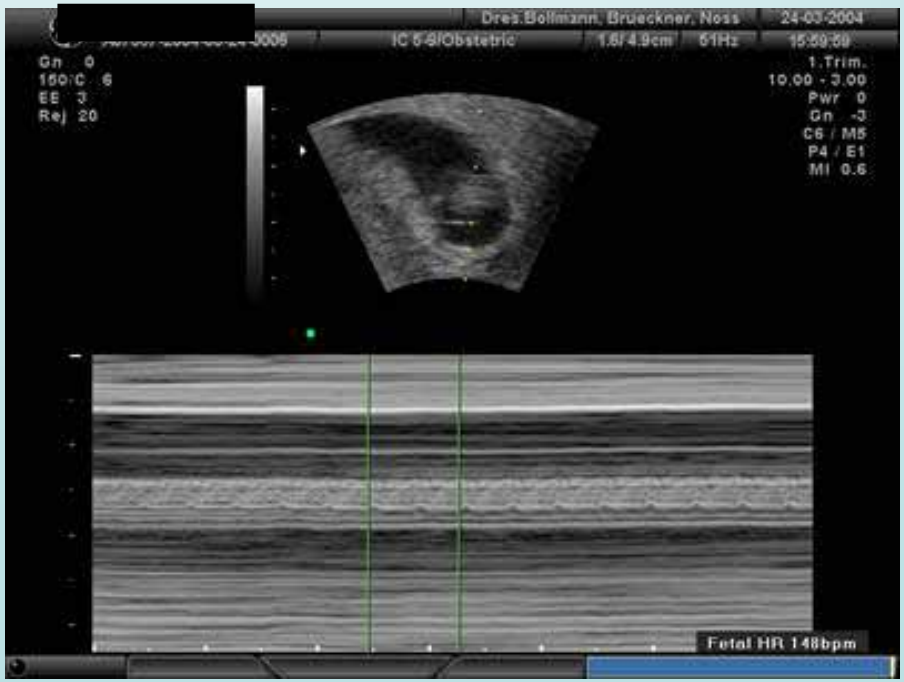
Schwangerschaft

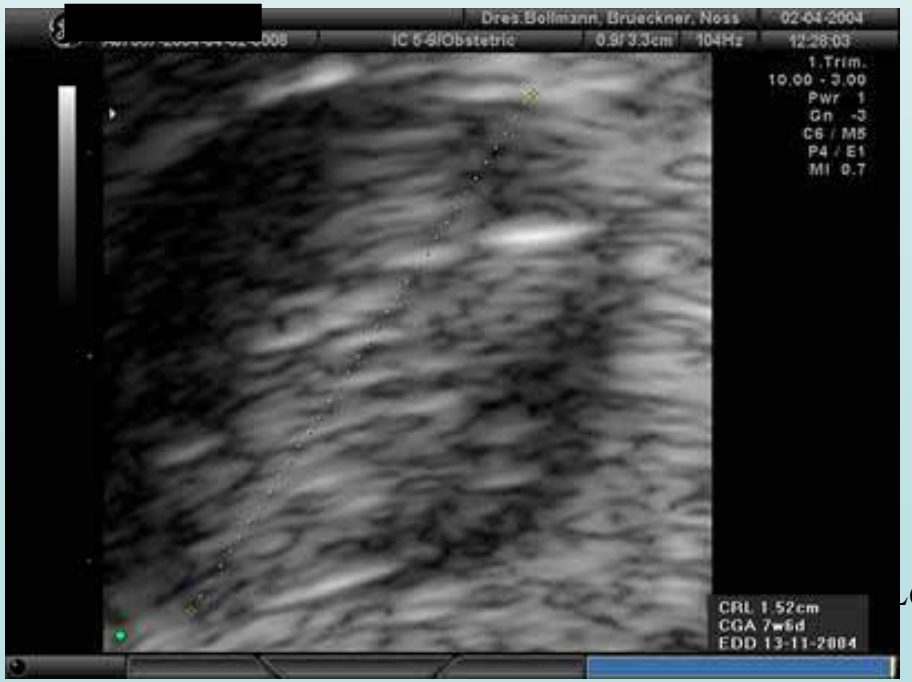
7 + 4 SSW

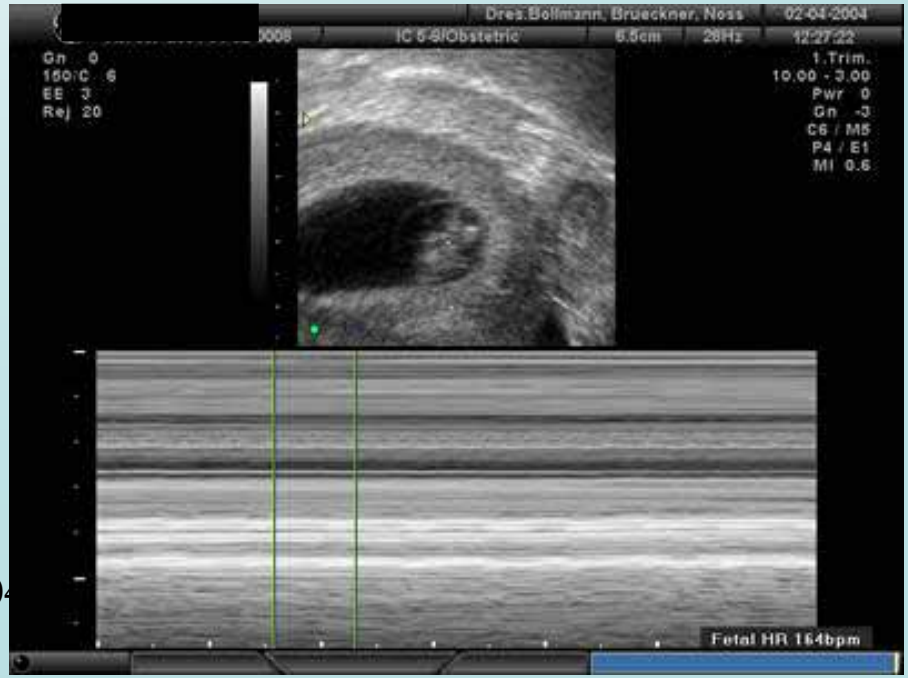




Schwangerschaft

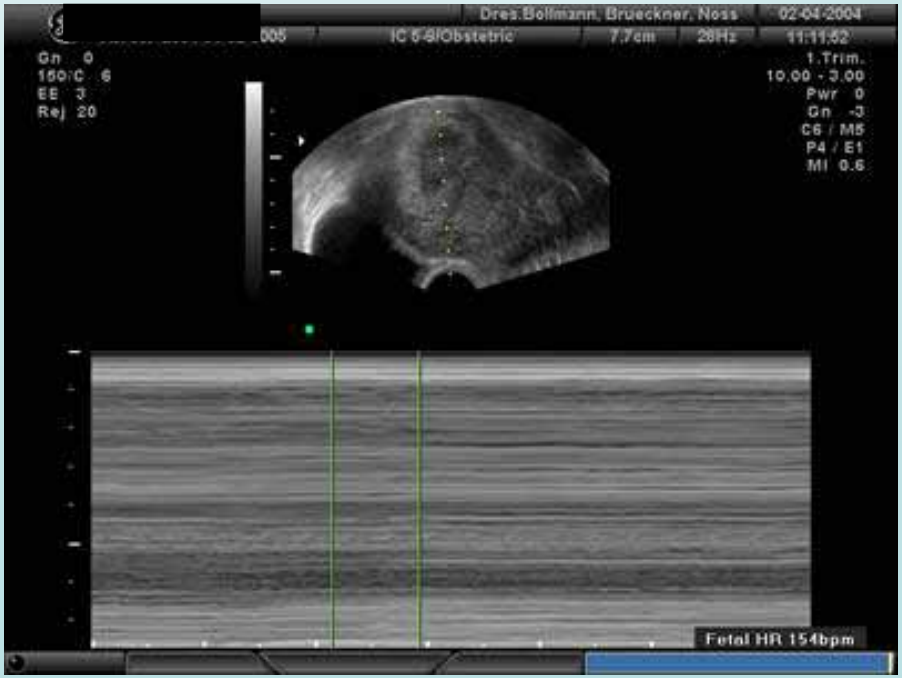
7 + 5 SSW





Schwangerschaft

8 +3 SSW



Gemini

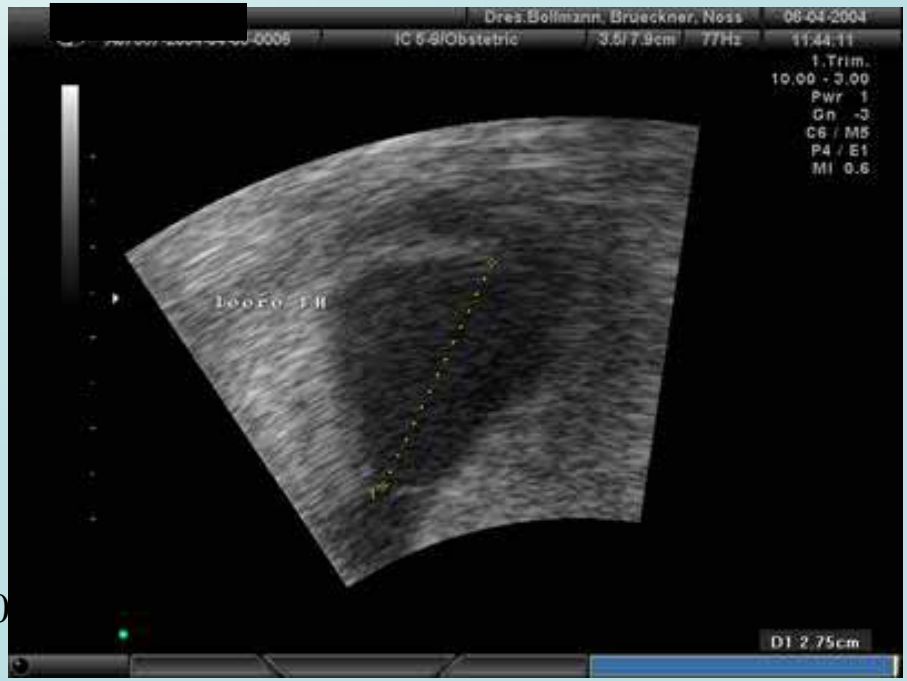
11. SSW

Gemini

12. SSW

Gemini

13. SSW



eist 07/0

3 Monate alt

Nilsson: Ein Kind entsteht

„Nackenfalte“ („Nackenödem“)

nuchal translucency

SSL 45 - 85mm

„Nackenfalte“
SSL 45 - 85mm

Statistische Risikoberechnung für Trisomie 21 (18 / 13) aus:

Blutabnahme (freies HCG + PAPP-A)

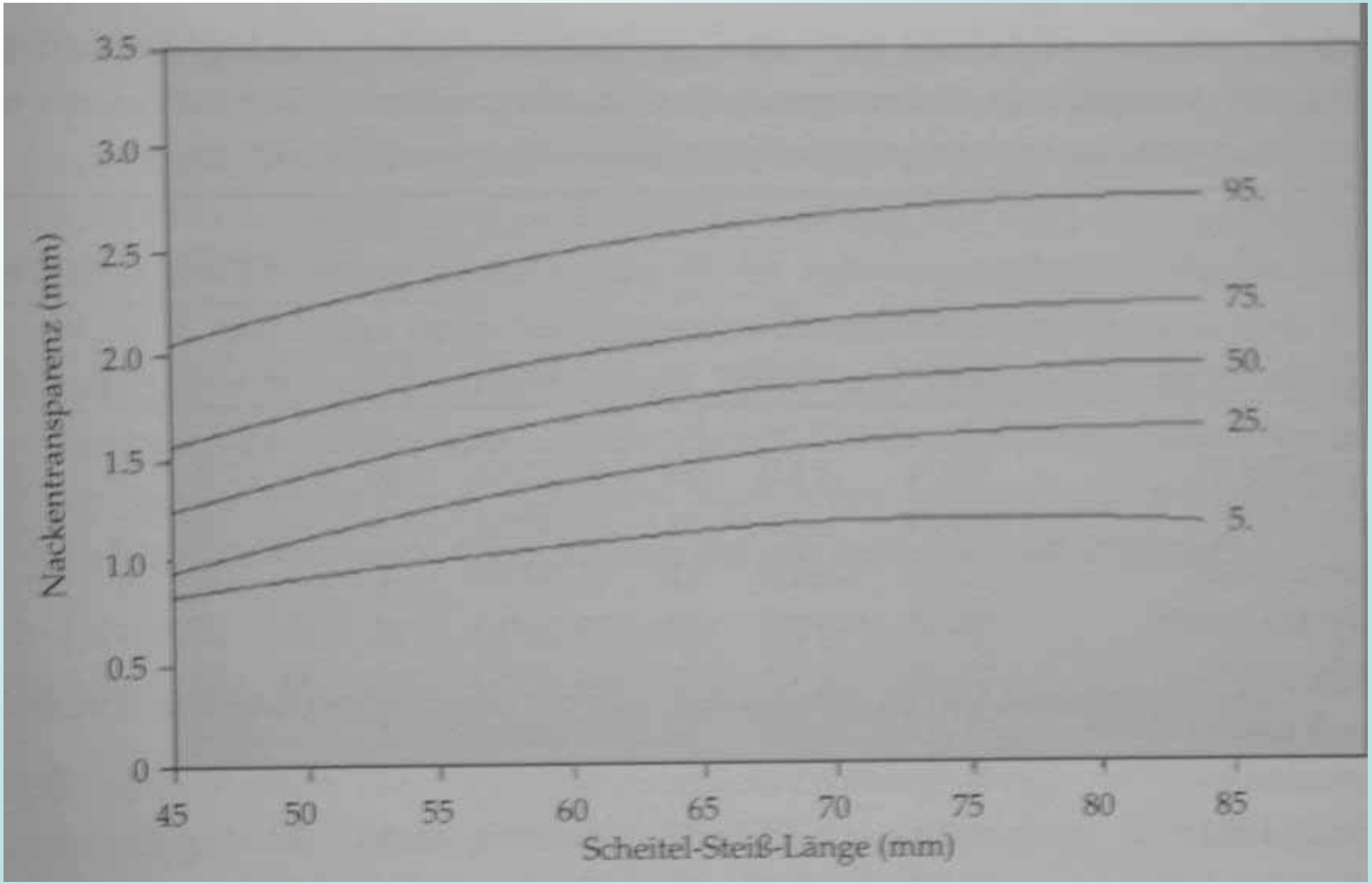
US: Nackenfalte + SSL (Scheitel-Steiß-Länge)

Schwangerschaftsalter

„Nackenfalte“

„Nackenfalte“

„Nackenfalte“



Nicolaides K H: Die Ultraschalluntersuchung der 11.-14. Schwangerschaftswoche

„Nackenfalte“

Nicolaides K H: Die Ultraschalluntersuchung der 11.-14. Schwangerschaftswoche

„Nackenfalte“

Nicolaides K H: Die Ultraschalluntersuchung der 11.-14. Schwangerschaftswoche

„Nackenfalte“

Trisomie 21

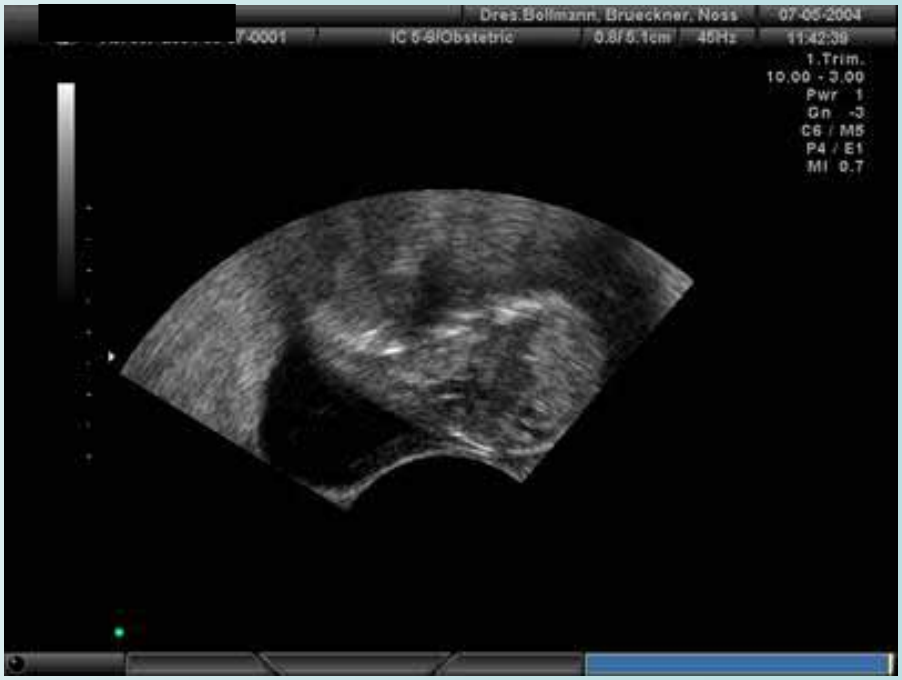
Nicolaides K H: Die Ultraschalluntersuchung der 11.-14. Schwangerschaftswoche

ab 14. SSW

13+0 SSW

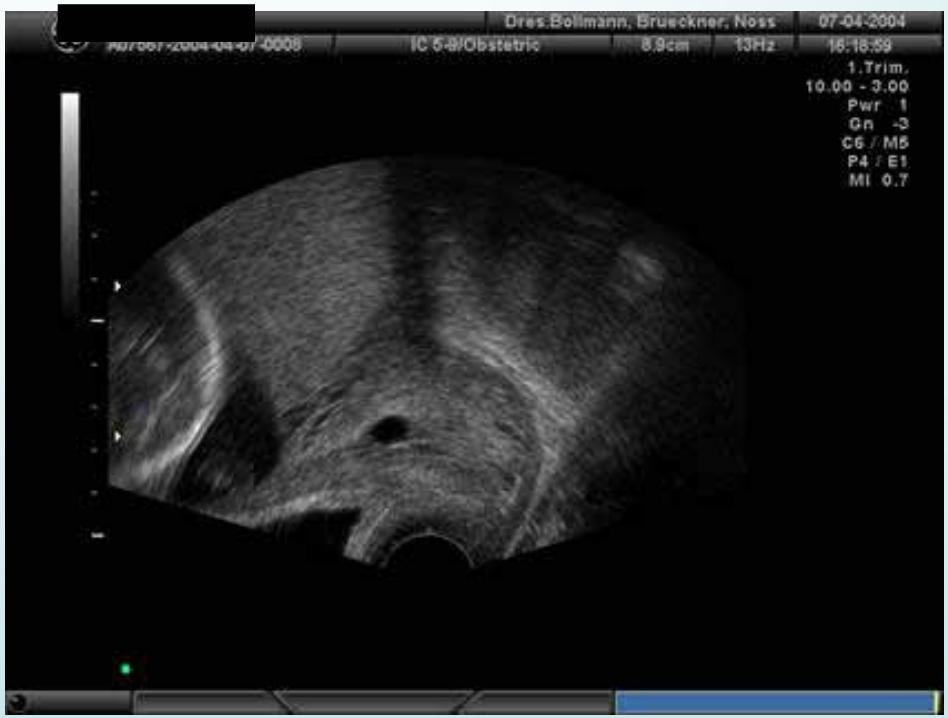
ab 14. SSW

13+0



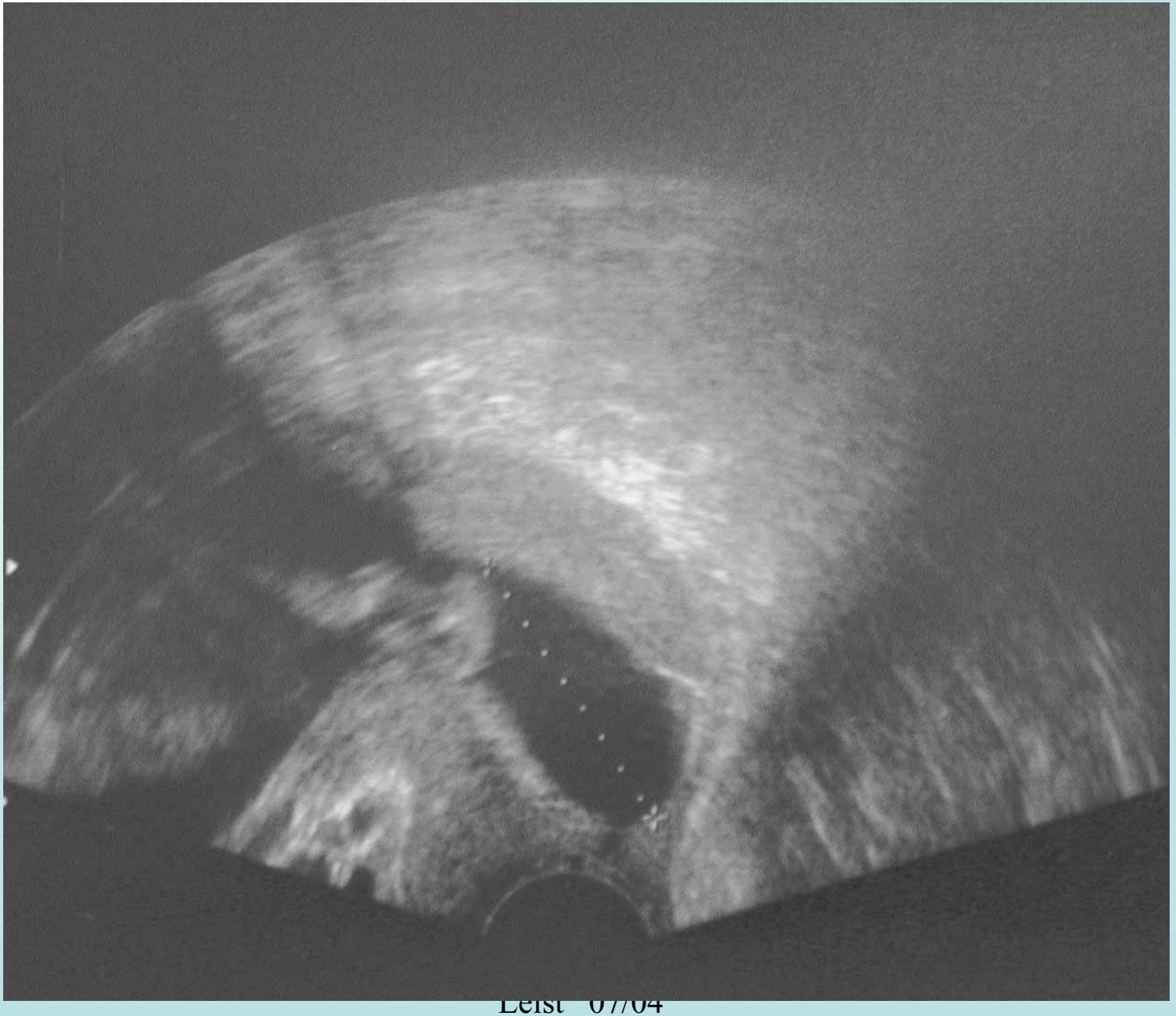
eist 07/04

Cervixlänge

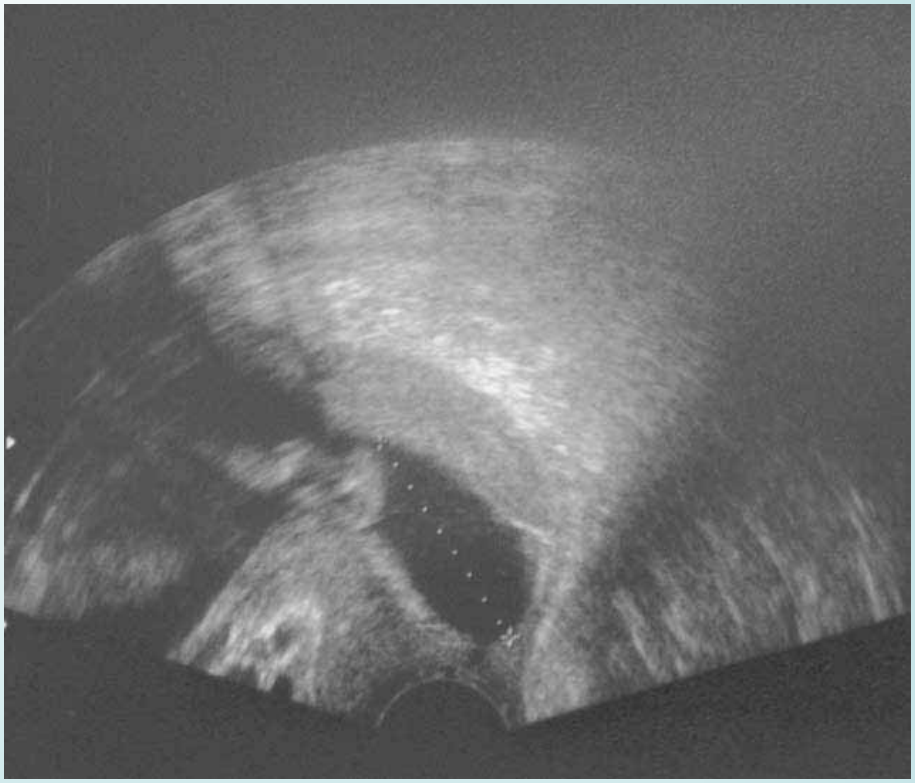


Cervixlänge

Cervixlänge



Cervixlänge



Frau Z. 40 Jahre

10/02 Tochter 2. ICSI (Blutungen 16. SSW)

07/03 ICSI Gemini-SS

19+5 SSW stationäre Einweisung

I Totgeburt 20.SSW

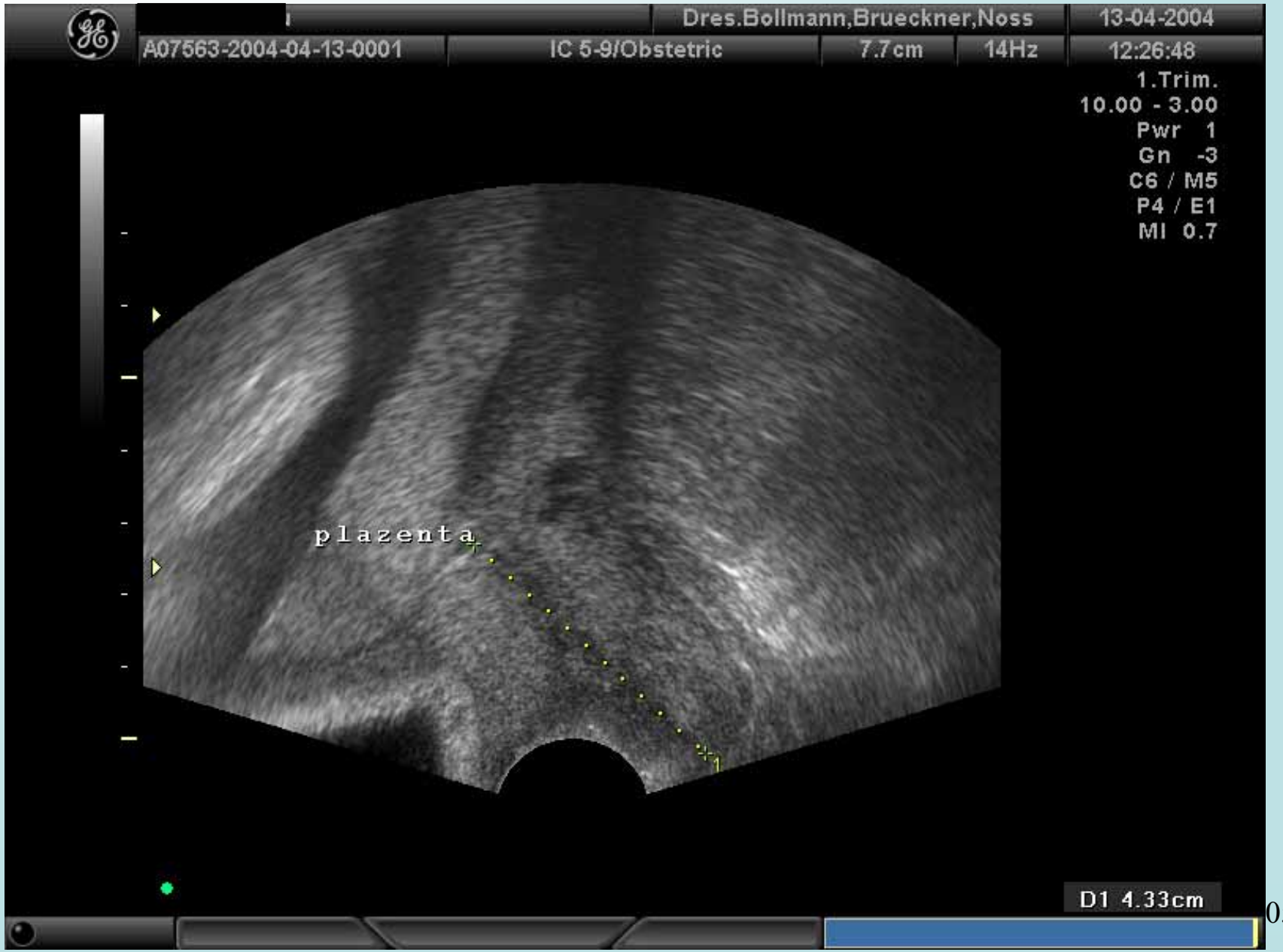
II Geburt 25. SSW (nach 4 Tagen verstorben)

Plazenta praevia

vorliegender Mutterkuchen

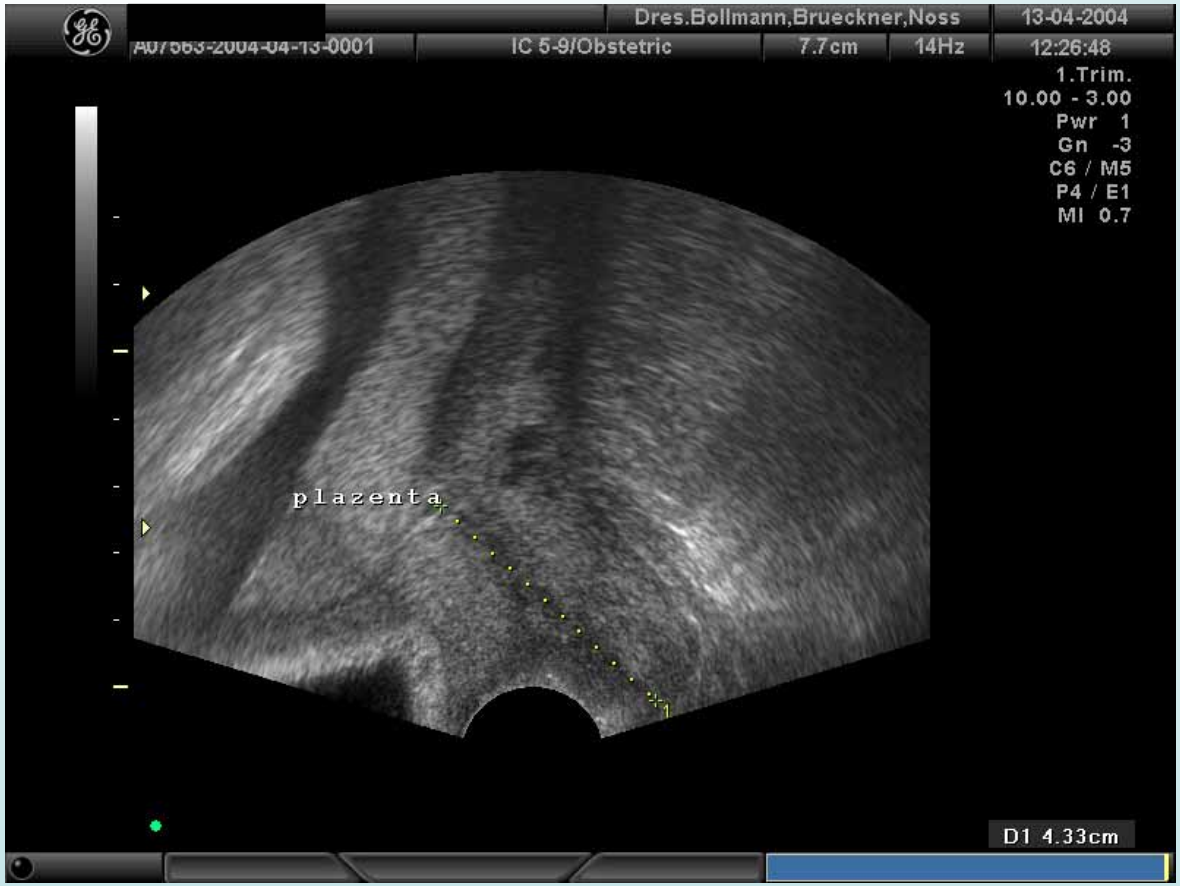
Plazenta praevia

vorliegender Mutterkuchen



Plazenta praevia

vorliegender Mutterkuchen



Frau C. 43 Jahre

09/03 3 Embryonen

Einlings-SS

~ 27. SSW Plazenta praevia totalis

03/04 Sectio

06/04 Hitzewallungen

FSH 94

LH 40

Fehlgeburt - Abort

iminens / incipiens

Windei

missed

extrauterin

rezidivierend

Fehlgeburt - Abort

imminens / incipiens

drohende / beginnende Fehlgeburt

	HCG	Prog
D + 11	42	3,4
D + 14	76	87

starke Blutung seit 2 Tagen

Fehlgeburt - Abort

imminens / incipiens

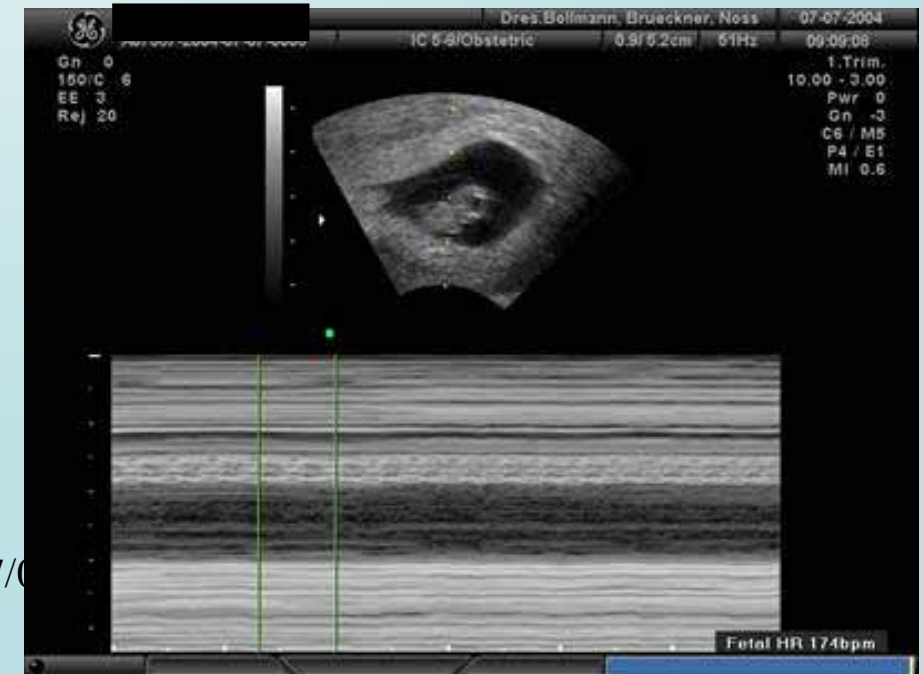
drohende / beginnende Fehlgeburt

8 + 2 SSW

leichte Schmierblutung

HCG 71.845

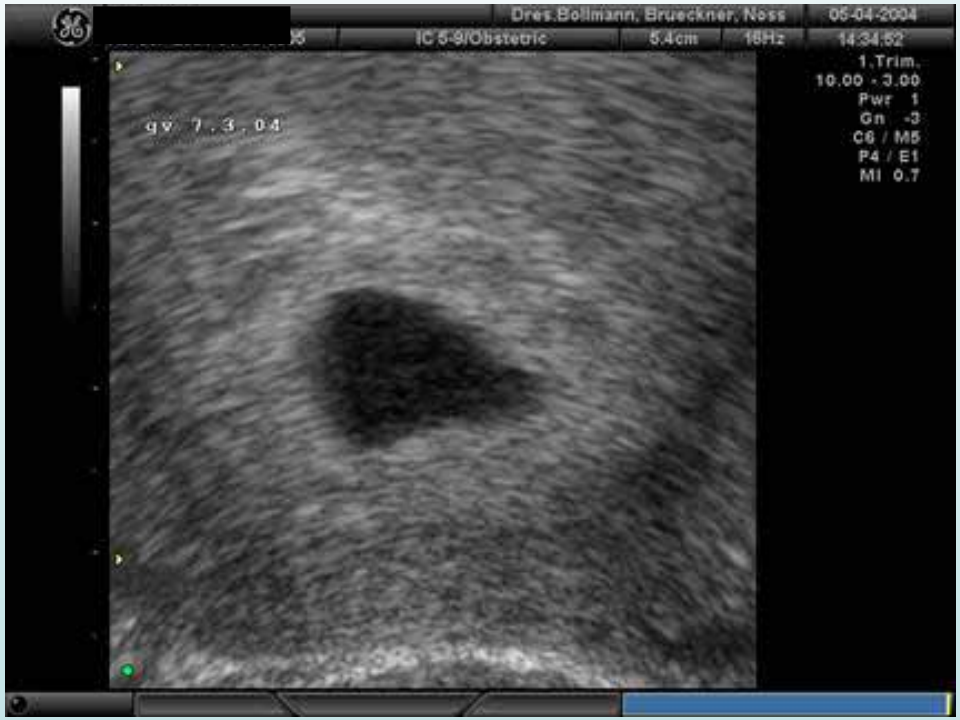
Prog 17,2



Fehlgeburt - Abort

D + 29 leere Fruchthöhle

„Windei“



EU

extrauterine Schwangerschaft / Abort

Frau D. 40 Jahre

19.03.04 1. ICSI

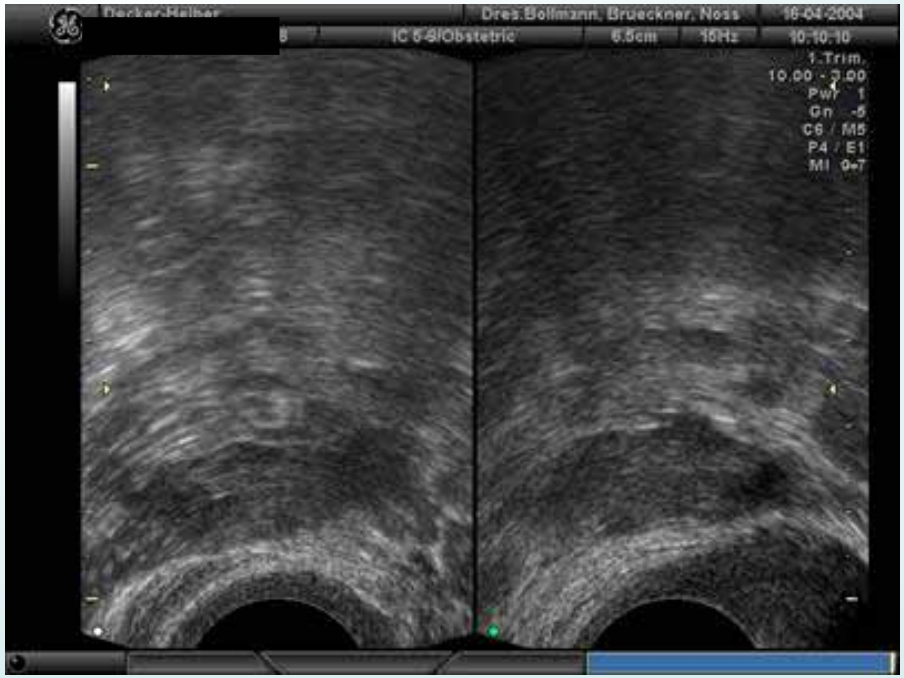
L.P. normal stark

D + 29

	HCG	Prog
D + 11	14,4	16,2
D + 14	29,1	15,2
D + 25	240	0,6
D + 29	455	1,3

Leist 07/04

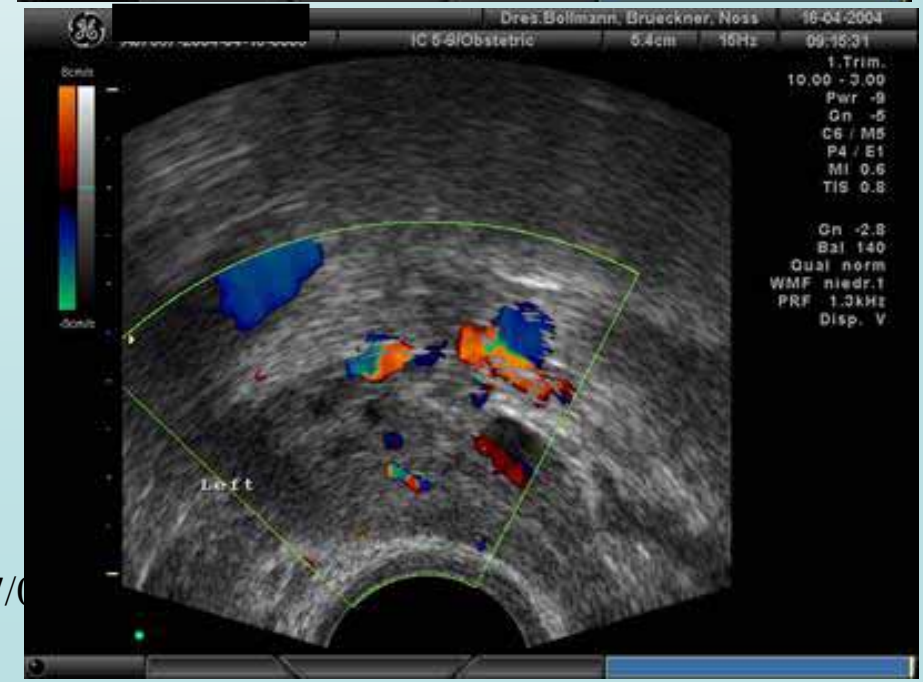
extrauterine Schwangerschaft



	HCG	Prog
D + 32	723	4,5
LSK	EU links	
	HCG 87	nach 3d
	HCG 18	nach 8d

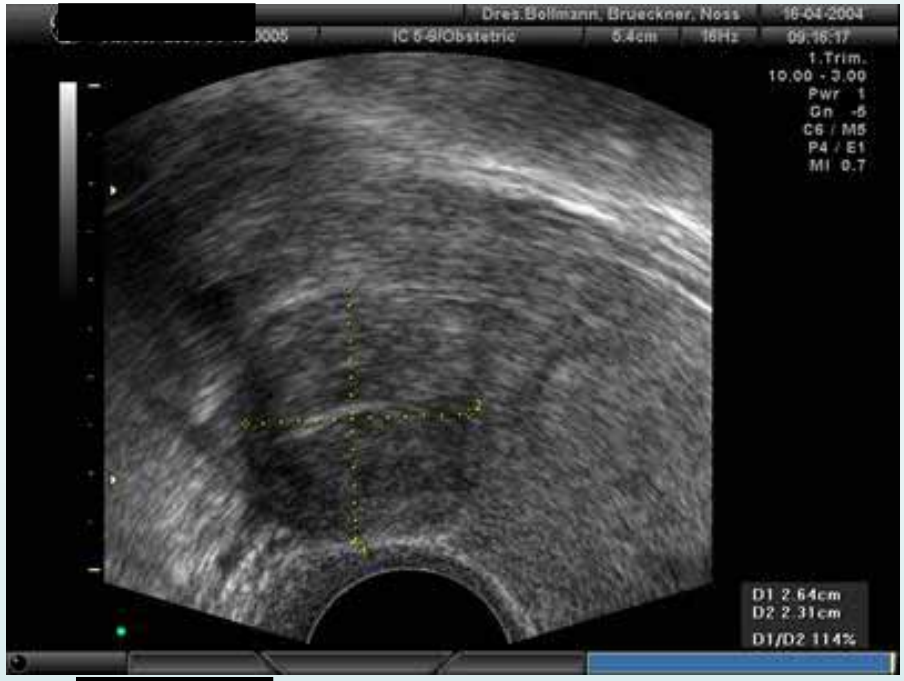
extrauterine Schwangerschaft

Spontan-SS HCG 1599



extrauterine Schwangerschaft

HCG 1599



16.04.04	HCG 1599 stationäre Einweisung
21.04.04	Maistr.: LSK Tubostomie rechts
26.04.04	V.a. Throphoblastpersistenz HCG 3145
	1. Methotrexat i.m.
03.05.	2. Methotrexat i.m. HCG 4381
08.05.	HCG 3063
13.05.	HCG 1729
03.-04.06.	Stationär wg. Unterbauchschmerzen
06.-09.06.	Maistr.: Unterbauch- + Rückenschmerzen
	Di: unklarer Infekt mit Fieber (CRP 18)
	Th: Antibiotika

Leist 07/04

Fehlgeburt - Abort

rezidivierende / wiederholte Fehlgeburten

6 + 4 SSW

2001 Partus

01/03 Geminiabort 7.+9.SSW

04/03 Abort 5.SSW

09/03 Abort 16.SSW

02/04 Diagnostik:

MTHFR heterozygot

6 + 4 HCG 8.5220

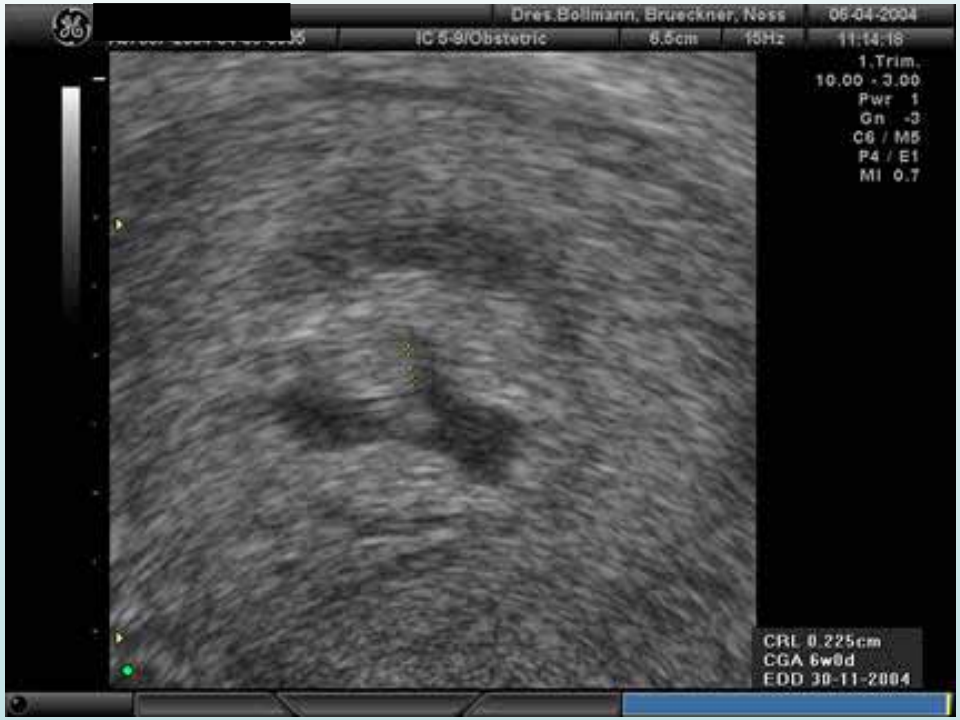
Prog 14,6

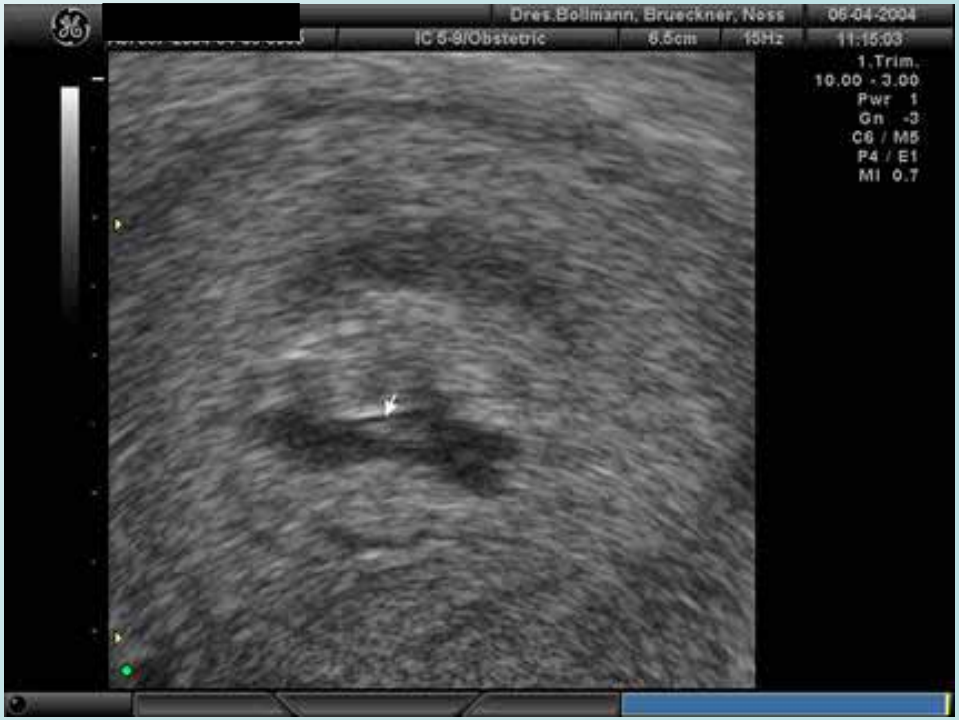
Fehlgeburt - Abort

6 + 4 SSW

Fehlgeburt - Abort

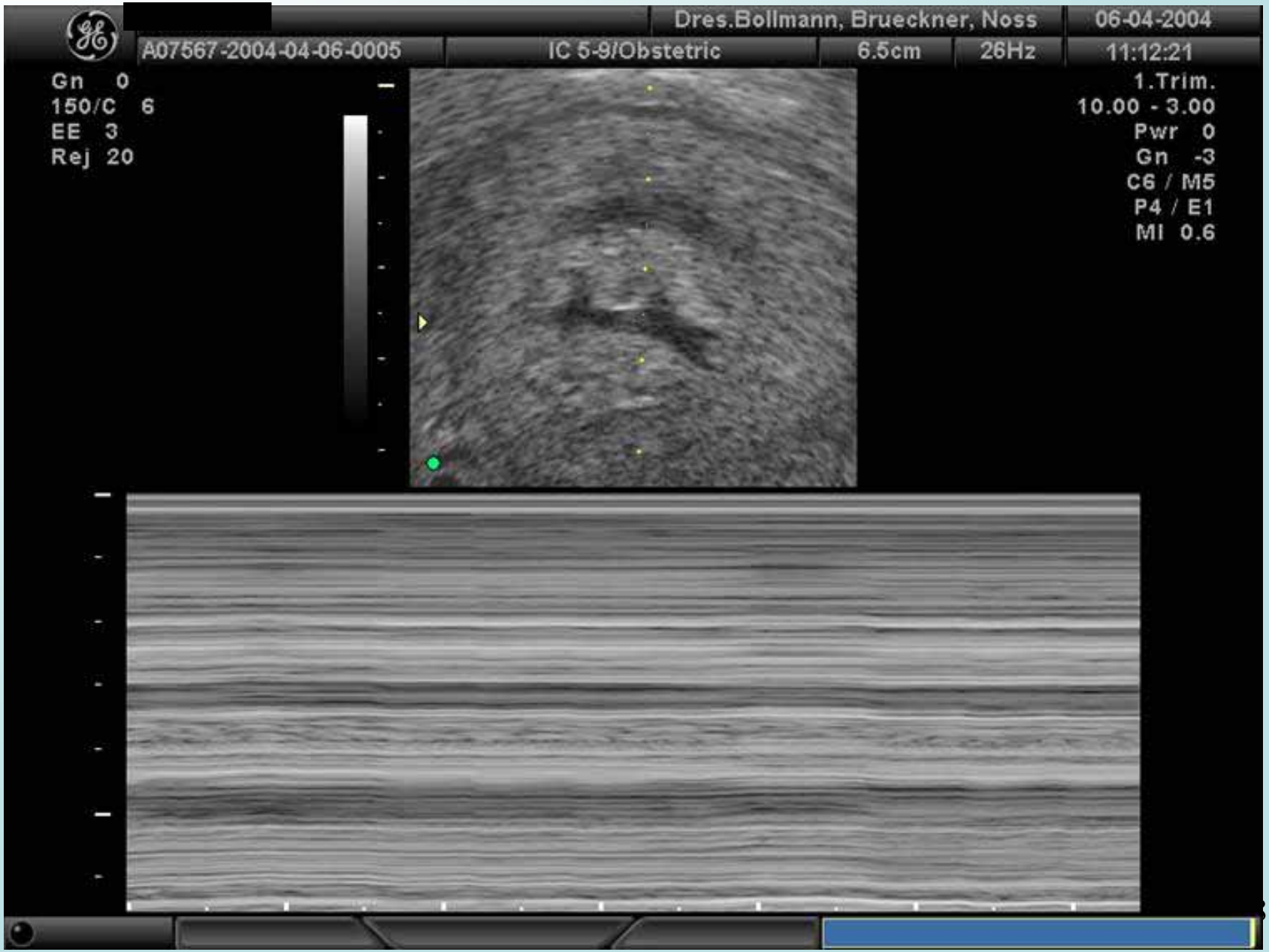
6 + 4 SSW





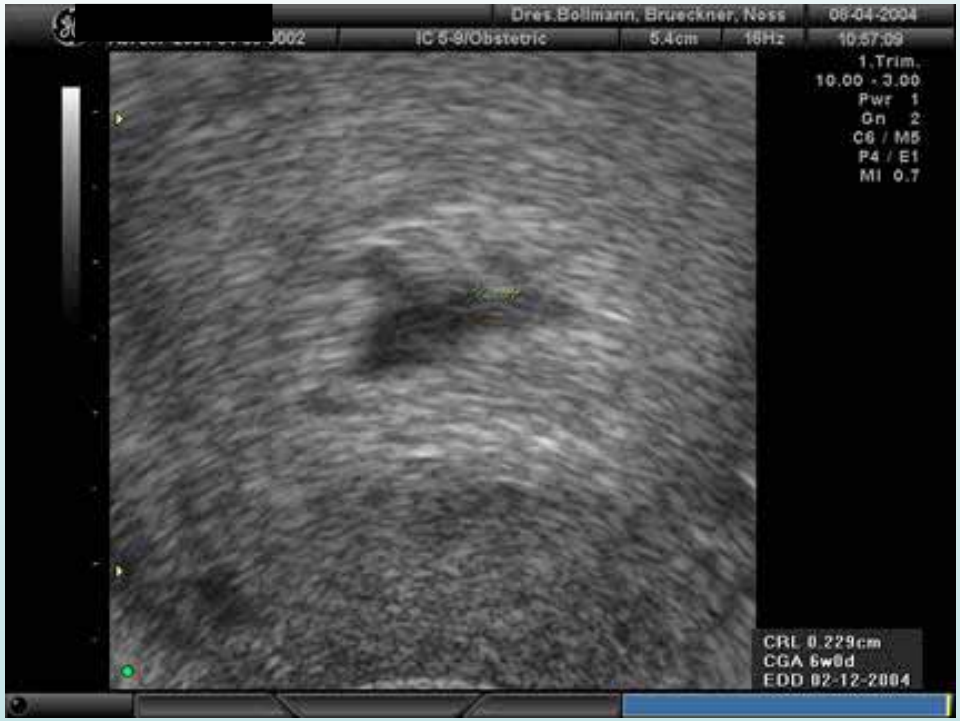
Fehlgeburt - Abort

6 + 4 SSW



Fehlgeburt - Abort

6 + 6 SSW



HCG 9.871

Prog 26,1

Fehlgeburt - Abort

7 + 4 SSW

keine Herzaktion

Fehlgeburt - Abort

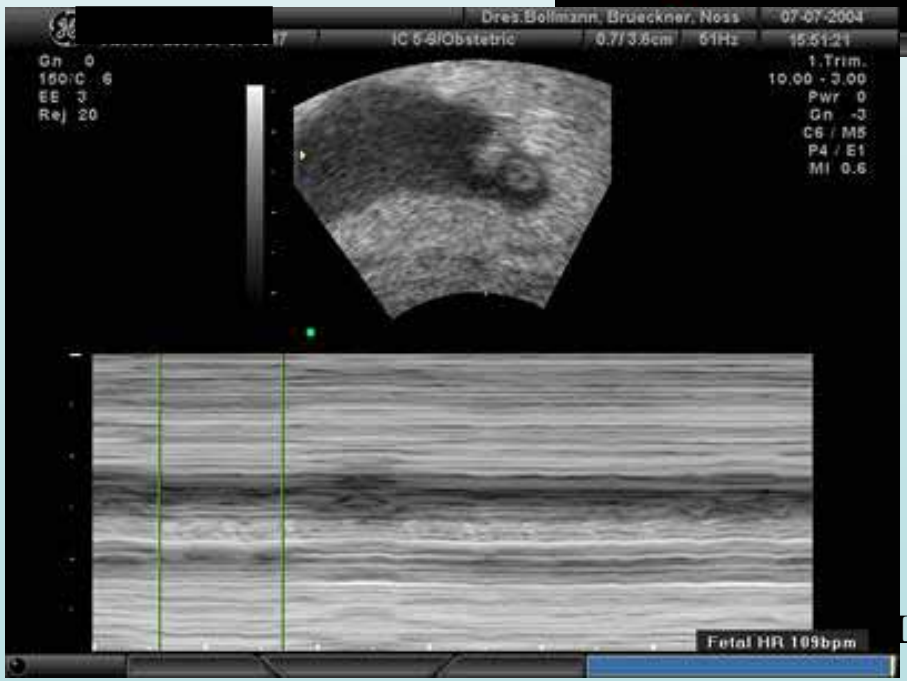
7 + 4 SSW

Kürette

Triploidie

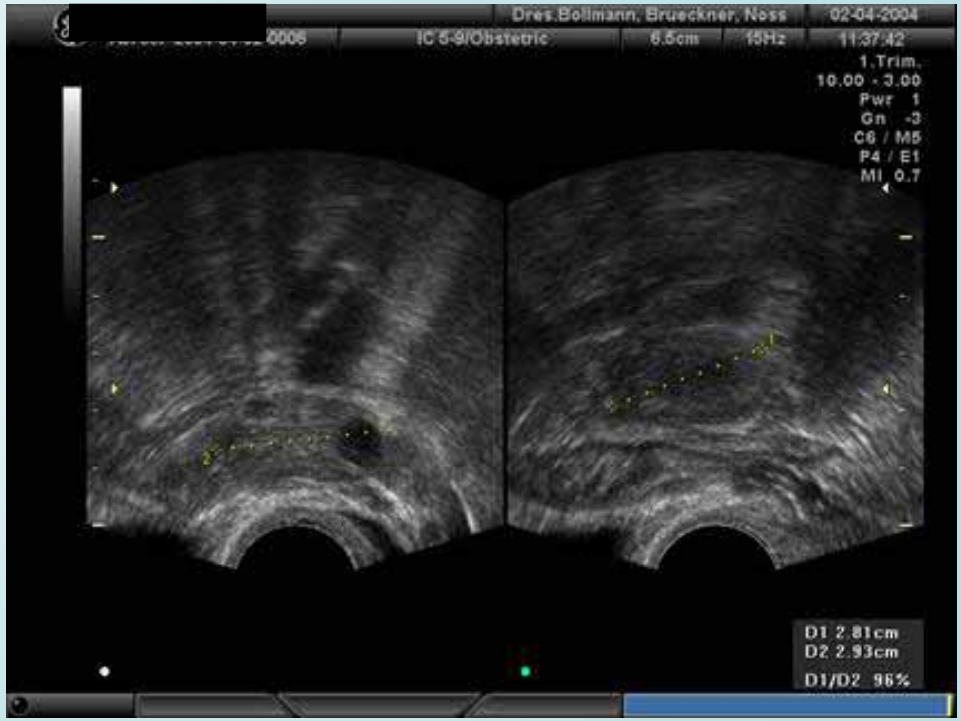
erneute Schwangerschaft

5. Gravida / 1. Para 6 + 5 SSW



Leist 07/04

Nachuntersuchung nach Abort



Kürette 25.03 wg. Missed abortion 7. SSW

02.04. HCG 250

22.04. HCG 0,9

Vaginaler Ultraschall

Theorie

Anatomie

Stimulation

Schwangerschaft

Pathologie

weitere Anwendung(smöglichkeit)en

Pathologie

Endometriumhyperplasie

Polypen

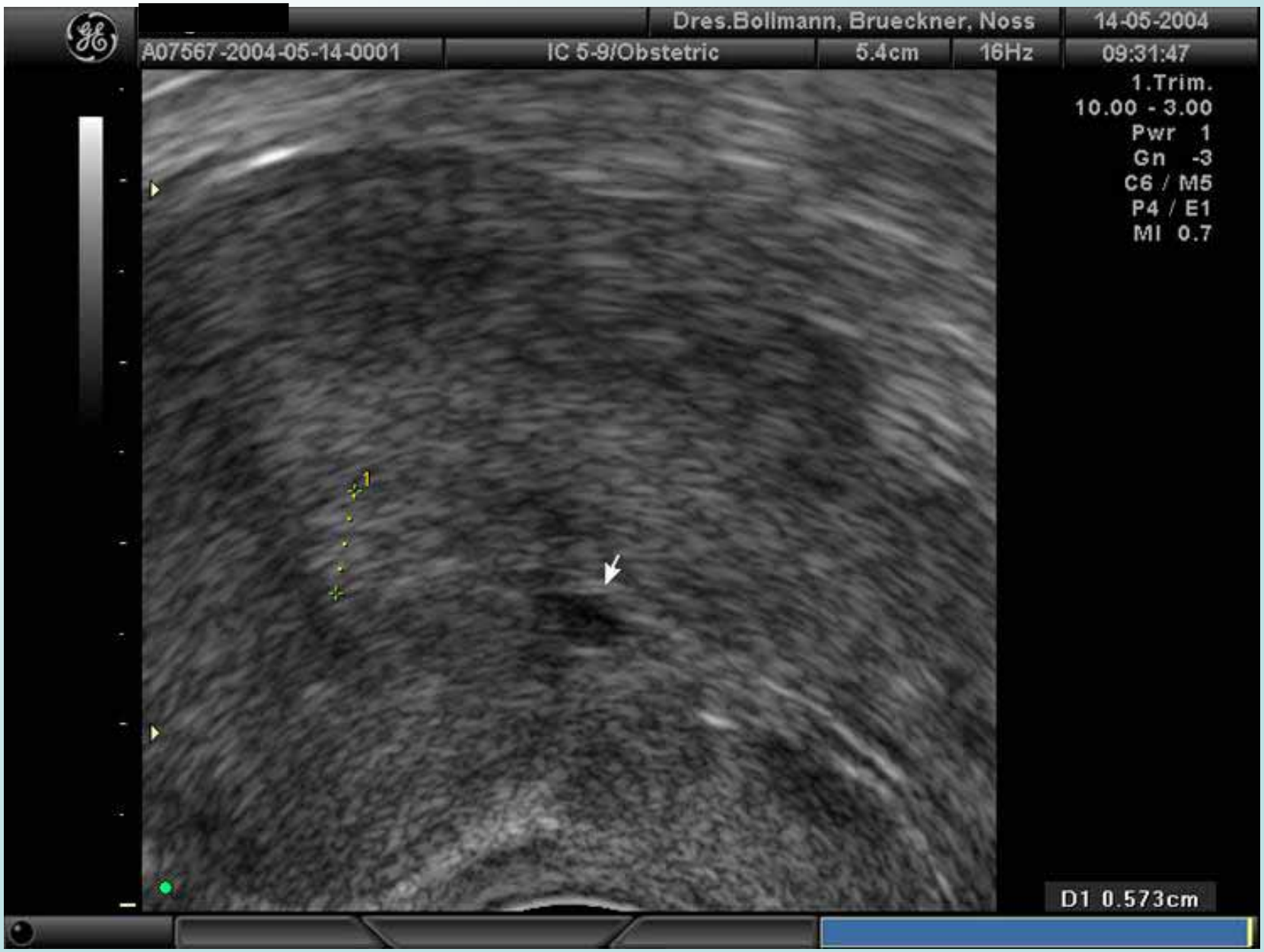
Myome

Sactosalpinx

Ovarialzysten

Karzinome

Alte Sectionarbe

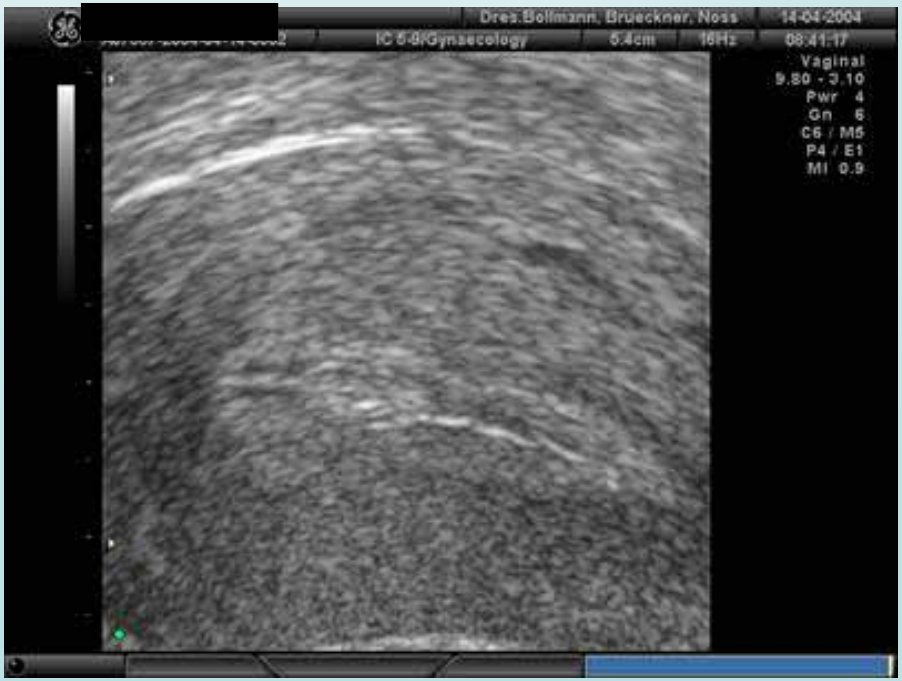


Endometriumhyperplasie

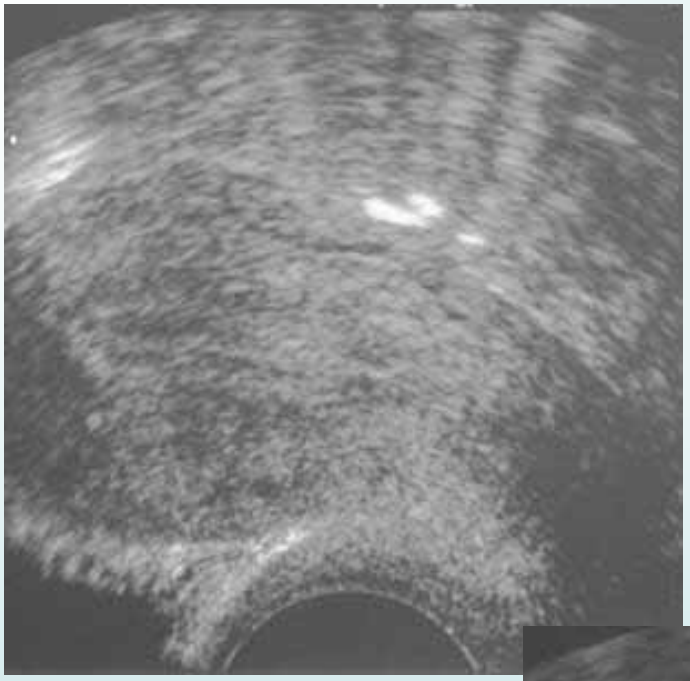
Polypen

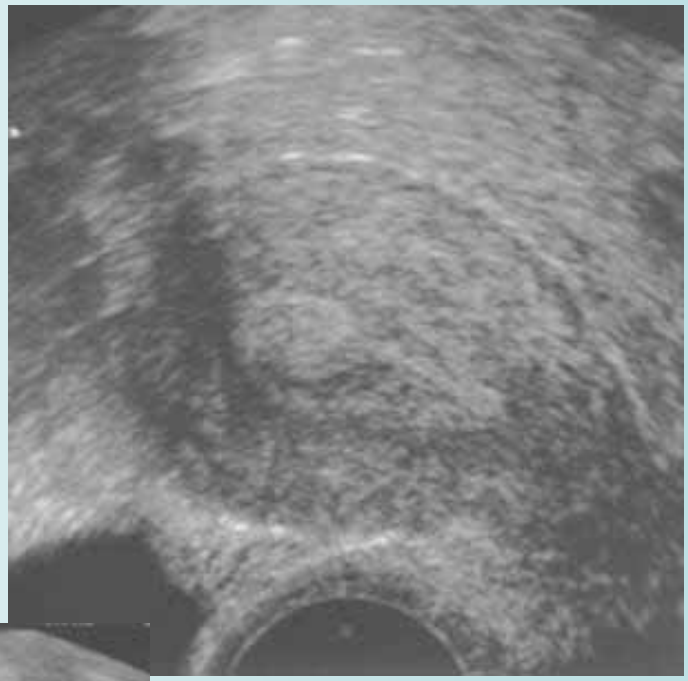
Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
08:40:24
Vaginal
Pwr 4
Gn 6
C6 / M5
P4 / E1
MI 0.8
D1 0.740cm

Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
08:40:45
Vaginal
Pwr 4
Gn 6
C6 / M5
P4 / E1
MI 0.8

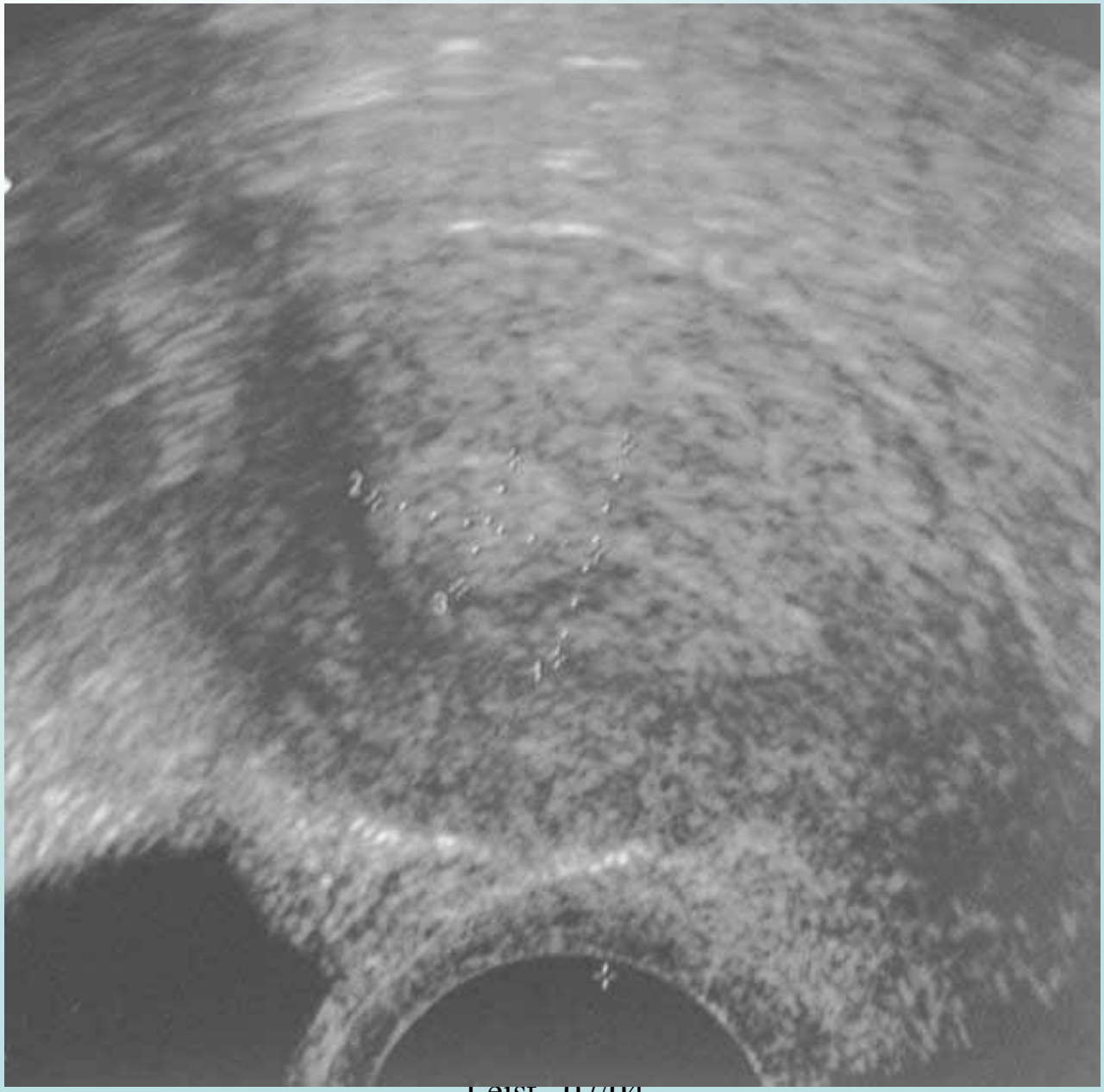

Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynaecology
5.4cm
16Hz
08:41:17
Vaginal
Pwr 4
Gn 6
C6 / M5
P4 / E1
MI 0.9

Polypen



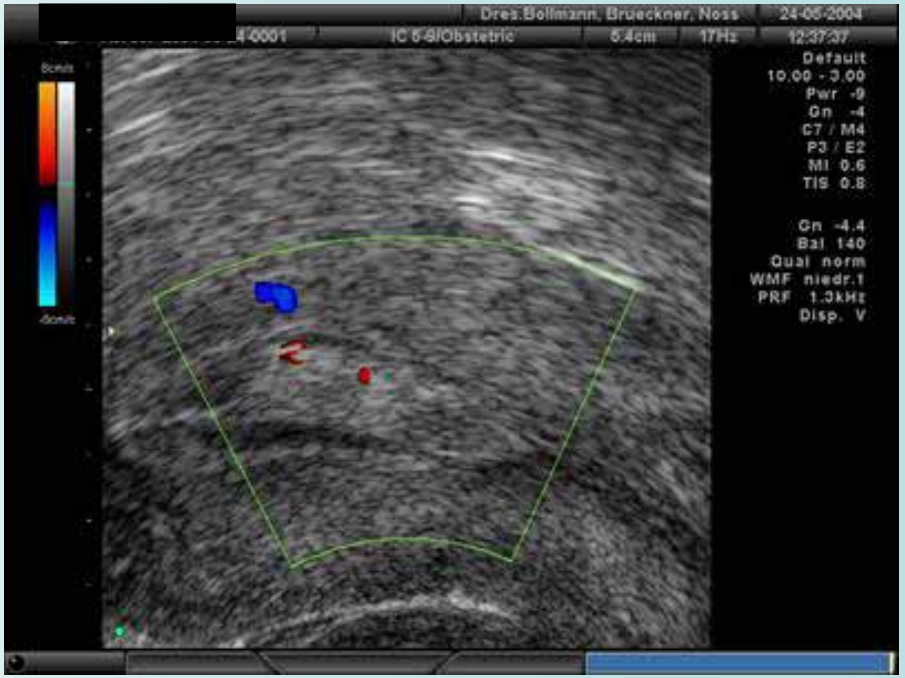


Polypen



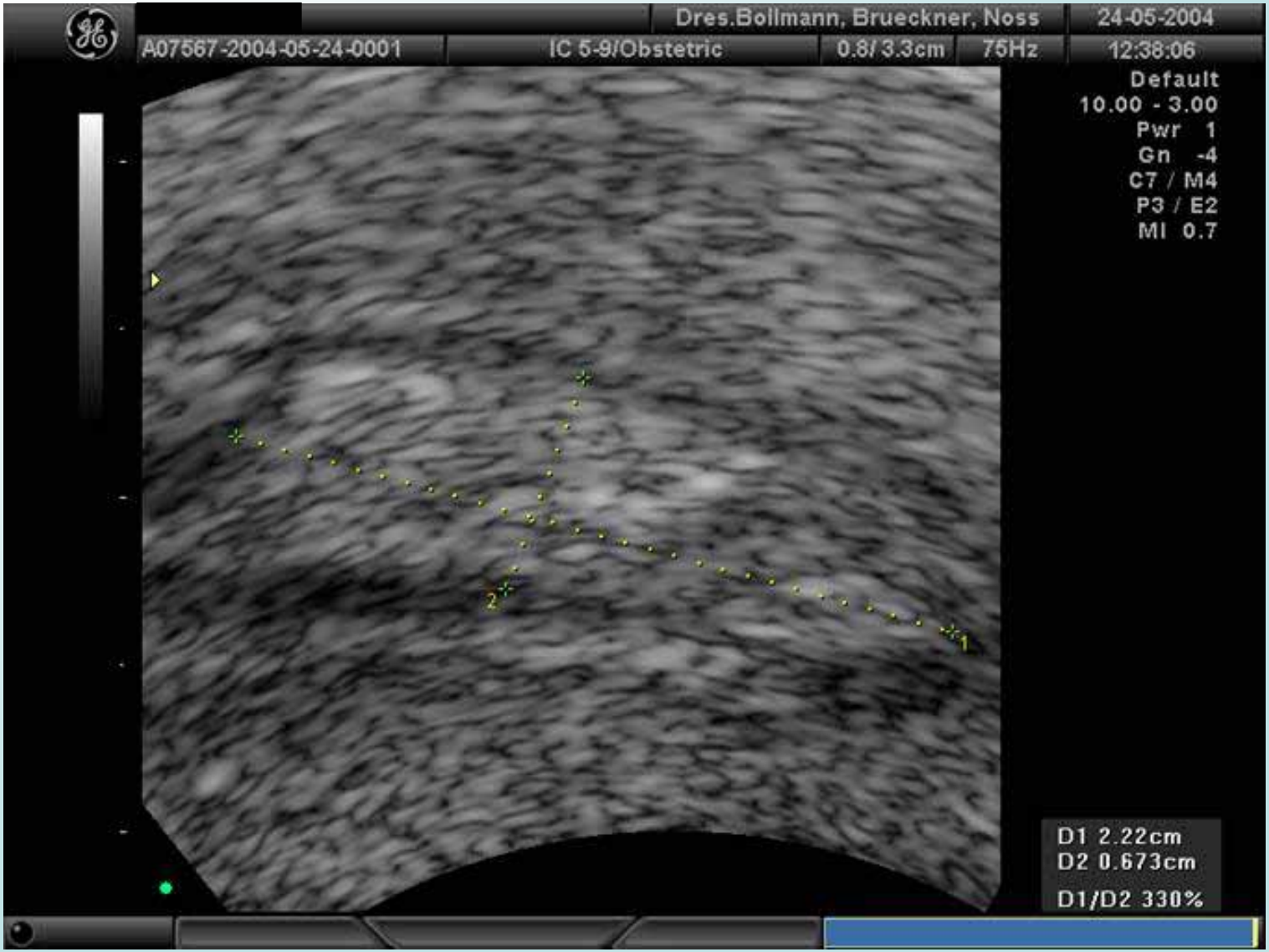
Polypen

Dres.Bollmann, Brueckner, Noss
24-05-2004
IC 5-9/Obstetric
5.4cm
17Hz
Default
Pwr 1
Gn -4
C7 / M4
P3 / E2
MI 0.7
D1 0.867cm
D2 1.88cm
D3 1.61cm
D1/D2 46%

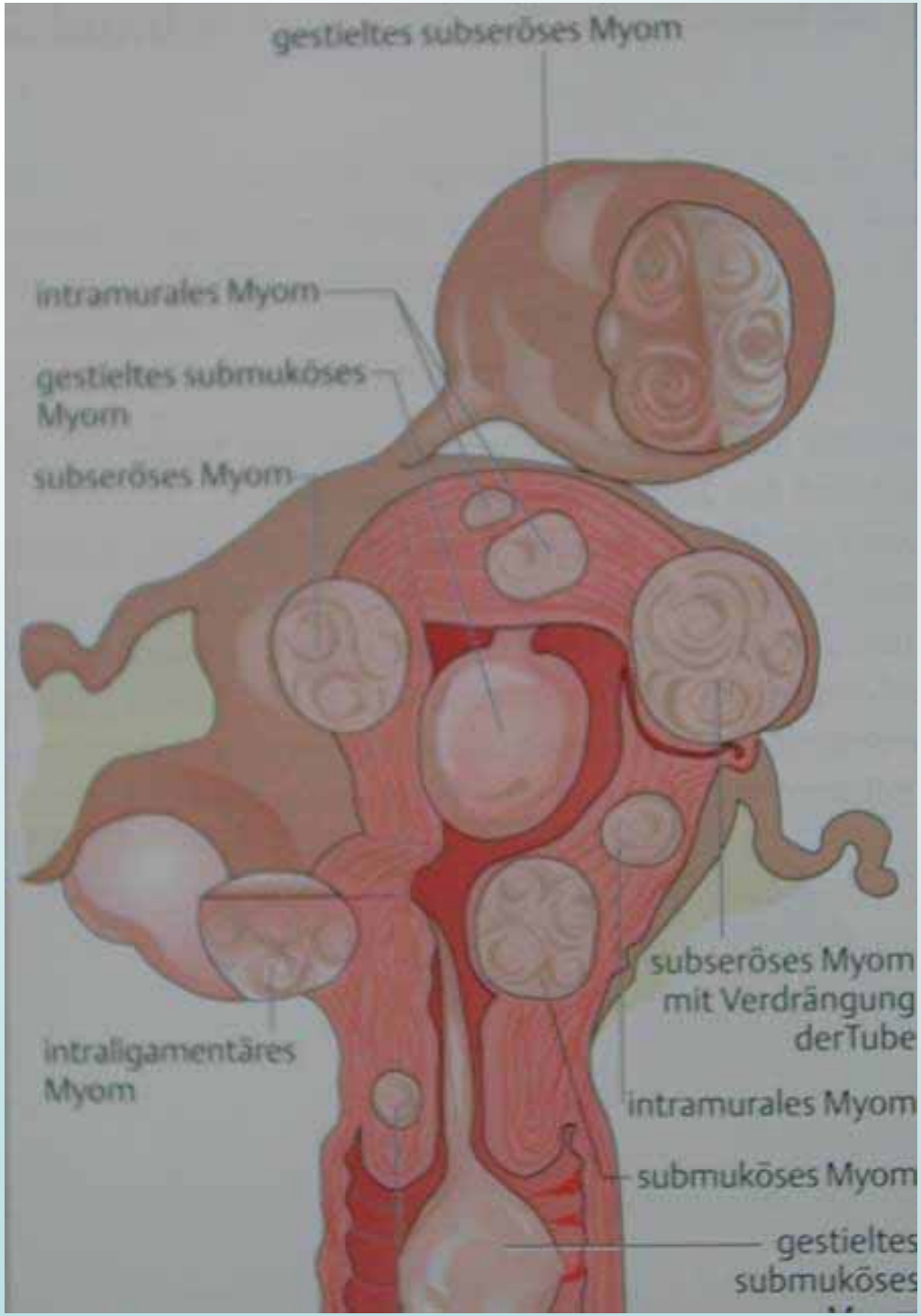

Dres.Bollmann, Brueckner, Noss
24-05-2004
IC 5-9/Obstetric
5.4cm
17Hz
Default
Pwr -9
Gn -4
C7 / M4
P3 / E2
MI 0.6
TIS 0.8
Gn -4.4
Bal 140
Qual norm
WMF niedr.1
PRF 1.3kHz
Disp. V

Dres.Bollmann, Brueckner, Noss
24-05-2004
IC 5-9/Obstetric
6.5cm
16Hz
Default
Pwr 1
Gn -4
C7 / M4
P3 / E2
MI 0.7
D1 8.15cm

Polypen


Dres.Bollmann, Brueckner, Noss
24-05-2004
A07567-2004-05-24-0001
IC 5-9/Obstetric
0.8/ 3.3cm
75Hz
12:38:06
Default
10.00 - 3.00
Pwr 1
Gn -4
C7 / M4
P3 / E2
MI 0.7
D1 2.22cm
D2 0.673cm
D1/D2 330%

Myome



März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

Myome

Dres.Bollmann, Brueckner, Noss
14-04-2004
A07567-2004-04-14-0007
IC 5-9/Obstetric
7.7cm
14Hz
16:04:55
1.Trim.
10.00 - 3.00
Pwr 1
Gn 7
C6 / M5
P4 / E1
MI 0.7
D1 1.88cm

Myome

Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynsecology
5.4cm
16Hz
09:32:00
Vaginal
9.80 - 3.10
Pwr 4
Gn 1
C6 / M5
P4 / E1
MI 0.9
D1 2.60cm
D2 2.52cm
D1/D2 103%

Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynsecology
5.4cm
16Hz
09:32:16
Vaginal
9.80 - 3.10
Pwr 4
Gn 1
C6 / M5
P4 / E1
MI 0.9
D1 2.11cm

Dres.Bollmann, Brueckner, Noss
14-04-2004
IC 5-9/Gynsecology
5.4cm
16Hz
09:31:52
Vaginal
9.80 - 3.10
Pwr 4
Gn 1
C6 / M5
P4 / E1
MI 0.9

Myome

Dres.Bollmann, Brueckner, Noss
02-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
10:44:03
Vaginal
9.80 - 3.10
Pwr 4
Gn -4
C6 / M5
P4 / E1
MI 0.8

Dres.Bollmann, Brueckner, Noss
02-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
10:45:09
Vaginal
9.80 - 3.10
Pwr 4
Gn -4
C6 / M5
P4 / E1
MI 0.8

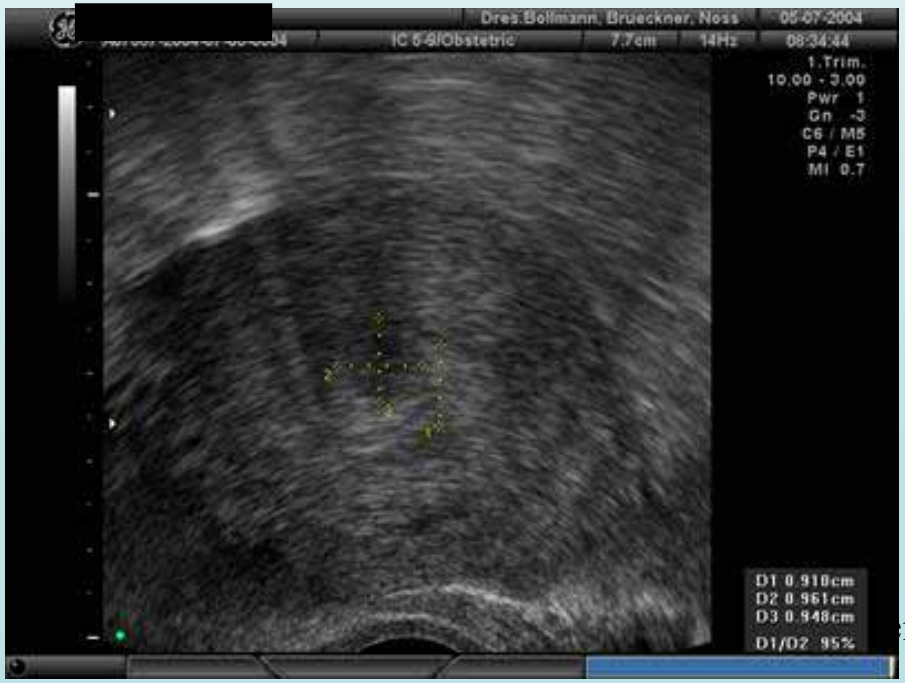
Dres.Bollmann, Brueckner, Noss
02-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
10:44:51
Vaginal
9.80 - 3.10
Pwr 4
Gn -4
C6 / M5
P4 / E1
MI 0.8
D1 3.87cm

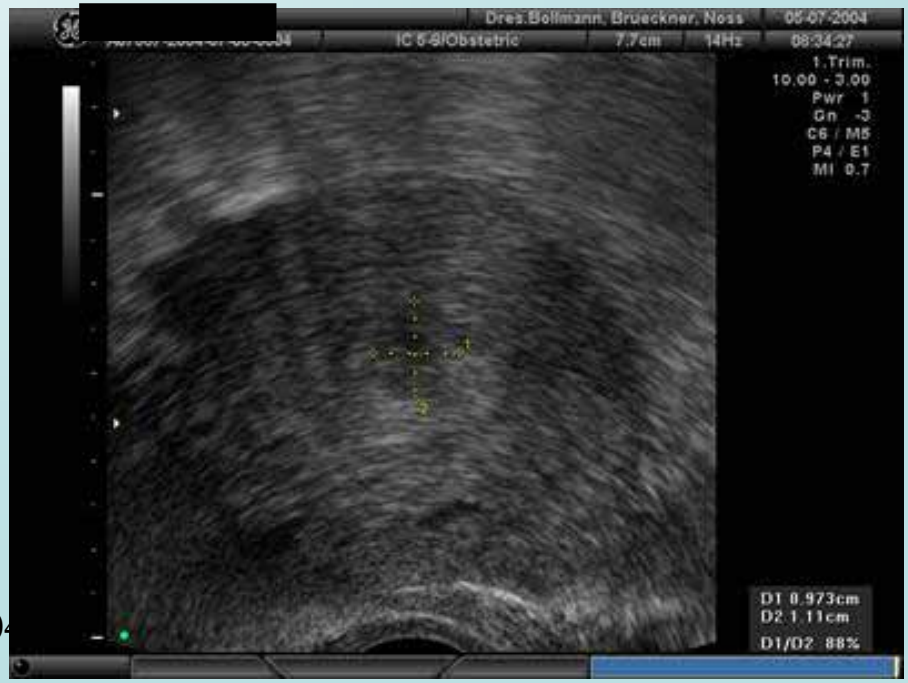
Dres.Bollmann, Brueckner, Noss
02-04-2004
IC 5-9/Gynaecology
6.5cm
16Hz
10:44:32
Vaginal
9.80 - 3.10
Pwr 4
Gn -4
C6 / M5
P4 / E1
MI 0.8
D1 4.54cm
D2 3.82cm
D1/D2 119%

Myome

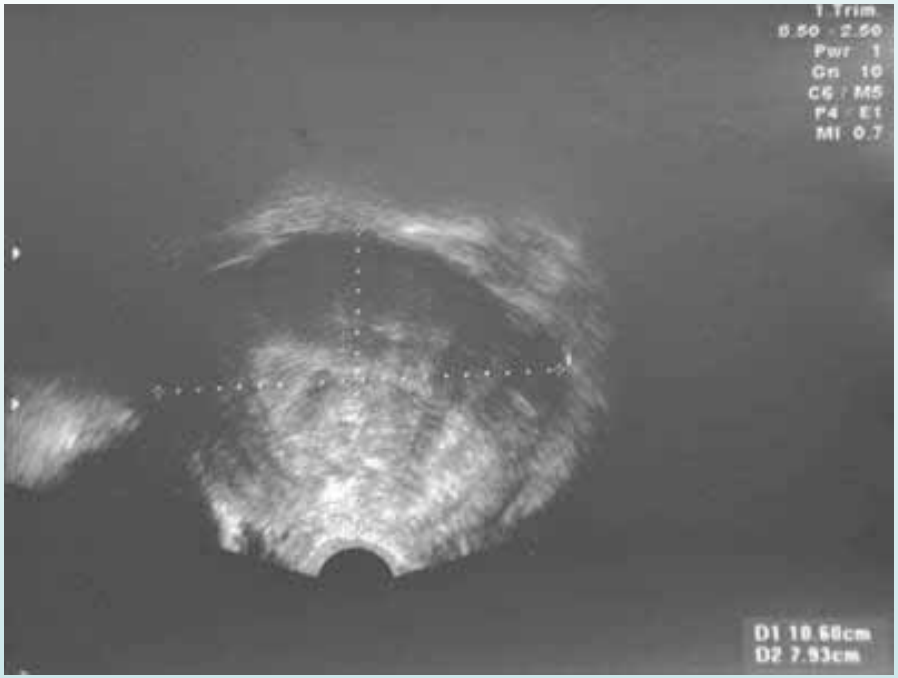
Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
6.5cm
16Hz
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 0.881cm

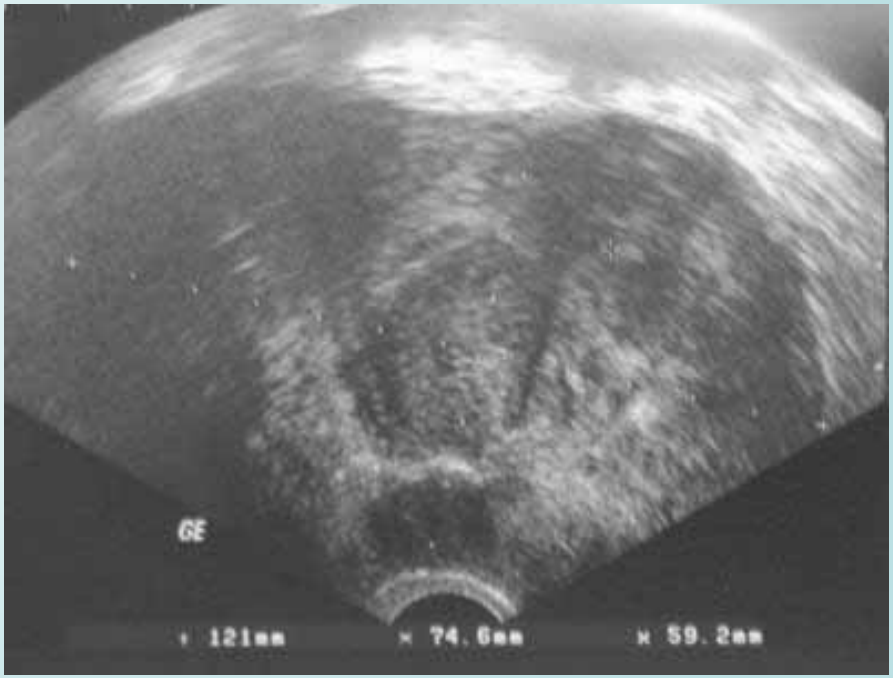
Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
7.7cm
14Hz
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 0.923cm


Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
7.7cm
14Hz
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 0.910cm
D2 0.961cm
D3 0.948cm
D1/D2 95%


Dres.Bollmann, Brueckner, Noss
05-07-2004
IC 5-9/Obstetric
7.7cm
14Hz
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
D1 0.973cm
D2 1.11cm
D1/D2 88%

Myome

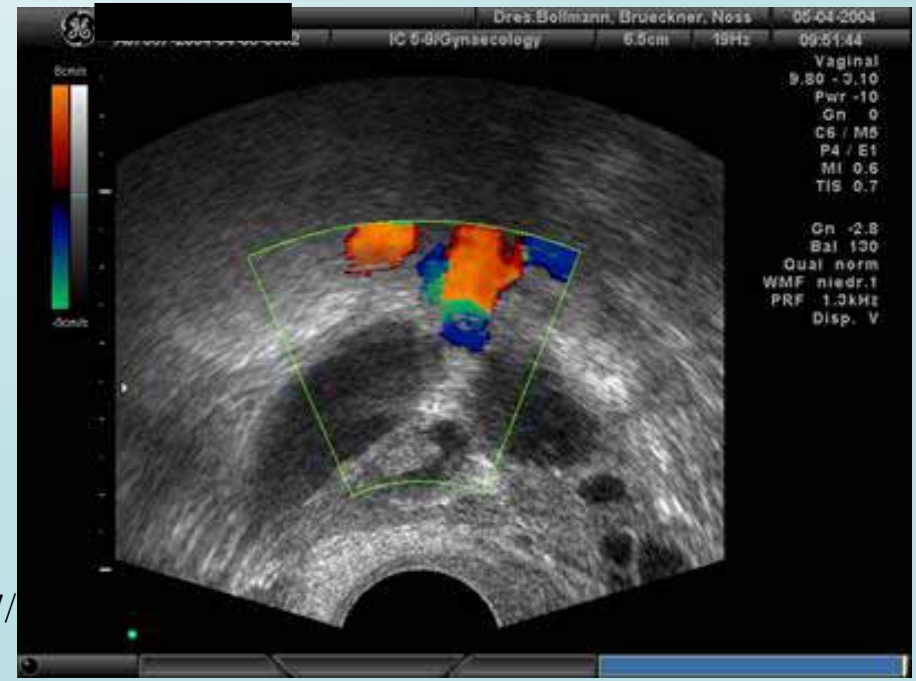




Sactosalpinx

Sactosalpinx

Sactosalpinx



Sactosalpinx

Ovarialzysten / Eierstockzysten

funktionelle Zysten

Gelbkörperzysten

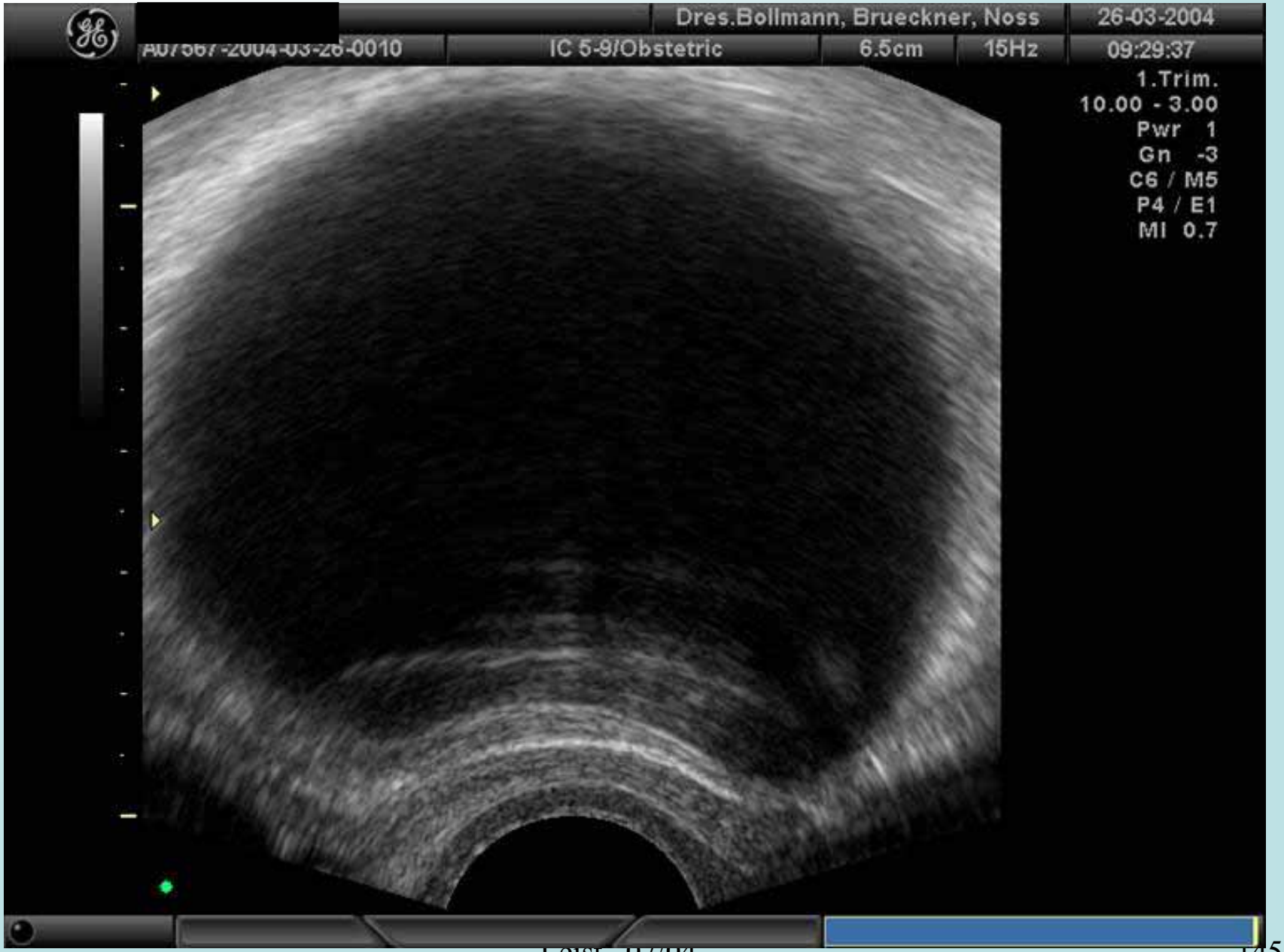
Endometriom

Dermoid

Ovarialzysten

funktionelle Zysten

funktionelle Zyste



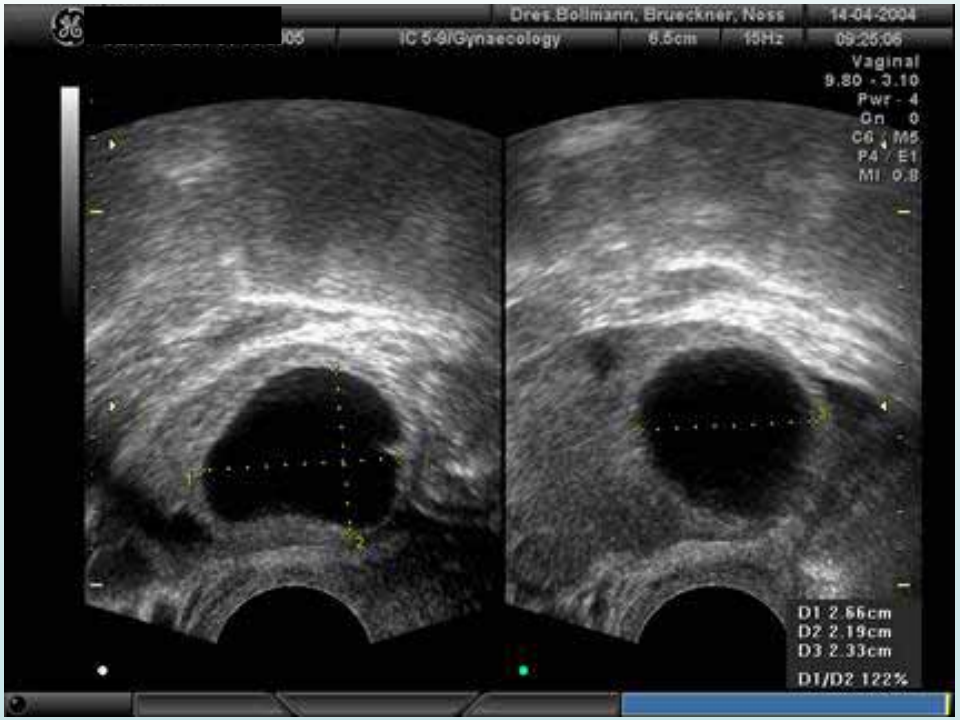
Ovarialzysten

V. a. Fibrom

Ovarialzysten

V. a. Fibrom

Endometriom



Endometriom

Dermoid

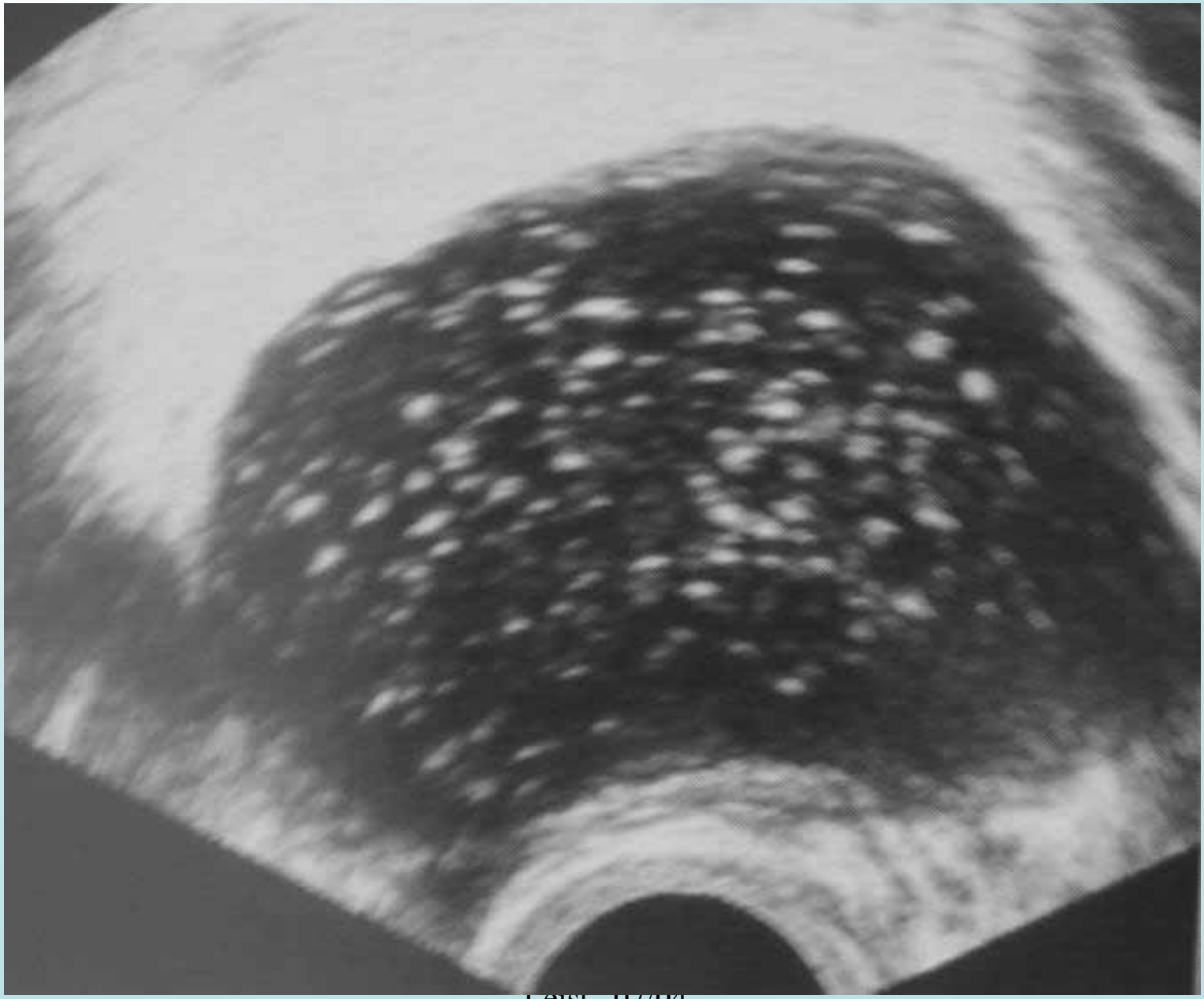
Dres.Bollmann, Brueckner, Noss
24-03-2004
IC 5-9/Obstetric
6.5cm
15Hz
14:57:53
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
v.a. Dermoid re
D1 3.13cm
D2 2.98cm
D1/D2 105%

Dres.Bollmann, Brueckner, Noss
24-03-2004
IC 5-9/Obstetric
6.5cm
15Hz
15:00:42
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7
gefaess
dermoid
ovar

Dermoid

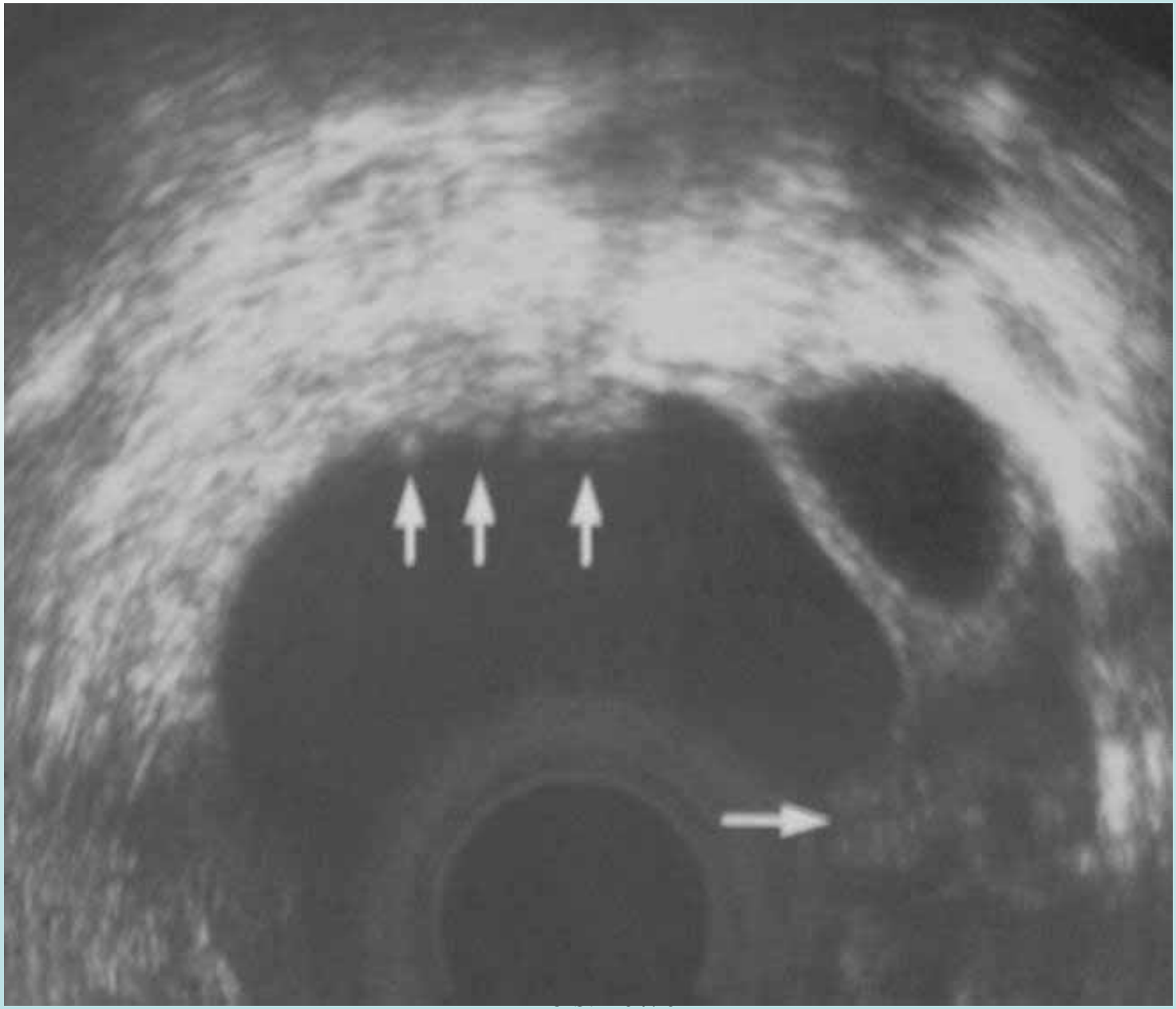
Dres.Bollmann, Brueckner, Noss
24-03-2004
IC 5-9/Obstetric
6.5cm
15Hz
15:00:42
1.Trim.
10.00 - 3.00
Pwr 1
Gn -3
C6 / M5
P4 / E1
MI 0.7

V. a . Ovarial-Ca / Eierstockskrebs



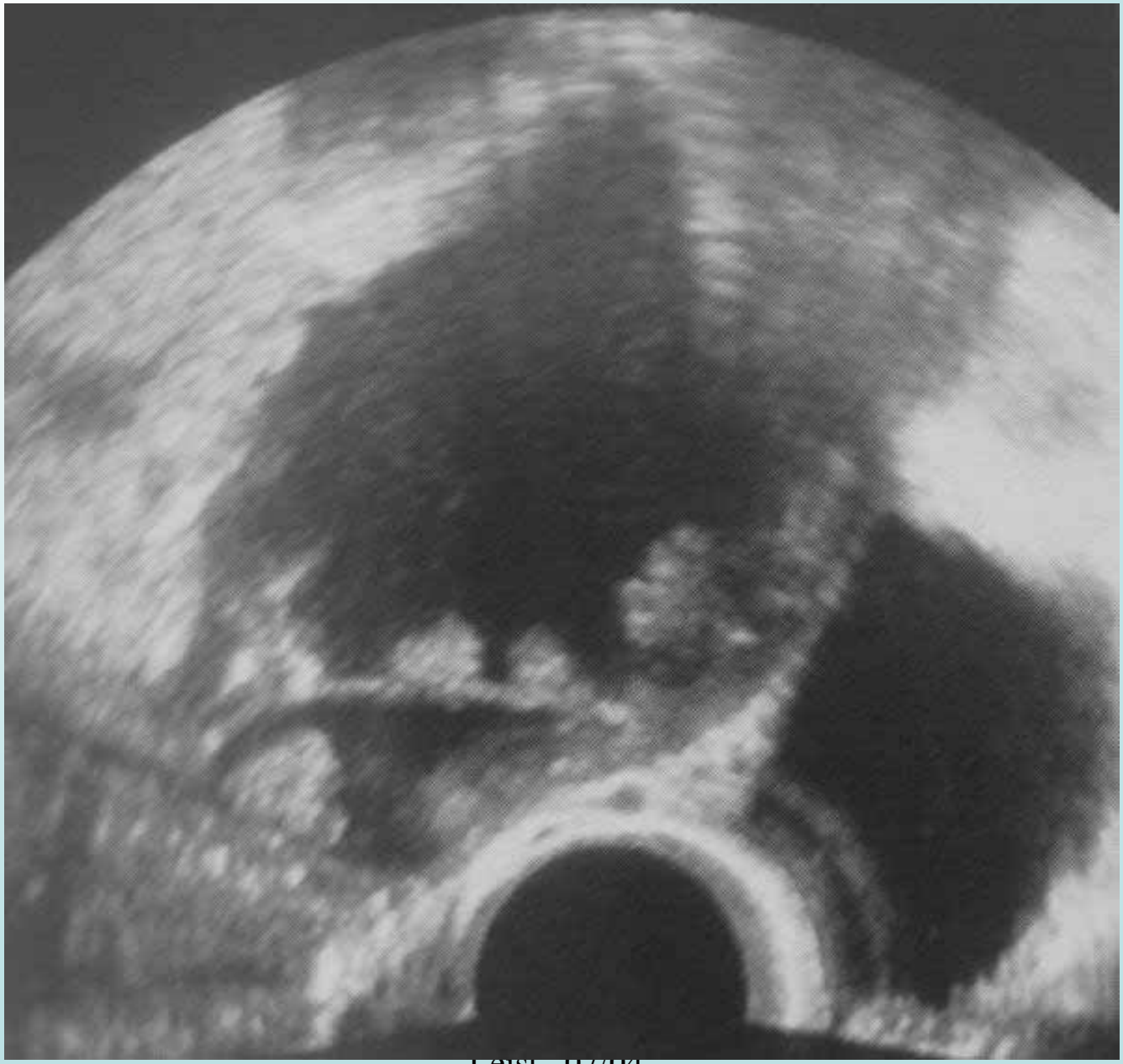
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

V. a. Ovarial-Ca / Eierstockskrebs



März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

V. a . Ovarial-Ca / Eierstockskrebs

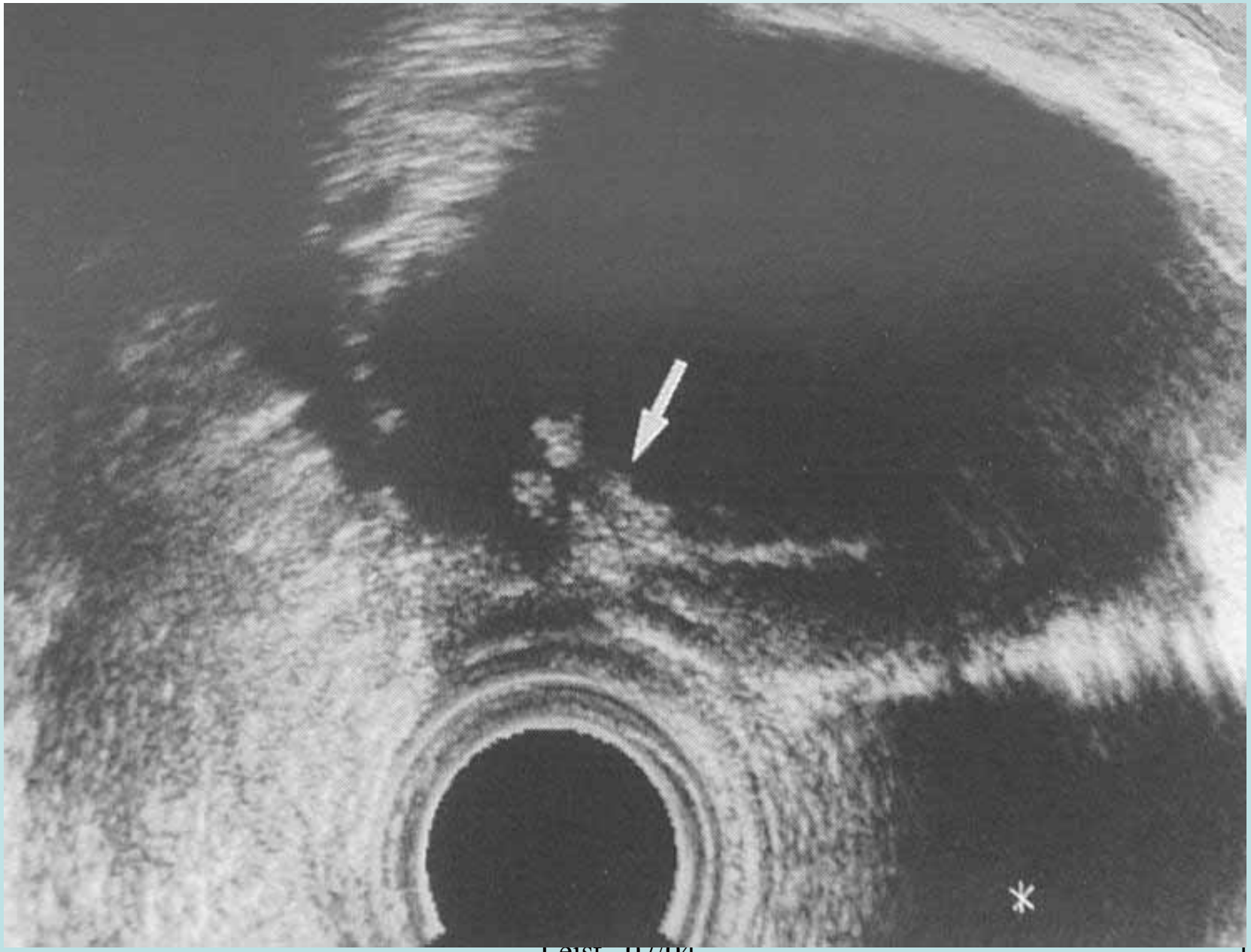


März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

V. a . Ovarial-Ca / Eierstockskrebs

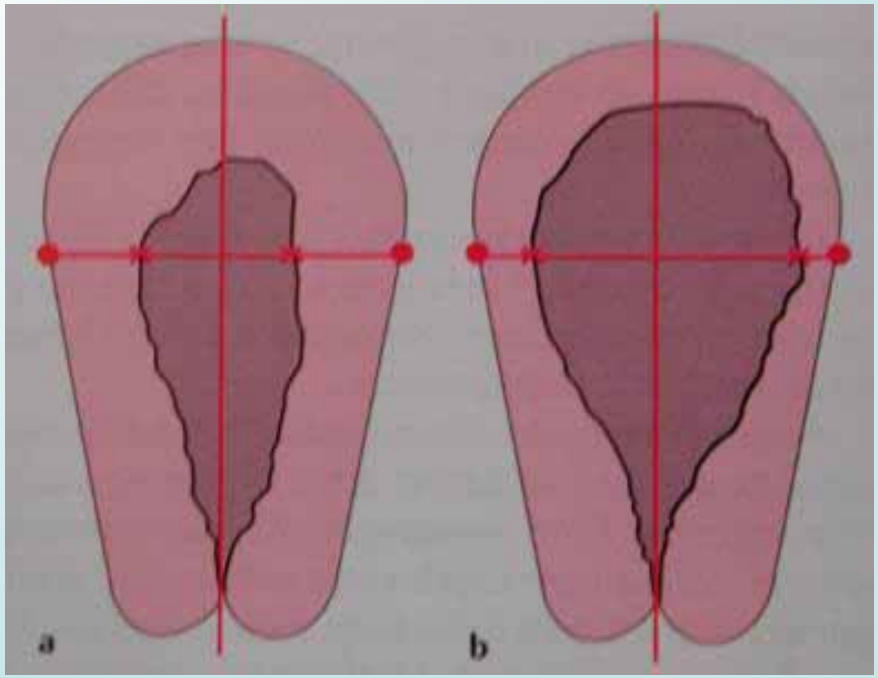
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

V. a . Ovarial-Ca / Eierstockskrebs



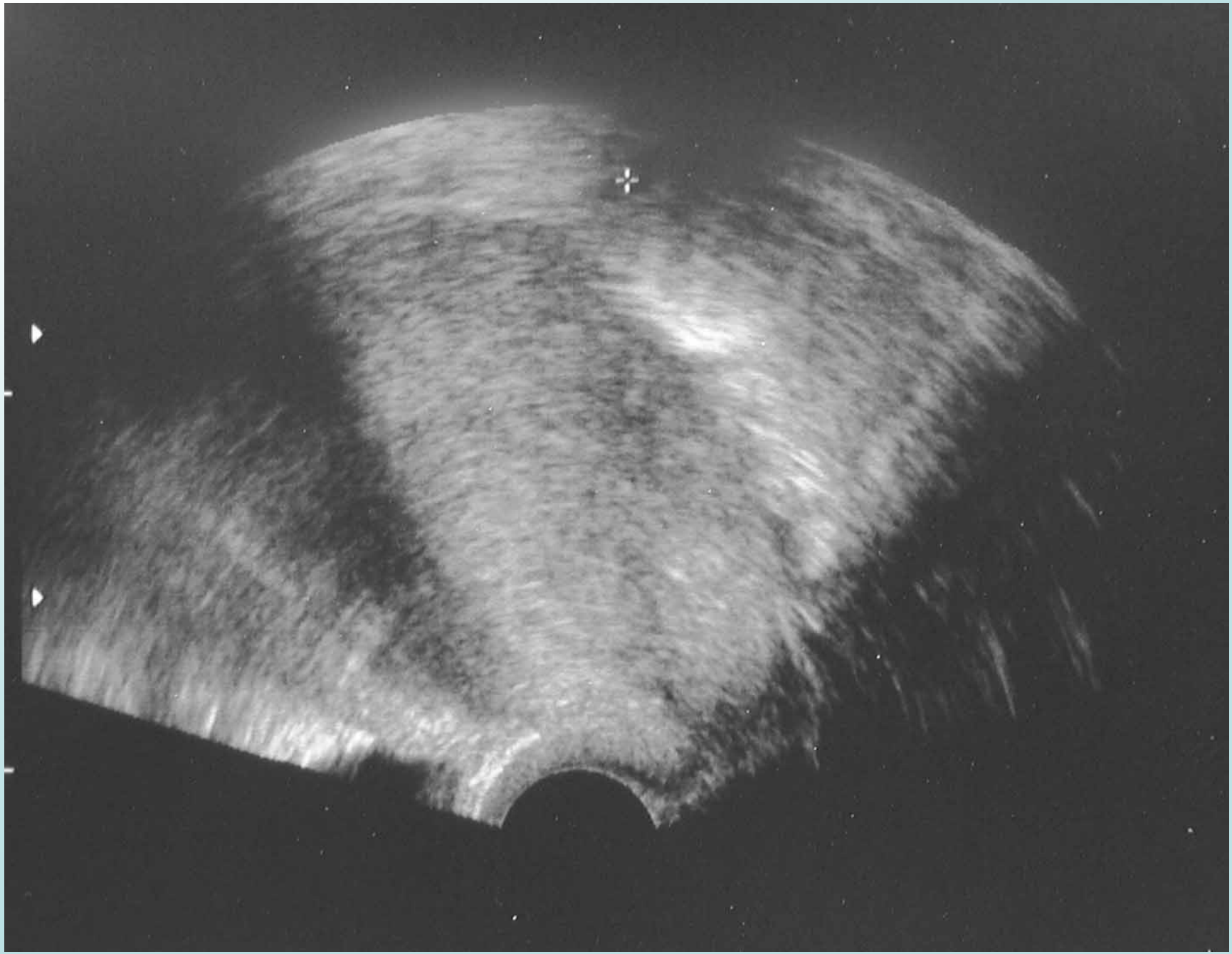
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

Endometrium-Ca / Gebärmutterkrebs

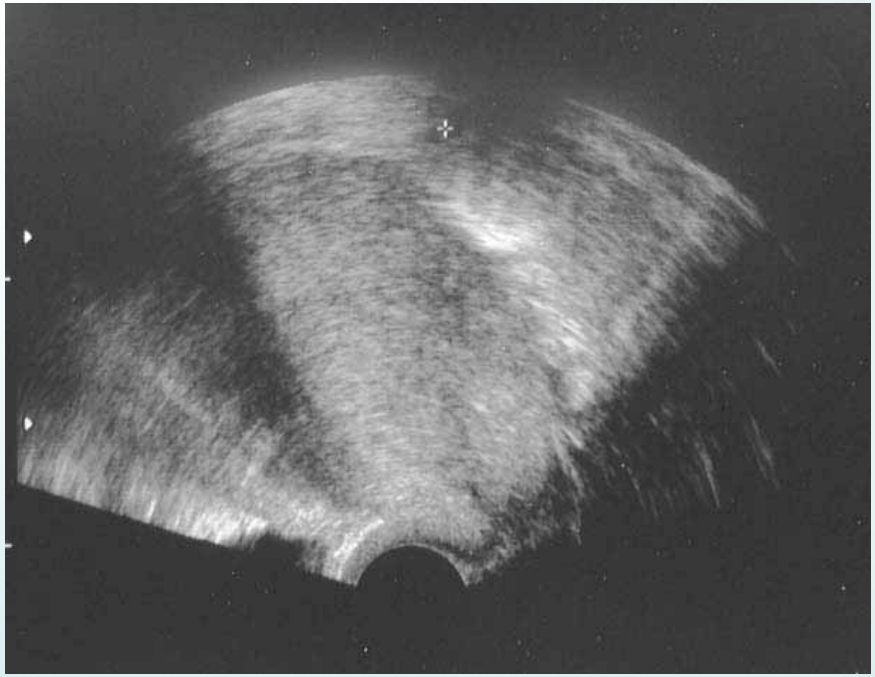


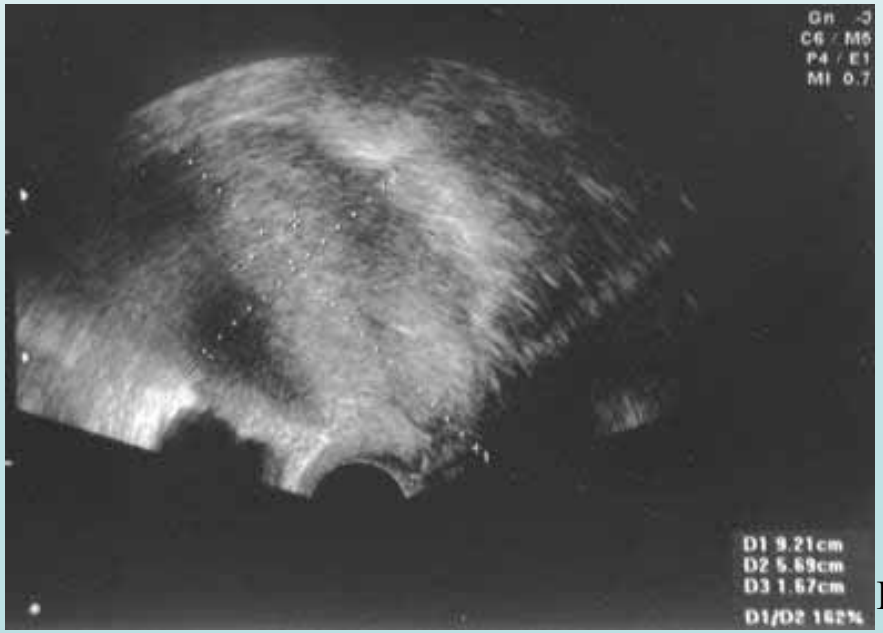
März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

Endometrium-Ca / Gebärmutterkrebs



Endometrium-Ca / Gebärmutterkrebs





Frau R 51 Jahre

Menopause seit 2½ Jahren

Schmierblutungen seit 6 Monaten

fraktionierte Abrasio

abdominale Hysterektomie mit

Adnektomie + Lymphonodektomie

vaginale Kontaktnachbestrahlung

pT1b, pN0 (O/27), R0, G3

Vaginaler Ultraschall

Theorie

Anatomie

Stimulation

Schwangerschaft

Pathologie

weitere Anwendung(smöglichkeit)en

weitere Anwendungen

postpartal

postoperativ

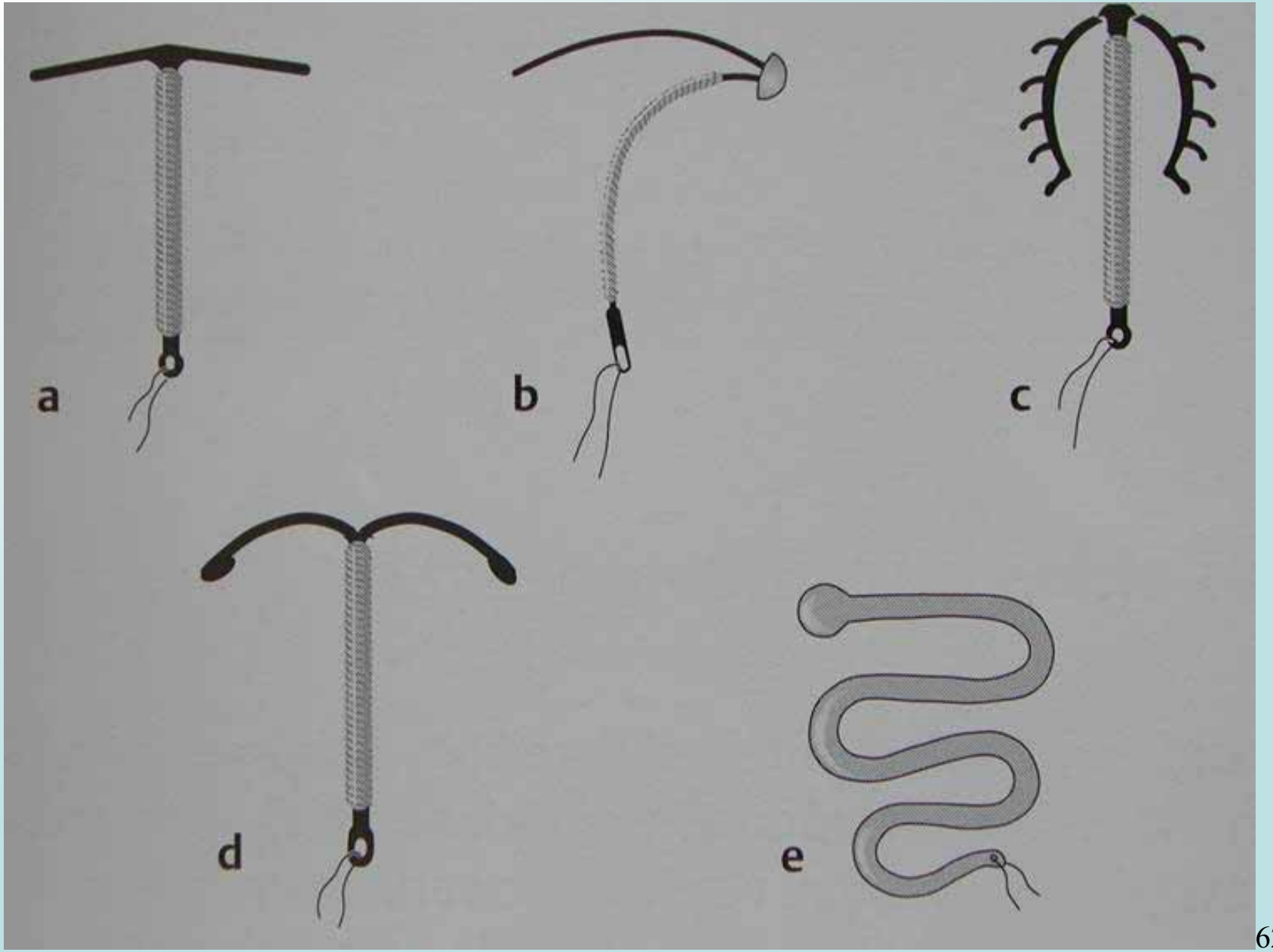
Spirale

HyCosy

Doppler

Spirale

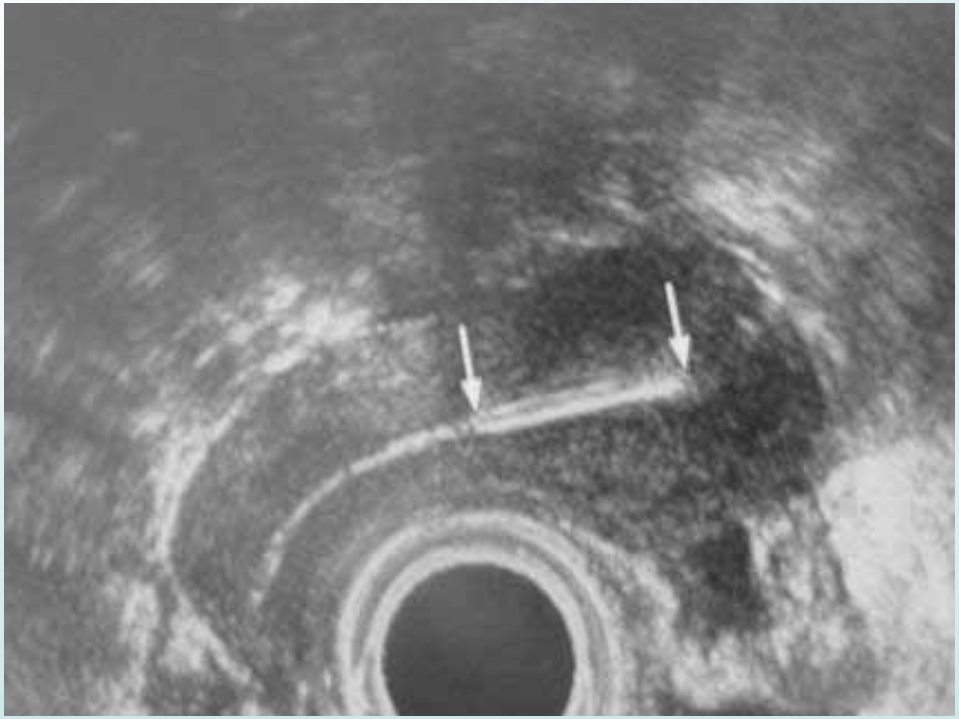
IUP = intrauterin Pessar

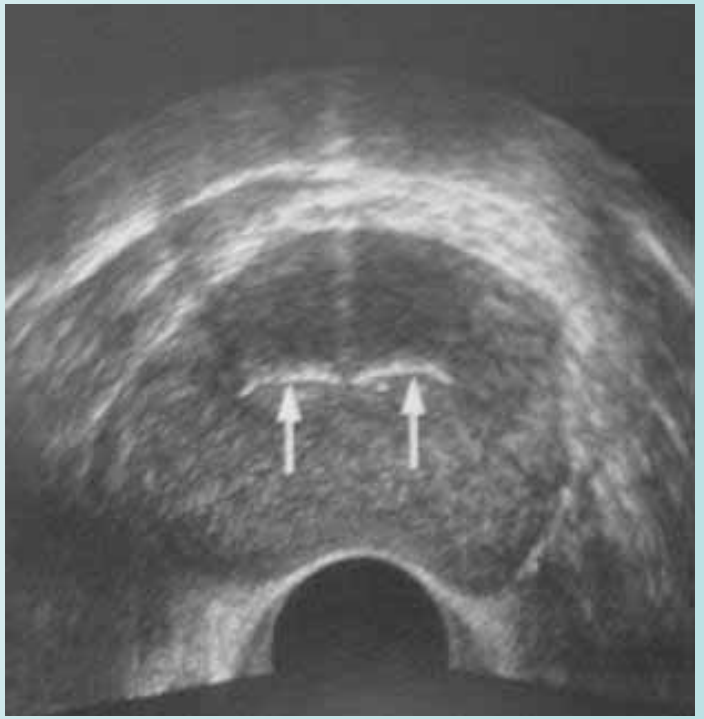


März (Hrsg.): Sonographische Diagnostik in Gynäkologie + Geburtshilfe

Spirale

IUP = intrauterin Pessar





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Spirale

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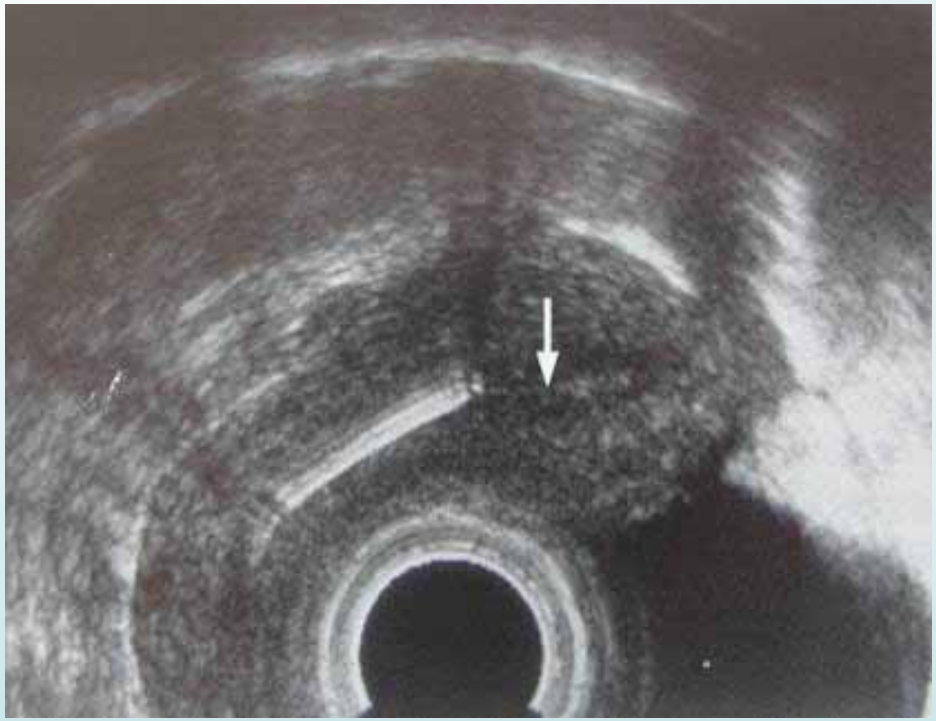

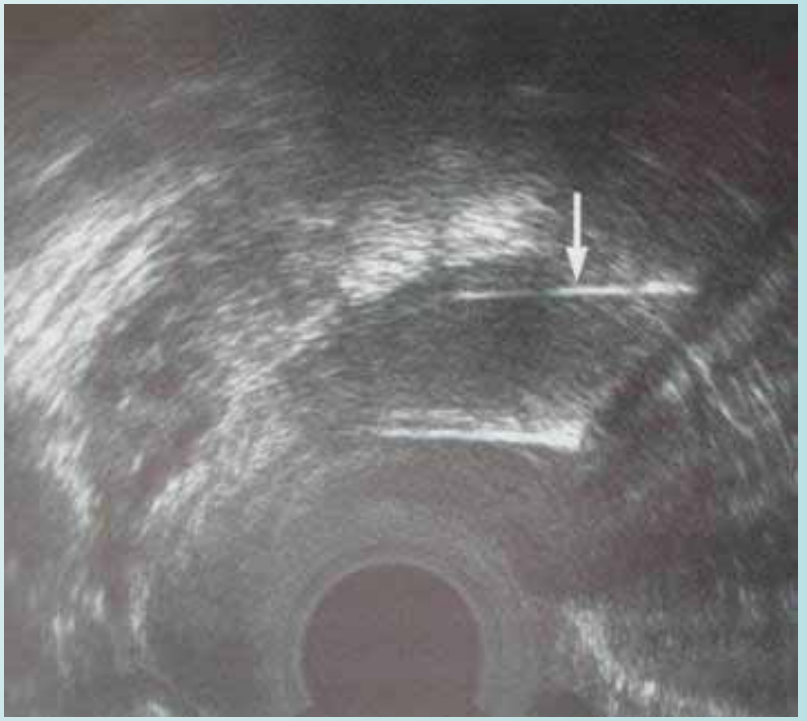

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HyCosy

Kontrastmitteldarstellung per Ultraschall

Beurteilung: Cavum (Gebärmutterhöhle)

Flüssigkeitsaustritt aus Eileitern

Literatur

- **März E. Hrsg.: Sonographische Diagnostik in Gynäkologie und Geburtshilfe. Lehrbuch und Atlas. Band I Gynäkologie. 1998**

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- **Nilsson L.: Ein Kind entsteht. Mosaik Verlag 1990**