



Medizinische Universität Graz

FERTILITY CHECK

ULTRASCHALL IN DER FERTILITÄTSDIAGNOSTIK

Monika WÖLFER

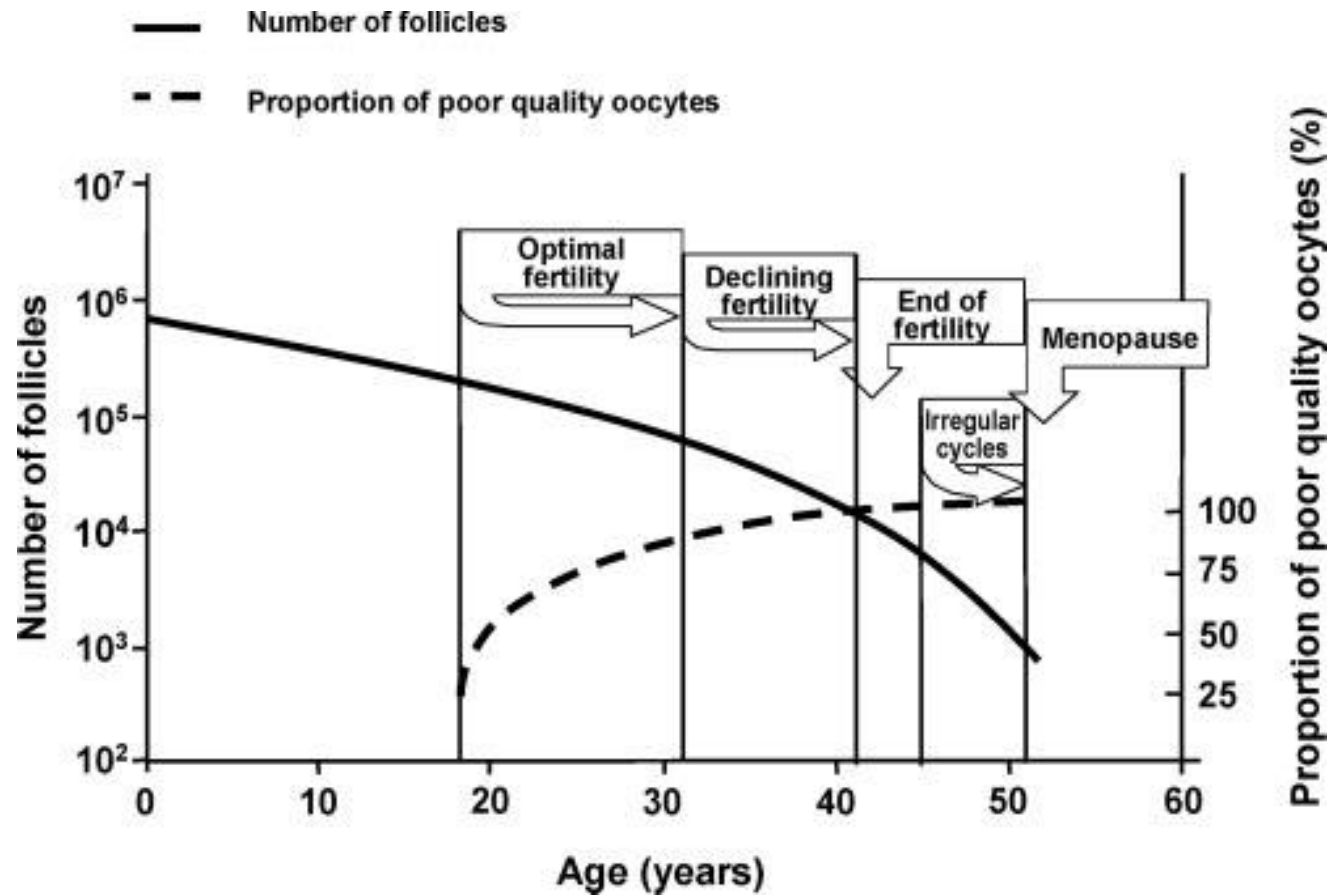
Frauenklinik der Medizinischen Universität Graz

Schwerpunkt Gyn. Endokrinologie und Fortpflanzungsmedizin

ultraschall update⁷ 2022



Fertilität der Frau ist altersabhängig

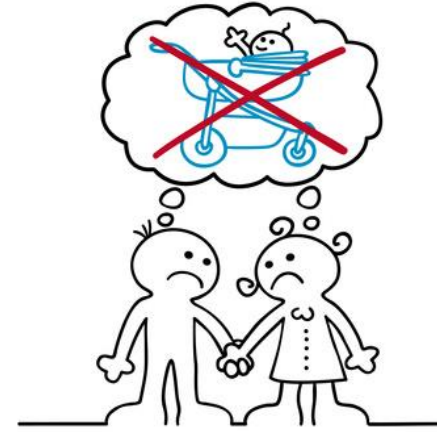


Tab. 1 Veränderung der Oozytenzahl im Laufe des Lebens der Frau

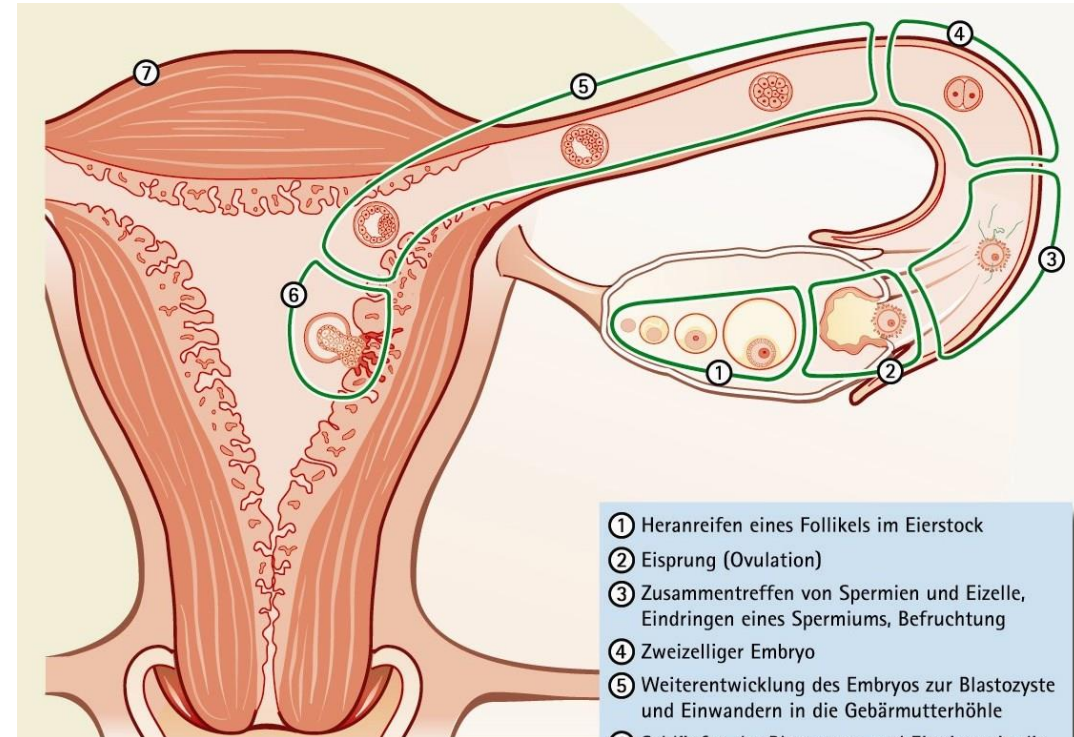
Oozyten	Zeitpunkt
7 Mio.	7. Fetalmonat (noch in utero)
1–2 Mio.	Geburt
400.000	14. Lebensjahr
? (individuell verschieden)	35. Lebensjahr
0–1000	Menopause

Fertilitätsstörungen

- ▶ ca. jedes 6. Paar von ungewollter Kinderlosigkeit betroffen



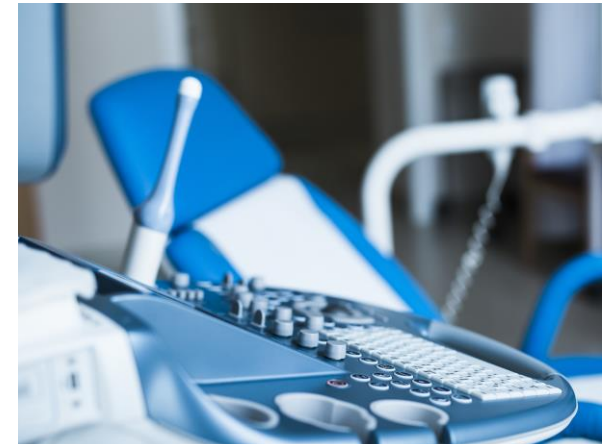
- ovulatorische Störungen
- Tubenfaktor
- uteriner Faktor
- männlicher Faktor
- idiopathisch



- ① Heranreifen eines Follikels im Eierstock
- ② Eisprung (Ovulation)
- ③ Zusammentreffen von Spermien und Eizelle, Eindringen eines Spermiums, Befruchtung
- ④ Zweizelliger Embryo
- ⑤ Weiterentwicklung des Embryos zur Blastozyste und Einwandern in die Gebärmutterhöhle
- ⑥ Schlüpfen der Blastozyste und Einnisten in die Gebärmutter Schleimhaut
- ⑦ Längsschnitt durch Gebärmutter, Eileiter und Eierstock

Fertility work up

- ▶ Spermogramm und Hormonstatus des Partners
- ▶ Hormonstatus der Frau (basal und luteal)
- ▶ Immunstatus
- ▶ Gyn. Untersuchung und Basis-Sonografie
- ▶ Spezielle Sonografie
 - ▶ Dopplersonografie
 - ▶ 3D Sonografie
 - ▶ Hydrosonografie
 - ▶ Hysteroskontrastmittelsonografie (HYCOSY)

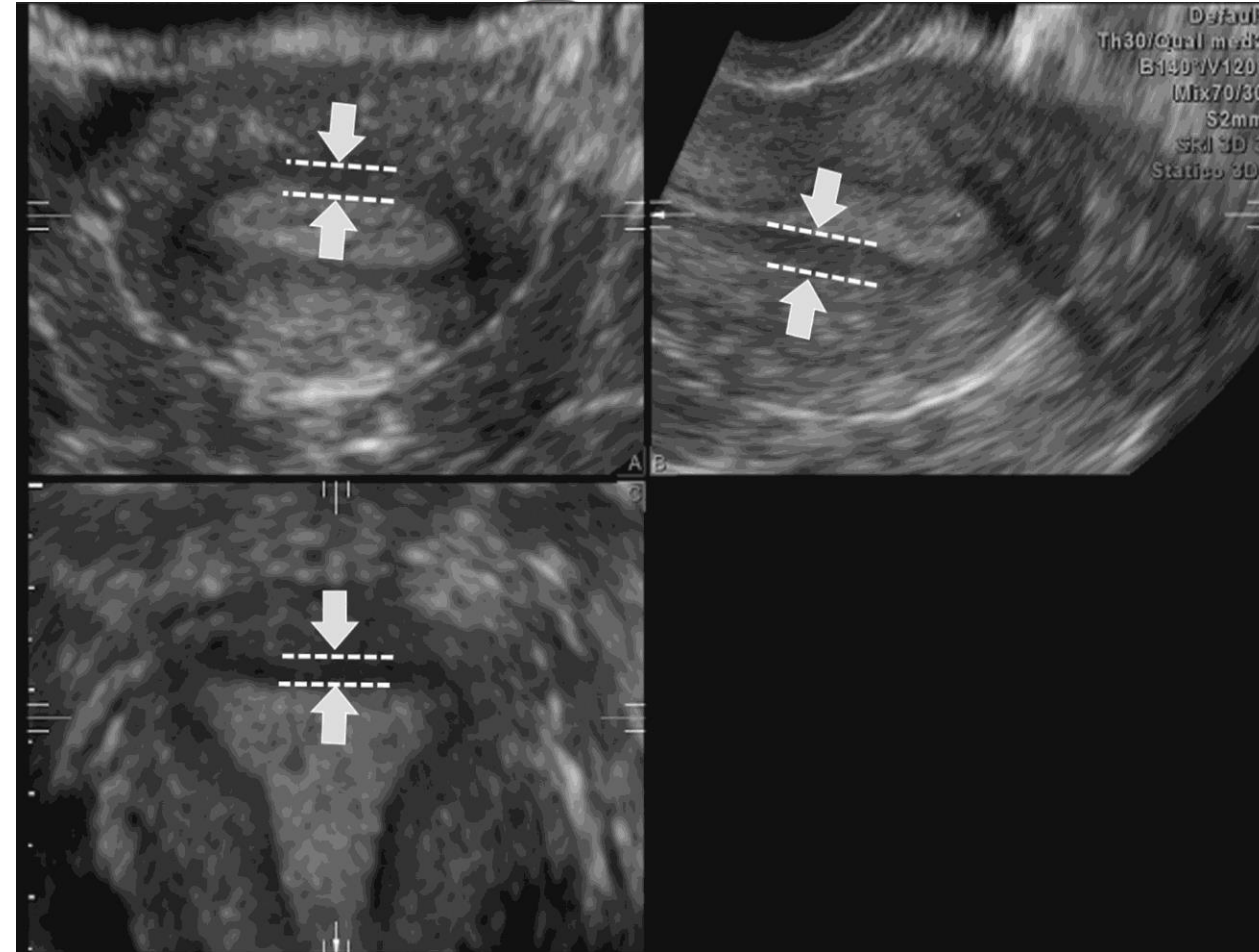


Übersicht Fertility Check

- ▶ Sonografie des Uterus
- ▶ Sonografie der tubo-ovariellen Einheit

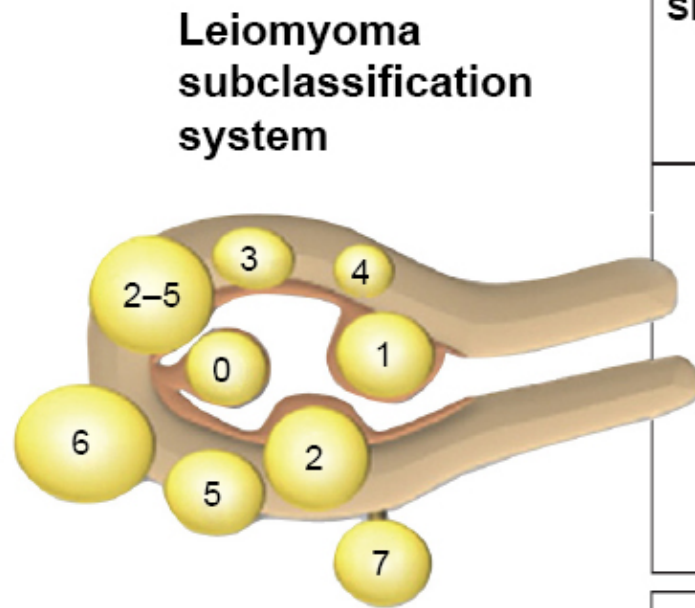
Basis-Sonografie des Uterus

- ▶ Uterus-Corpus und Cervix
 - ▶ Form, Kontur, Größe, Lage
 - ▶ „sliding sign“
 - ▶ „site specific tenderness“
 - ▶ Pathologien?
- ▶ Myometrium
 - ▶ Echogenität, Wanddicke, Pathologien?
 - ▶ Adenomyosis uteri
 - ▶ Myome
- ▶ Endometrium
 - ▶ Aufbau, „uterine lining“
 - ▶ Abgrenzbarkeit, „junctional zone“



*Van den Bosch T et al, 2015
Hoopmann M. et al. 2021*

Uterus myomatosis



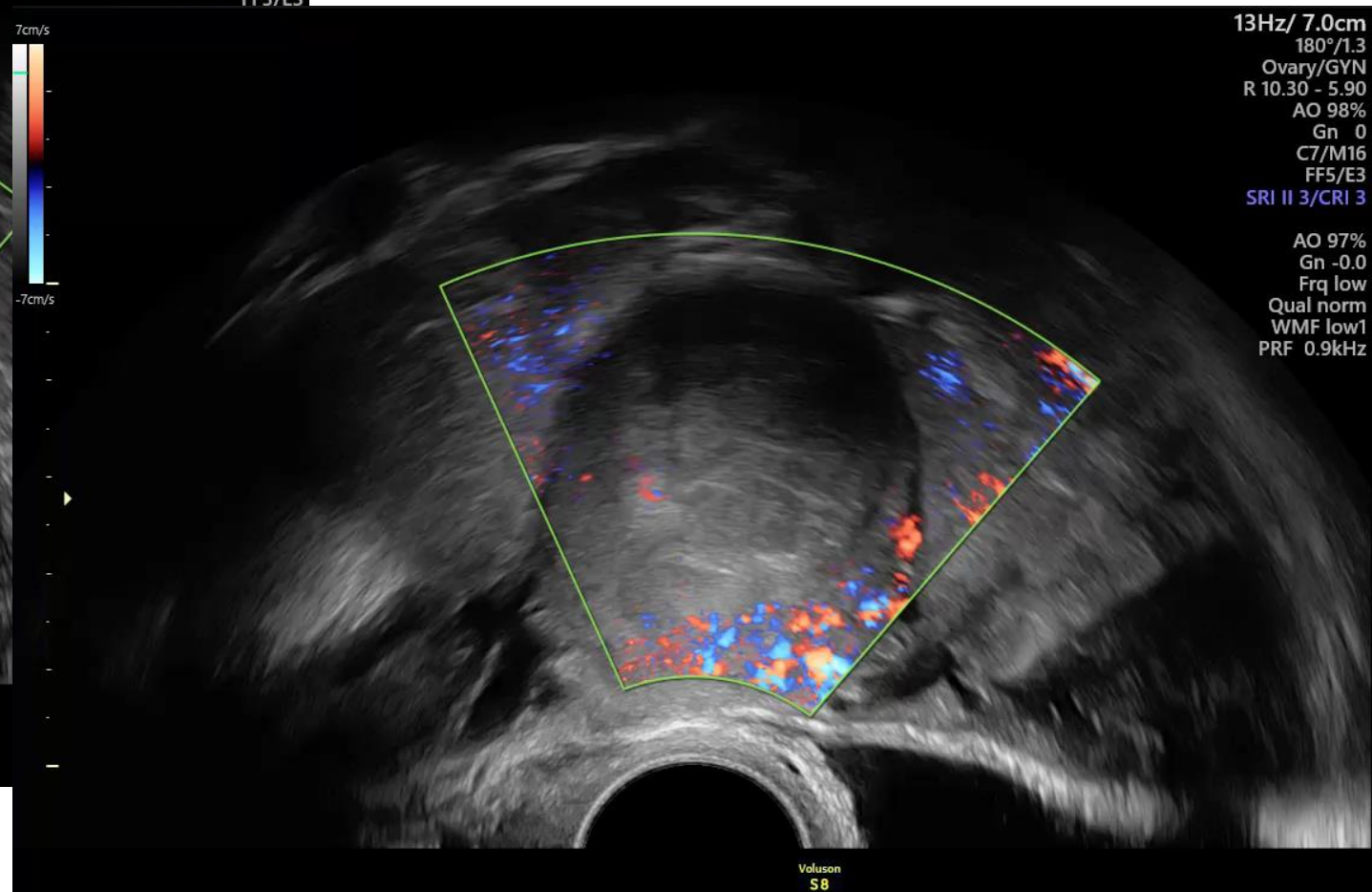
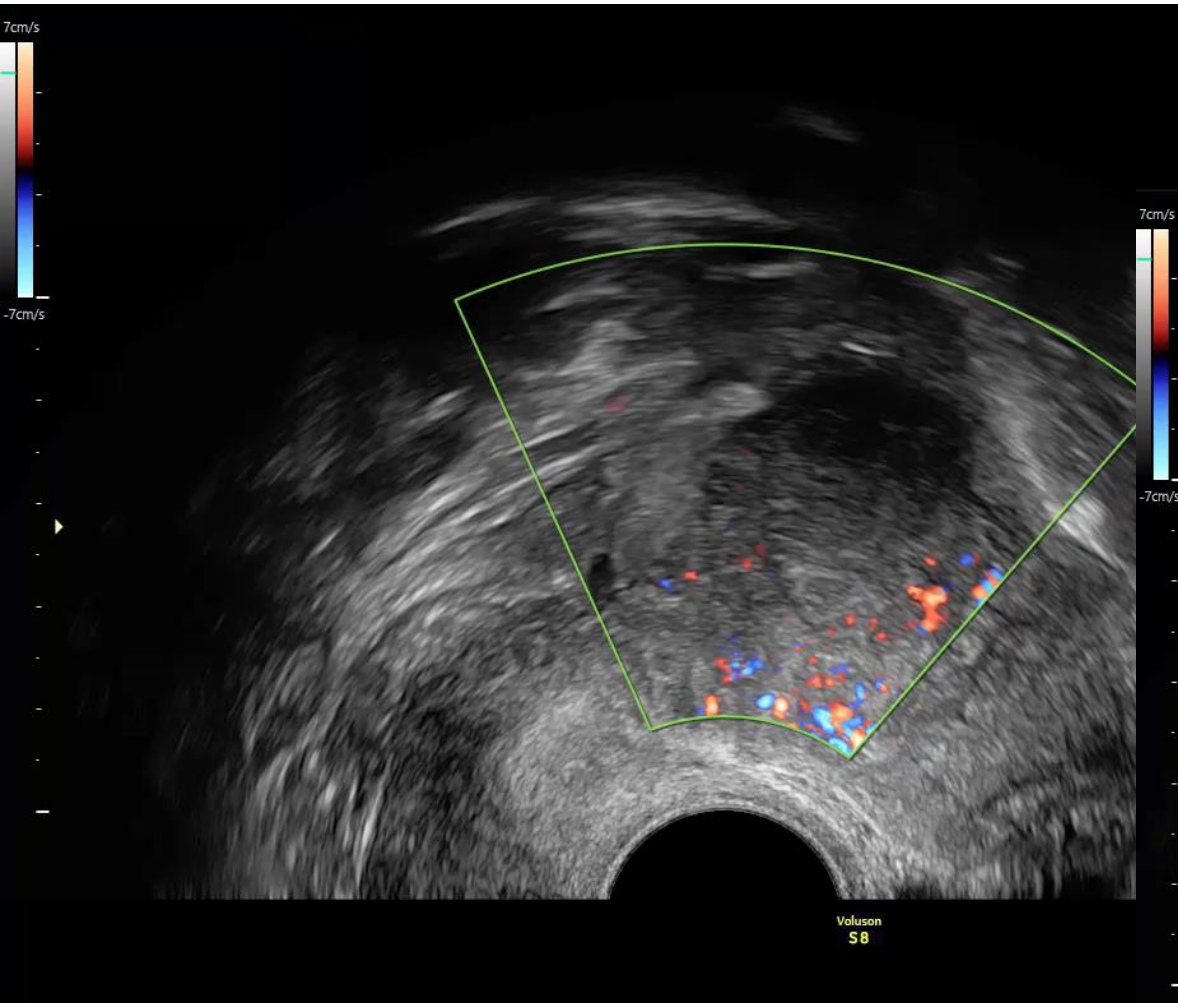
SM – Submucosal	0	Pedunculated intracavitary
	1	<50% intramural
	2	≥50% intramural
O – Other	3	Contacts endometrium; 100% intramural
	4	Intramural
	5	Subserosal ≥50% intramural
	6	Subserosal <50% intramural
	7	Subserosal pedunculated
	8	Other (specify eg, cervical, parasitic)
Hybrid leiomyomas (impact both endometrium and serosa)	Two numbers are listed separated by a hyphen. By convention, the first refers to the relationship with the endometrium, while the second refers to the relationship to the serosa. One example is given below	
	2–5	Submucosal and subserosal, each with less than half the diameter in the endometrial and peritoneal cavities, respectively

Figure 1 FIGO leiomyoma subclassification system.

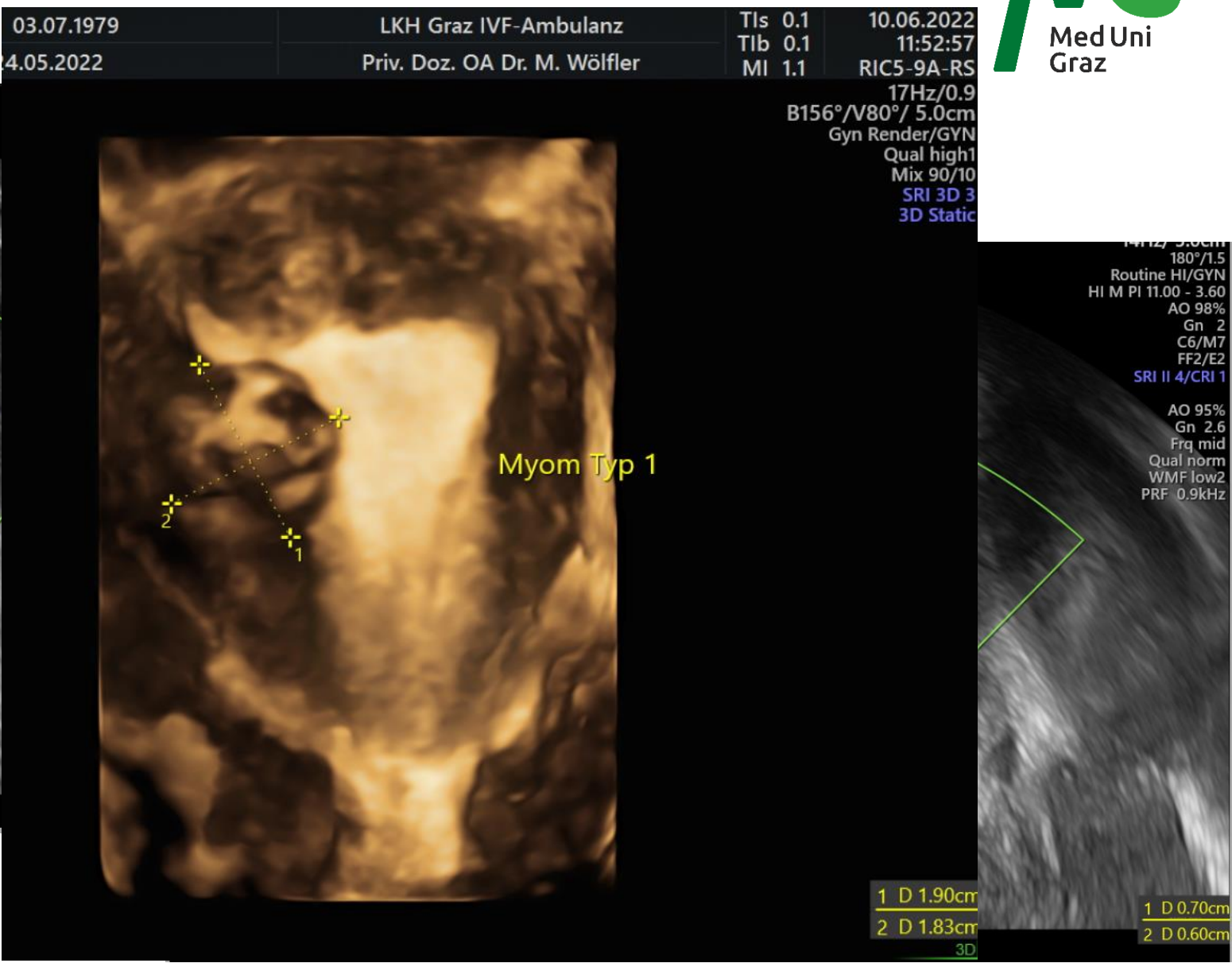
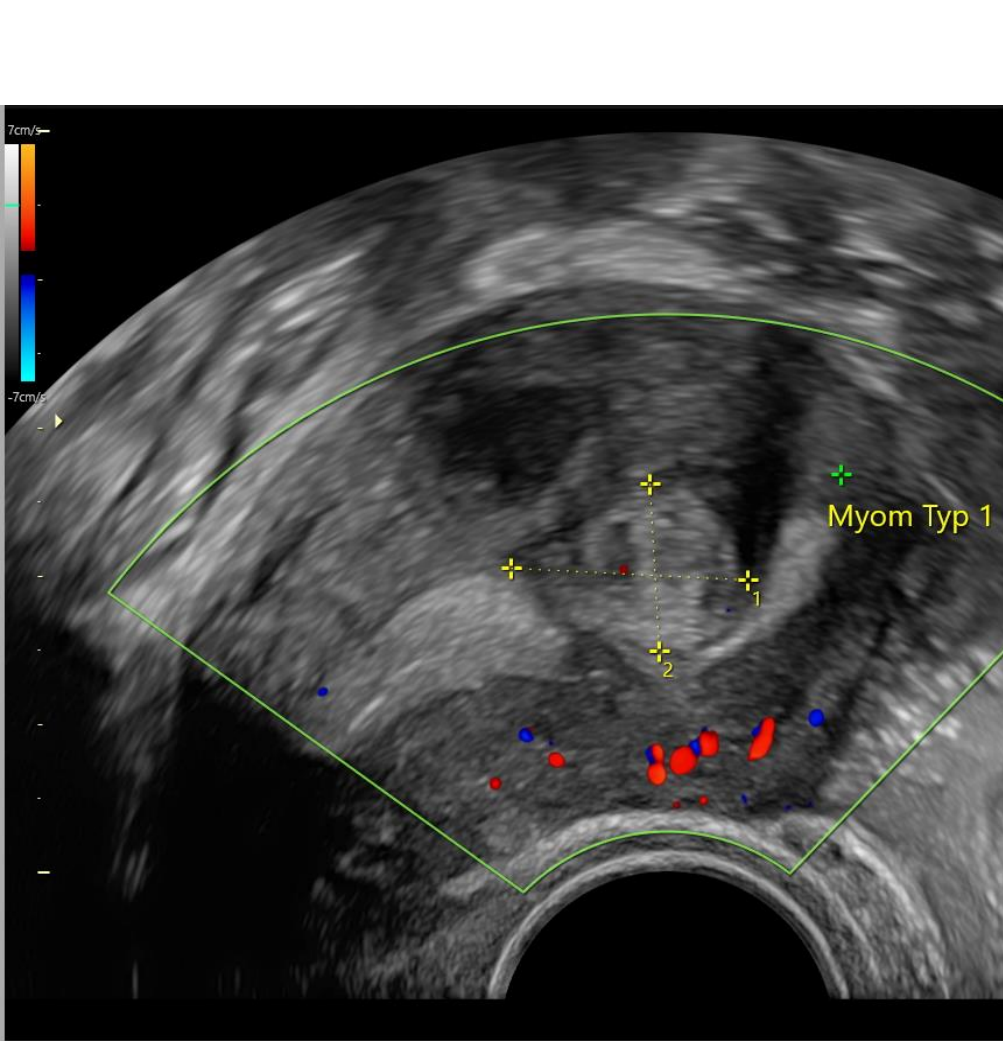
Note: Reprinted from *Int J Gynaecol Obstet*. Vol 113(1). Munro MG, Critchley HO, Broder MS, Fraser IS, FIGO Working Group on Menstrual Disorders. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Pages 3–13. Copyright 2011, with permission from Elsevier.¹

Abbreviation: FIGO, International Federation of Gynecology and Obstetrics.

Uterus myomatosus



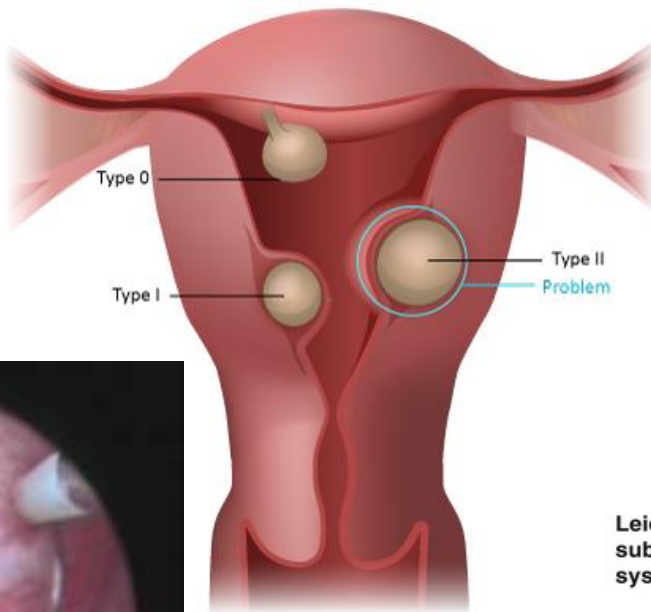
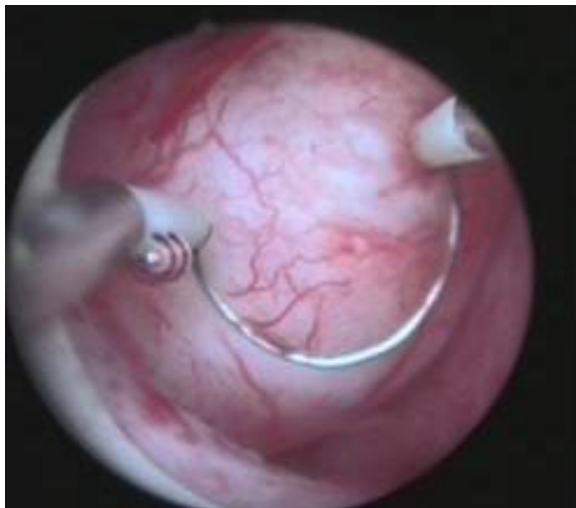
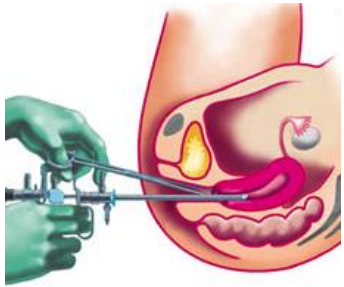
Submucöse Myome



Therapie bei Uterus myomatosus

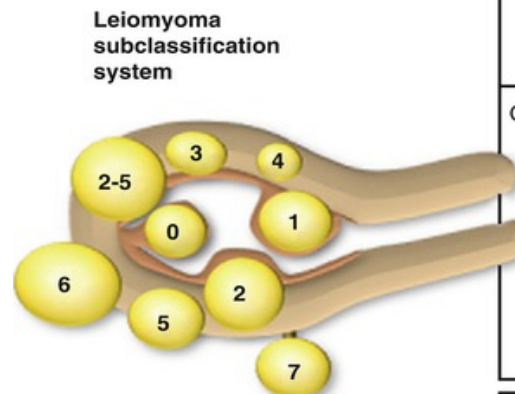
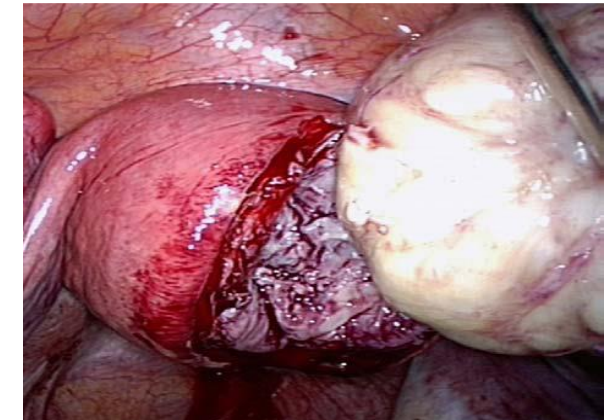
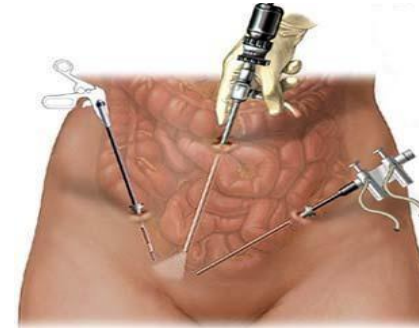
►► Submucöse Myome (Typ 0-2):

- Myomresektion per Hysteroskopie

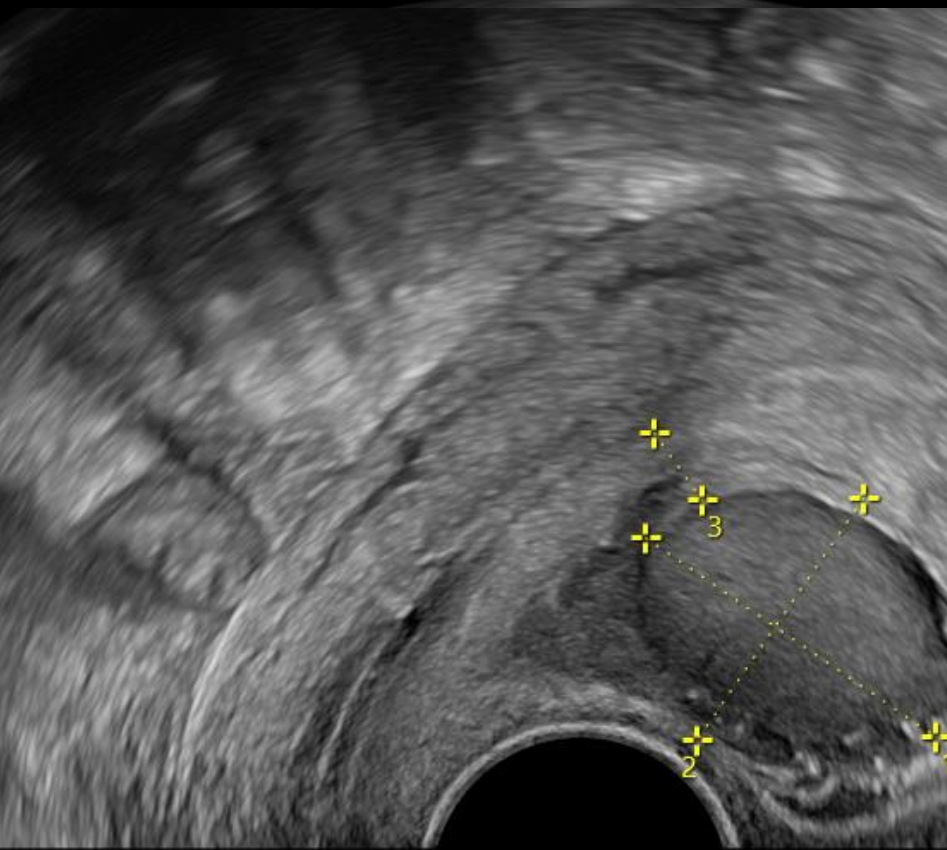


►► Intramurale/subseröse Myome:

- Myomenukleation per Laparoskopie

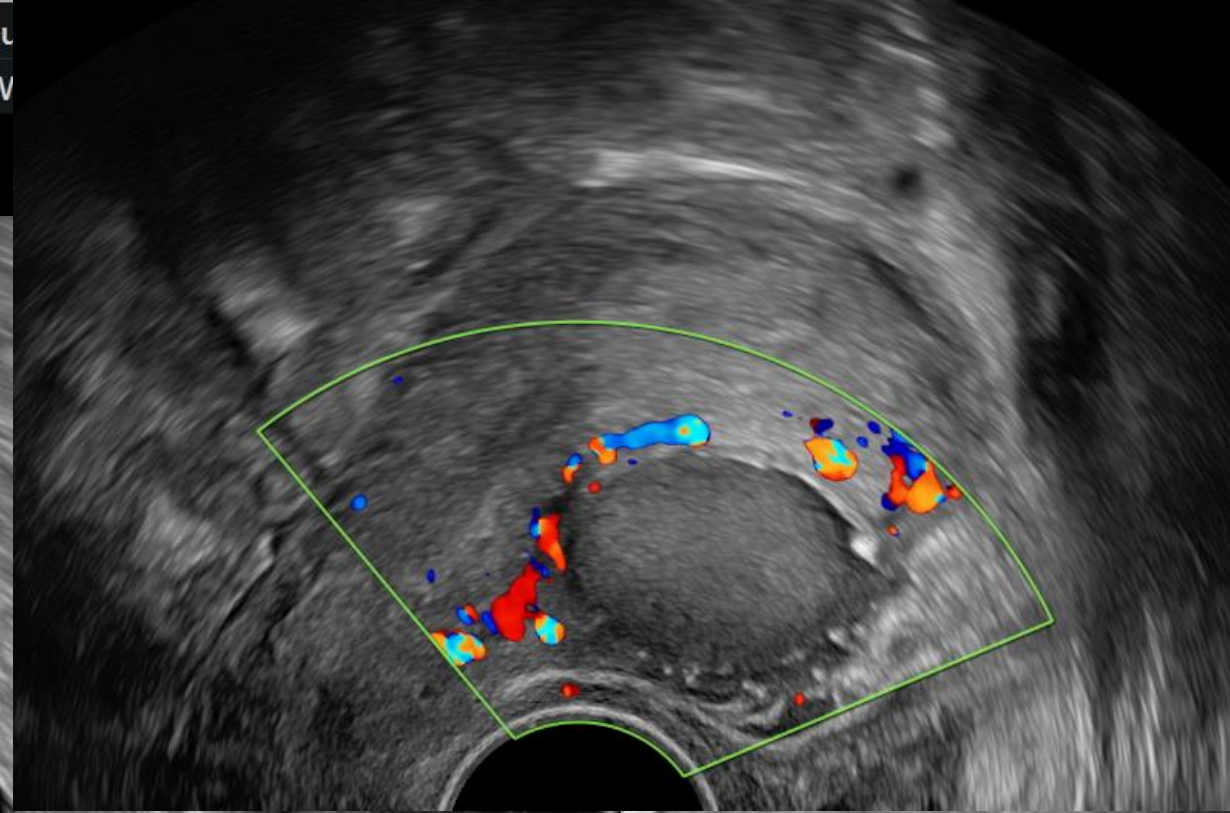


SM - Submucosal	0	Pedunculated intracavitary
	1	<50% Intramural
	2	≥50% Intramural
O - Other	3	Contacts endometrium; 100% intramural
	4	Intramural
	5	Subserosal ≥50% intramural
	6	Subserosal <50% intramural
	7	Subserosal pedunculated
	8	Other (specify e.g. cervical, parasitic)

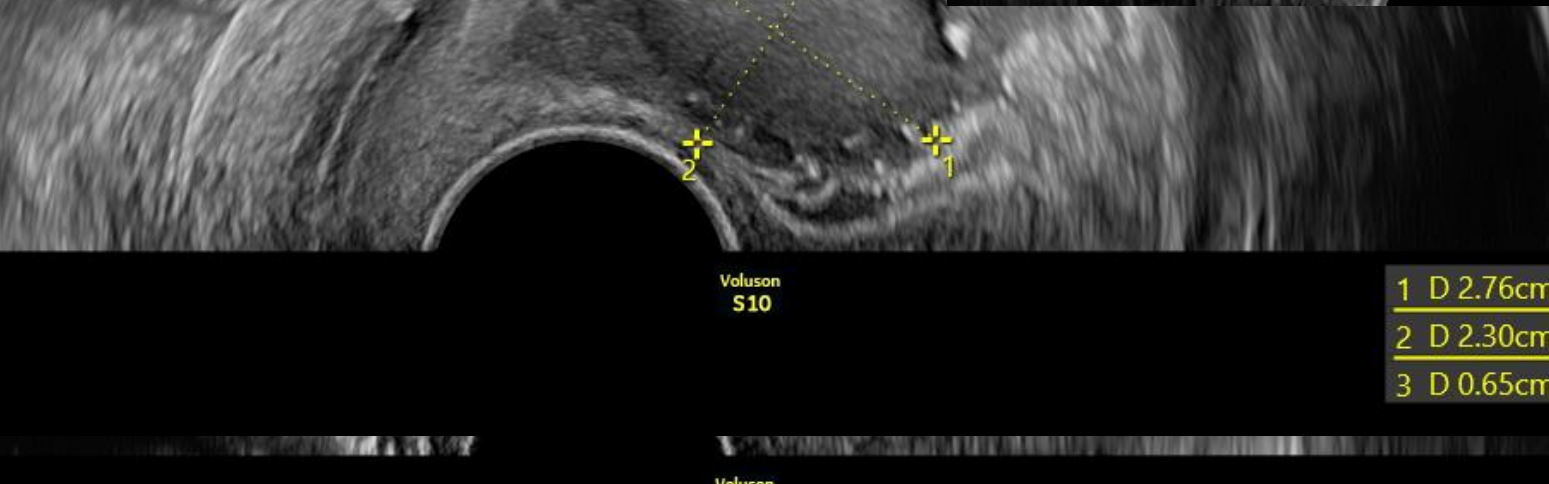


Voluson
S10

- 1 D 2.76cm
- 2 D 2.30cm
- 3 D 0.65cm



180°/1.3
Penetration/GYN
P 8.10 - 3.20
AO 98%
Gn -2
C7/M7
FF5/E2
SRI II 3/CRI 1



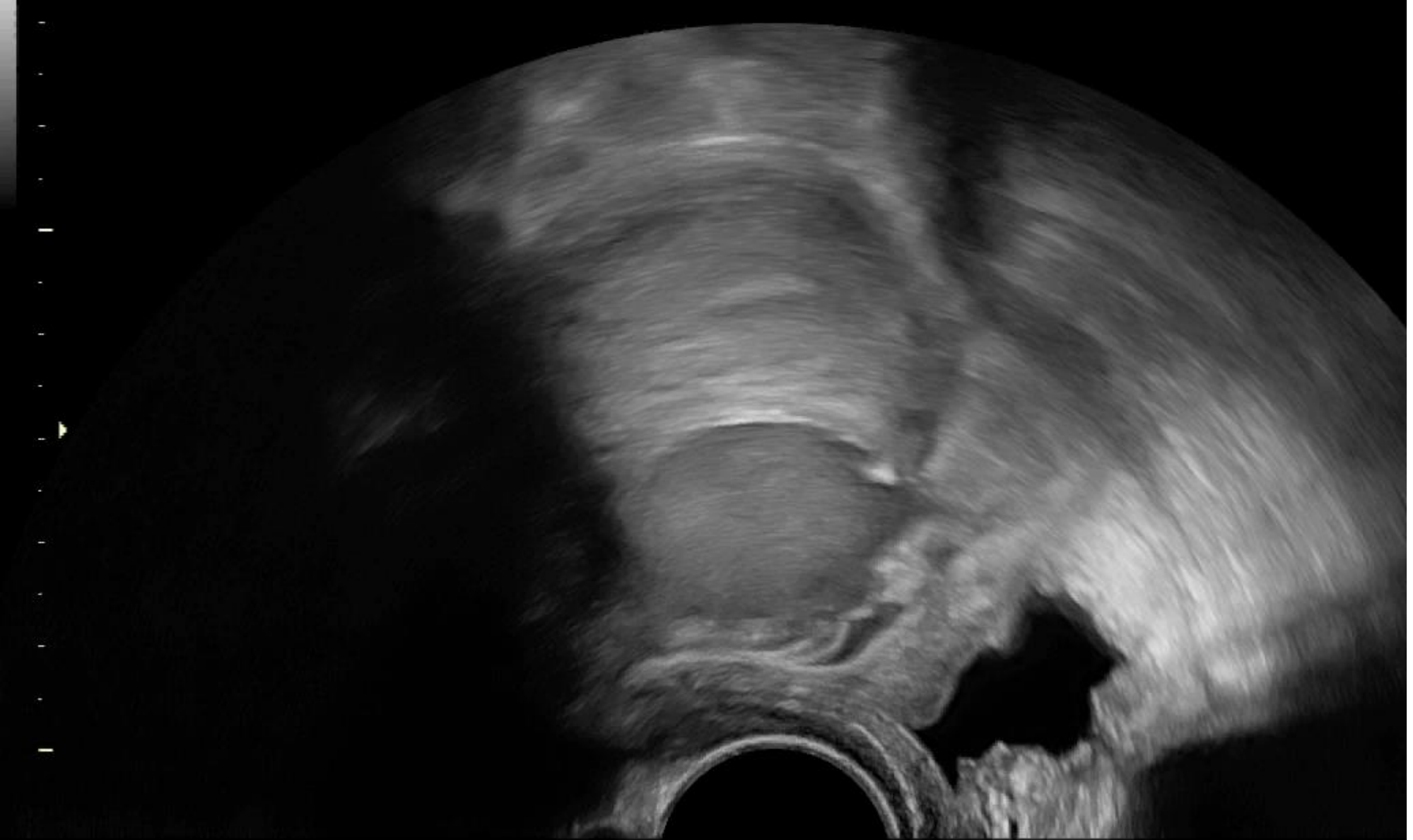
Voluson
S10

- Ut-L 8.40cm
- Ut-H 4.80cm



Voluson
S10

- 1 D 4.99cm

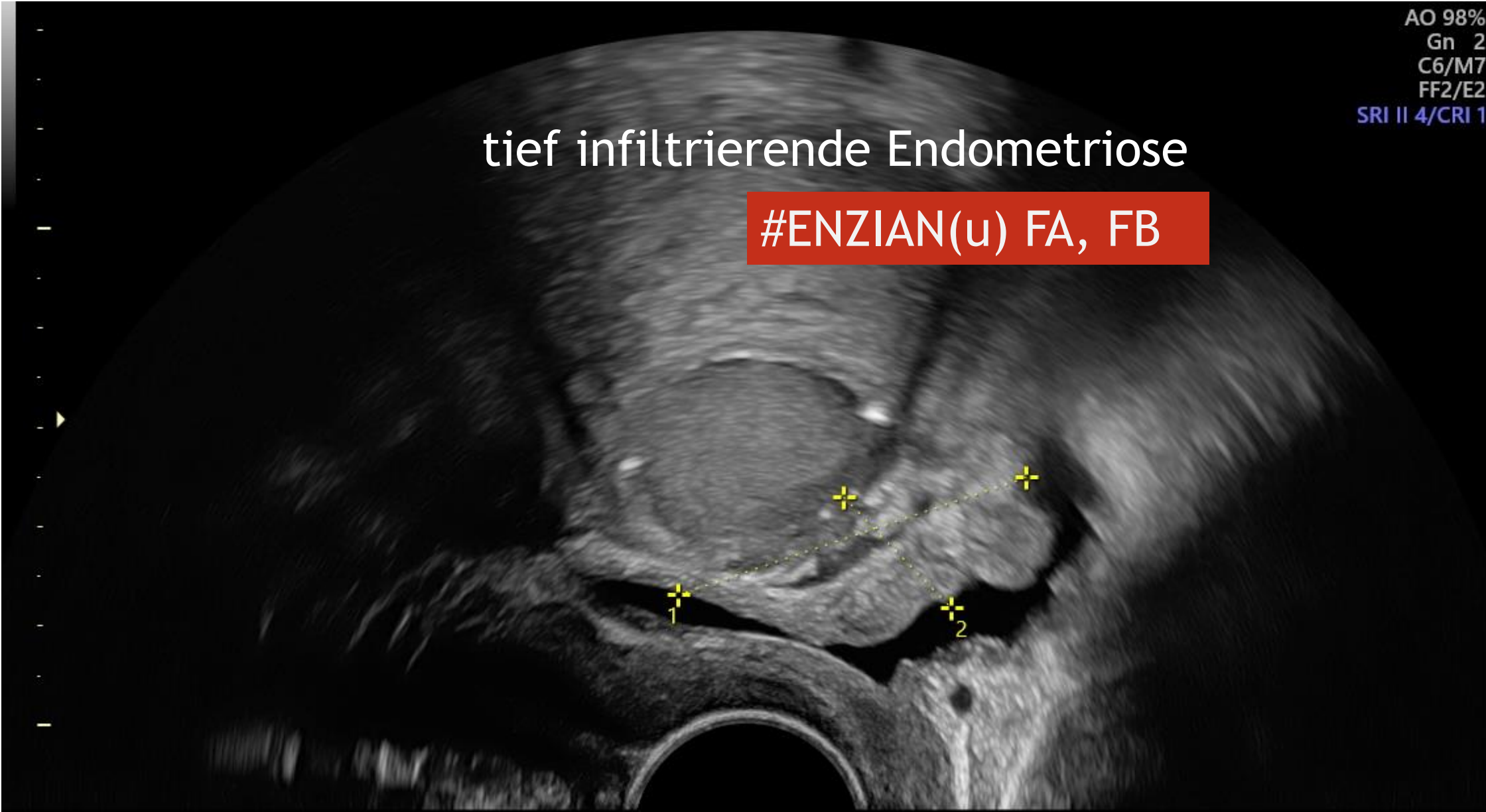


AO 98%
Gn 2
C6/M7
FF2/E2
SRI II 4/CRI 1



tief infiltrierende Endometriose

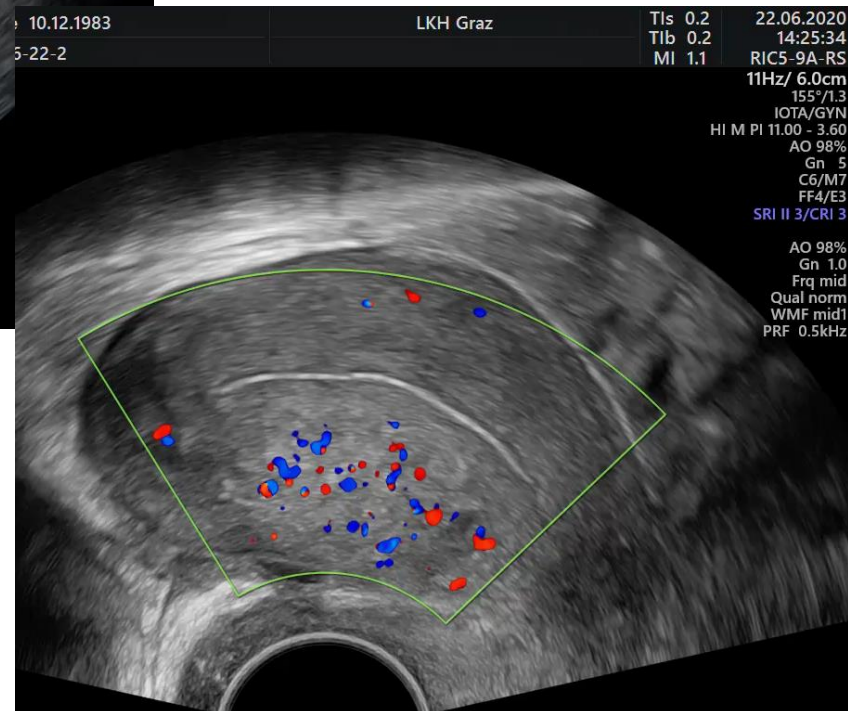
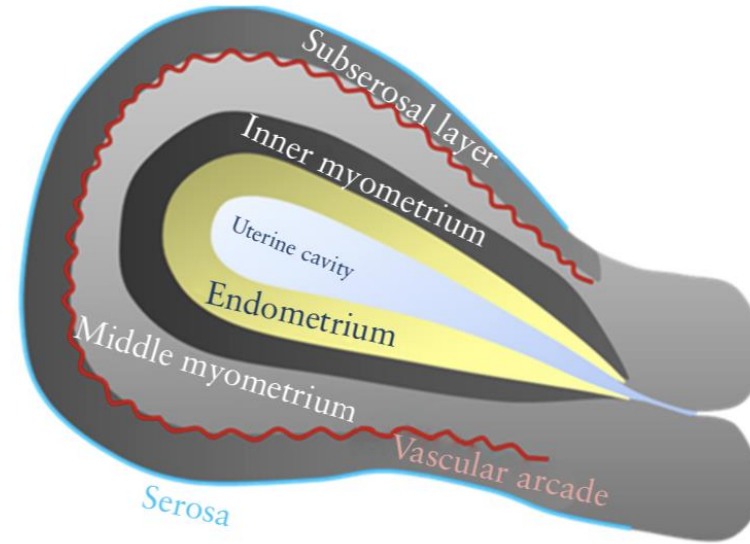
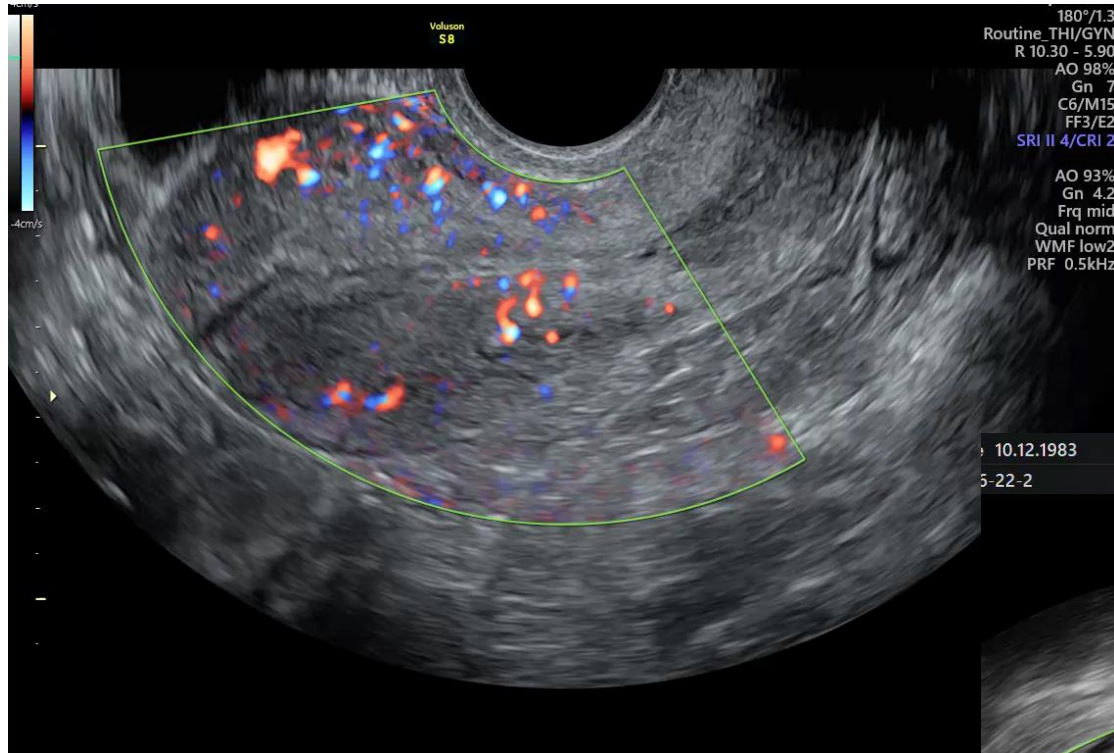
#ENZIAN(u) FA, FB



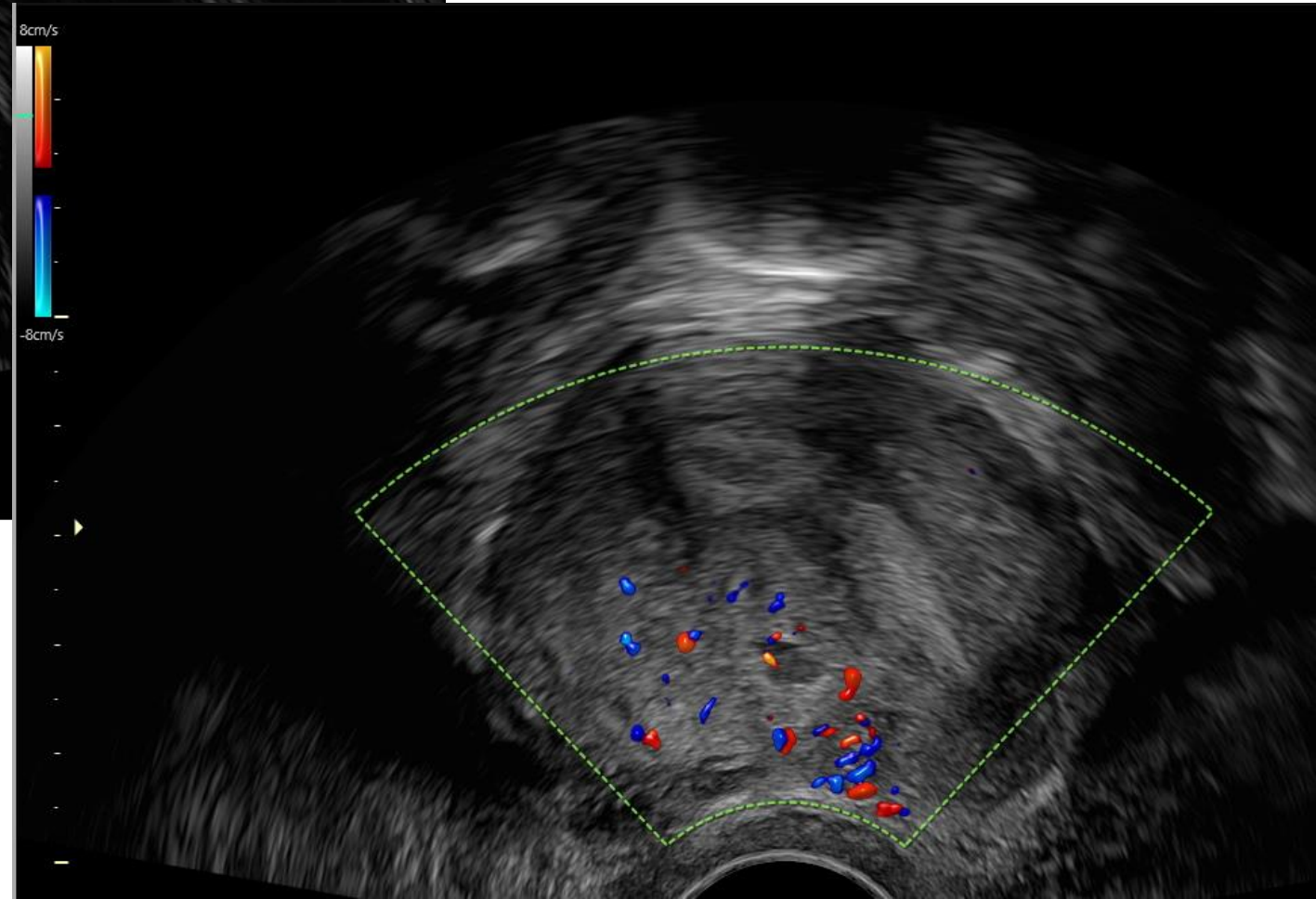
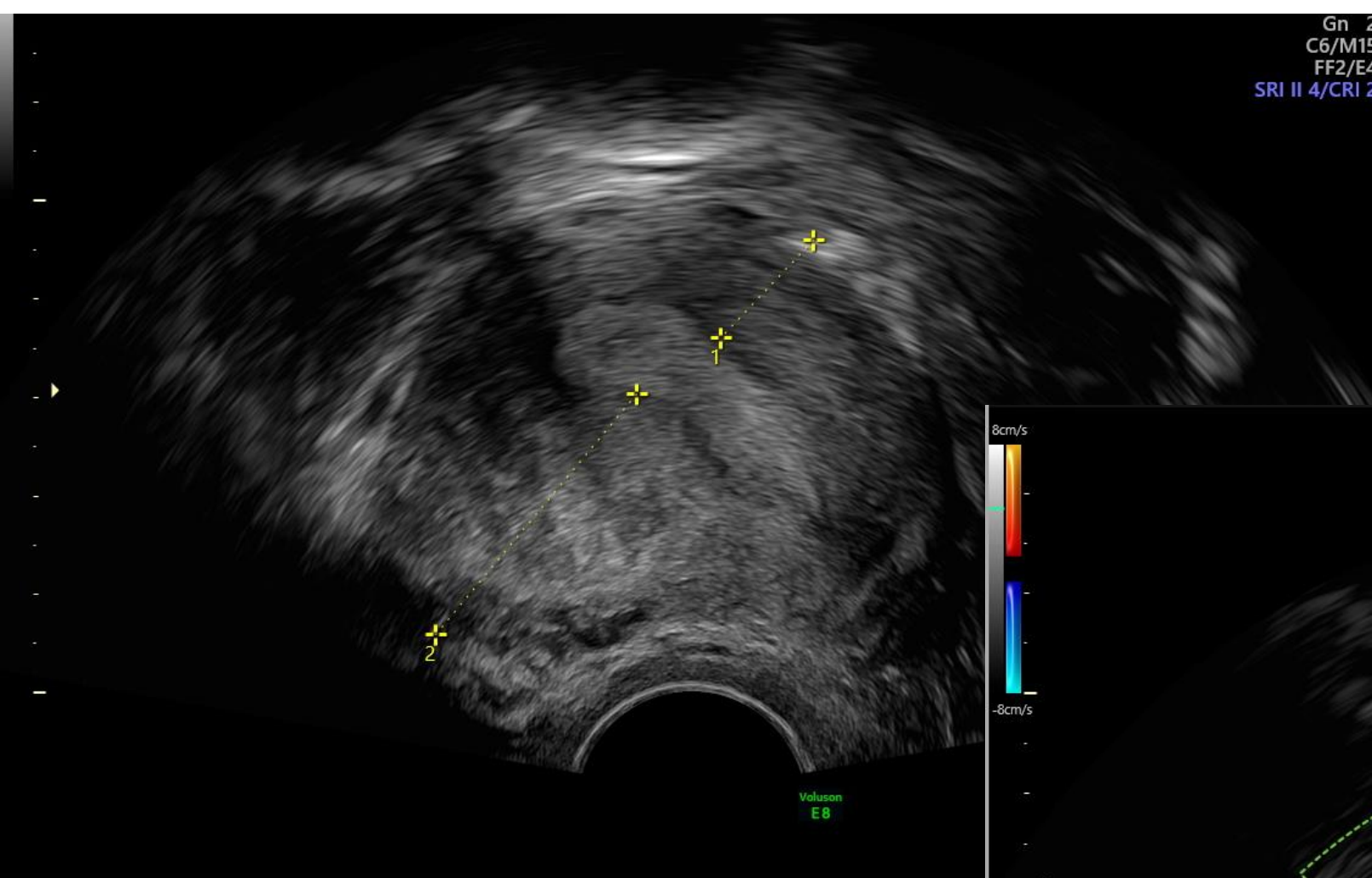
Voluson
S10

1 D 3.75cm
2 D 1.57cm

Myometrium



Gn 2
C6/M15
FF2/E4
SRI II 4/CRI 2



Consensus Statement |  [Free Access](#) |

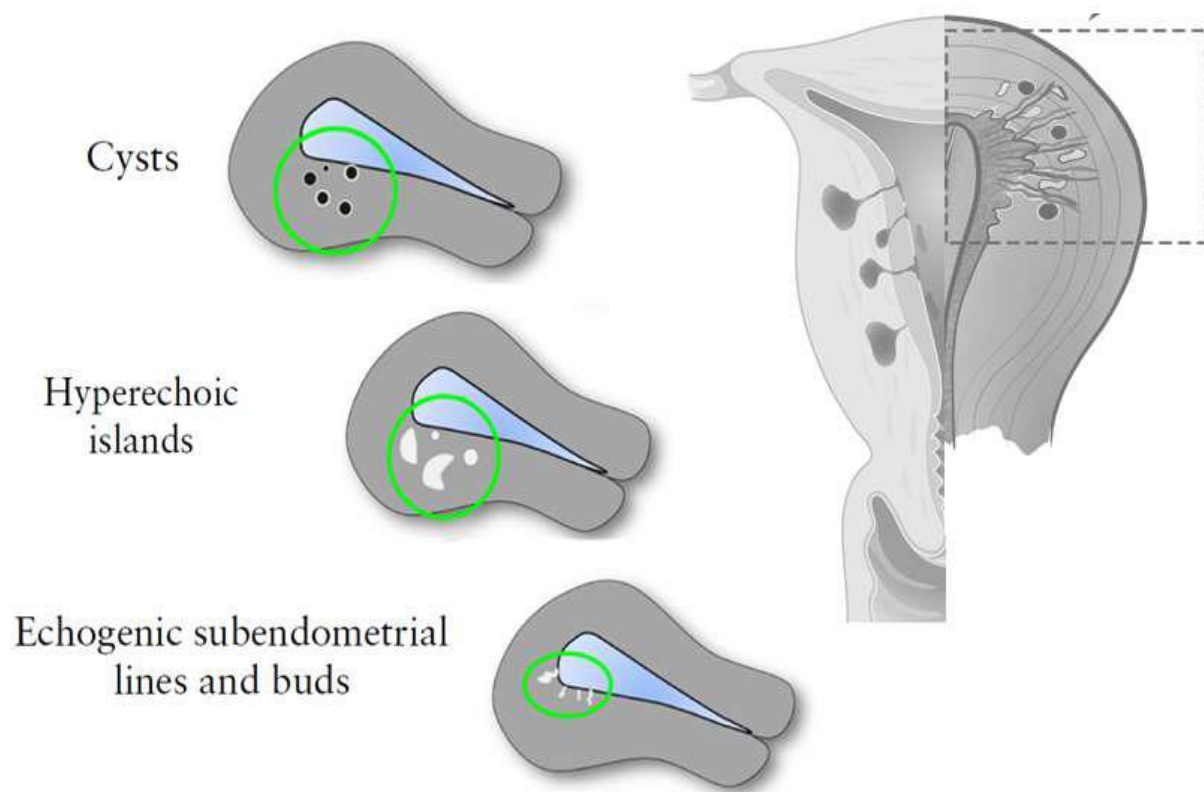
Terms, definitions and measurements to describe sonographic features of myometrium and uterine masses: a consensus opinion from the Morphological Uterus Sonographic Assessment (MUSA) group

T. Van den Bosch✉, M. Dueholm, F. P. G. Leone, L. Valentin, C. K. Rasmussen, A. Votino, D. Van Schoubroeck, C. Landolfo, A. J. F. Installé, S. Guerriero, C. Exacoustos, S. Gordts, B. Benacerraf, T. D'Hooghe, B. De Moor, H. Brölmann, S. Goldstein, E. Epstein, T. Bourne, D. Timmerman ... [See fewer authors](#) ^

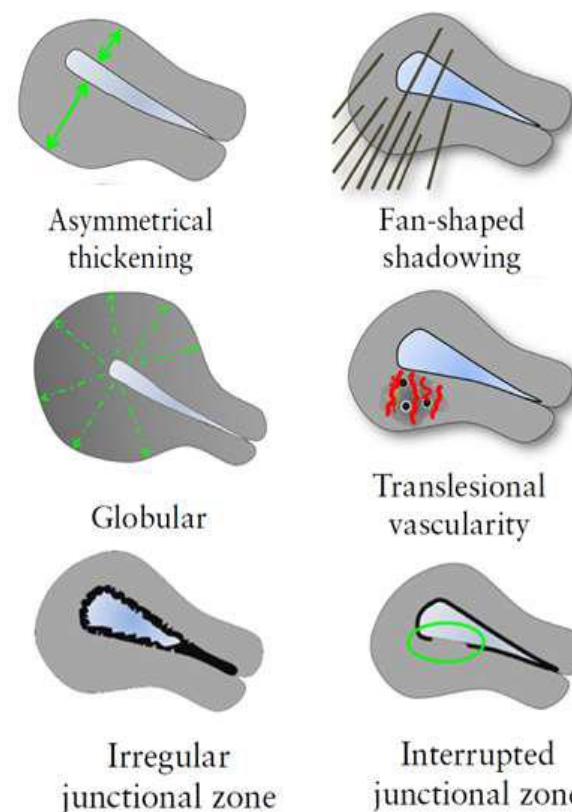
First published: 04 February 2015 | <https://doi.org/10.1002/uog.14806> | Citations: 107

Adenomyosis uteri

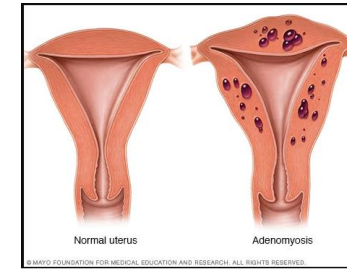
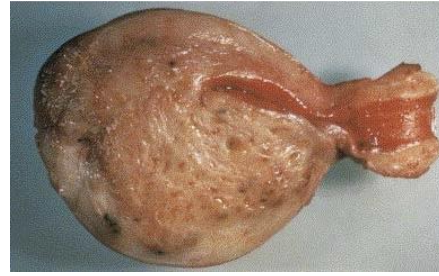
Direct features



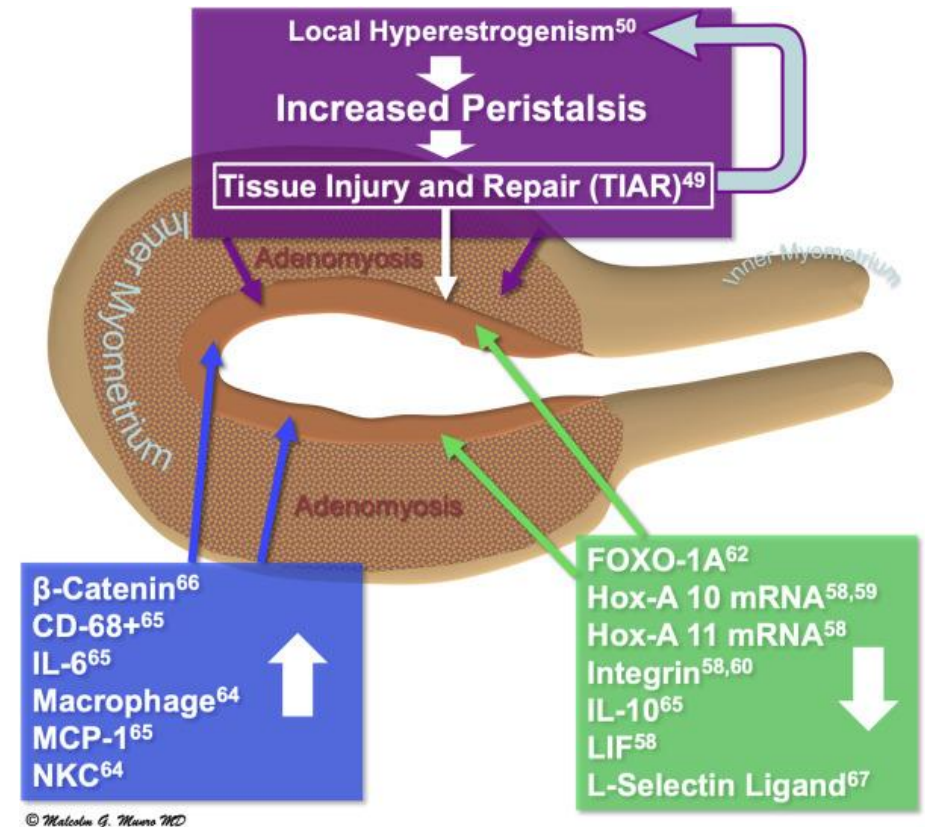
Indirect features



Adenomyosis uteri

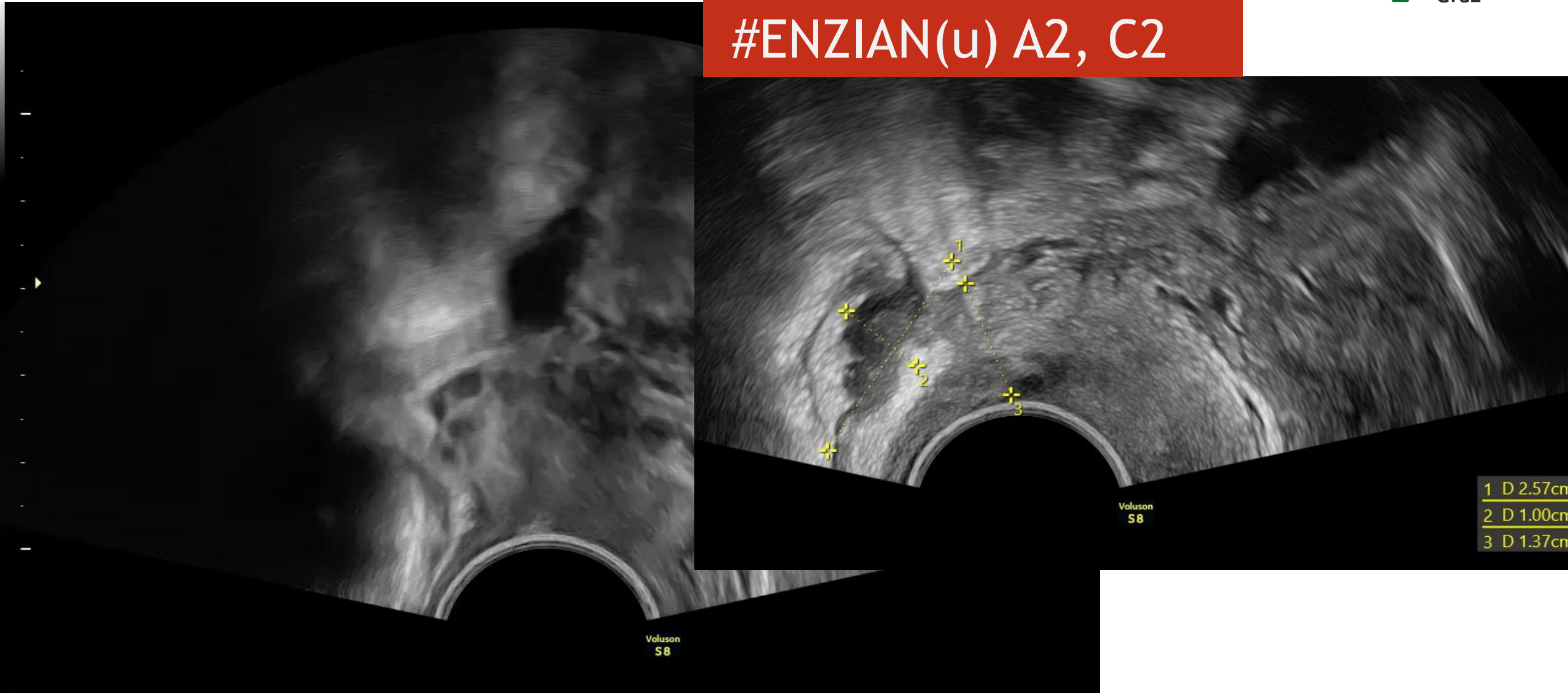


- ▶ verändertes endometriales Milieu
- ▶ chronische proinflammatorische Veränderungen
- ▶ uterine Hyperperistalsis
- ▶ häufige Assoziation mit Endometriose, insbesondere tief-infiltrierende Endometriose



Uterine sliding sign

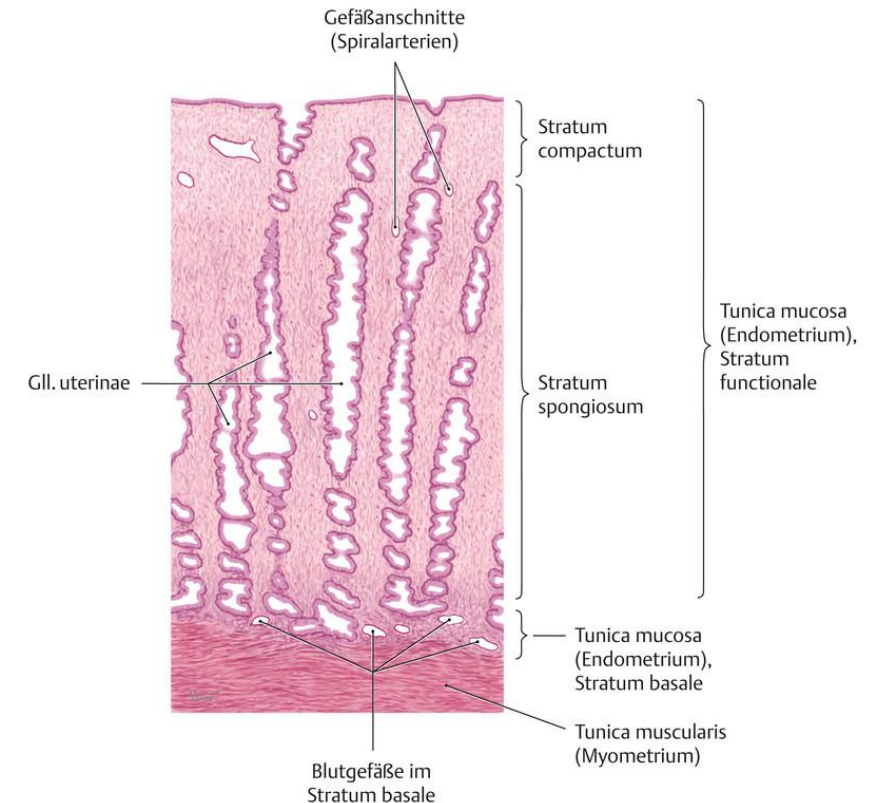
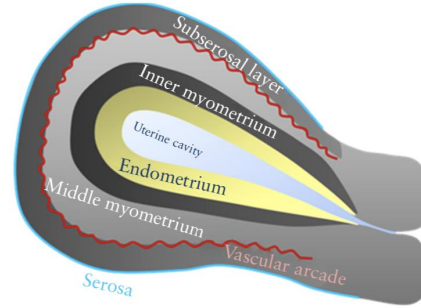
#ENZIAN(u) A2, C2



Voluson
S8

Endometrium

- ▶ Aufbau „uterine lining“
- ▶ Abgrenzbarkeit „junctional zone“
- ▶ zyklusabhängige Veränderungen des Stratum functionale verändern die sonographische Beurteilbarkeit
 - ▶ diffuse Pathologien i.e. Endometriumhyperplasie
 - ▶ fokale Pathologien i.e. Polypen



180°/1.5
Routine HI/GYN
HI M PI 11.00 - 3.60
AO 98%
Gn 14
C6/M7
FF2/E2
SRI II 4/CRI 1



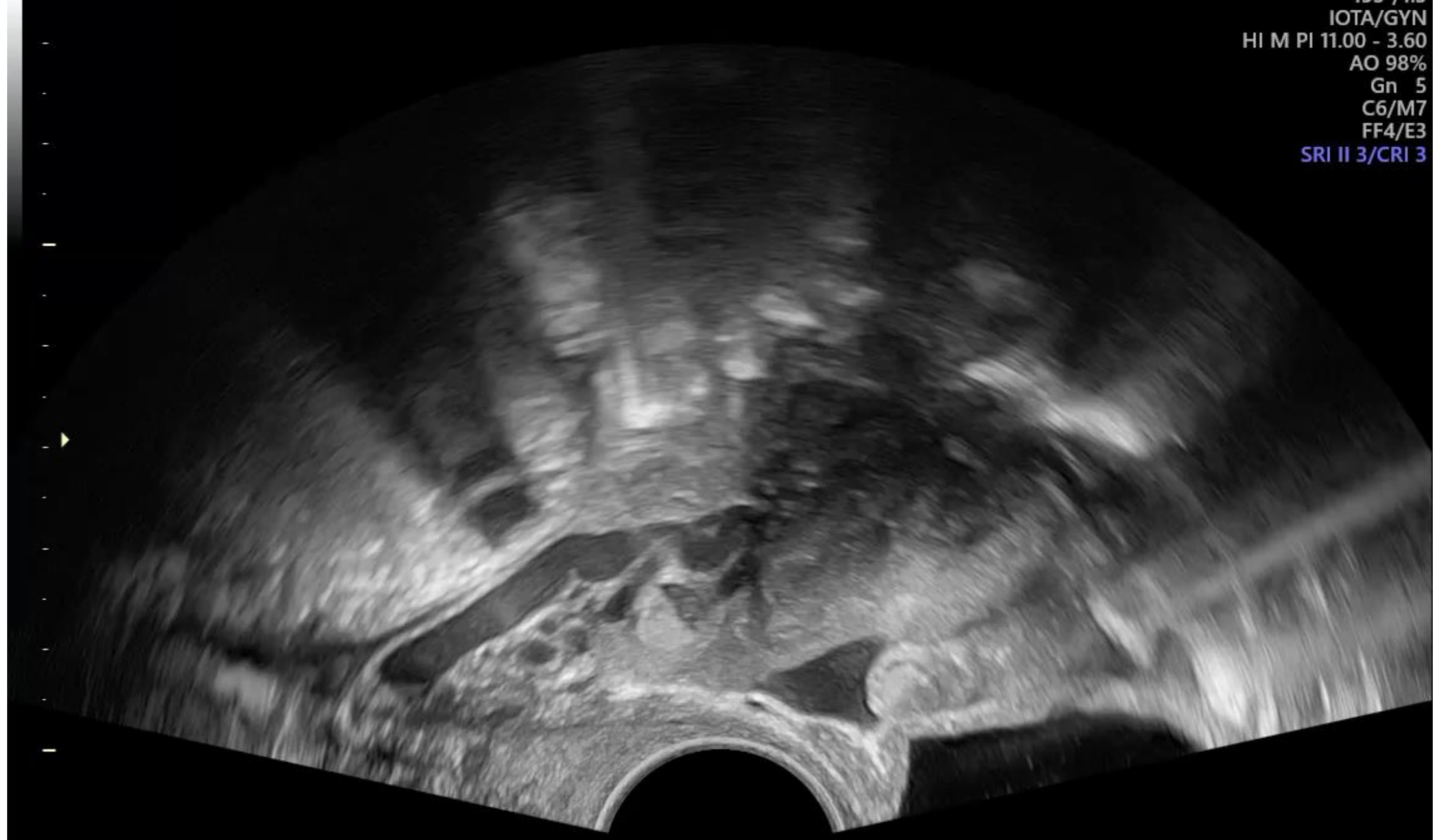
Ut-L

Ut-H

Ut-L 10.09cm

Ut-H 5.27cm

IOTA/GYN
HI M PI 11.00 - 3.60
AO 98%
Gn 5
C6/M7
FF4/E3
SRI II 3/CRI 3



Voluson
S8

Endometriumpathologien - IETA Empfehlungen



ULTRASOUND
in Obstetrics & Gynecology



Consensus Statement |  [Free Access](#) |

Terms, definitions and measurements to describe the sonographic features of the endometrium and intrauterine lesions: a consensus opinion from the International Endometrial Tumor Analysis (IETA) group

F. P. G. Leone, D. Timmerman, T. Bourne, L. Valentin, E. Epstein, S. R. Goldstein, H. Marret, A. K. Parsons, B. Gull, O. Istre, W. Sepulveda, E. Ferrazzi, T. Van den Bosch  ... [See fewer authors](#) 

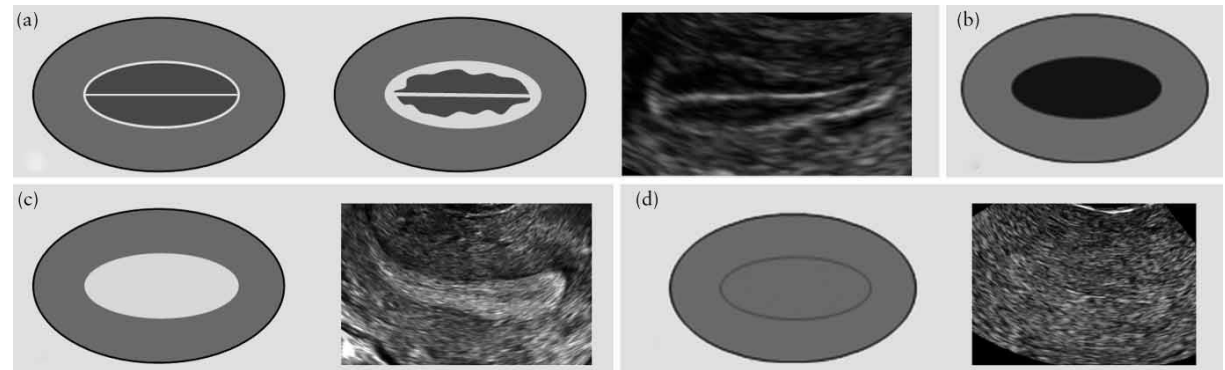
First published: 15 December 2009 |

<https://doi-10.1002/uog.7487> | Citations: 82

Beurteilung des Endometriums

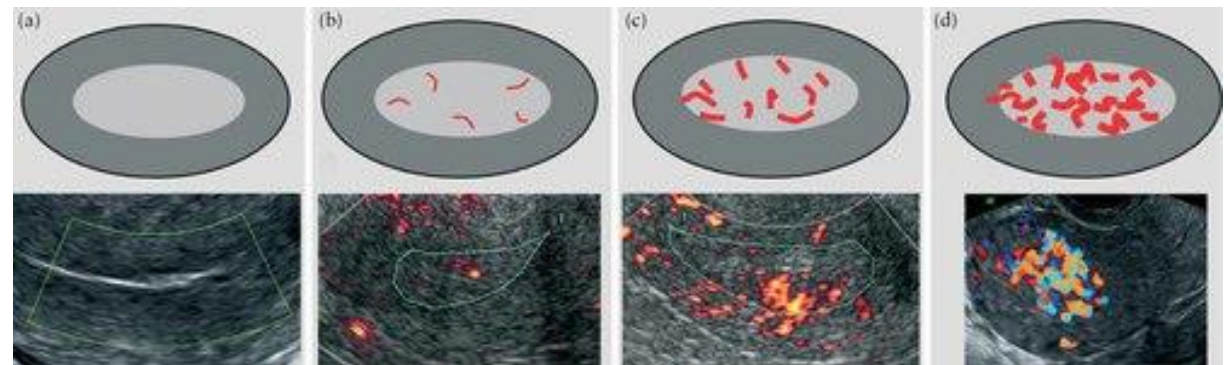
► Uniform endometrial echogenicity:

- (a) three-layer pattern
- (b) hypoechogenic
- (c) hyperechogenic
- (d) Isoechogenic

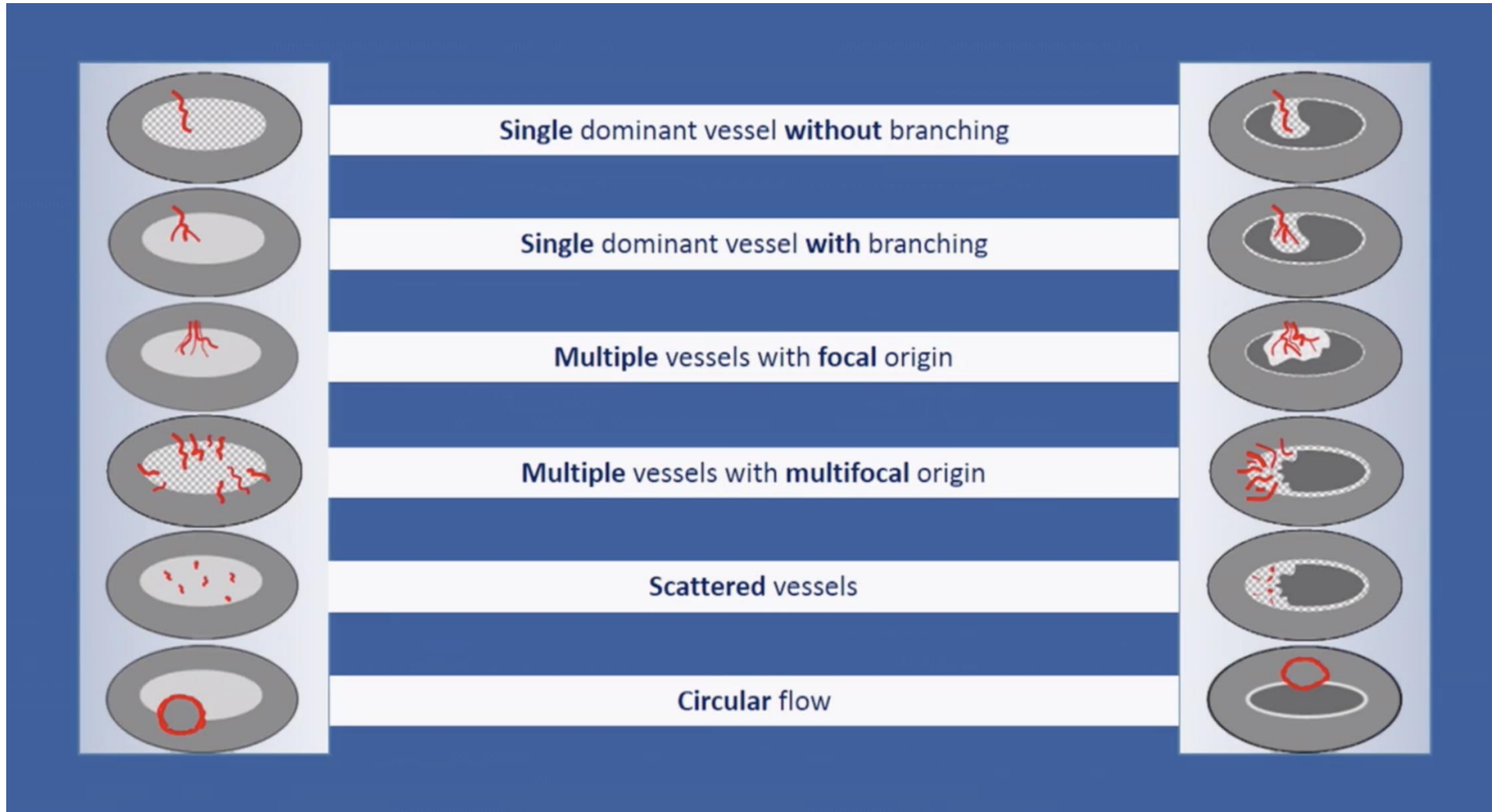


► Color Doppler assessment:

- (a) no flow
- (b) minimal flow
- (c) moderate flow
- (d) abundant flow



Vaskularisationsmuster



Hysteroscopy in recurrent in-vitro fertilisation failure (TROPHY): a multicentre, randomised controlled trial

Tarek El-Toukhy, Rudi Campo, Yacoub Khalaf, Carla Tabanelli, Luca Gianaroli, Sylvie S Gordts, Stephan Gordts, Greet Mestdagh, Tonko Mardesic, Jan Voboril, Gian L Marchino, Chiara Benedetto, Talha Al-Shawaf, Luca Sabatini, Paul T Seed, Marco Gergolet, Grigoris Grimbizis, Hoda Harb, Arri Coomarasamy

Summary

Lancet 2016; 387: 2614–21

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April 27, 2016

[http://dx.doi.org/10.1016/S0140-6736\(16\)00258-0](http://dx.doi.org/10.1016/S0140-6736(16)00258-0)

See [Comment](#) page 2578

See [Articles](#) page 2622

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G Mestdagh MD); SISMER,

Assisted Conception Unit,

Bologna, Italy (C Tabanelli MD,

L Gianaroli MD); Leuven

Institute for Fertility and

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Pronatal, Assisted Conception

Unit, Prague, Czech Republic

(T Mardesic MD, J Voboril MD);

Obstetrics and Gynaecology

Department, University of

Turin, Torino, Italy

(G L Marchino MD,

Prof C Benedetto MD); Centre for

Reproductive Medicine, Barts

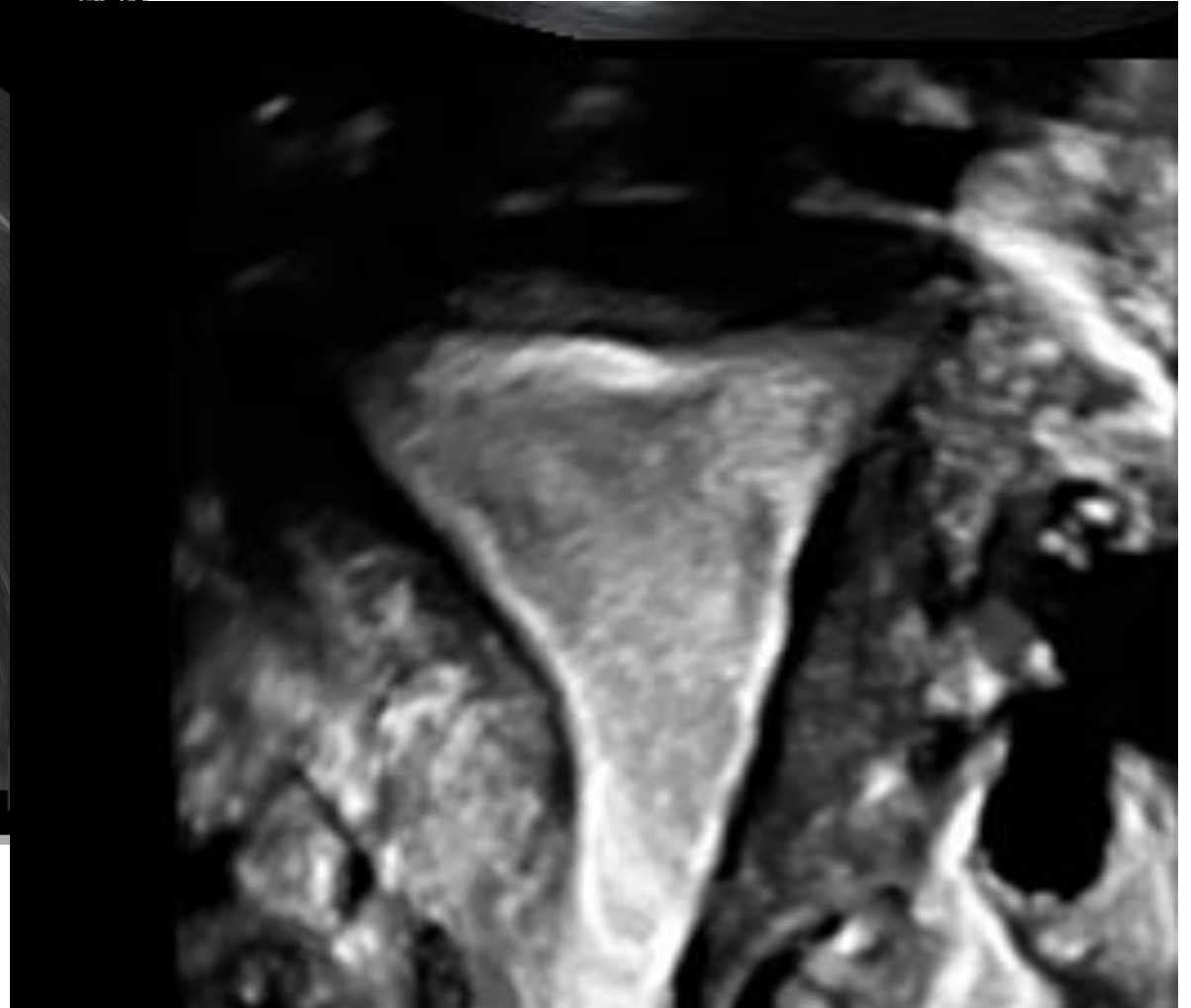
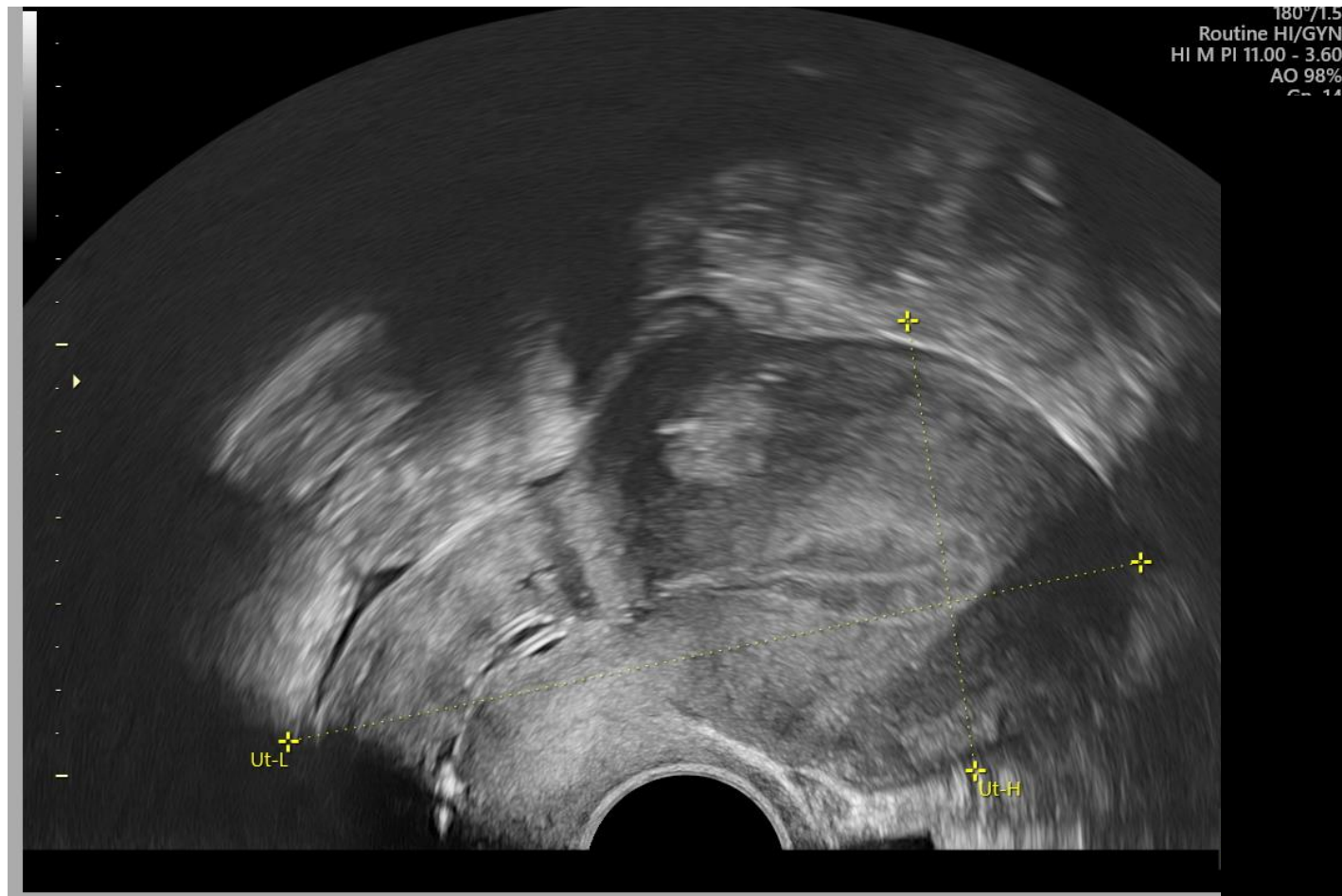
Background The success rate of in-vitro fertilisation (IVF) remains low and many women undergo multiple treatment cycles. A previous meta-analysis suggested hysteroscopy could improve outcomes in women who have had recurrent implantation failure; however, studies were of poor quality and a definitive randomised trial was needed. In the TROPHY trial we aimed to assess whether hysteroscopy improves the livebirth rate following IVF treatment in women with recurrent failure of implantation.

Methods We did a multicentre, randomised controlled trial in eight hospitals in the UK, Belgium, Italy, and the Czech Republic. We recruited women younger than 38 years who had normal ultrasound of the uterine cavity and history of two to four unsuccessful IVF cycles. We used an independent web-based trial management system to randomly assign (1:1) women to receive outpatient hysteroscopy (hysteroscopy group) or no hysteroscopy (control group) in the month before starting a treatment cycle of IVF (with or without intracytoplasmic sperm injection). A computer-based algorithm minimised for key prognostic variables: age, body-mass index, basal follicle-stimulating hormone concentration, and the number of previous failed IVF cycles. The order of group assignment was masked to the researchers at the time of recruitment and randomisation. Embryologists involved in the embryo transfer were masked to group allocation, but physicians doing the procedure knew of group assignment and had hysteroscopy findings accessible. Participants were not masked to their group assignment. The primary outcome was the livebirth rate (proportion of women who had a live baby beyond 24 weeks of gestation) in the intention-to-treat population. The trial was registered with the ISRCTN Registry, ISRCTN35859078.

Findings Between Jan 1, 2010, and Dec 31, 2013, we randomly assigned 350 women to the hysteroscopy group and 352 women to the control group. 102 (29%) of women in the hysteroscopy group had a livebirth after IVF compared with 102 (29%) women in the control group (risk ratio 1·0, 95% CI 0·79–1·25; $p=0\cdot96$). No hysteroscopy-related adverse events were reported.

Interpretation Outpatient hysteroscopy before IVF in women with a normal ultrasound of the uterine cavity and a history of unsuccessful IVF treatment cycles does not improve the livebirth rate. Further research into the effectiveness of surgical correction of specific uterine cavity abnormalities before IVF is warranted.

2D und 3D Sonografie des Cavum uteri



Diagnostik von Uterusanomalien



Human Reproduction, Vol.31, No.1 pp. 2–7, 2016

Advanced Access publication on November 4, 2015 doi:10.1093/humrep/dev264

human
reproduction

ESHRE PAGES

The Thessaloniki ESHRE/ESGE consensus on diagnosis of female genital anomalies[†]

Grigoris F. Grimbizis*, Attilio Di Spiezio Sardo, Sotirios H. Saravelos, Stephan Gordts, Caterina Exacoustos, Dominique Van Schoubroeck, Carmina Bermejo, Nazar N. Amso, Geeta Nargund, Dirk Timmerman, Apostolos Athanasiadis, Sara Brucker, Carlo De Angelis, Marco Gergolet, Tin Chiu Li, Vasilios Tanos, Basil Tarlatzis, Roy Farquharson, Luca Gianaroli, and Rudi Campo

Congenital Uterine Anomalies (CONUTA) common ESHRE/ESGE Working Group and invited Experts, ESGE Central Office, Diestsevest 43/0001, 3000 Leuven, Belgium

*Correspondence address. 1st Department of Obstetrics & Gynecology, Aristotle University of Thessaloniki, Tsimiski 51 Street, 54623 Thessaloniki, Greece. E-mail: grigoris.grimbizis@gmail.com, grimbi@med.auth.gr

Uterusanomalien - CONUTA Empfehlungen

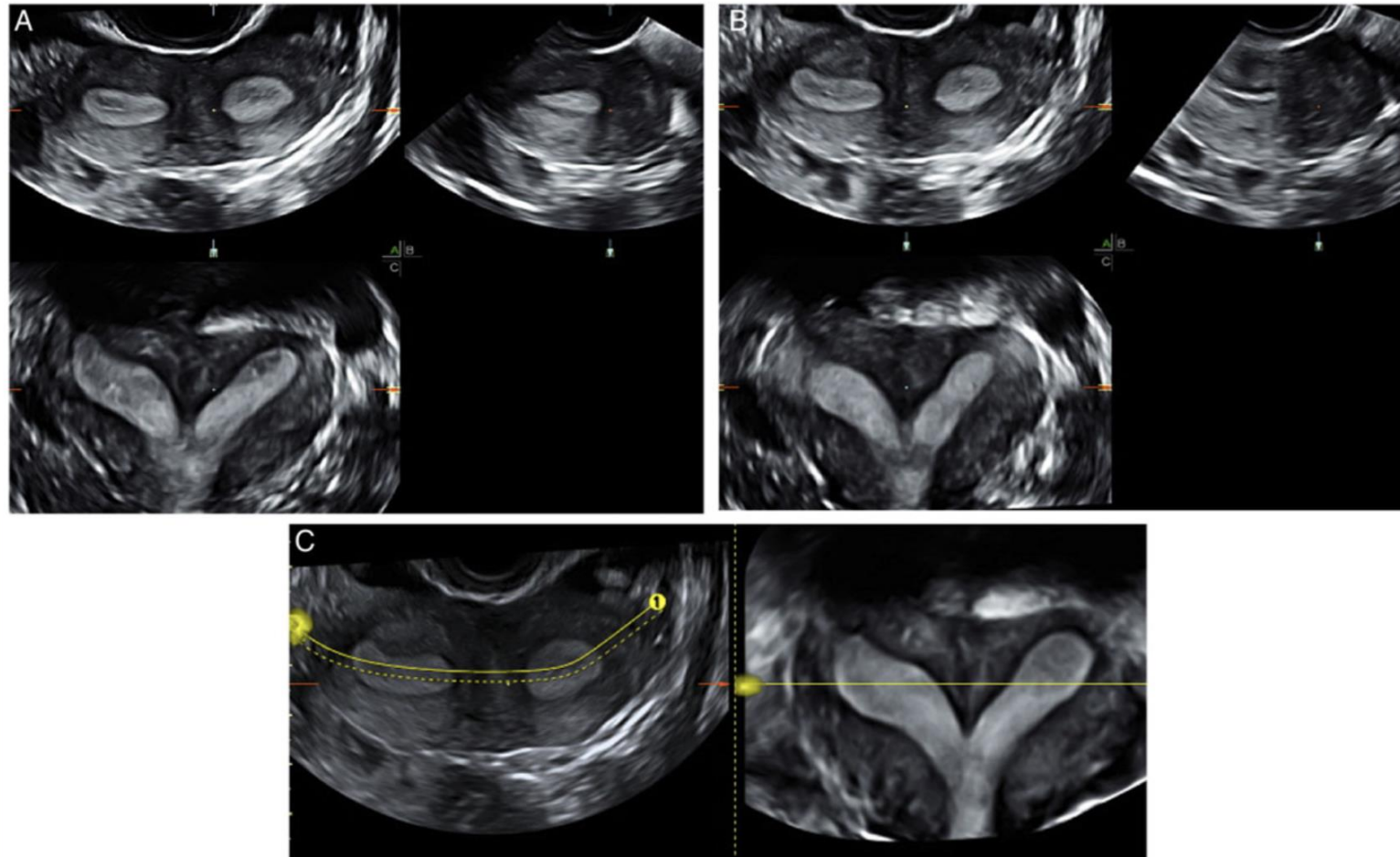
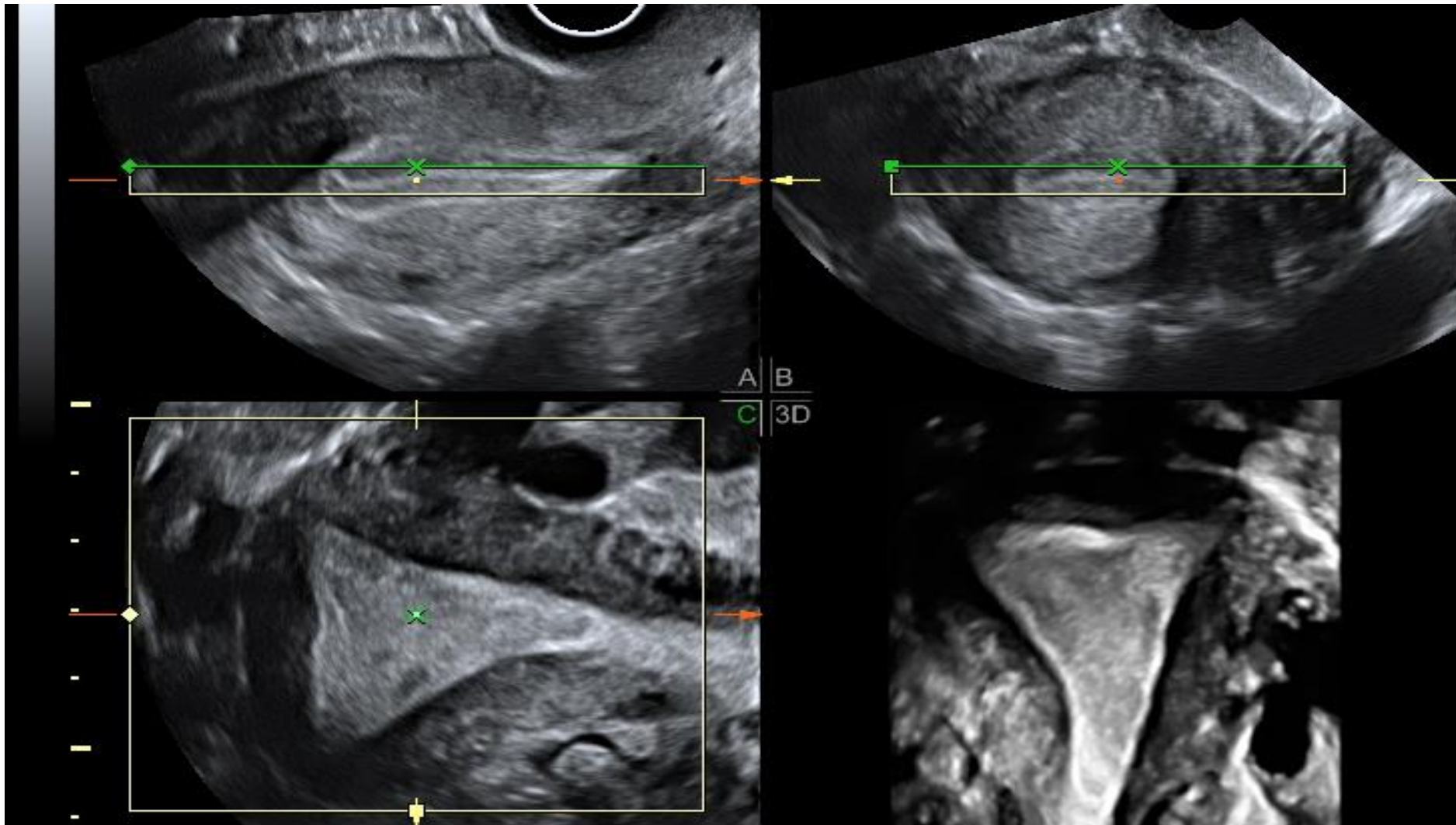


Figure 3 (A–C) How to obtain an optimal 3D US coronal plane. Cutting line is not perfect on the endometrium in plane a and b; thus, if necessary, the dotted line can be curved to follow the endometrium and the tubal ostia, as shown in plane c.

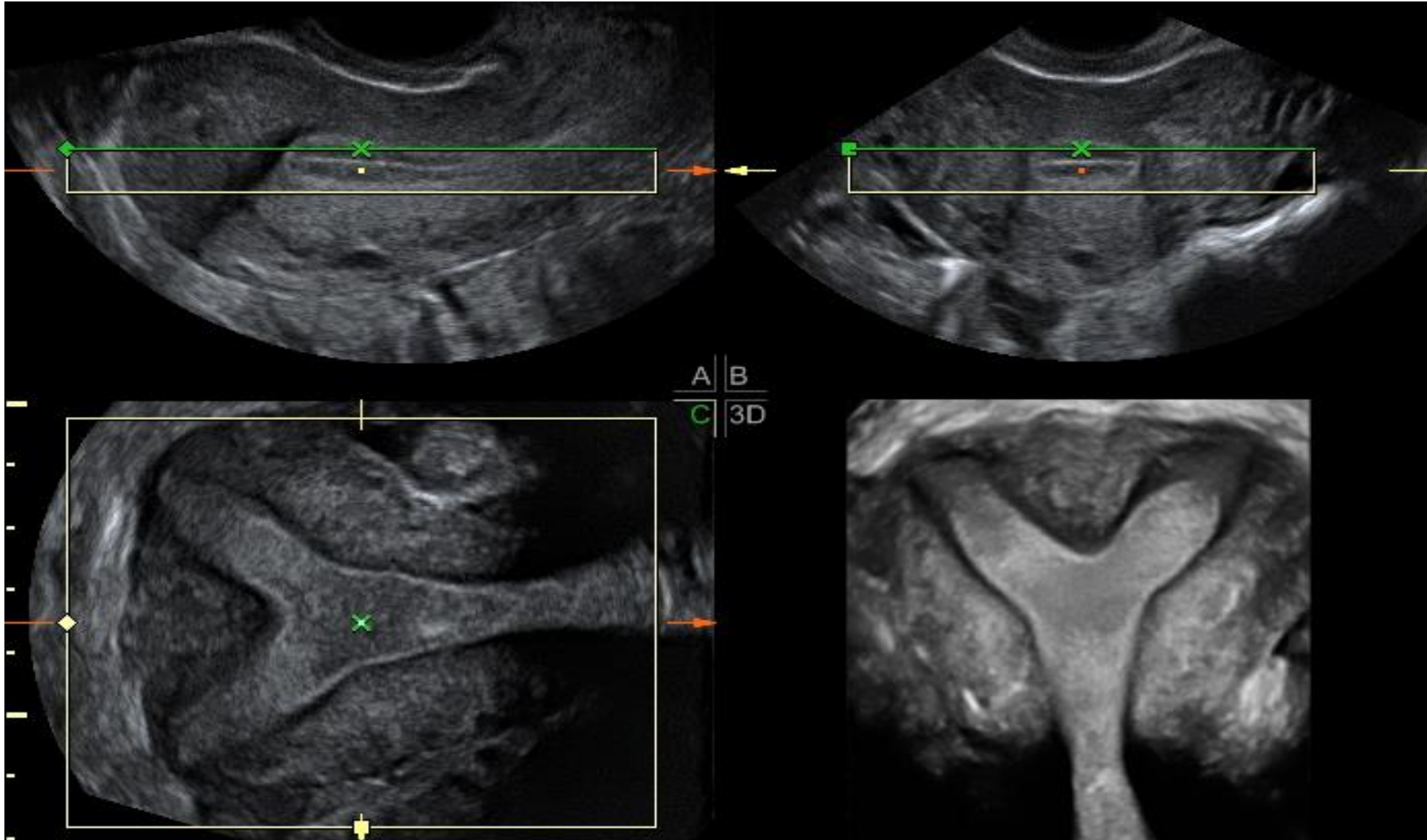
Normales Cavum uteri



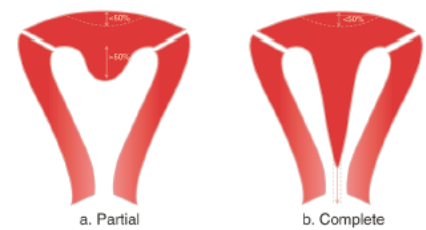
Class U0/normal uterus



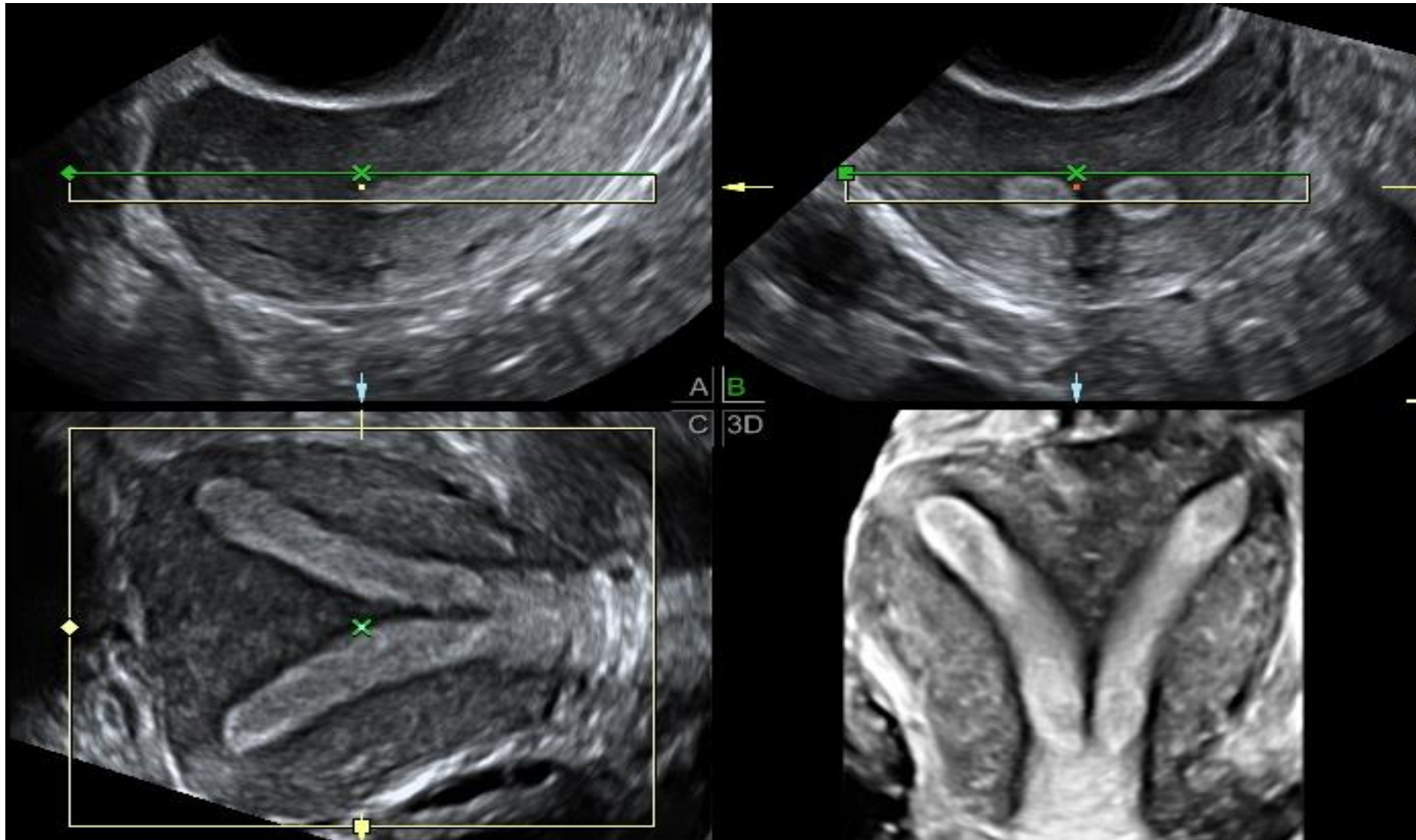
Uterus subseptus



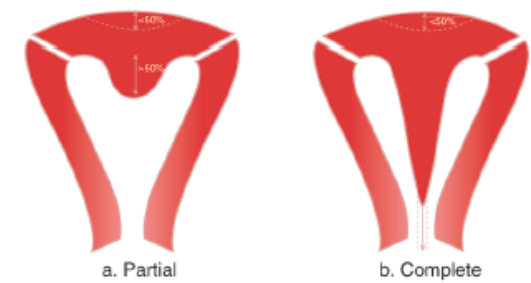
Class U2/septate uterus



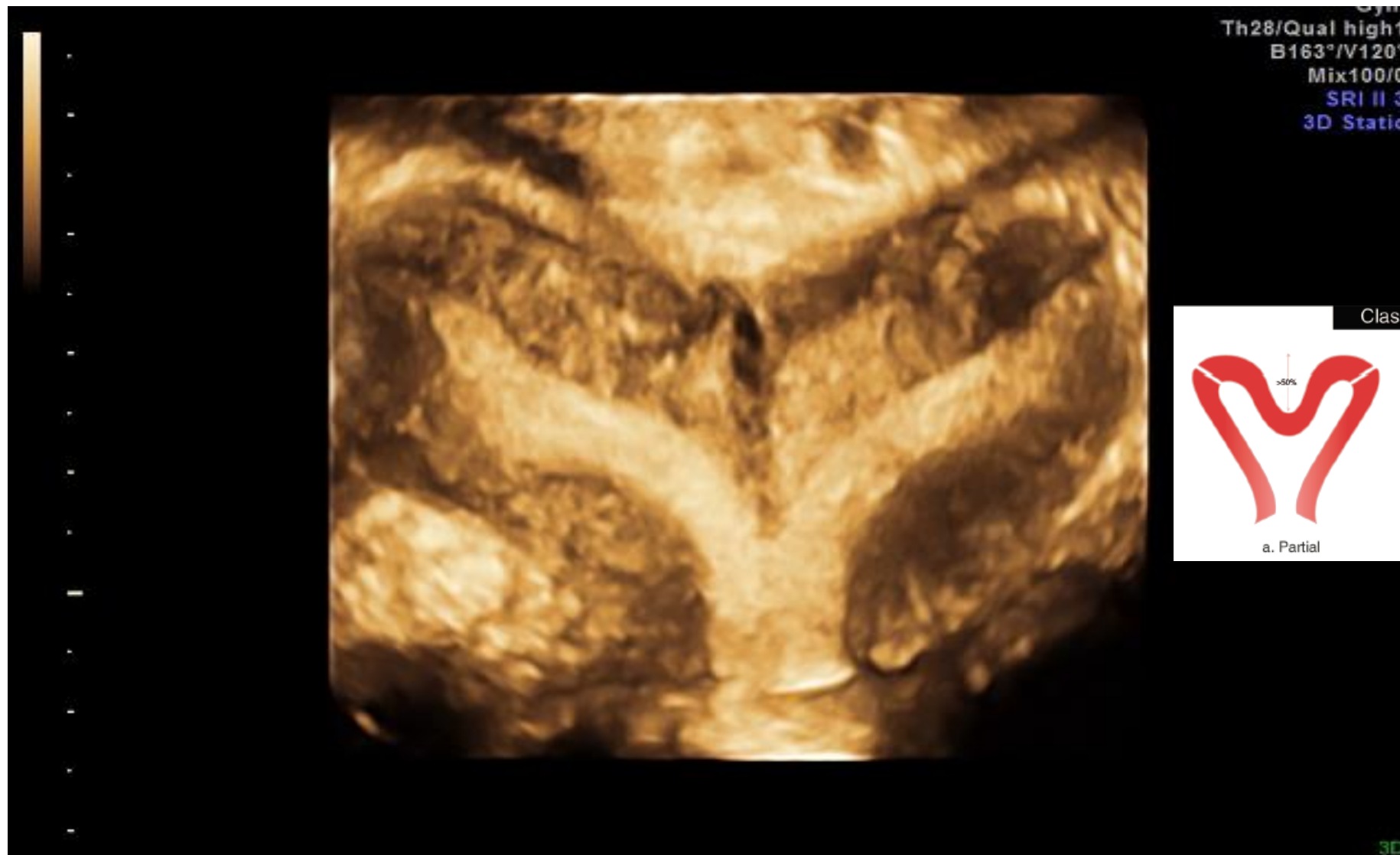
Uterus septus



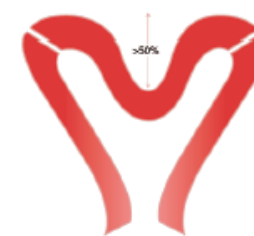
Class U2/septate uterus



Uterus bicornis



Class U3/Bicorporeal Uterus



a. Partial



b. Complete



c. Bicorporeal septate

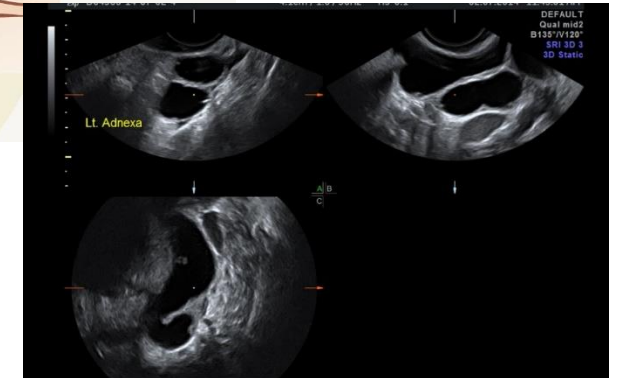
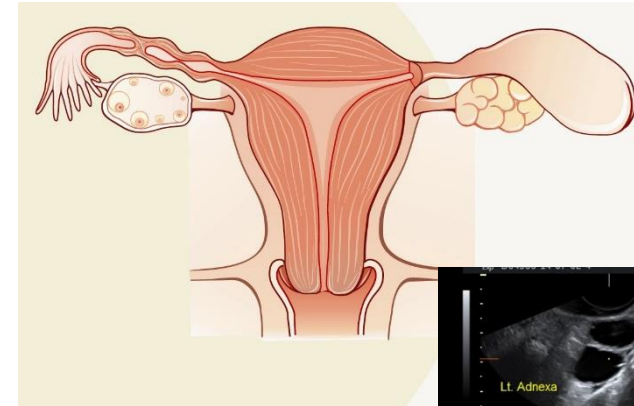
Übersicht Fertility Check

- ▶ Sonografie des Uterus
- ▶ Sonografie der tubo-ovariellen Einheit

Tubo-ovarielle Einheit

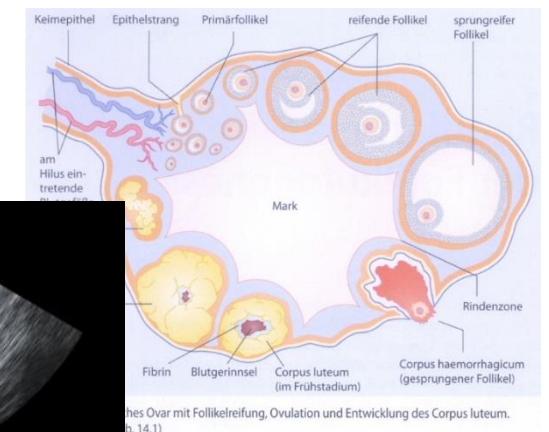
► Tube

- Pathologie i.S. Hydrosalpinx?
- Hinweis für Adhäsionen?
- Durchgängigkeit



► Ovar

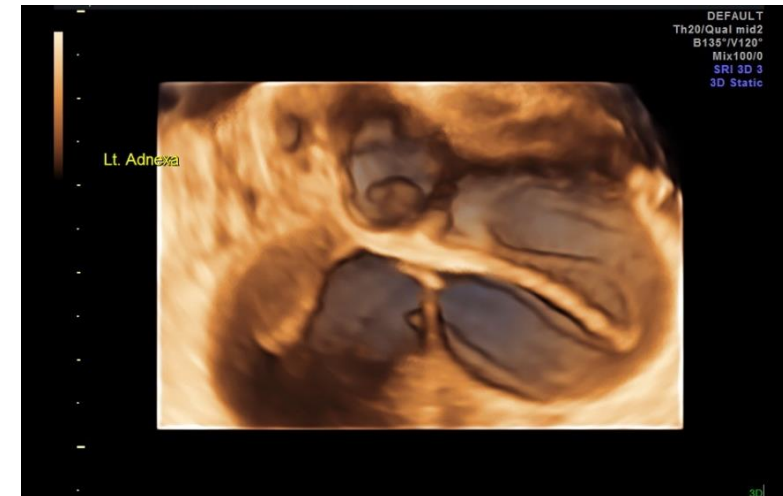
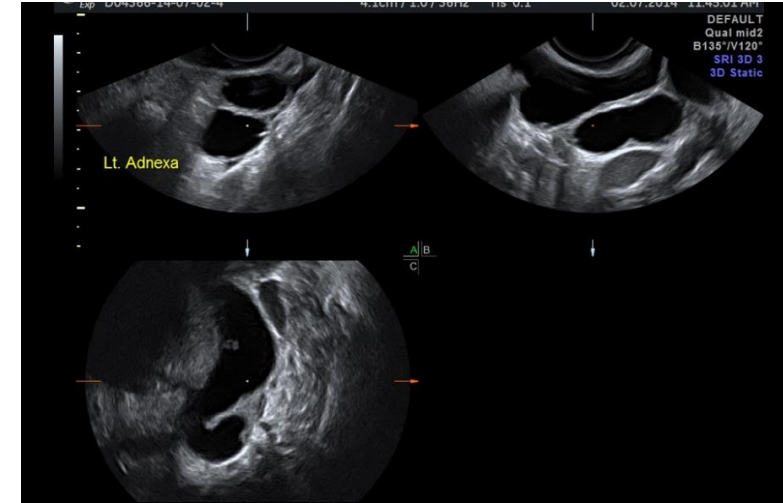
- Morphologie, Topographie, Verschieblichkeit
- ovarielle Reserve
- Pathologien



Das Ovar mit Follikelreifung, Ovulation und Entwicklung des Corpus luteum.
(S. 14.1)

Tube - Hydrosalpinx

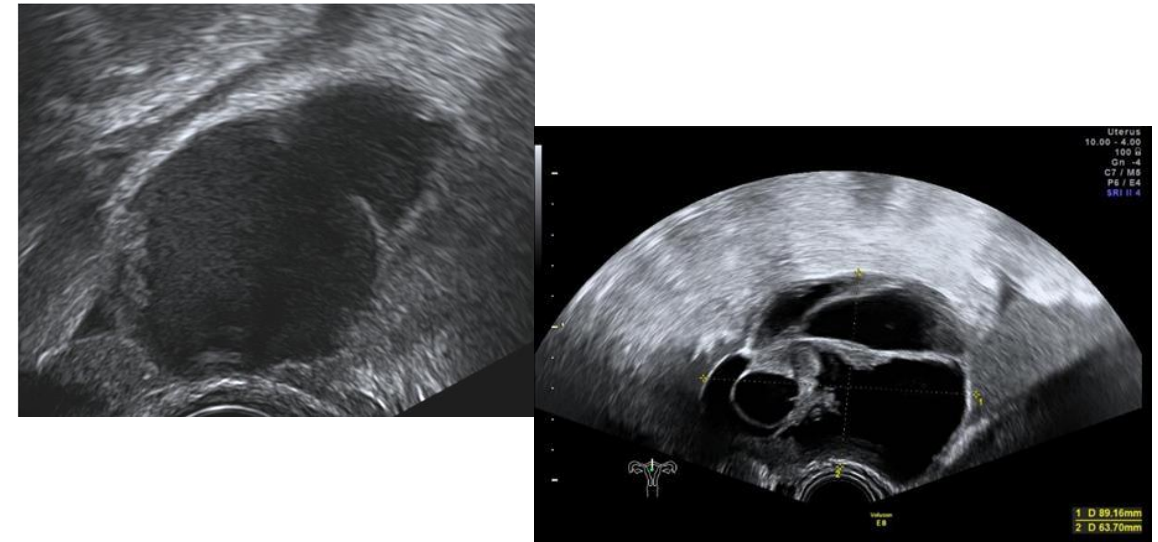
- ▶ Prävalenz (Kinderwunsch): 10-30%
- ▶ Sonografische Kriterien:
 - ▶ Die Tubenwand stellt sich als echoreiche Doppelkontur dar
 - ▶ Im Falle der Hydrosalpinx ist das Lumen echoleer
 - ▶ Bei einer Pyosalpinx können homogene Binnenechos zu sehen sein
 - ▶ Typischer mäanderförmiger Verlauf



Tube - Hydrosalpinx

Differenzialdiagnose:

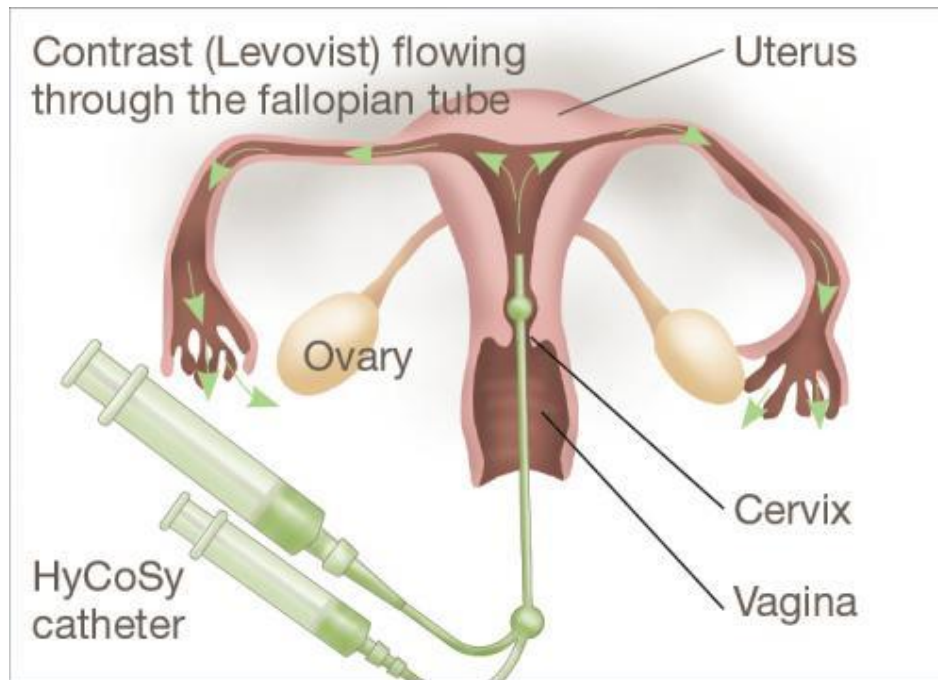
- ▶ Varikosis pelvis ist durch die Farbdarstellung des Blutflusses sicher abgrenzbar
- ▶ träge Darmschlingen zeigen im Gegensatz zur Tube eine echoarme Wand und echoreichen Inhalt > ggf. Abwarten, ob peristaltische Bewegungen darstellbar sind
- ▶ entzündliche Prozesse im Adnexegebiet
- ▶ Endometriose
- ▶ Malignom-suspekte Befunde



Tubenabklärung

» HYCOSY

(Hystero - Contrast - Sonography)

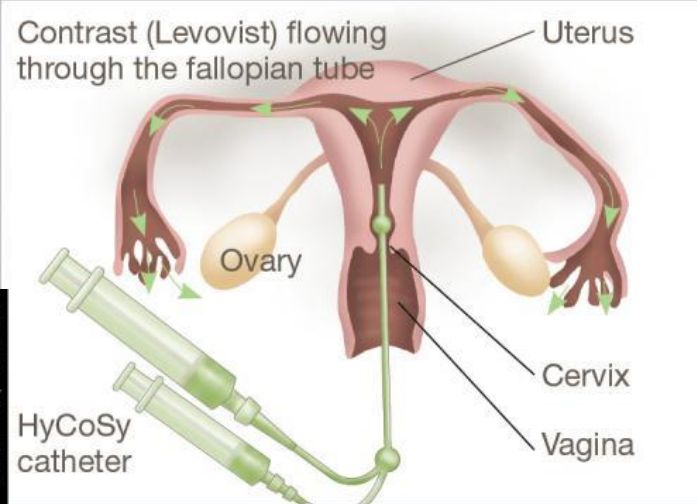
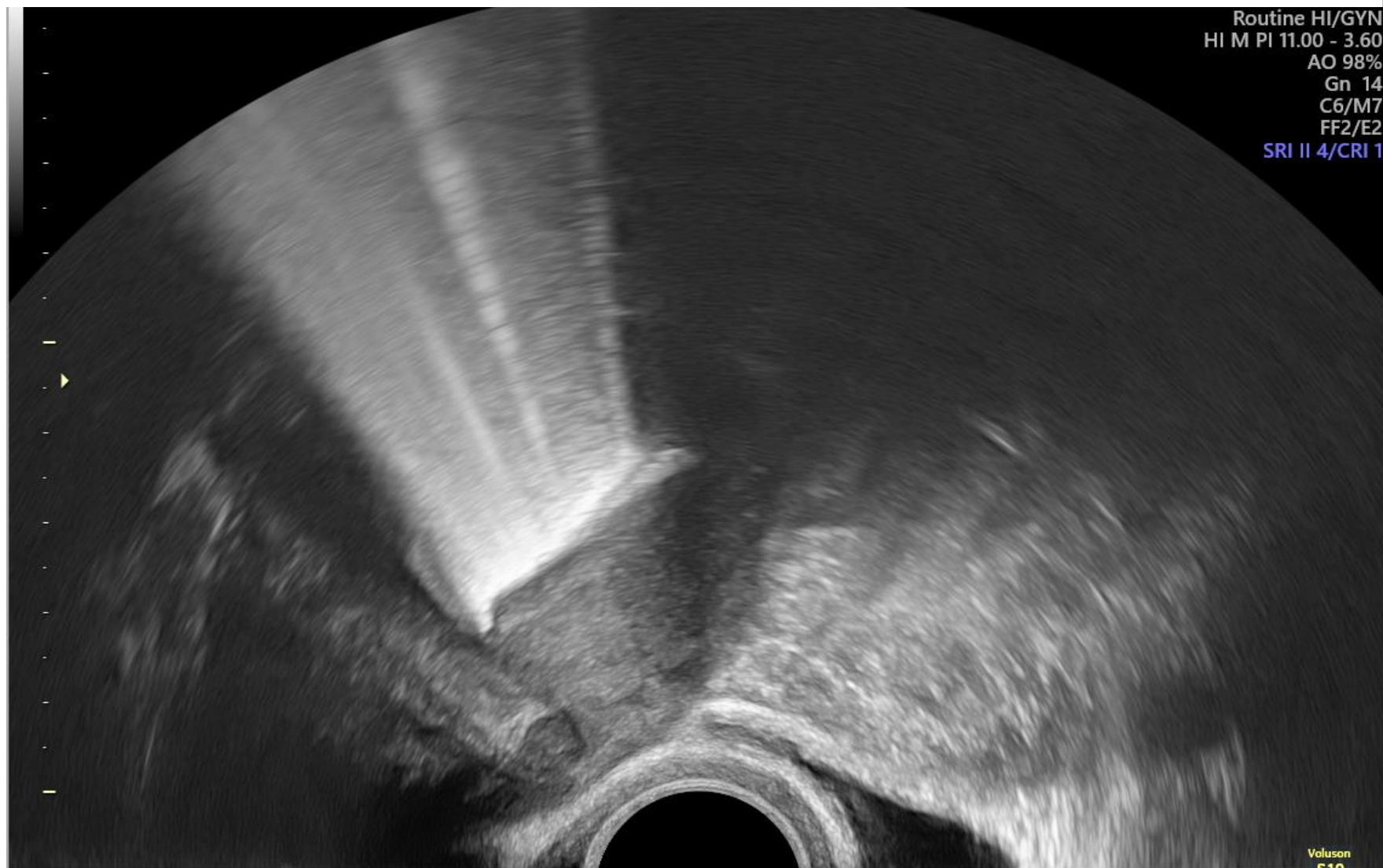


» HSG

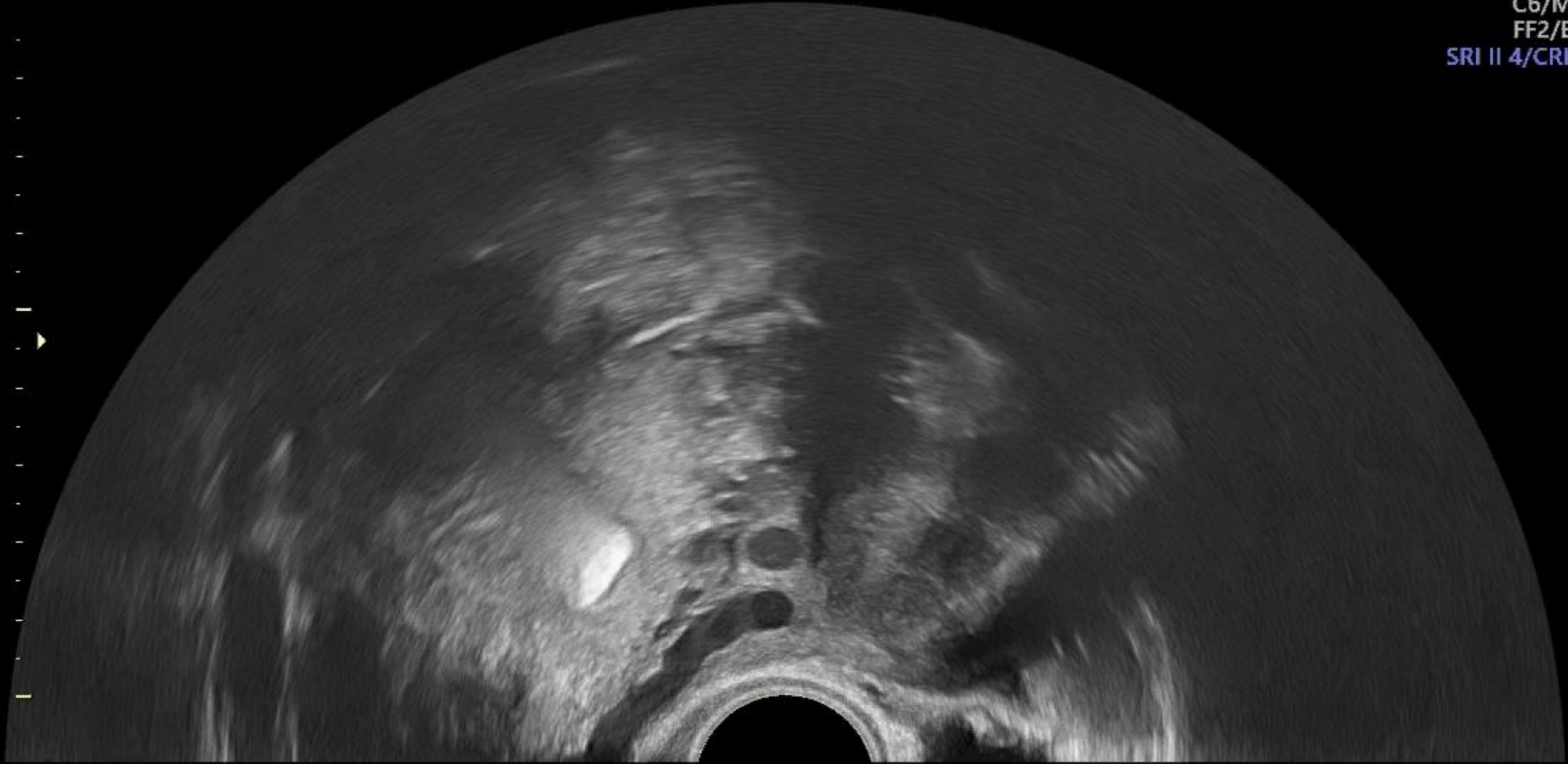
Hysterosalpingographie



HysteroContrastSonography (HYCOSY)



C6/M7
FF2/E2
SRI II 4/CRI 1



Voluson
S10

C6/M7
FF2/E2
SRI II 4/CRI 1

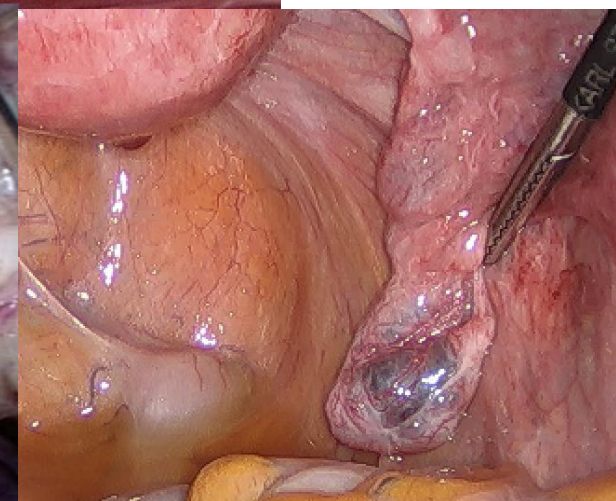
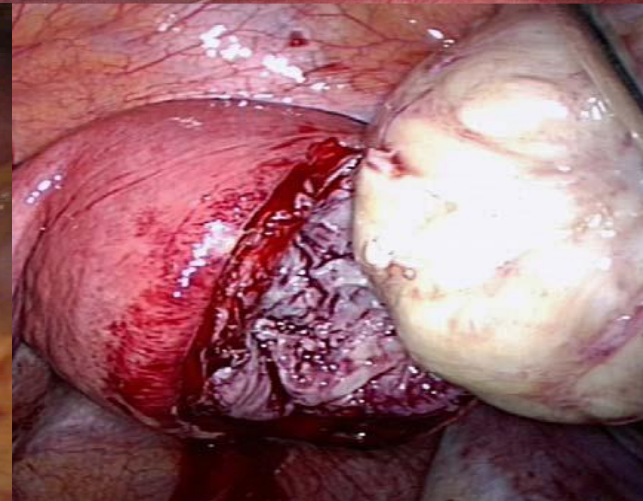
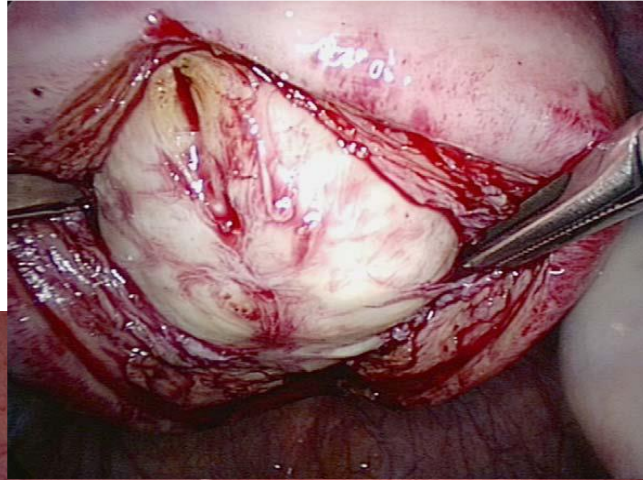
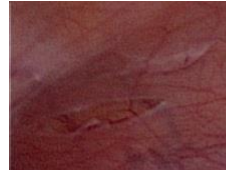
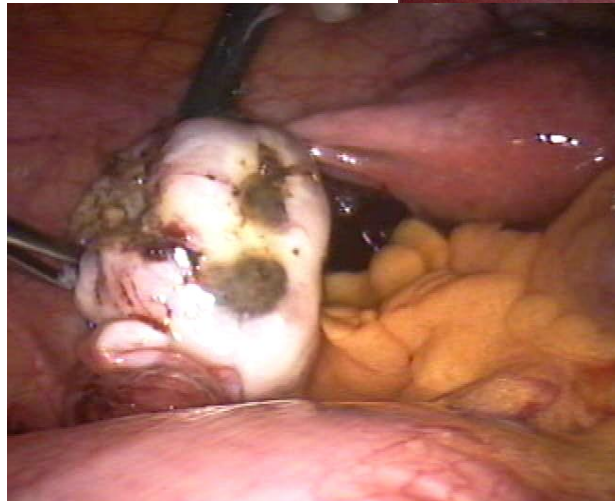
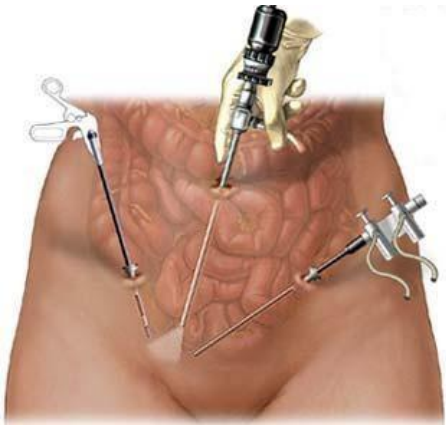


Voluson
S10

Tubenabklärung im Rahmen von Operationen

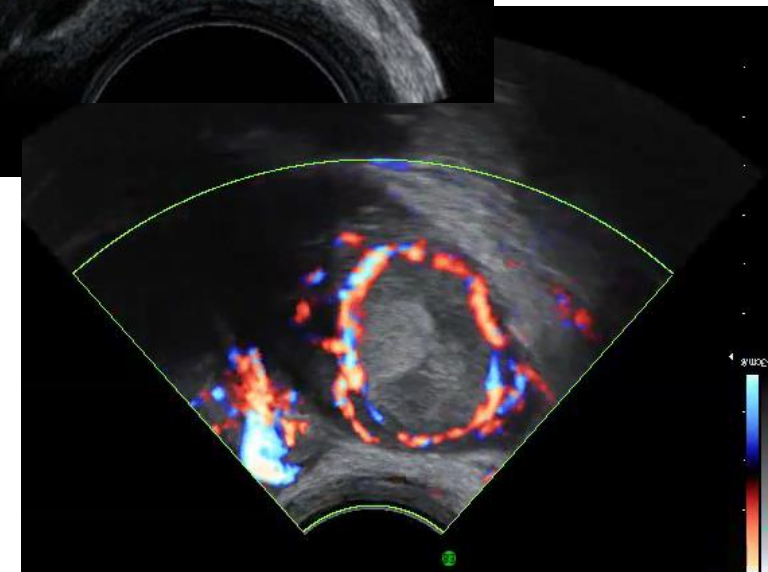
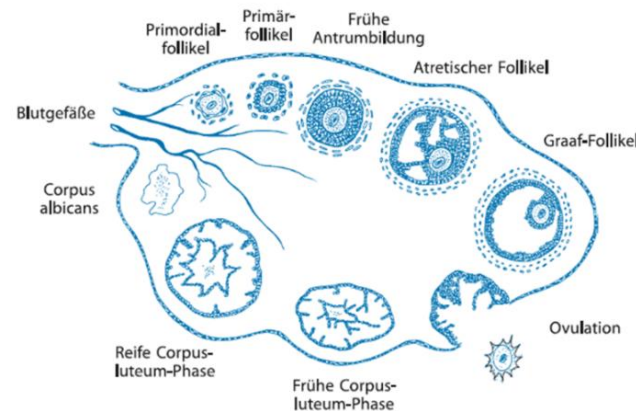
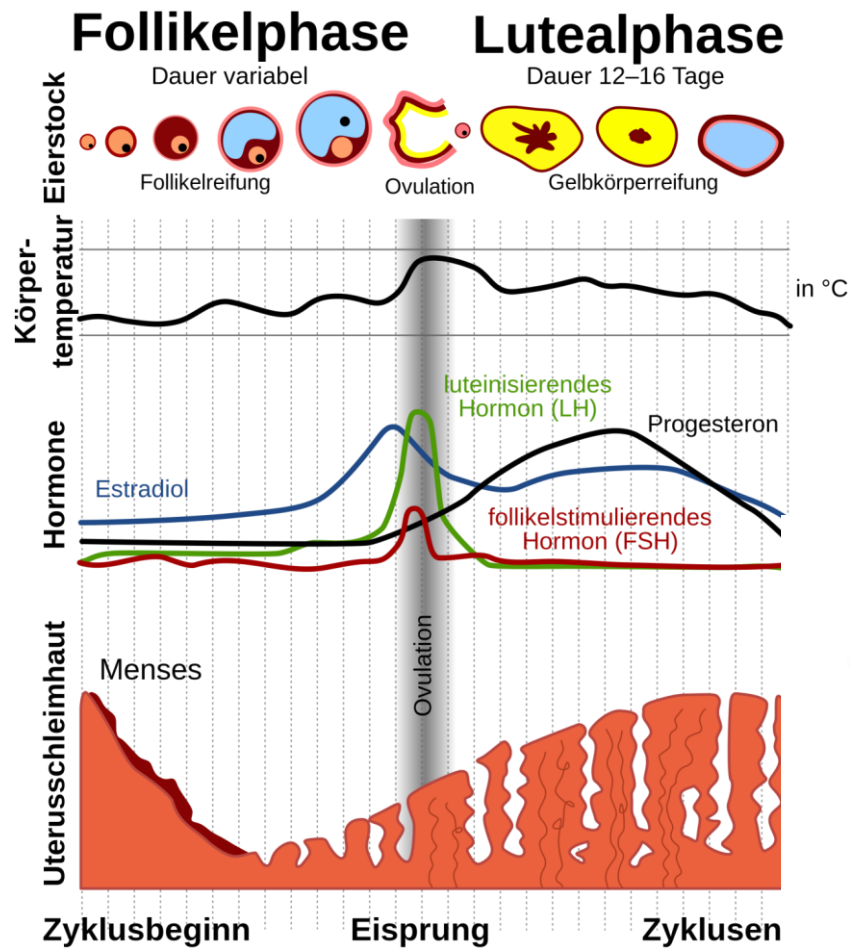
►► Chromopertubation

- per Laparoskopie
- nur bei Verdacht auf pelvine Pathologien indiziert

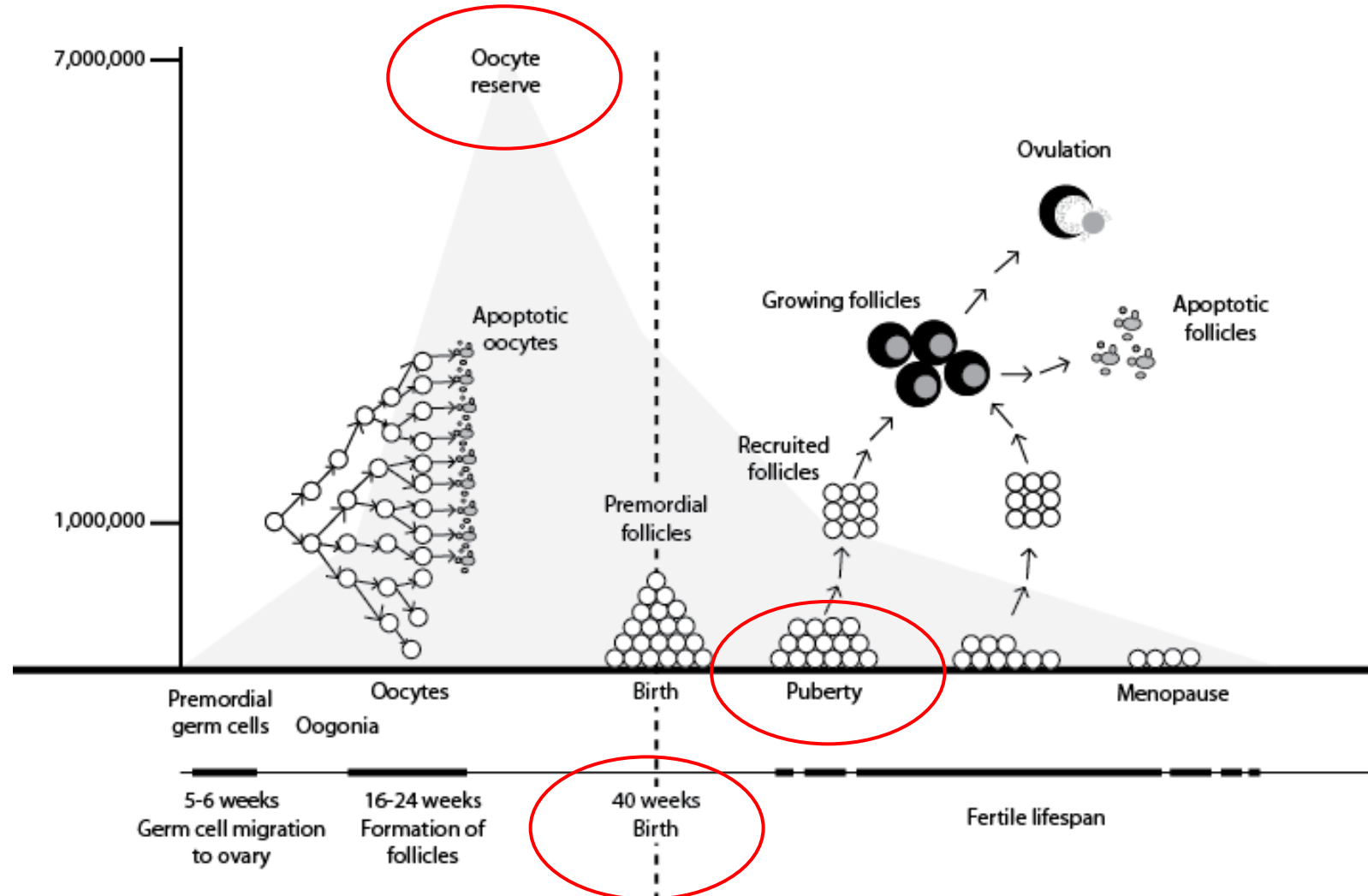


Ovar

Morphologie, Topographie, Verschieblichkeit

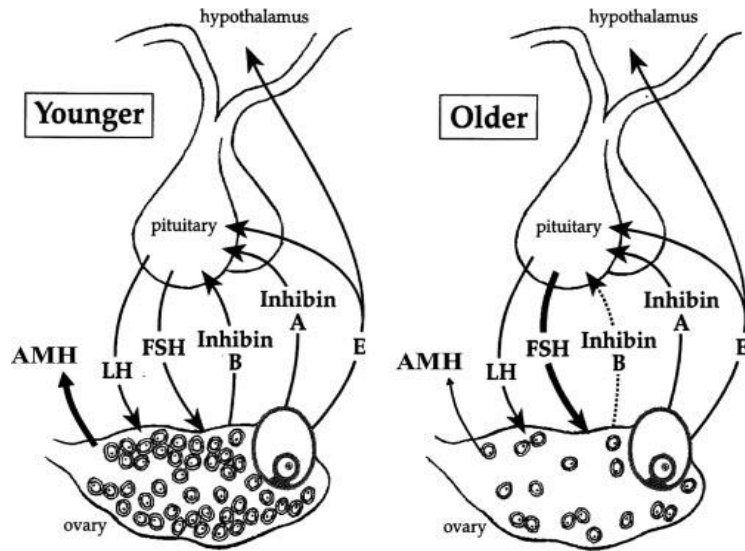


Ovarielle Reserve

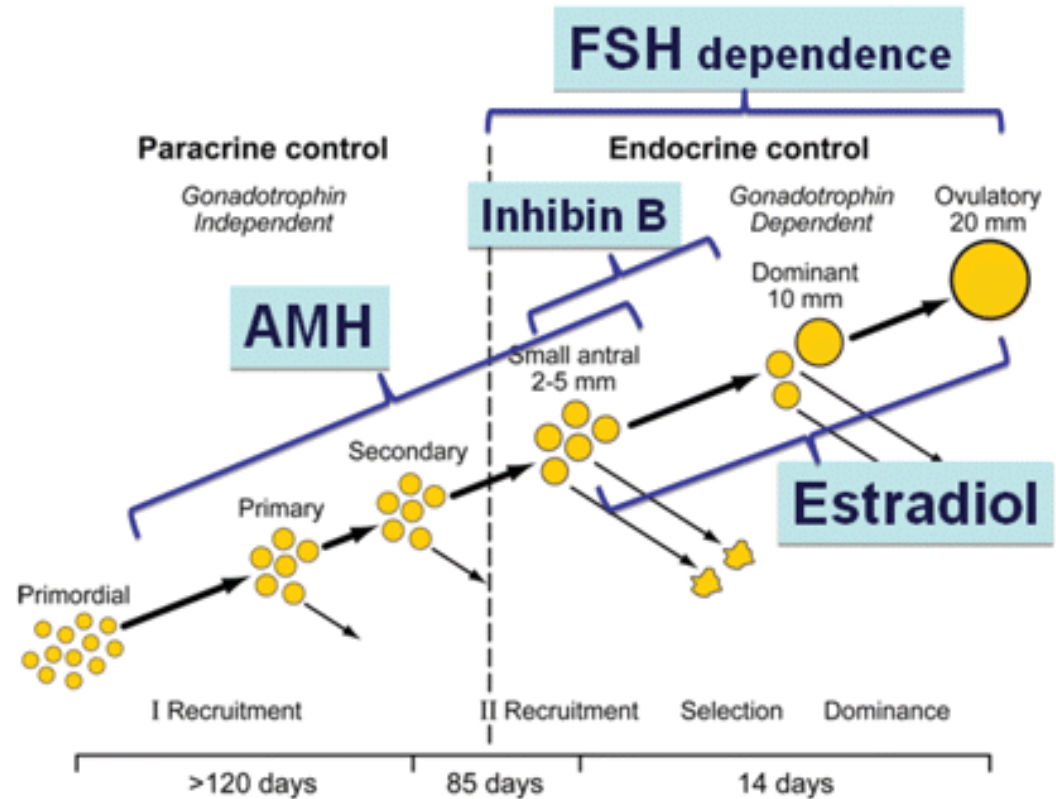


Ovarielle Reserve

Anzahl antraler Follikel (AFC)



Anti-Müller-Hormon (AMH)



Ovarielle Reserve

Human Reproduction Update, Vol.17, No.1 pp. 46–54, 2011

Advanced Access publication on July 28, 2010 doi:10.1093/humupd/dmq034

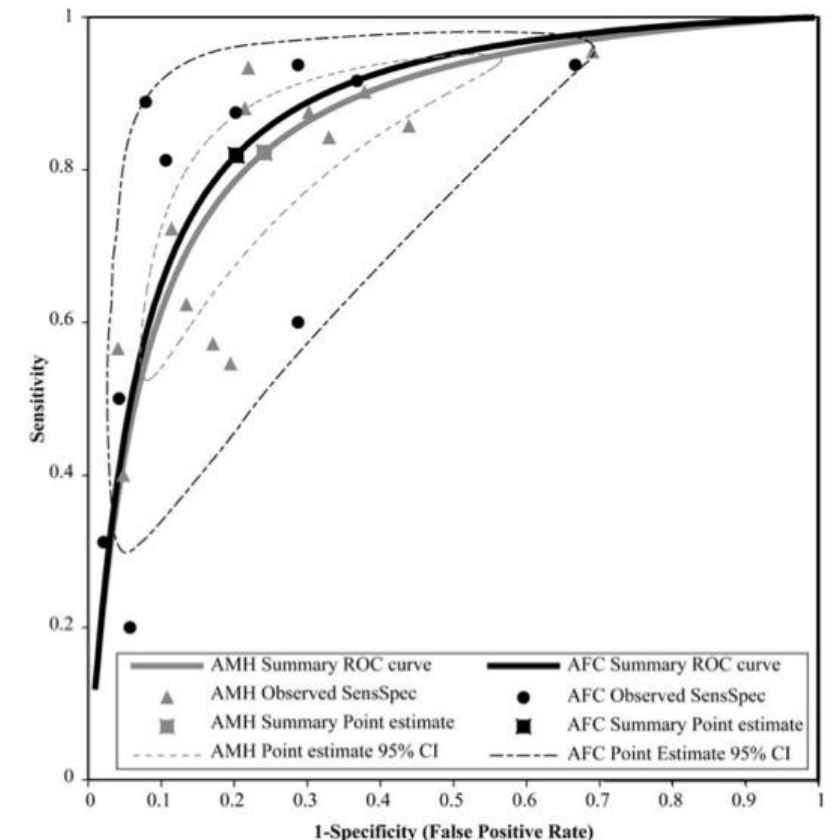
human
reproduction
update



AMH and AFC as predictors of excessive response in controlled ovarian hyperstimulation: a meta-analysis

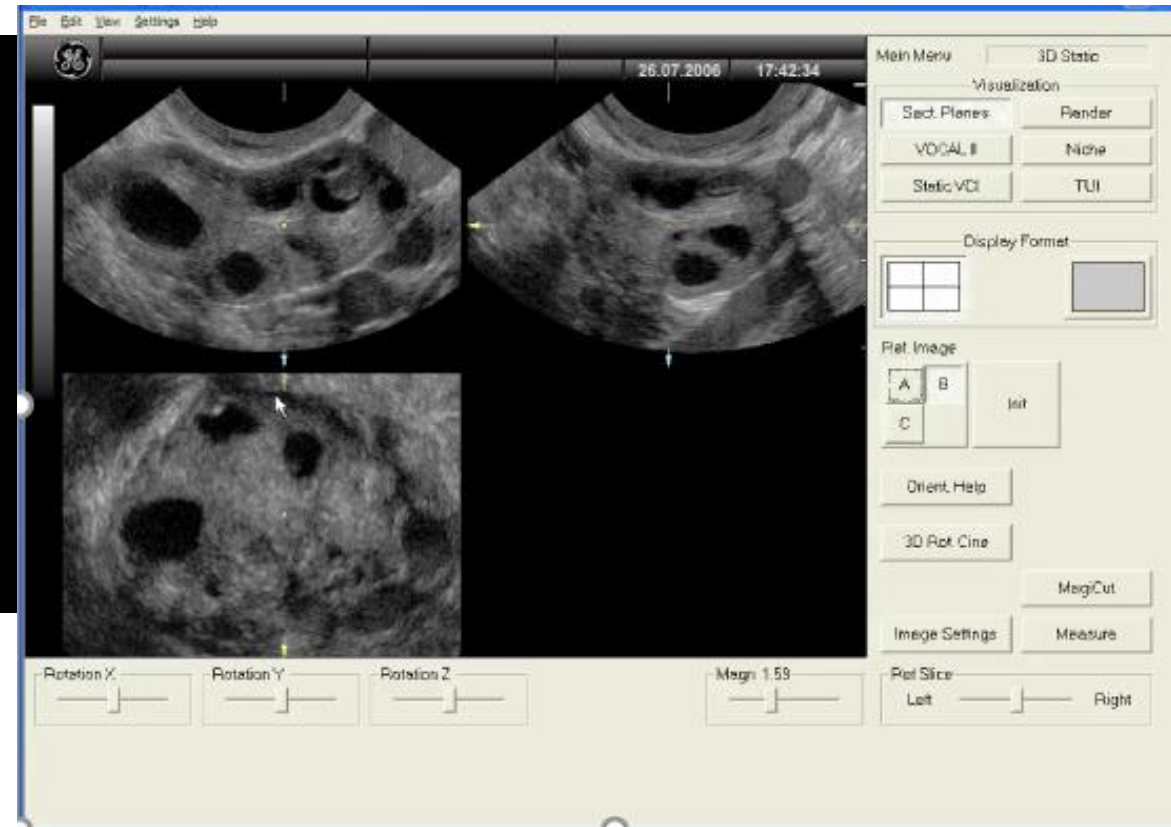
S.L. Broer^{1,*}, M. Dölleman¹, B.C. Opmeer², B.C. Fauser¹, B.W. Mol³, and F.J.M. Broekmans¹

- ▶ AMH und AFC gut vergleichbar
- ▶ Estimates of sensitivity and specificity:
 - AMH 82 and 76%
 - AFC 82 and 80%



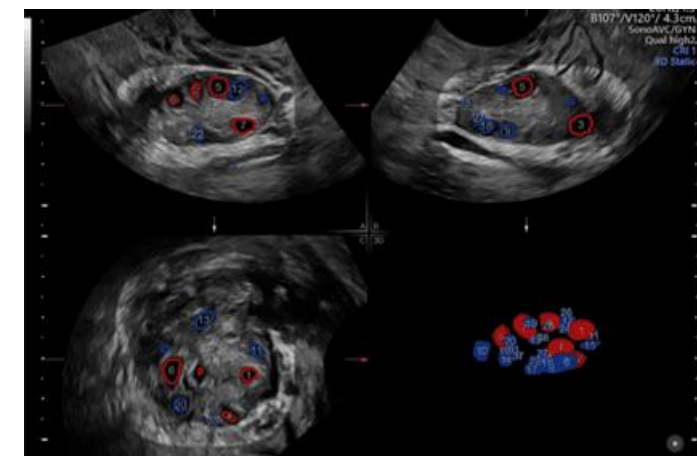
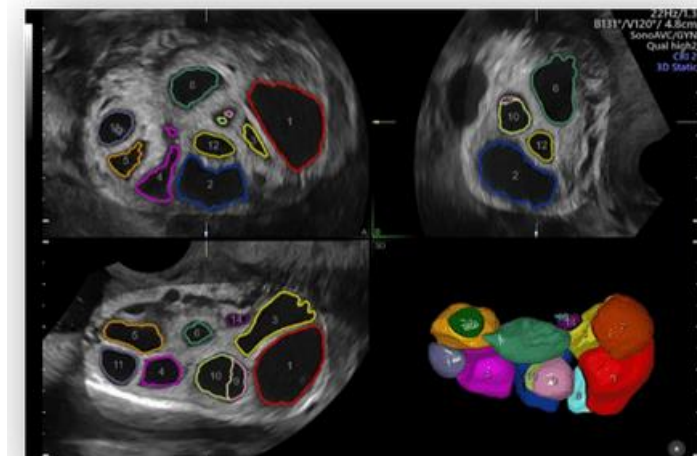
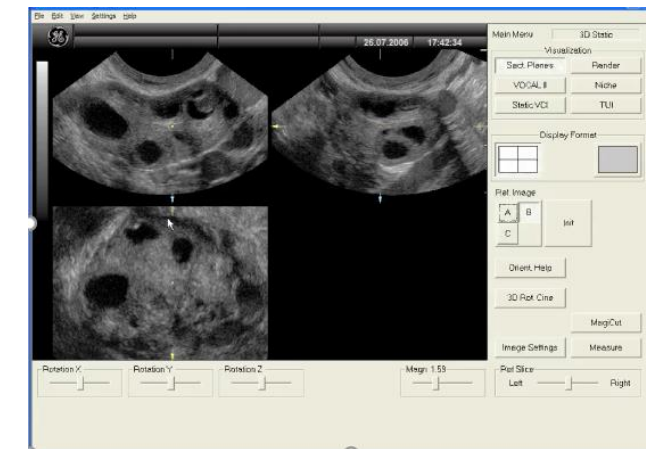
Beurteilung AFC

- 2D Sonografie vs. 3D Sonografie



Automatisierte AFC Messungen

- SonoAVC follicle (Sonography-based Automated Volume Count follicle) berechnet automatisch die Anzahl, die Dimensionen und das Volumen von echoarmen Strukturen in einem Volumen-Sweep.
- SonoAVC antral zählt automatisch die Anzahl der Antrafollikel im Eierstock und unterstützt bei der Kategorisierung in benutzerdefinierte Größengruppen.



Ovarielle Reserve - AFC

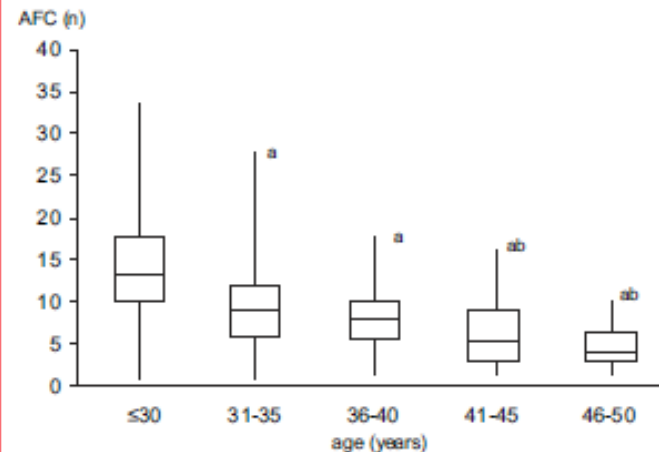
Age-specific nomogram for the decline in antral follicle count throughout the reproductive period

Antonio La Marca, M.D., Ph.D.,^a Elena Spada, M.D.,^b Giovanna Sighinolfi, M.D.,^a Cindy Argento, M.D.,^a Alessandra Tirelli, M.D.,^a Simone Giulini, M.D.,^a Silvano Milani, M.D.,^b and Annibale Volpe, M.D.^a



FIGURE 1

Women were categorized in the following groups based on age: ≤30 years (n = 68), 31–35 years (n = 76), 36–40 years (n = 96), 41–45 years (n = 92), and 46–50 years (n = 30). The horizontal line represents the median, the box represents the 25th and 75th centiles, and the vertical line represents the lowest and highest values. ANOVA indicated a statistically significant difference in AFC values between the groups (*F* ratio, 41,907; *P* < 0.001). a = *P* < 0.05 vs. age group ≤30 years; b = *P* < 0.05 vs. age groups ≤30, 31–35, and 36–40 years.



La Marca. Nomogram for the AFC. Fertil Steril 2011.

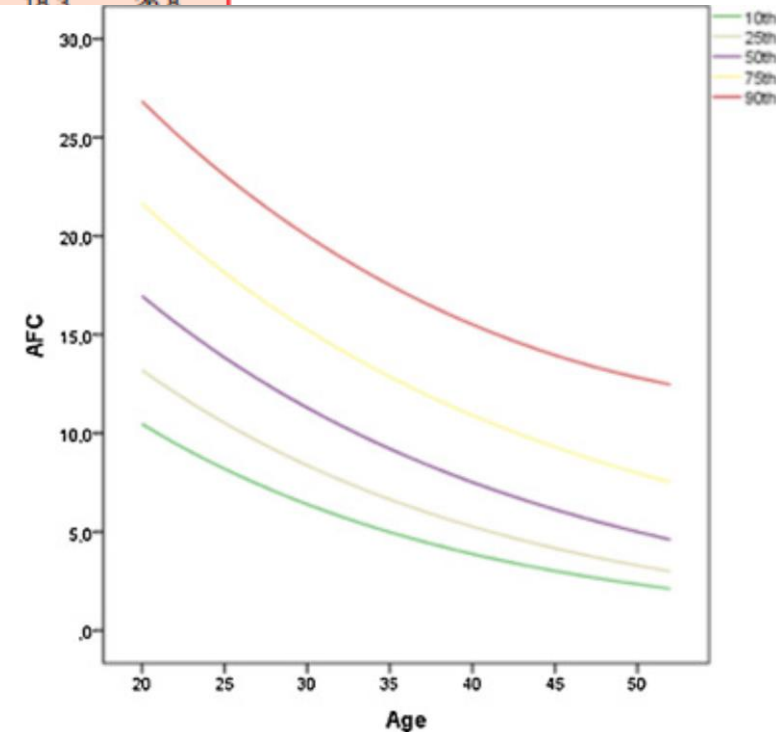
TABLE 1

Values of 5th, 25th, 50th, 75th, and 95th centiles as a function of age.

Age (y)	5th	25th	50th	75th	95th
16	6.2	11.6	16.6	22.6	33.2
17	6.0	11.4	16.2	22.1	32.4
18	5.9	11.1	15.8	21.5	31.6
19	5.7	10.8	15.4	21.0	30.8
20	5.6	10.5	15.0	20.5	30.0
21	5.4	10.2	14.6	19.9	29.2
22	5.3	10.0	14.2	19.4	28.4
23	5.1	9.7	13.8	18.8	27.6
24	5.0	9.4	13.4	18.3	26.8
25	4.8	9.1	13.0	17.8	26.0
26	4.7	8.8	12.6	17.3	25.2
27	4.6	8.6	12.2	16.8	24.4
28	4.4	8.3	11.8	16.3	23.6
29	4.3	8.0	11.4	15.8	22.8
30	4.1	7.7	11.0	15.3	22.0
31	4.0	7.4	10.6	14.8	21.2
32	3.8	7.1	10.2	14.3	20.4
33	3.7	6.9	9.8	13.8	19.6
34	3.5	6.6	9.4	13.3	18.8
35	3.4	6.3	9.0	12.8	18.0
36	3.2	6.0	8.6	12.3	17.2
37	3.1	5.7	8.2	11.8	16.4
38	2.9	5.5	7.7	11.3	15.6
39	2.8	5.2	7.3	10.8	14.8
40	2.6	4.9	6.9	10.3	14.0
41	2.5	4.6	6.5	9.8	13.2
42	2.3	4.3	6.1	9.3	12.4
43	2.2	4.1	5.7	8.8	11.6
44	2.0	3.8	5.3	8.3	10.8
45	1.9	3.5	4.9	7.8	10.0
46	1.7	3.2	4.5	7.3	9.2
47	1.6	2.9	4.1	6.8	8.4
48	1.4	2.7	3.7	6.3	7.6
49	1.3	2.4	3.3	5.8	6.8

Note: The value of a centile at age *t* can be computed as $y = M \times (1 + \text{SDS} \times L \times S)^{-1/L}$, where *M* is the value of the 50th centile at age *t* and the SD score is the value of normal deviate. *L* = 0.425; *S* = 0.490.

La Marca. Nomogram for the AFC. Fertil Steril 2011.



La Marca, FertilSteril 2011
Bozdog G. EurJObGyn 2016

Ovarielle Reserve - AMH

TABLE 1

Day 1 to 4 serum AMH level distribution (ng/mL) in all reviewed patients (presumably healthy cohort).

Age (y)	5th percentile	10th percentile	Median	90th percentile	95th percentile	n
<25	0.97 (1.13)	1.78 (1.78)	5.13 (3.59)	13.45 (8.87)	15.63 (10.40)	194 (65)
25	1.56 (0.81)	2.01 (1.56)	5.42 (3.91)	10.64 (7.29)	13.87 (8.20)	83 (33)
26	1.02 (1.00)	2.19 (1.98)	4.91 (4.23)	9.98 (8.53]	11.87 (9.08)	111 (48)
27	1.02 (1.44)	1.59 (1.77)	4.12 (3.33)	9.87 (7.52)	11.71 (8.38)	143 (60)
28	0.99 (1.02)	1.40 (1.34)	4.96 (4.24)	11.39 (9.39)	14.06 (10.73)	120 (58)
29	0.51 (0.51)	1.03 (0.79)	3.87 (3.87)	9.12 (7.97)	11.10 (9.12)	163 (69)
30	0.72 (1.10)	1.16 (1.42)	3.53 (3.51)	8.35 (6.36)	11.02 (6.75)	184 (76)
31	0.60 (0.55)	1.14 (1.15)	3.59 (3.23)	9.14 (6.59)	13.54 (8.68)	187 (73)
32	0.48 (0.81)	0.88 (1.01)	3.44 (3.50)	7.86 (6.03)	10.19 (8.80)	183 (70)
33	0.56 (0.92)	0.80 (1.09)	2.70 (2.80)	7.98 (5.36)	11.94 (7.88)	158 (64)
34	0.42 (0.69)	0.65 (0.92)	2.49 (2.54)	6.57 (6.60)	7.62 (7.00)	164 (64)
35	0.36 (1.14)	0.73 (1.26)	2.58 (3.10)	5.15 (5.99)	6.87 (7.17)	162 (64)
36	0.31 (0.37)	0.50 (0.81)	2.28 (2.62)	5.95 (5.92)	8.62 (9.14)	161 (74)
37	0.09 (0.05)	0.34 (0.31)	1.85 (1.72)	5.33 (4.19)	7.10 (5.50)	153 (70)
38	0.15 (0.47)	0.32 (0.80)	1.66 (2.16)	5.20 (5.90)	6.66 (6.66)	127 (61)
39	0.29 (0.41)	0.45 (0.57)	1.72 (1.74)	4.71 (4.55)	5.61 (5.22)	139 (59)
40	0.09 (0.09)	0.29 (0.39)	1.27 (1.62)	3.73 (5.36)	5.78 (8.83)	94 (36)
41	0.38 (0.43)	0.52 (0.60)	1.26 (1.17)	3.98 (5.38)	5.68 (6.01)	58 (16)
42	0.07 (0.15)	0.17 (0.28)	1.20 (1.26)	3.67 (3.07)	4.31 (3.66)	59 (20)
43	0.00 (0.12)	0.00 (0.25)	0.81 (0.79)	3.03 (1.66)	3.35 (1.94)	31 (8)
>43	0.00 (0.00)	0.00 (0.07)	0.72 (0.88)	2.49 (3.19)	2.87 (3.84)	67 (17)
All	0.30 (0.47)	0.62 (0.81)	2.91 (2.89)	8.30 (6.60)	10.93 (8.25)	2,741 (1105)

Note: Age-dependent analysis of basal serum AMH levels in the presumably healthy group is shown in parentheses.

Shebl. AMH in women of reproductive age. Fertil Steril 2011.

Shebl et al, 2011

Definition and significance of polycystic ovarian morphology: a task force report from the Androgen Excess and Polycystic Ovary Syndrome Society

Didier Dewailly^{1,*}, Marla E. Lujan², Enrico Carmina³, Marcelle I. Cedars⁴, Joop Laven⁵, Robert J. Norman⁶, and Héctor F. Escobar Morreale⁷



Figure 1 Picture of PCOM obtained with old (2001, left panel) and new (2009, right panel) ultrasound equipment. Small follicles ≤ 2 mm in diameter (arrows) can be visualized and counted with the new equipment. Reproduced from Dewailly et al. (2011) with permission from Oxford University Press, Copyright 2011.

Table IV Main recommendations.

- (1) The threshold for FNPO defining PCOM should be ≥ 25 follicles per whole ovary.
 - (a) This threshold applies to use of newer imaging technology (essentially transducer frequency ≥ 8 MHz),
 - (b) FNPO is recommended over OV since FNPO has been shown to have greater predictive power for PCOS and less variability among populations aged 18–35 years
 - (c) Real-time methods should follow recently proposed standardization. Offline methods, with either 2D or 3D ultrasound, must be applied after completion of a learning curve and standardization.
- (2) The threshold for OV should remain at ≥ 10 ml.

OV may have a role in instances when image quality does not allow for reliable estimates of FNPO.
- (3) The use of the AMH assay as a surrogate to ultrasound is for research purpose only at the present time. Only in-house AMH thresholds for PCOM can be used until there is standardization of the assay techniques.

FNPO, follicle number pre ovary; OV, ovarian volume.

PCOS - guideline: ovarian morphology

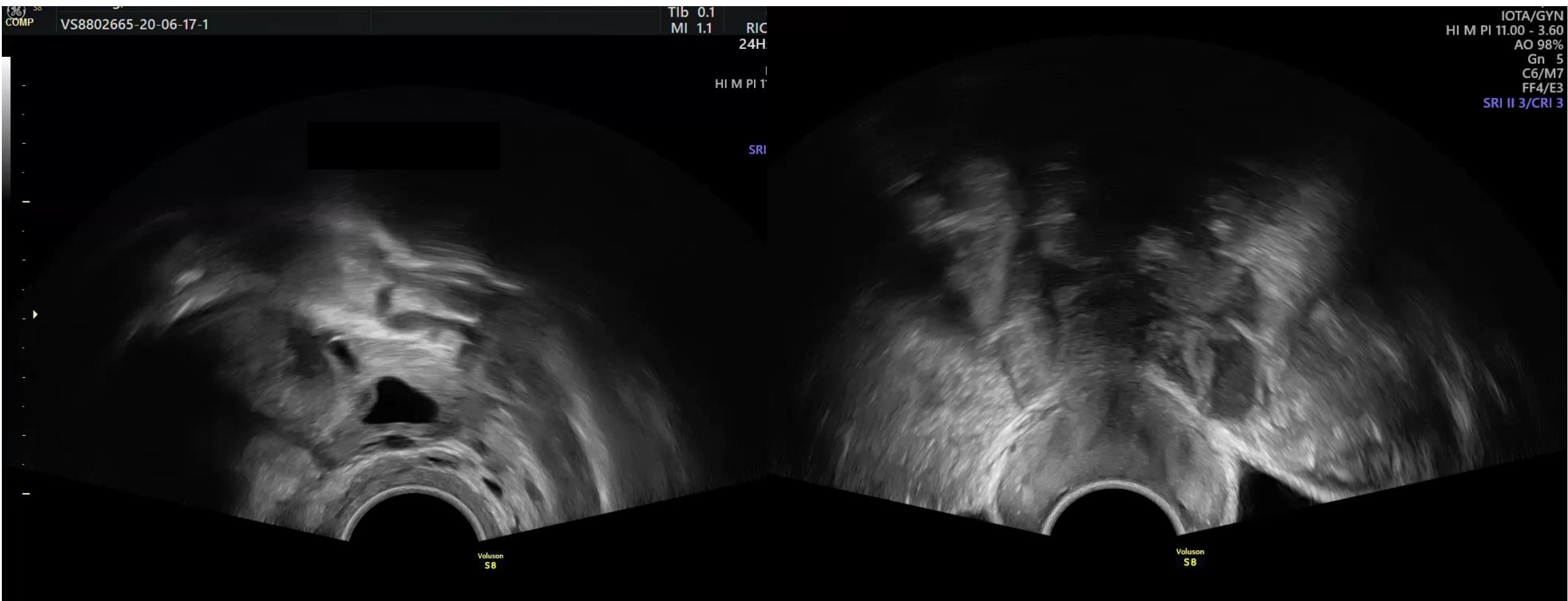
International evidence-based
guideline for the assessment
and management of polycystic
ovary syndrome 2018

1.4 Ultrasound and polycystic ovarian morphology (PCOM)

- 1.4.1 CCR Ultrasound should not be used for the diagnosis of PCOS in those with a gynaecological age of < 8 years (< 8 years after menarche), due to the high incidence of multi-follicular ovaries in this life stage. ♦ ♦ ♦ ♦
-

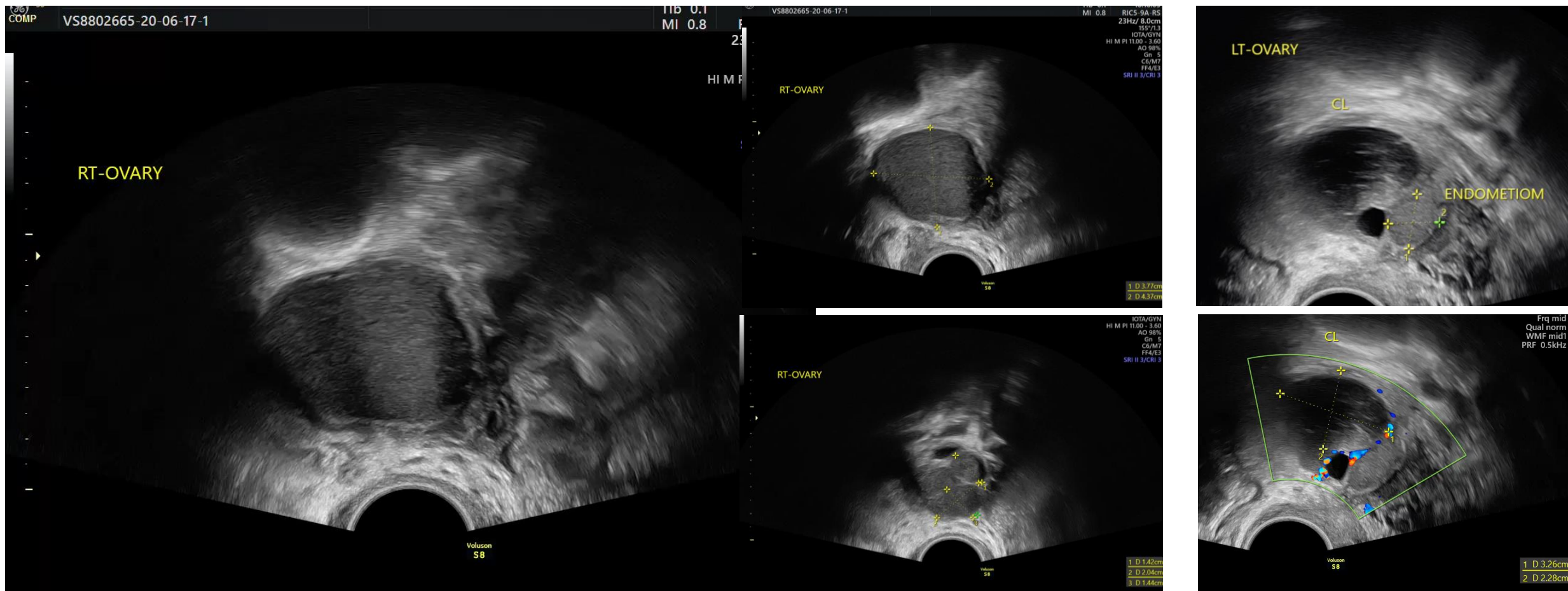


Ovar: Pathologien und Verschieblichkeit

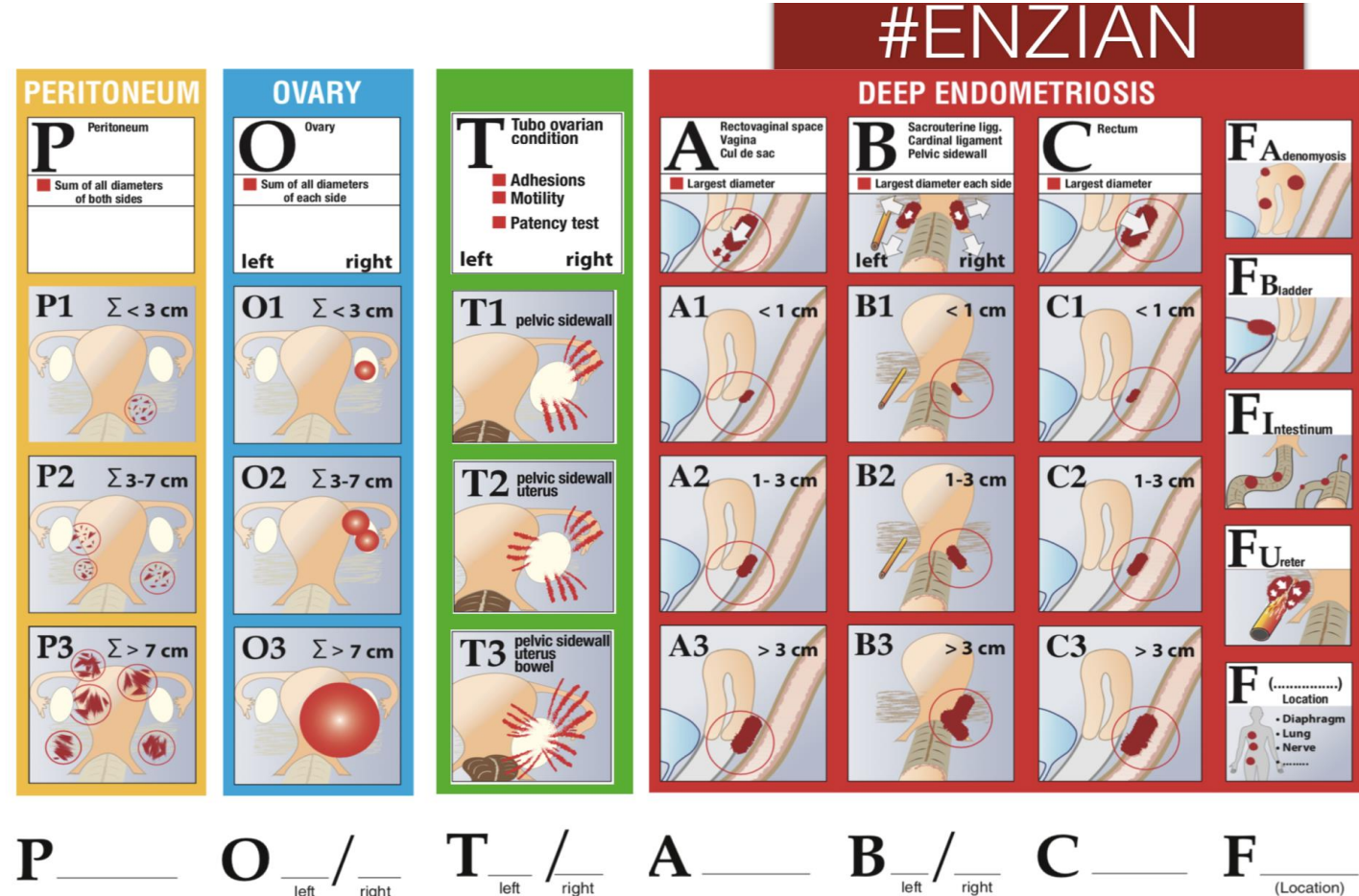


Routine-Evaluation der Adnexe

► IOTA Kriterien für Beschreibung der Ovarien



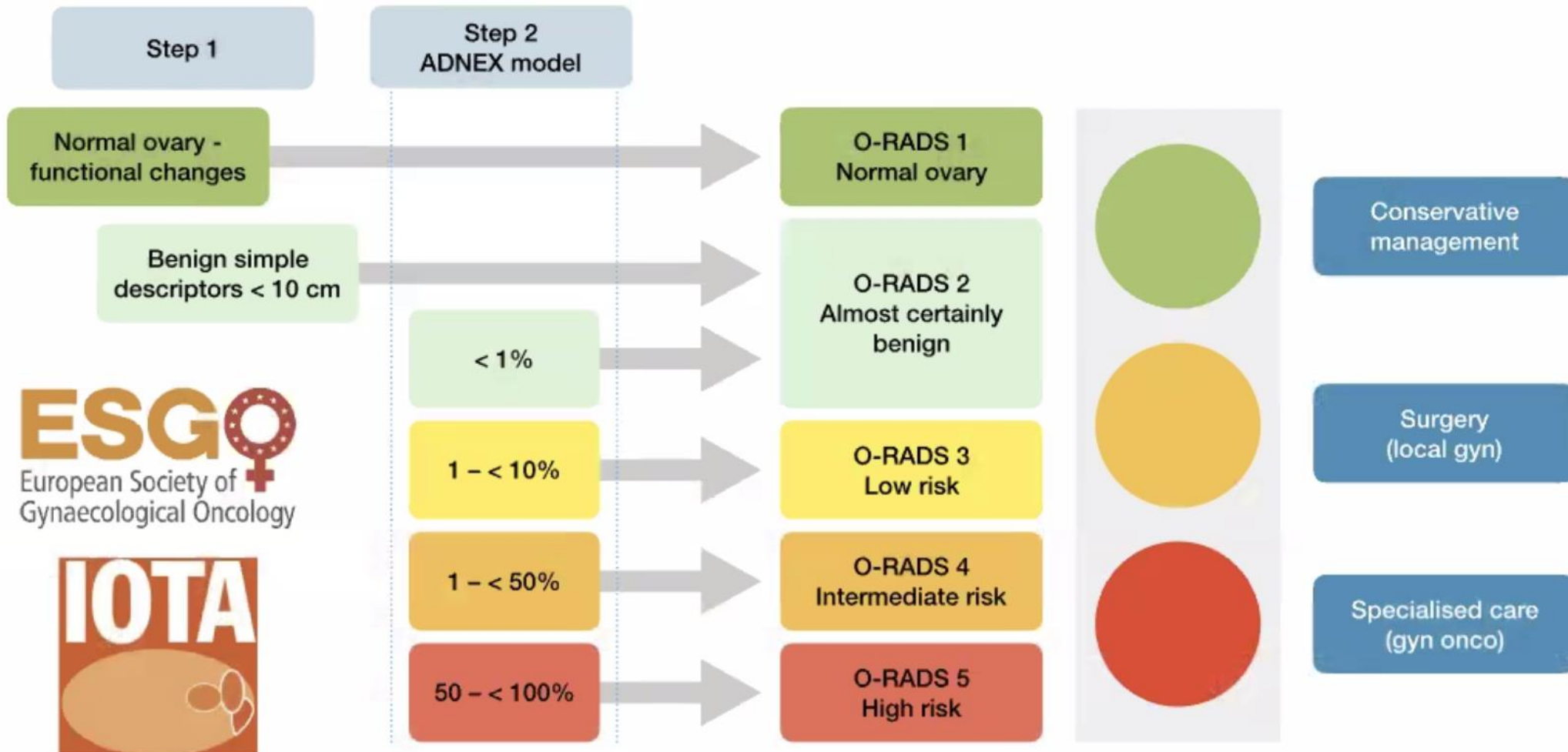
- ▶ P Peritoneum
- ▶ O Ovar
- ▶ T Tube
- ▶ A Septum rectovaginale
- ▶ B Beckenwand etc.
- ▶ C Rektum
- ▶ FA, FB, FI, FU, FO



#ENZIAN(s) assessment by surgery

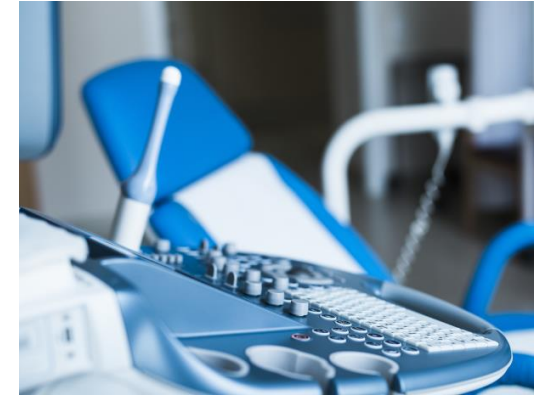
Ovar - Pathologien

Management Algorithm for Ovarian Cysts



Fertility Check mittels Ultraschall ermöglicht ...

- ▶ schnelle und effiziente Beurteilung der Reproduktionsorgane (ovarielle Reserve)
- ▶ aussagekräftige Funktionsdiagnostik (HYCOSY)
- ▶ Differentialdiagnostik bei Veränderungen an Uterus (MUSA; CONUTA; IETA) und Ovarien (IOTA; O-RADS)
- ▶ detaillierte Beschreibung von Endometriose mittels #ENZIAN(u) Klassifikation



Advanced course on ultrasound examination of endometriosis and adenomyosis

17-18 OCTOBER 2022

SWEDEN

LIVESTREAM

ISUOG APPROVED COURSE

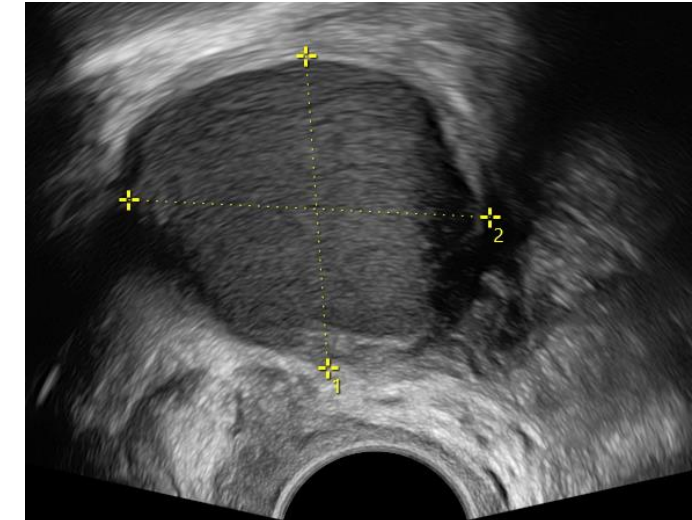
Course leaders: Lil Valentin, Povilas Sladkevicius, Ligita Jokubkiene Time: 17th and 18th October

2022 Contact, information, registration: Dana Sladkeviciene, dana.sladkeviciene@med.lu.se Venue:

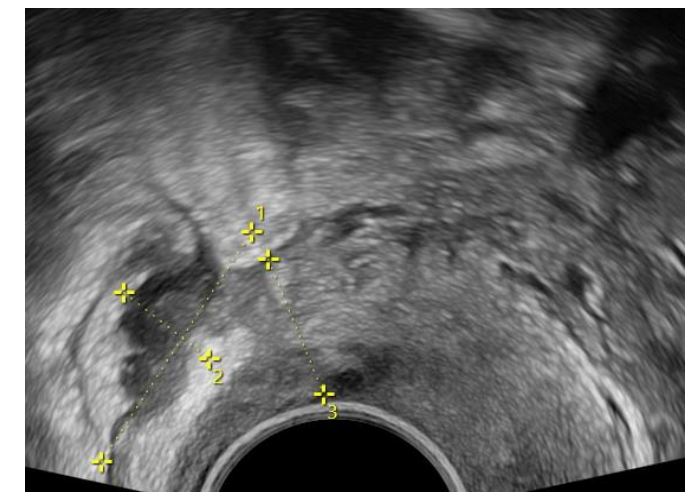
Web-based course (Zoom) Name of organizing institution (public): Dept Obstet Gynecol, Skane University Hospital, Malmö, SWEDEN

Suitable for: Specialists in obstetrics and gynecology with at least basic skills in gynecological ultrasound and interest in endometriosis

Program: Lectures, live scanning, case presentations. The course includes image optimization, scanning-technique, pelvic anatomy as seen with ultrasound (central, anterior, posterior and lateral compartment),

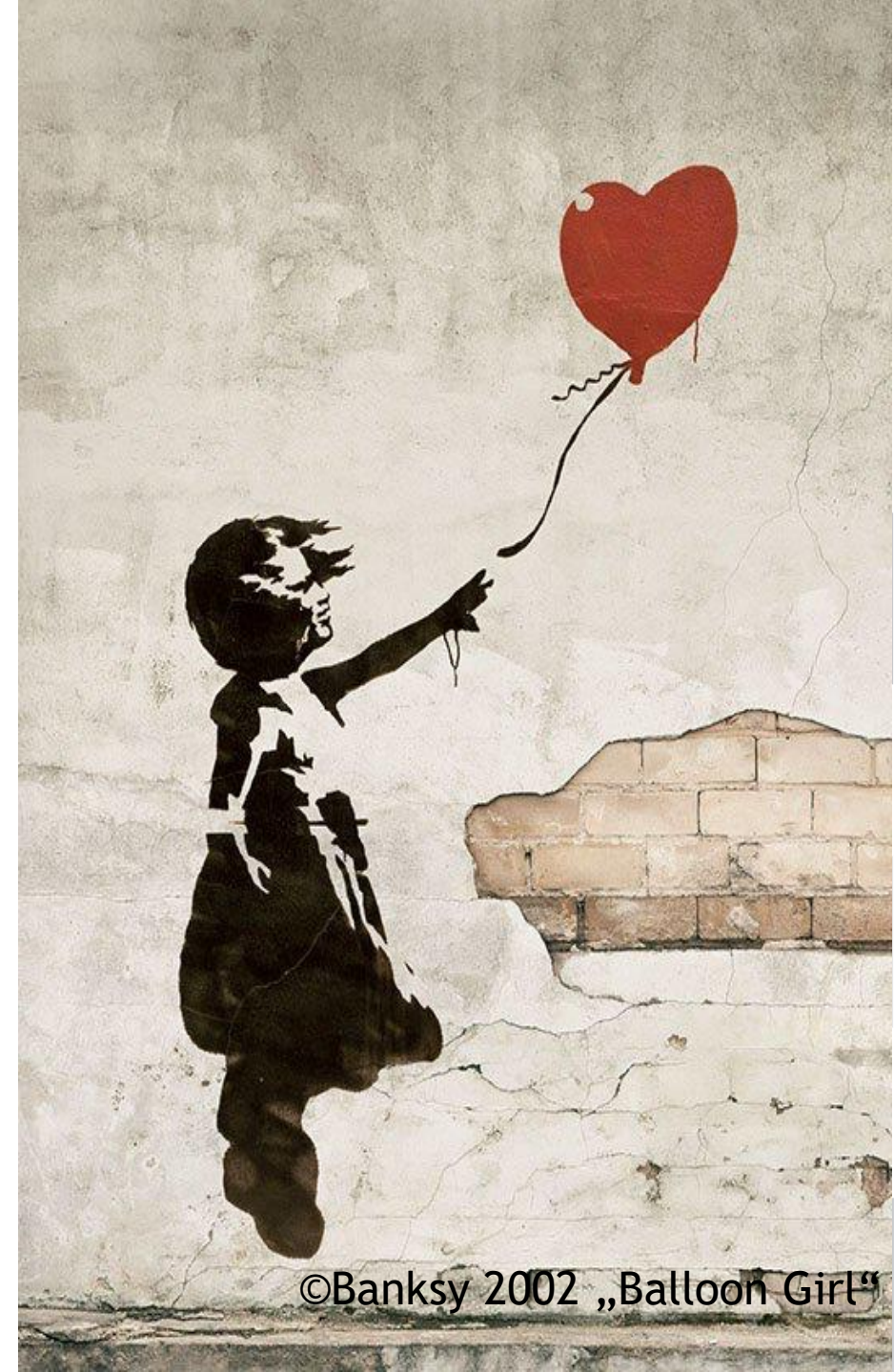


<https://www.isuog.org/event/advanced-course-on-ultrasound-examination-of-endometriosis-and-adenomyosis.html>



Fazit

- ▶▶ Sonografie ist eine der tragenden Säulen in der Fertilitätsdiagnostik
- ▶▶ proaktives Vorgehen bei Veränderungen unbedingt empfehlenswert



©Banksy 2002 „Balloon Girl“

**Vielen Dank für Ihre
Aufmerksamkeit!**



monika.woelfler@medunigraz.at



Medizinische Universität Graz

Priv.-Doz. Dr. med. Monika WÖFLER

Frauenklinik der Medizinischen Universität Graz

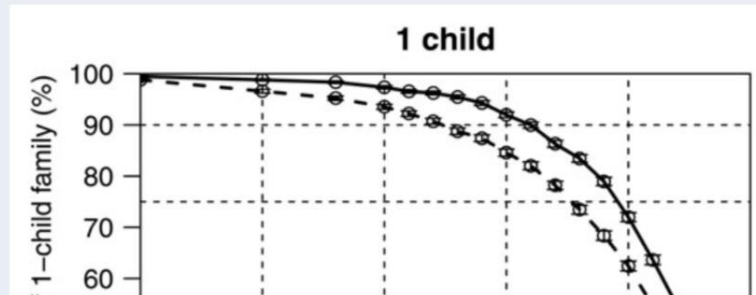
Schwerpunkt Gyn. Endokrinologie und Fortpflanzungsmedizin

Leitung Universitäre Kompetenzeinheit Endometriose

monika.woelfler@medunigraz.at



Realizing a desired family size: when should couples start?



Couples should start at **age 32 years** for a one-child family, at **27 years** for a two-child family, and at **23 years** for three children. When IVF is an option: **35 years** or younger, for two children **31 years**, and treatment start for three children **28 years**.

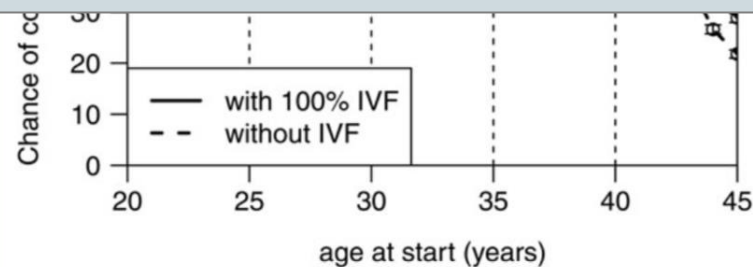


Figure 1 Relationship between the female age at which couples start building a family and the chance of realizing a family with one child, with and without use of IVF. The short lines above and below each point in the graph indicate the 95% confidence intervals.

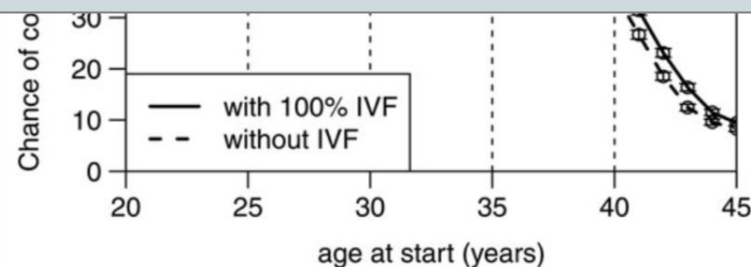
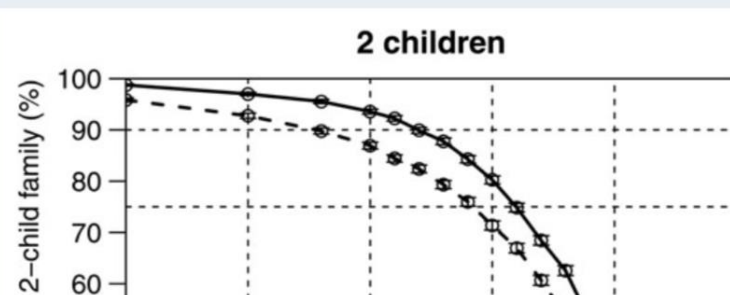


Figure 2 Relationship between the female age at which couples start building a family and the chance of realizing a family with two children, with and without use of IVF. The short lines above and below each point in the graph indicate the 95% confidence intervals.

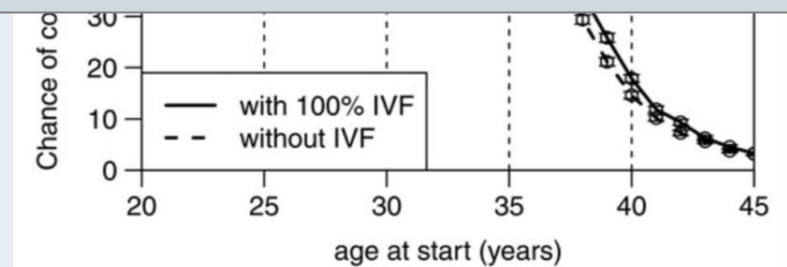
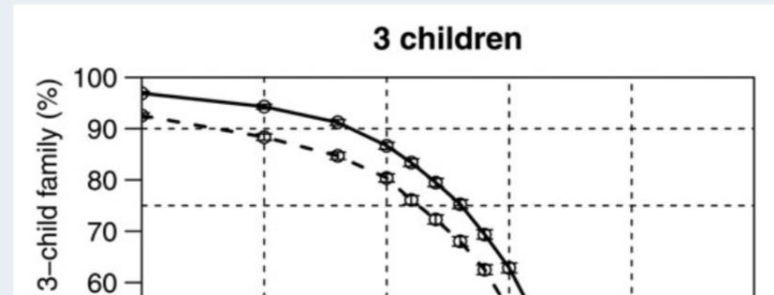


Figure 3 Relationship between the female age at which couples start building a family and the chance of realizing a family with three children, with and without use of IVF. The short lines above and below each point in the graph indicate the 95% confidence intervals.

Updated Guideline



Endometriosis

Guideline of European Society of Human Reproduction and Embryology

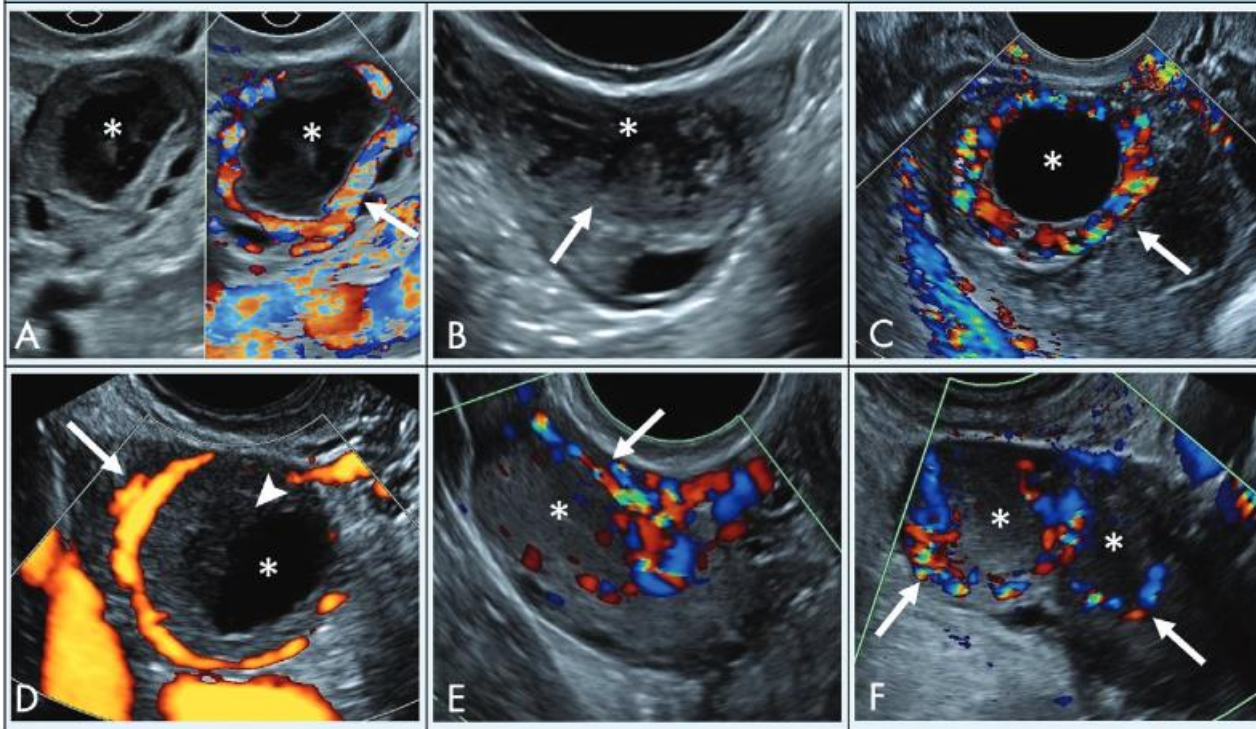
2022

ESHRE Endometriosis Guideline Development Group

Chapter	Changes in the current version
Diagnosis of endometriosis	! <u>Laparoscopy is no longer the diagnostic gold standard</u> and it is now only recommended in patients with negative imaging results and/or where empirical treatment was unsuccessful or inappropriate.
Treatment of endometriosis-associated pain	! Studies on GnRH antagonist treatments support their use as an additional (second line) treatment option. ! Recent data indicate that postoperative medical treatment may be beneficial towards pain management and support a recommendation to offer it in women not desiring immediate pregnancy. <i>Danazol and anti-progestogens, laparoscopic uterosacral nerve ablation (LUNA), presacral neurectomy (PSN) and anti-adhesion agents are no longer included in recommendations, but still covered in the text</i>
Treatment of endometriosis-associated infertility	! The extended administration of GnRH agonist prior to ART treatment to improve live birth rate in infertile women with endometriosis (ultralong protocol) is no longer recommended due to unclear benefits. ! The Endometriosis Fertility Index (EFI) was added as a step in the treatment as it can support decision-making for the most appropriate option to achieve pregnancy after surgery. NEW Information on pregnancy and fertility preservation was added.

Ovar: Corpus luteum

Typical Corpora Lutea



- ▶ A Corpus luteum with color Doppler and without color Doppler demonstrates central cystic component (asterisks) with smooth thickened wall, avascular internal echoes, and peripheral vascularity (arrow).
- ▶ B, Corpus lutea with central component, thickened wall, and crenulated inner margin (arrow).
- ▶ C, Anechoic thick-walled cyst (asterisk) with intense peripheral vascularity (arrow).
- ▶ D, Color Doppler energy demonstrates peripheral vascularity (arrow) in this cystic (asterisk) corpus luteum with retracting clot (arrowhead).
- ▶ E, Corpus luteum as hypoechoic region (asterisk) without central cystic component but with peripheral flow (arrow) at color Doppler.
- ▶ F, Two corpora lutea in setting of dual ovulation manifest by two hypoechoic regions (asterisks) with peripheral flow (arrows).

O-RADS US Risk Stratification and Management System: A Consensus Guideline from the ACR Ovarian-Adnexal Reporting and Data System Committee. Rochelle F. Andreotti, MD•Dirk Timmerman et al.