The role of classification of endometriosis: From r-ASRM to #Enzian, the common language for diagnostics and treatment

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Chair SIG Endometriosis ESGE
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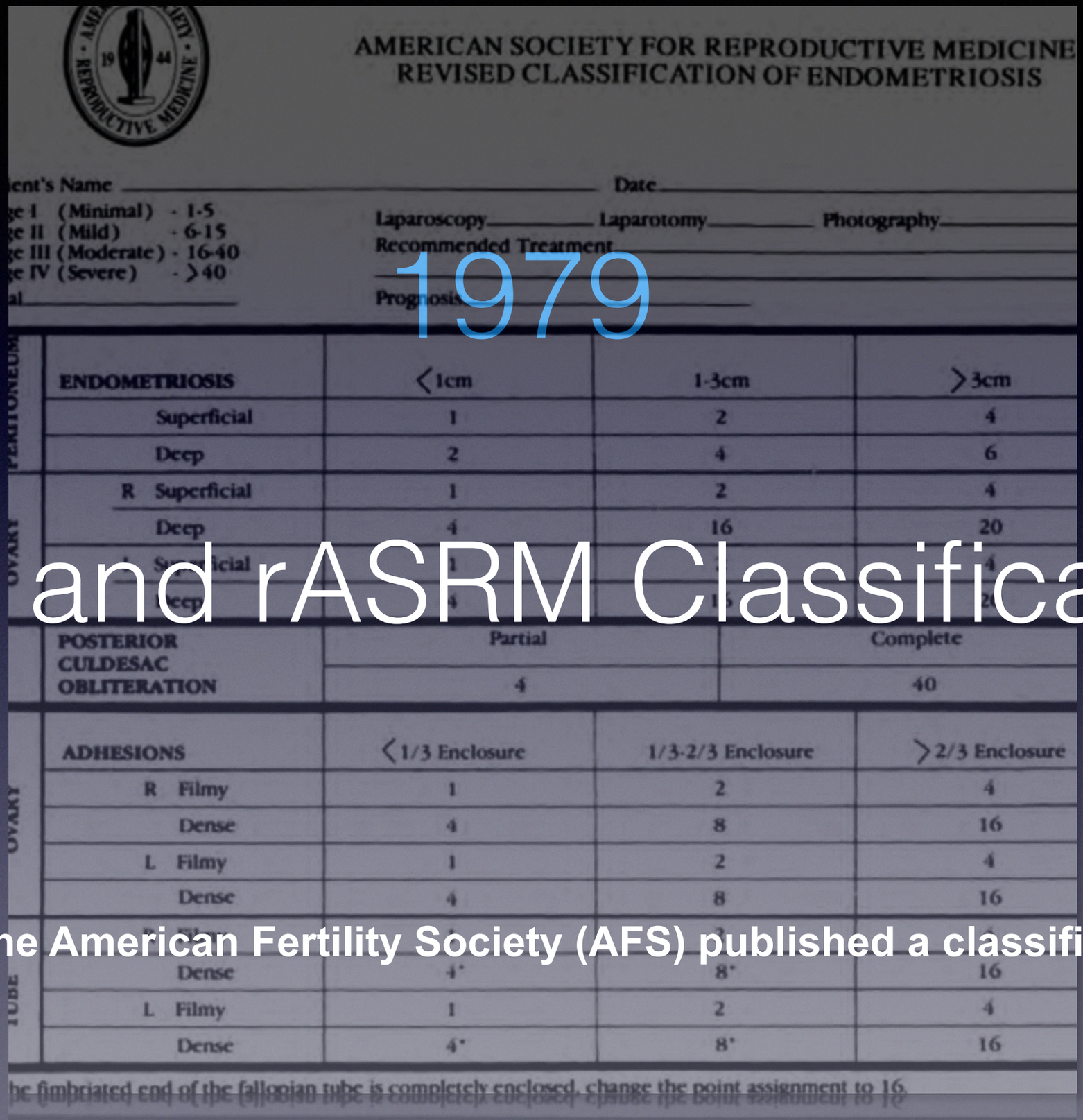
What is of interest?

- Extent of disease
- Activity
- Dynamic of the disease
- Symptoms
  - Pain
  - Sterility
- Prognosis
- Treatment

Extent of Endometriosis

AFS and rASRM Classification



AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
REVISED CLASSIFICATION OF ENDOMETRIOSIS

ient's Name _____ Date _____

Stage I (Minimal) - 1-5
Stage II (Mild) - 6-15
Stage III (Moderate) - 16-40
Stage IV (Severe) - >40

Laparoscopy _____ Laparotomy _____ Photography _____
Recommended Treatment _____
Prognosis _____

1979

	ENDOMETRIOSIS	<1cm	1-3cm	>3cm
PERITONEUM	Superficial	1	2	4
	Deep	2	4	6
OVARY	R Superficial	1	2	4
	Deep	4	16	20
	Superficial	1	2	4
	Deep	4	16	20

	POSTERIOR CULDESAC OBLITERATION	Partial	Complete
		4	40

	ADHESIONS	<1/3 Enclosure	1/3-2/3 Enclosure	>2/3 Enclosure
OVARY	R Filmy	1	2	4
	Dense	4	8	16
	L Filmy	1	2	4
	Dense	4	8	16
TUBE	R Filmy	1	2	4
	Dense	4*	8*	16
	L Filmy	1	2	4
	Dense	4*	8*	16

*If the fimbriated end of the fallopian tube is completely enclosed, change the point assignment to 16.

In 1979 the American Fertility Society (AFS) published a classification scheme

revised in 1985 (The American Fertility Society (1979), (1985)) and 1997 (r-ASRM) (The American Fertility Society (1997))

r-ASRM Classification

Designed to evaluate:

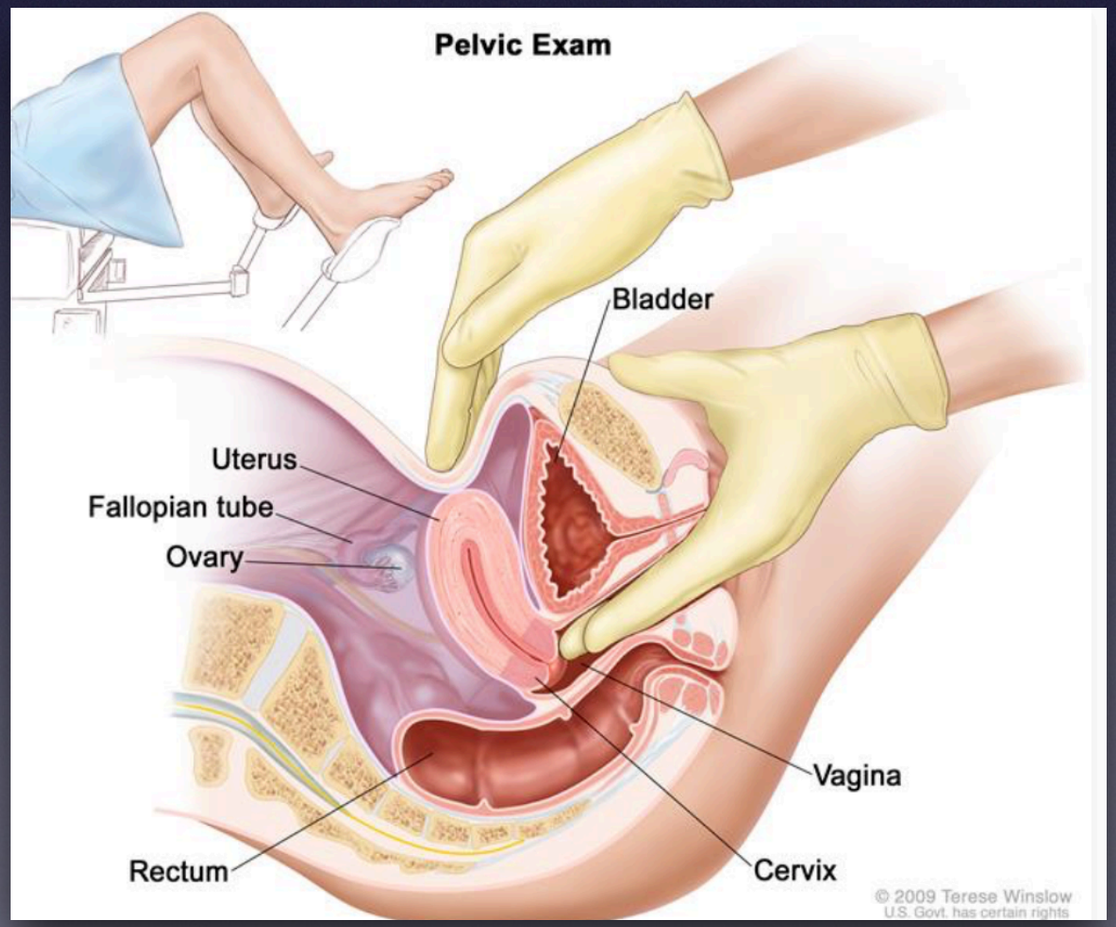
- the extent of endometriosis and function of reproductive organs

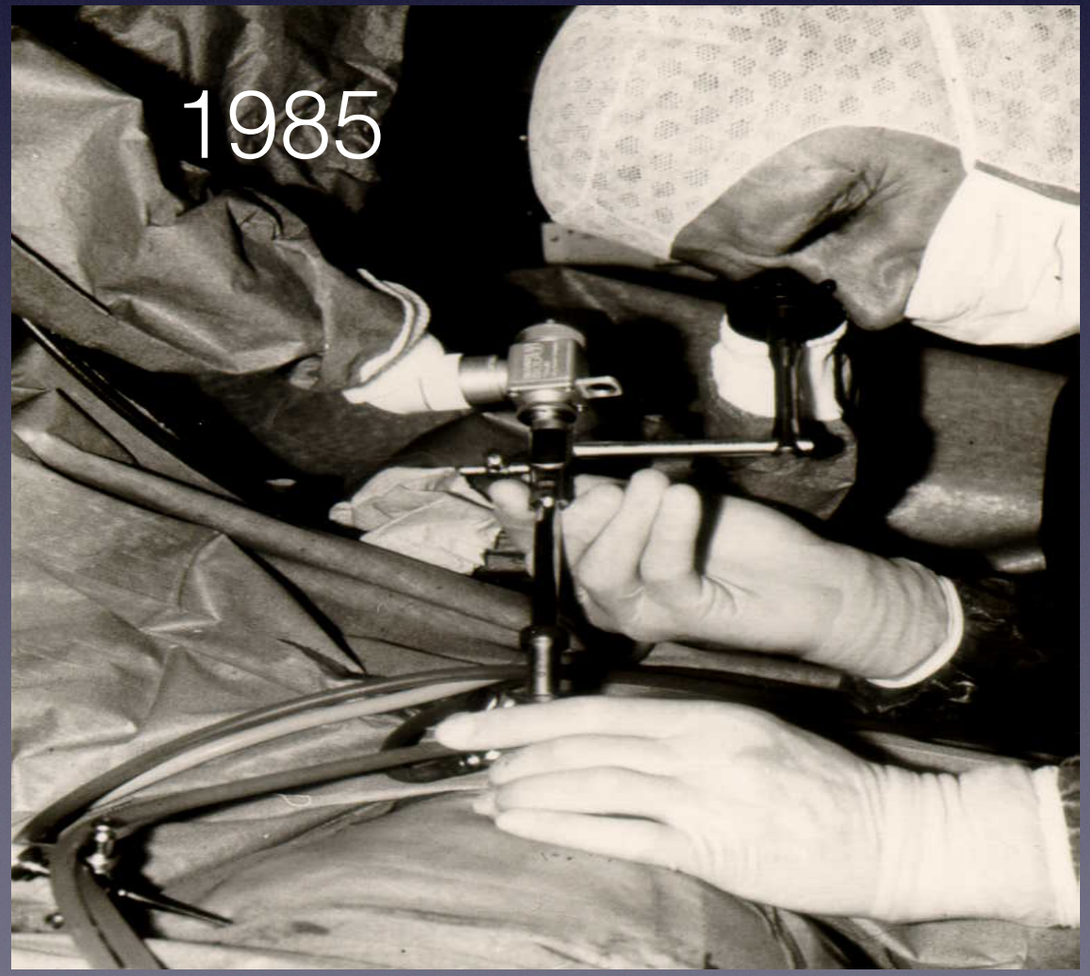
- special attention was paid to the extent of intra-abdominal, non-infiltrating disease with involvement of the peritoneum, uterus, ovaries and tubes

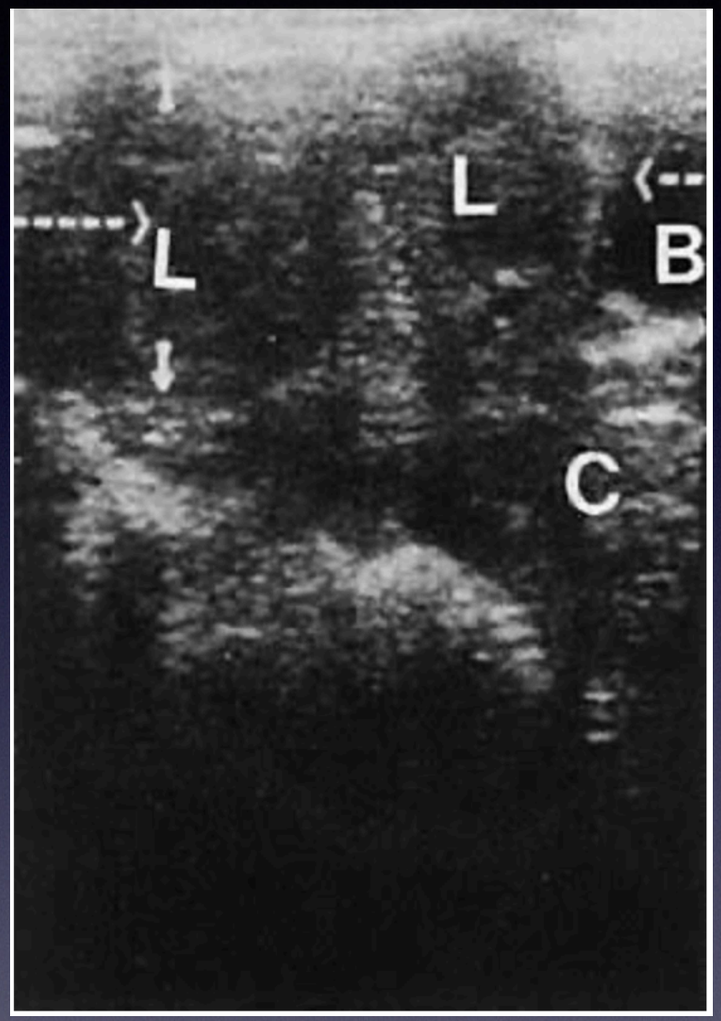
- Adhesions that partially obscure the pelvis and other lesions of endometriosis are also assessed as a major criterion for the severity of the disease

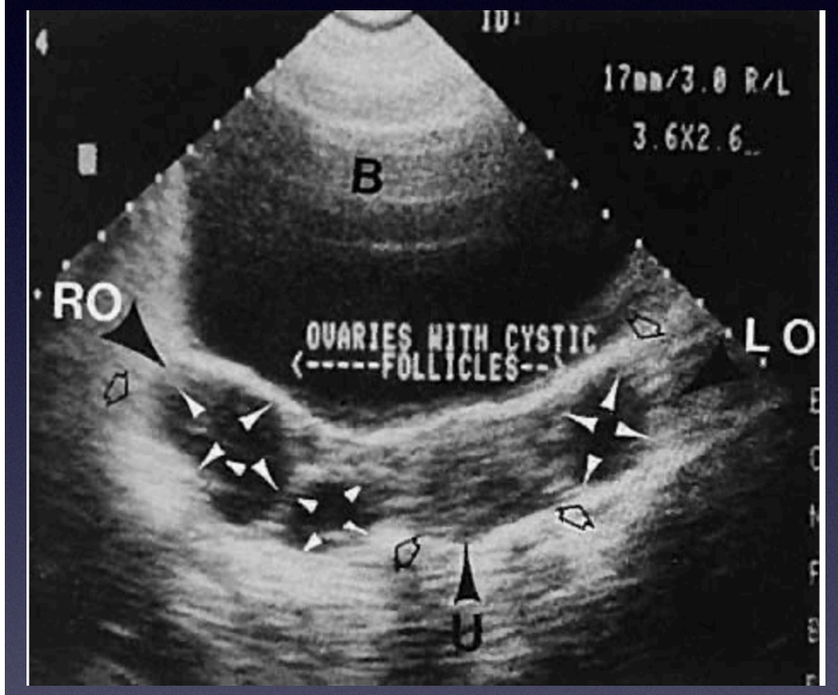
Endometriosis- Diagnostics 1979

- History
- Clin. examination
- Ultrasound (?)
- Surgery LSC/LAP






L
L
B
C


17mm/3.0 R/L
3.6X2.6
B
RO
OVARIES WITH CYSTIC
FOLLICLES
LO

r-ASRM

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
REVISED CLASSIFICATION OF ENDOMETRIOSIS

Patient's Name _____ Date _____

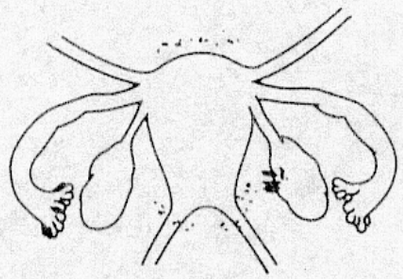
Stage I (Minimal) - 1-5
Stage II (Mild) - 6-15
Stage III (Moderate) - 16-40
Stage IV (Severe) - >40
Total _____

Laparoscopy _____ Laparotomy _____ Photography _____
Recommended Treatment _____
_____
Prognosis _____

PERITONEUM	ENDOMETRIOSIS	<1cm	1-3cm
	Superficial	1	2
	Deep	2	4
OVARY	R Superfi		
	Deep	4	16
	L. Superfi al	1	2
	Deep	4	16
	POSTERIOR CULDESAC OBLITERATION	Partial	
		4	
OVARY	ADHESIONS	<1/3 Enclosure	1/3-2/3 Enclosure
	R Filmy	1	2
	Dens		
	L Filmy	1	2
	Dense	4	8
TUBE	R Filmy	1	2
	Dense	4*	8*
	L Filmy	1	2
	Dense	4*	8*

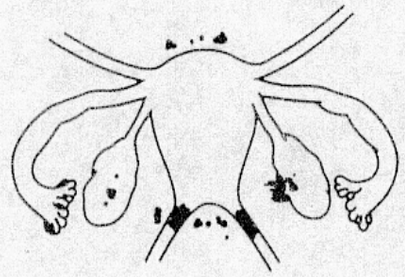
*If the fimbriated end of the fallopian tube is completely enclosed, change the point assignment
Denote appearance of superficial implant types as red [(R), red, red-pink, flamelike, vesicular blob
opacifications, peritoneal defects, yellow-brown], or black [(B) black, hemosiderin deposits, b
described as R___%, W___% and B___%. Total should equal 100%.

STAGE I (MINIMAL)



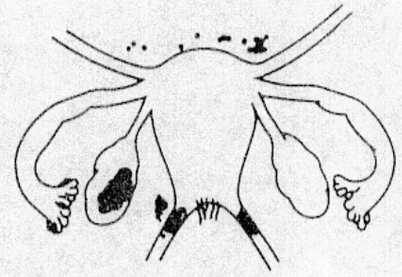
PERITONEUM
Superficial Endo - 1-3cm - 2
R. OVARY
Superficial Endo - <1cm - 1
Filmy Adhesions - <1/3 - 1
TOTAL POINTS 4

STAGE II (MILD)



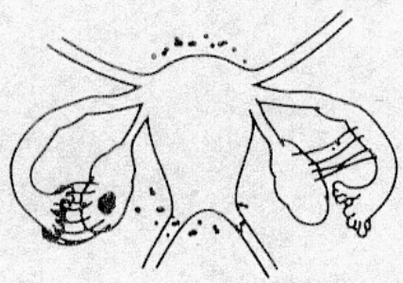
PERITONEUM
Deep Endo - >3cm - 6
R. OVARY
Superficial Endo - <1cm - 1
Filmy Adhesions - <1/3 - 1
L. OVARY
Superficial Endo - <1cm - 1
TOTAL POINTS 9

STAGE III (MODERATE)



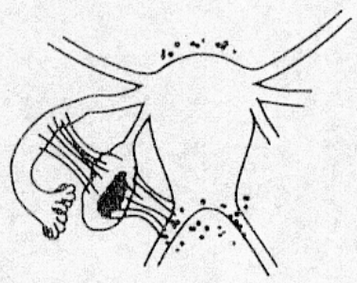
PERITONEUM
Deep Endo - >3cm - 6
CULDESAC
Partial Obliteration - 4
L. OVARY
Deep Endo - 1-3cm - 16
TOTAL POINTS 26

STAGE III (MODERATE)



PERITONEUM
Superficial Endo - >3cm - 4
R. TUBE
Filmy Adhesions - <1/3 - 1
R. OVARY
Filmy Adhesions - <1/3 - 1
L. TUBE
Dense Adhesions - <1/3 - 16*
L. OVARY
Deep Endo - <1cm - 4
Dense Adhesions - <1/3 - 4
TOTAL POINTS 30

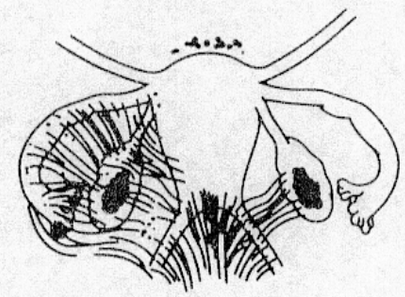
STAGE IV (SEVERE)



PERITONEUM
Superficial Endo - >3cm - 4
L. OVARY
Deep Endo - 1-3cm - 32**
Dense Adhesions - <1/3 - 8**
L. TUBE
Dense Adhesions - <1/3 - 8**
TOTAL POINTS 52

* Point assignment changed to 16
** Point assignment doubled

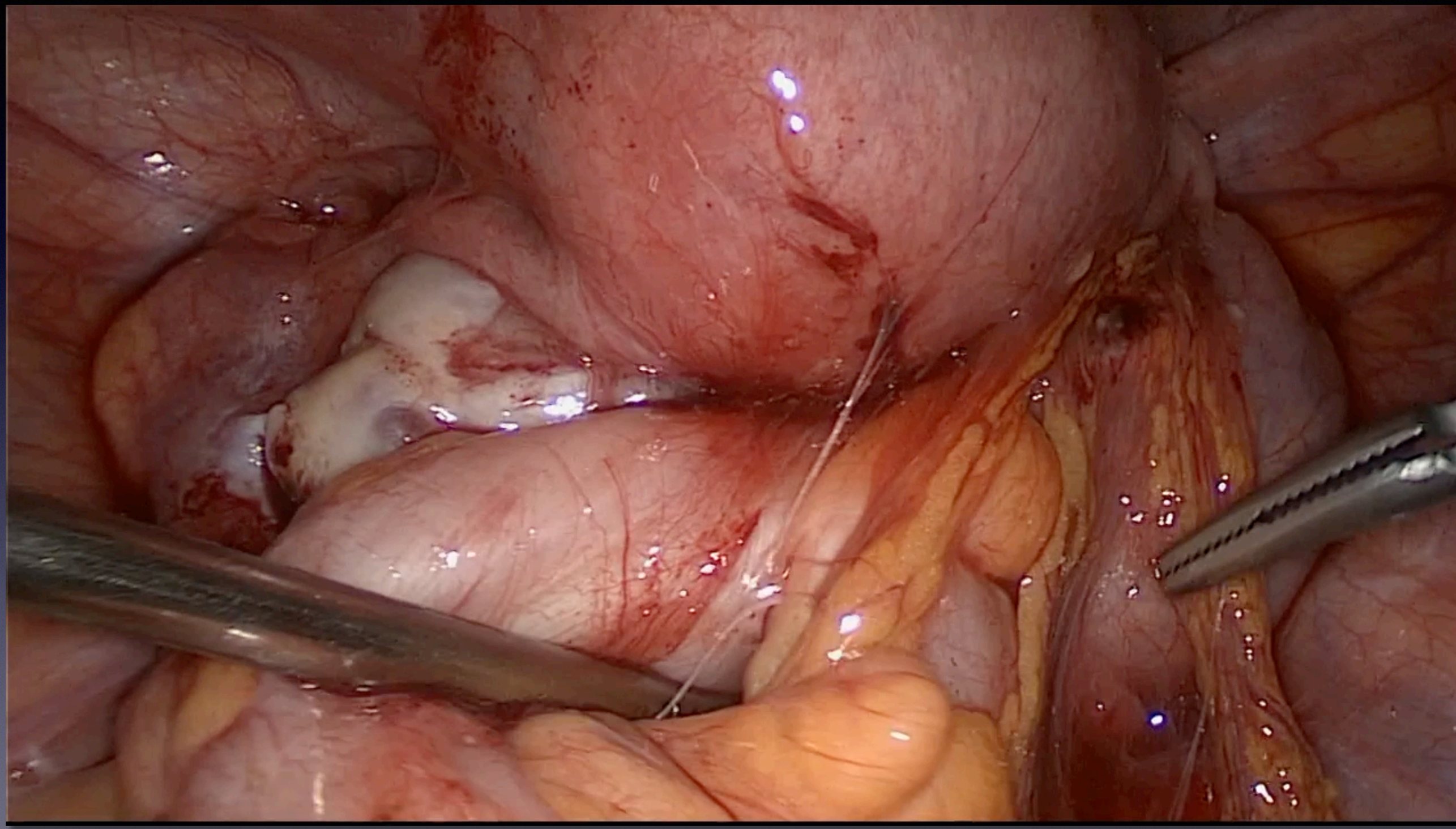
STAGE IV (SEVERE)

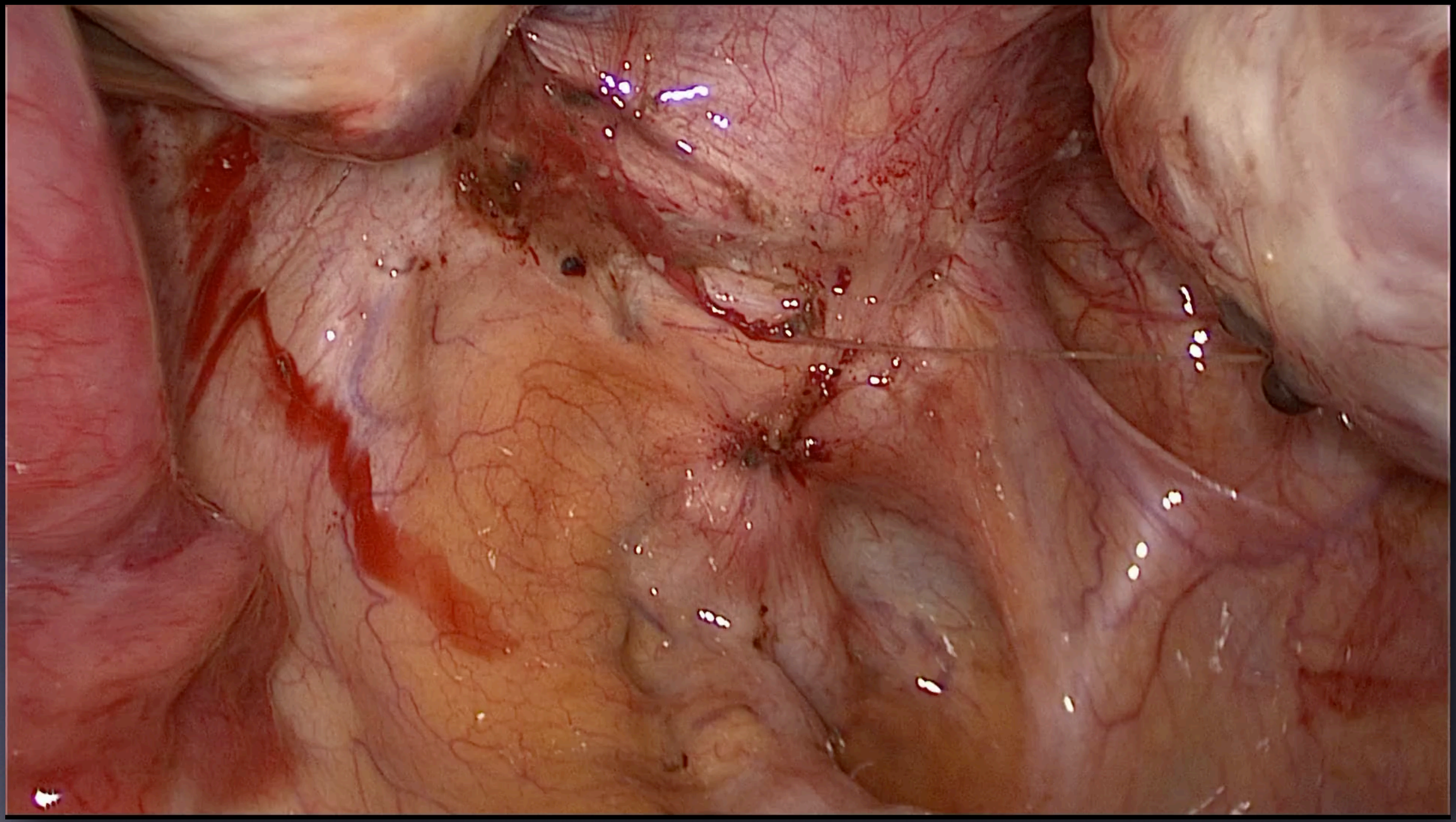


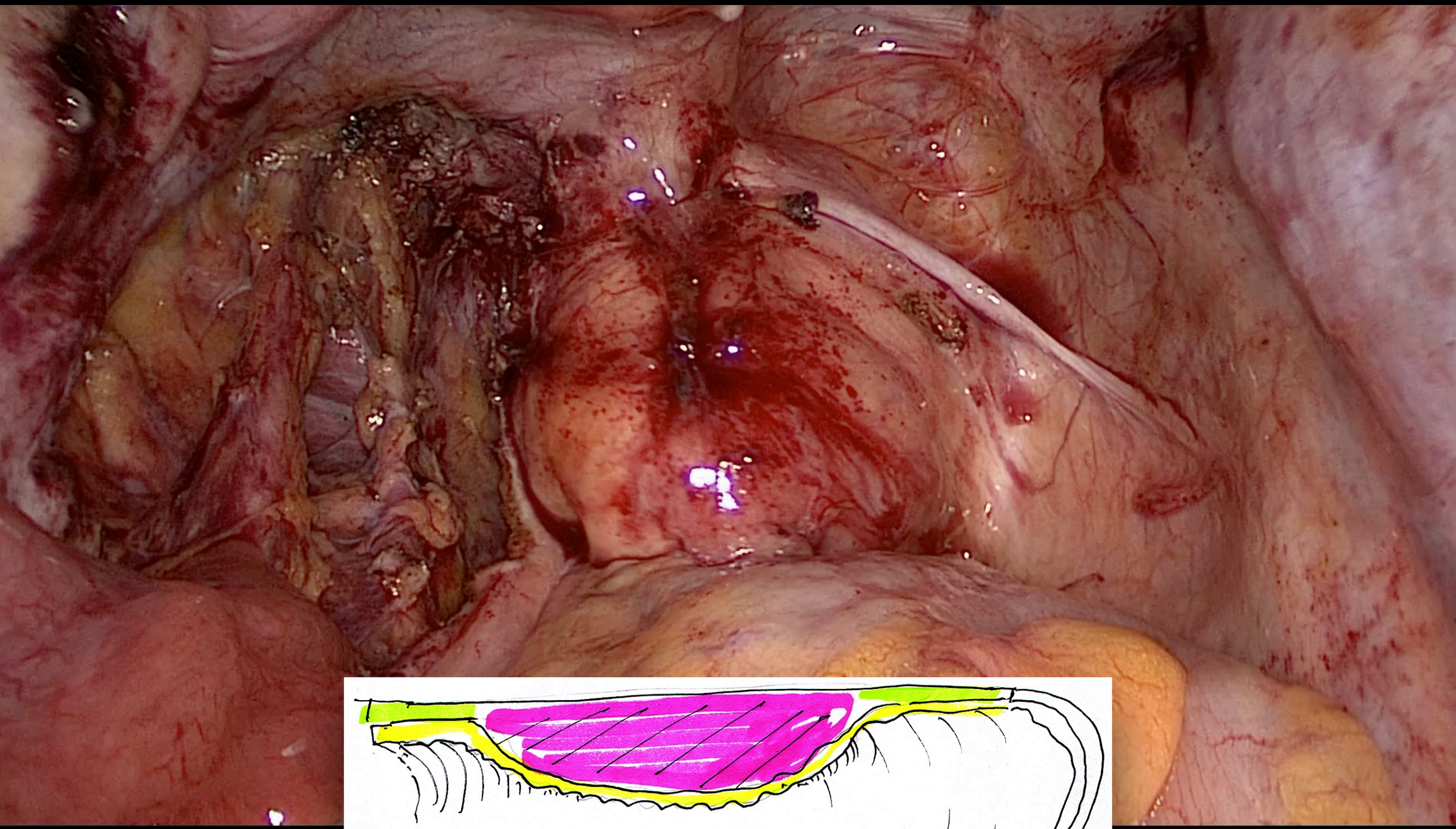
PERITONEUM
Deep Endo - >3cm - 6
CULDESAC
Complete Obliteration - 40
R. OVARY
Deep Endo - 1-3cm - 16
Dense Adhesions - <1/3 - 4
L. TUBE
Dense Adhesions - >2/3 - 16
L. OVARY
Deep Endo - 1-3cm - 16
Dense Adhesions - >2/3 - 16
TOTAL POINTS 114

r-ASRM 1-4

#Enzian(s) P2, O2/0, T3-/0+, A1, B2/0, $C3_u$, FA_u





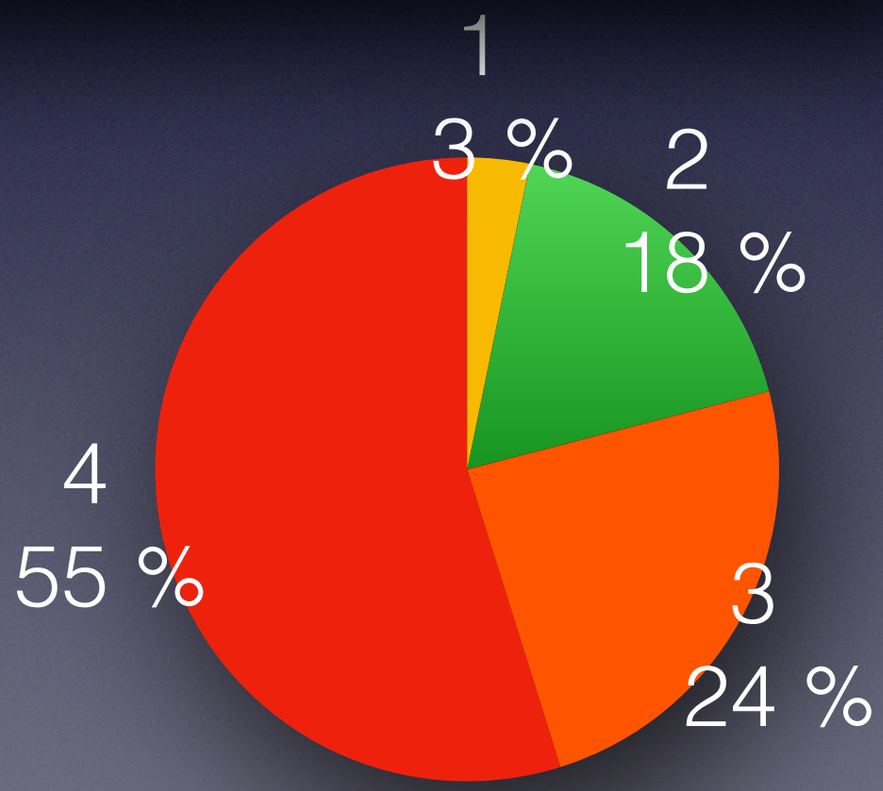


- 63 Patients (1996 until 2002)
- all of them had severe dychezia and/or dysmenorrhea and Dyspareunia

- Improvement after surgery : QoL. 2/10 to 8/10; p-value 0.005

- 21 % of patients were staged r-ASRM 1 or 2

- 55 % stage 4



r-ASRM-Score in patients with endometriosis involving the bowel 2002 M.Wustlich, J. Keckstein, et al ;

- Stage doesn’t correlate with the symptoms!
- Why???

- The method of examination may not be valid for the diagnosis!
- The method may not be used properly!
- The findings are incomplete!


2
SAMSUNG
WS80A

Rationale for a classification for deep infiltrating endometriosis (DIE)

- Comparison of symptoms and extent of the disease of DIE
- Comparison of different therapeutic options
- Analysis of complication rate
- Preoperative
- Intraoperative
- Postoperative

Classification of DIE

Koninckx P, Martin D, Fertil Steril 1992

Adamyan L,1993

Donnez & Nisolle. Baillieres Clin Obstet Gynecol 1995

Chapron Ch et al. Human Reprod 2003

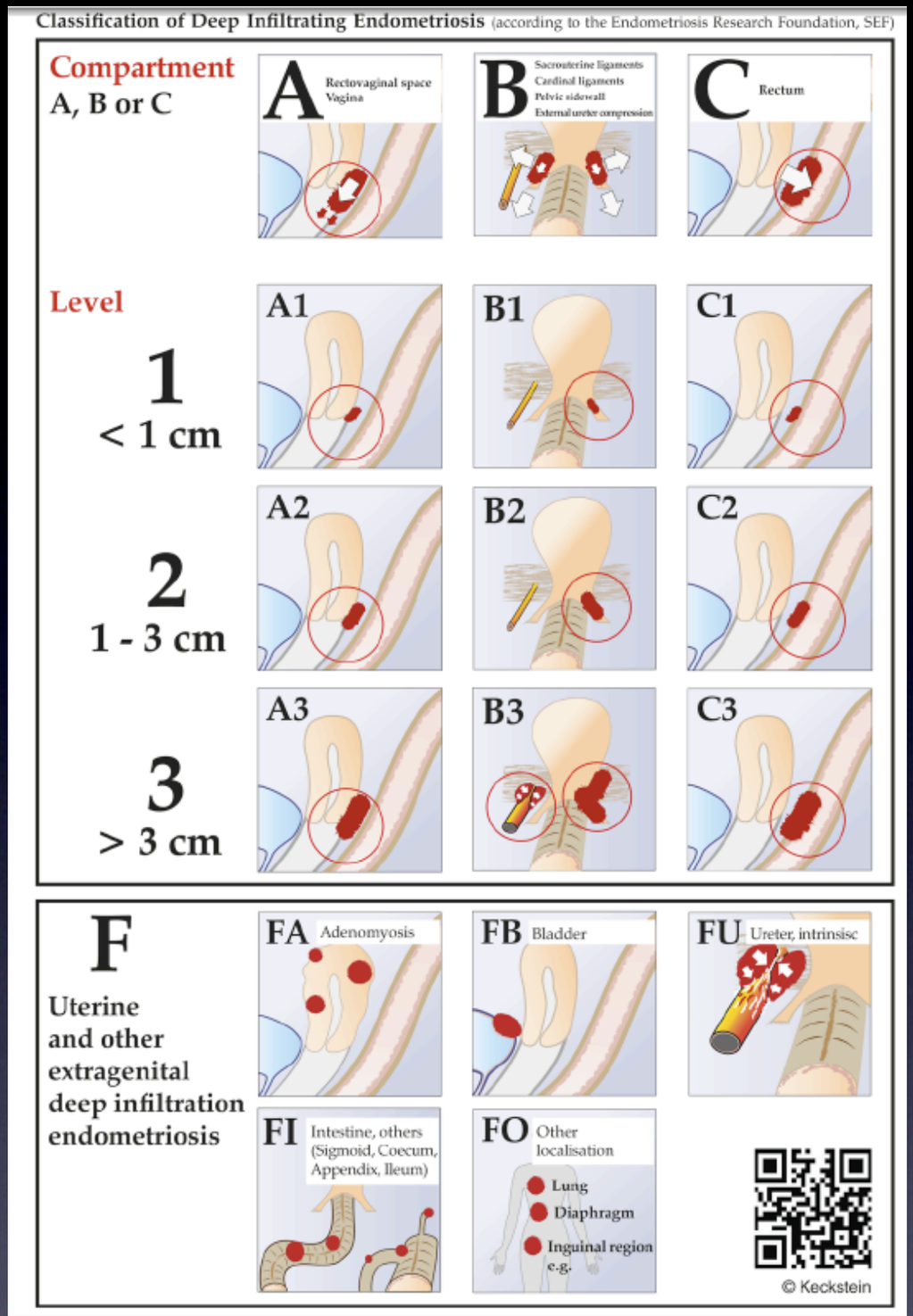
Keckstein J et al Zbl Gynäkol 2003 („Enzian“)

Koninckx P, Ussia A, Adamyan L, Wattiez A 2011

Khazali S, („VNESS“) 2016

ENZIAN
Classification for DE

- SEF Scientific Endometriosis Foundation, 2002
  - J. Keckstein ,K.-W. Schweppe
  - M. Sillem,R. Greb
  - R. Mangold, N. Reeka
  - O. Richter, V. Terruhn
  - H.-R. Tinneberg, U. Ulrich,
  - M. Possover, K. Neis
  - A. E. Schindler, Dr. Buchweitz

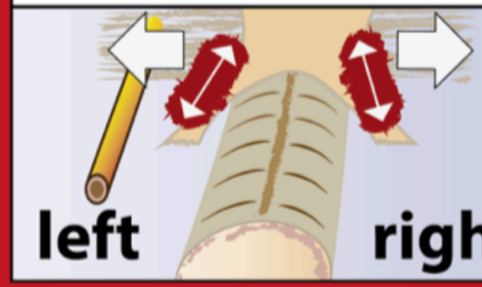


- Keckstein J, Ulrich U et al, ENZIAN Klassifikation der tief infiltrierenden Endometriose. Zentralbl Gynäkol 2003;125:291
- Tuttlies F, Keckstein J et al.; ENZIAN Score, classification of DIE, Zentralbl Gynäkol 2005;127:275-282
- Keckstein, J. and G. Hudelist (2020). "Classification of DE including bowel endometriosis: from r-ASRM to #Enzian-Classification." Best Practice & Research Clinical Obstetrics & Gynaecology **in press**


A
Rectovaginal space
Vagina
Largest Diameter

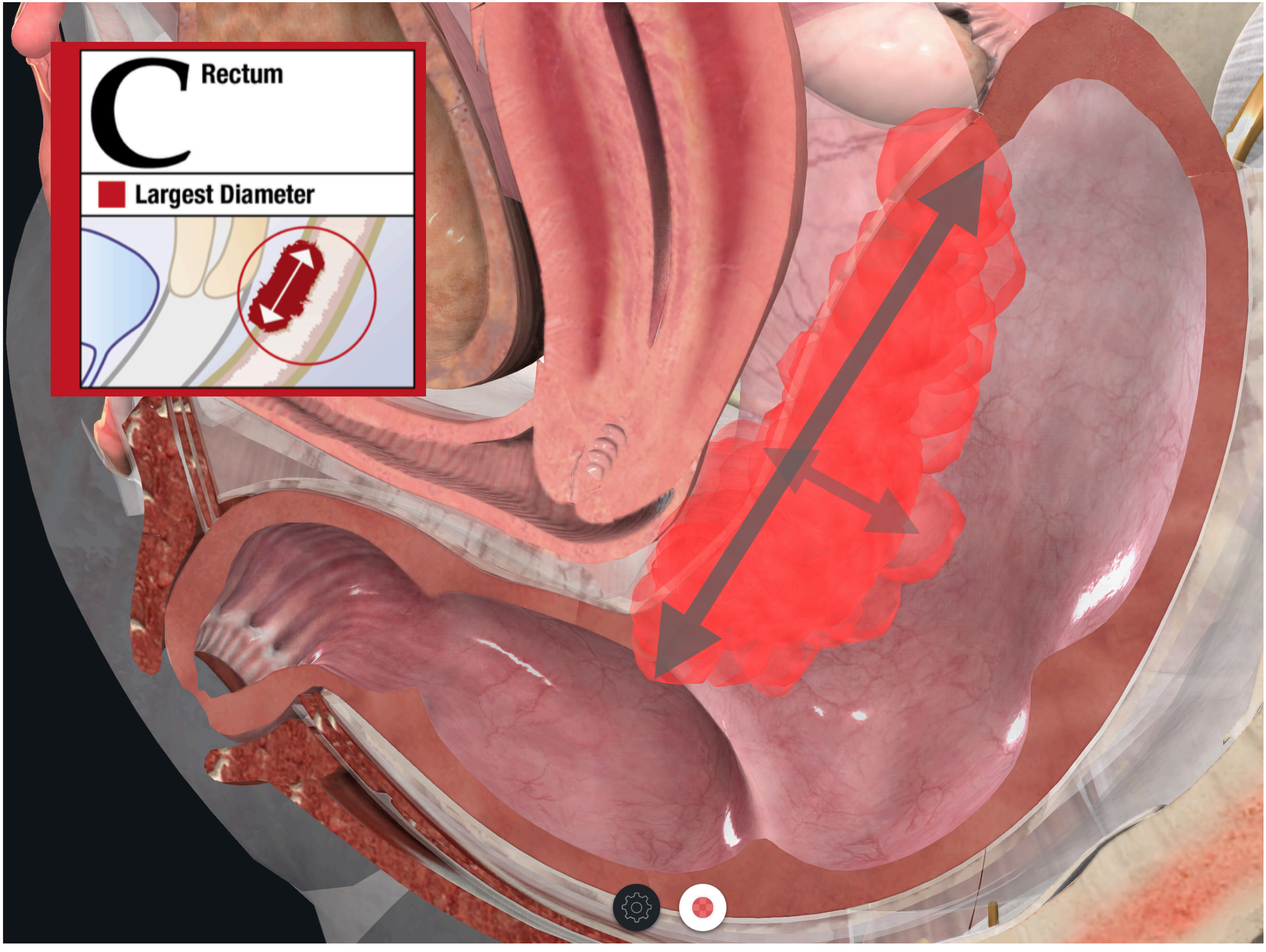
B Sacrouterine ligg.
Cardinal ligaments
Pelvic sidewall

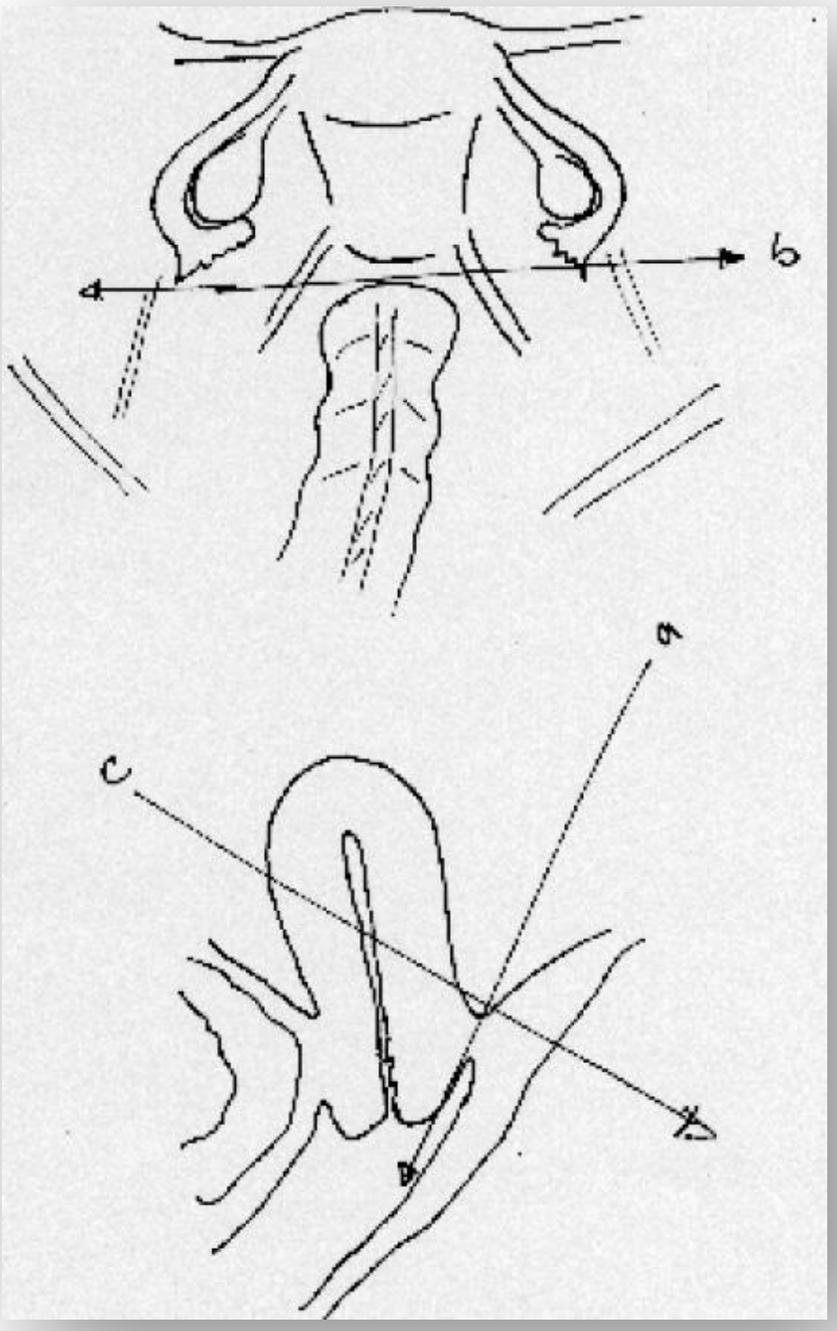
Largest Diameter



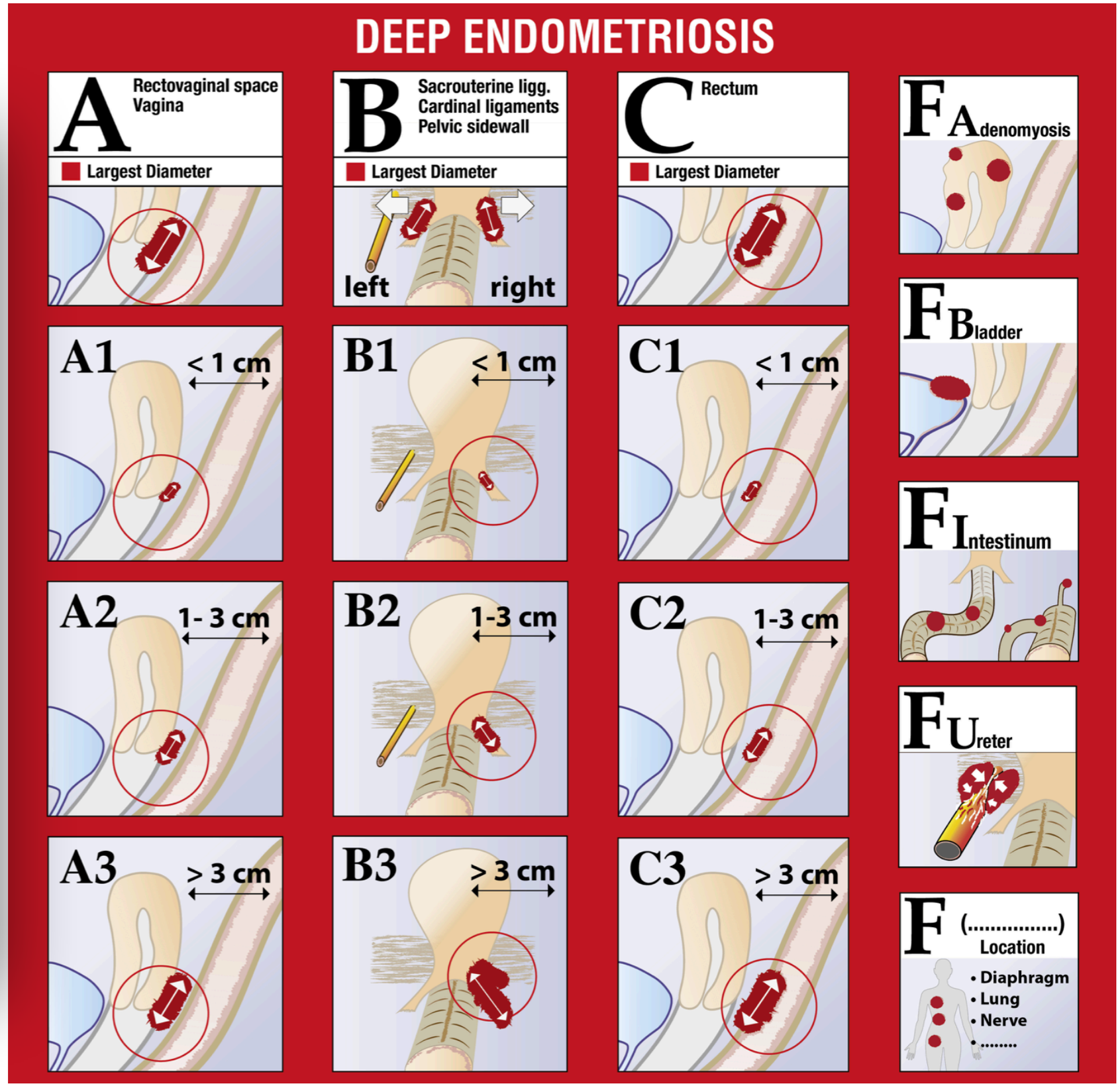
Cardinal lig.

USL

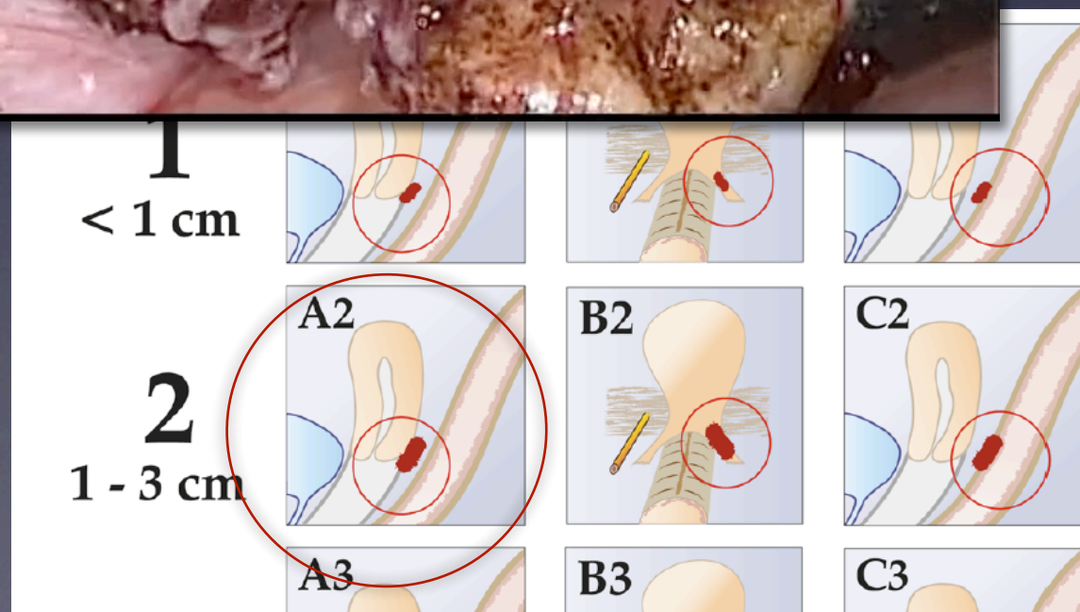

C
Rectum
Largest Diameter

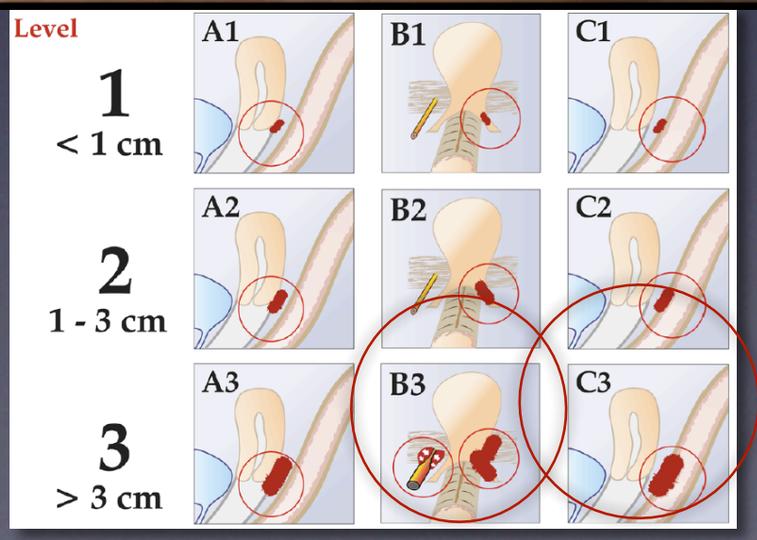


ENZIAN Klassifikation (2002, 2012)

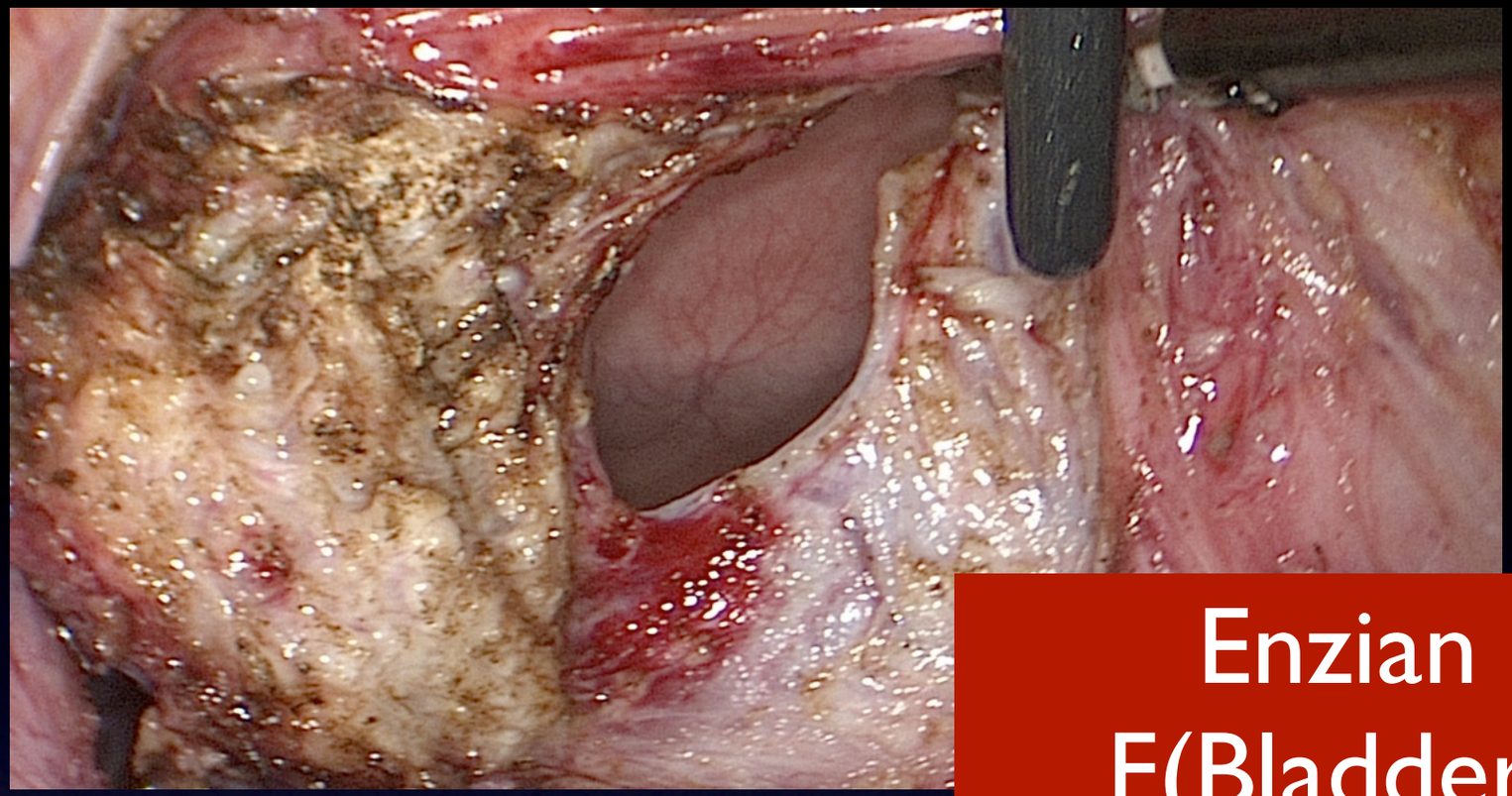


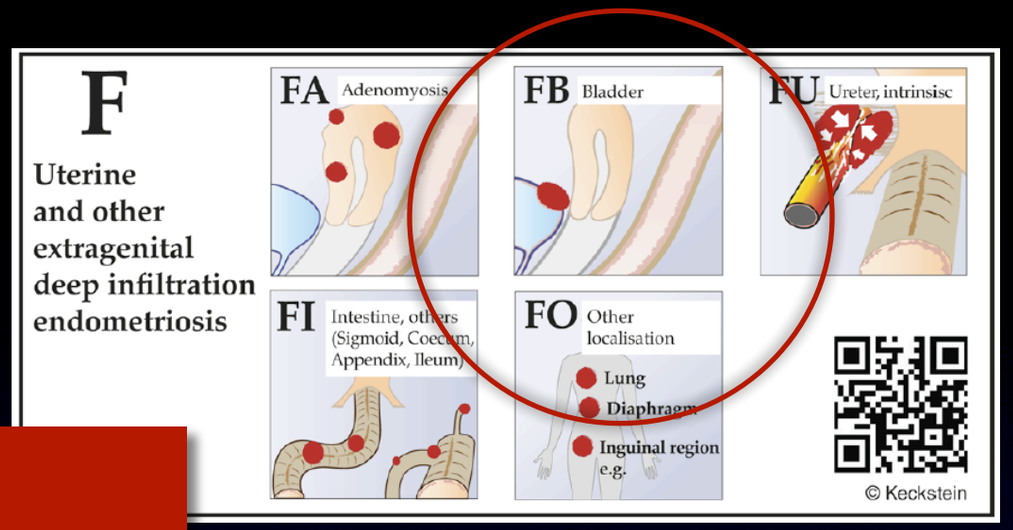
Enzian A2



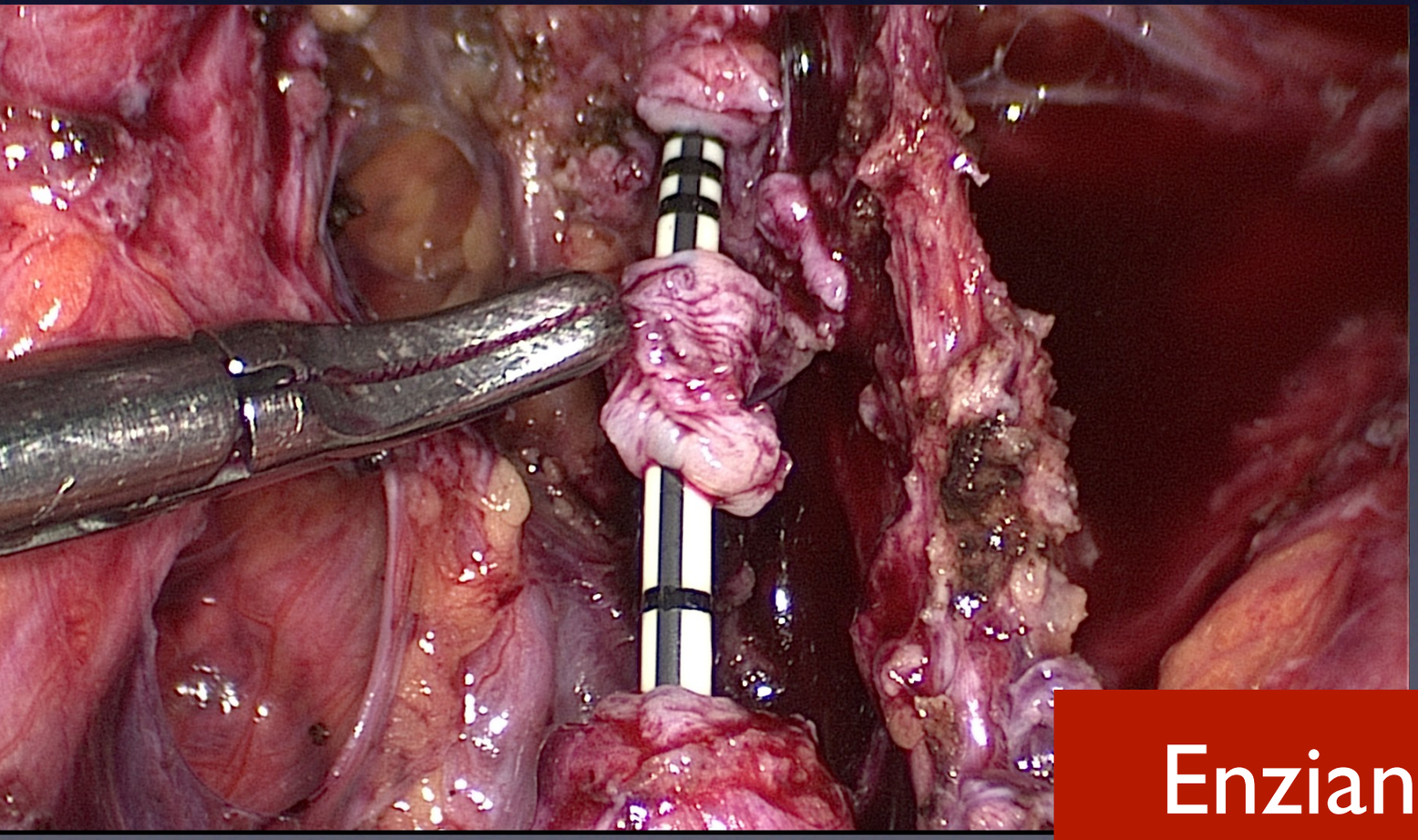


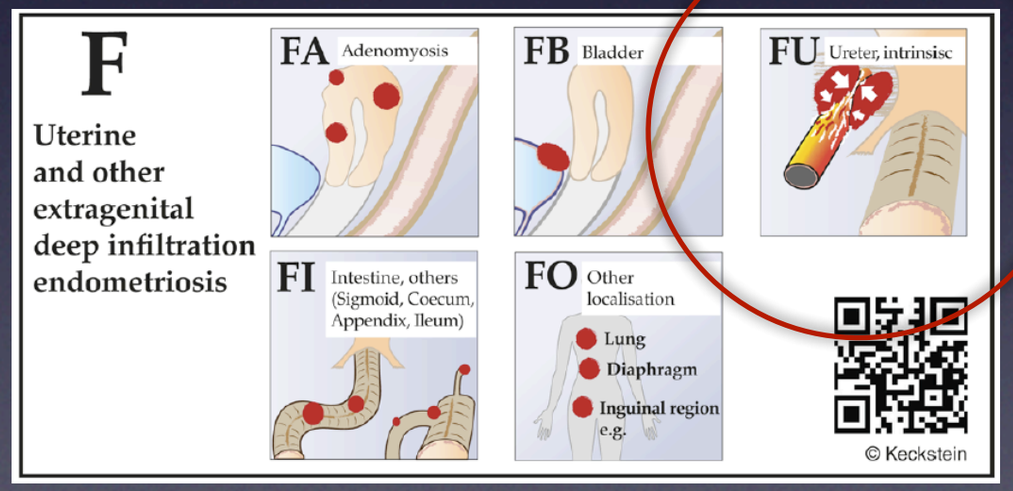
r-ASRM I — Enzian B3/0,C3



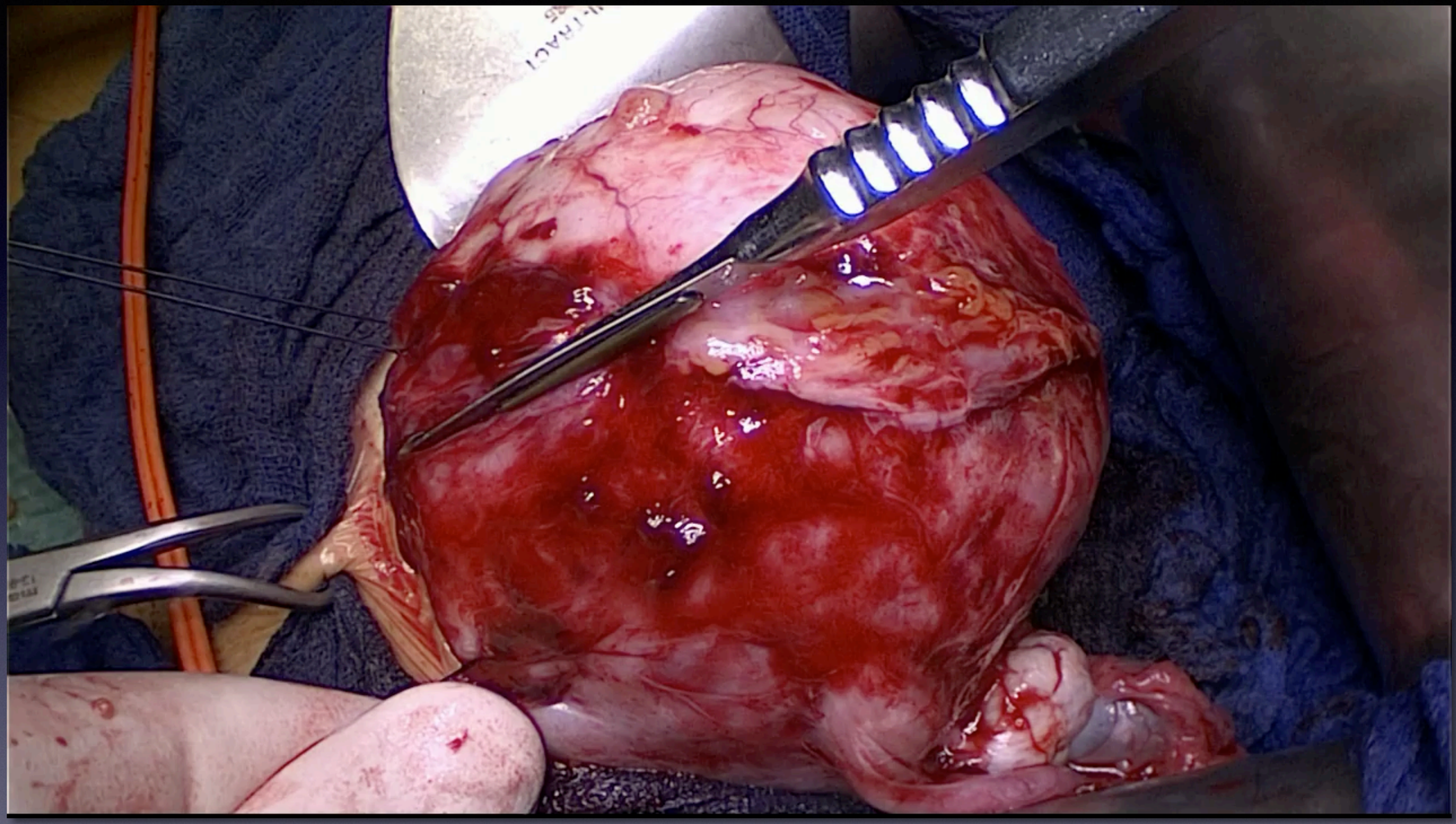


Enzian F(Bladder)

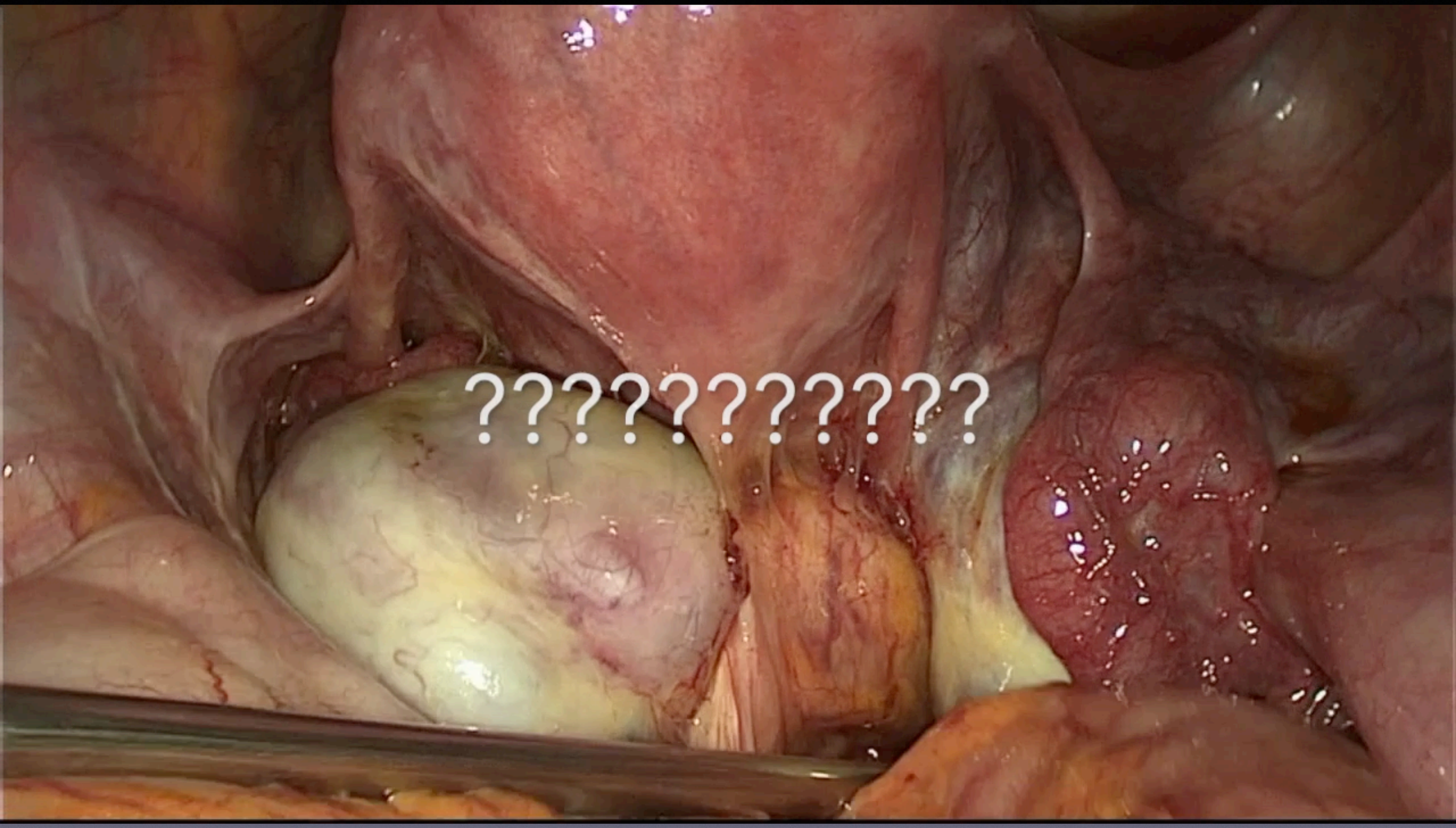




Enzian FU(I)

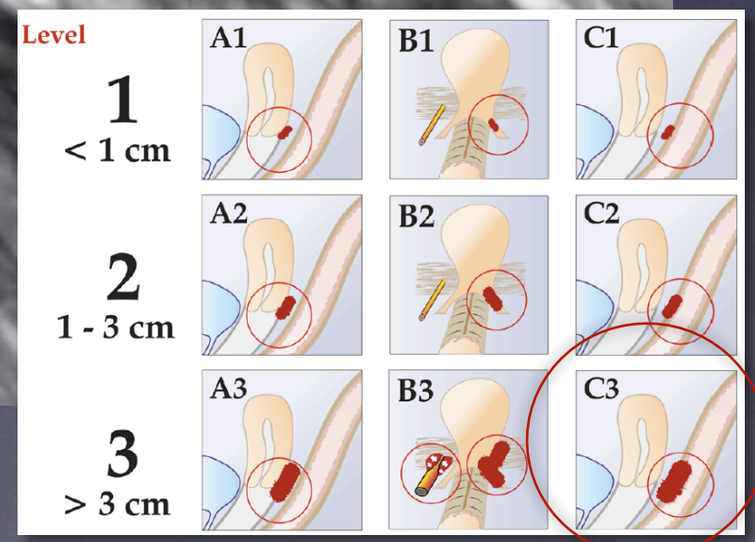


Enzian FA



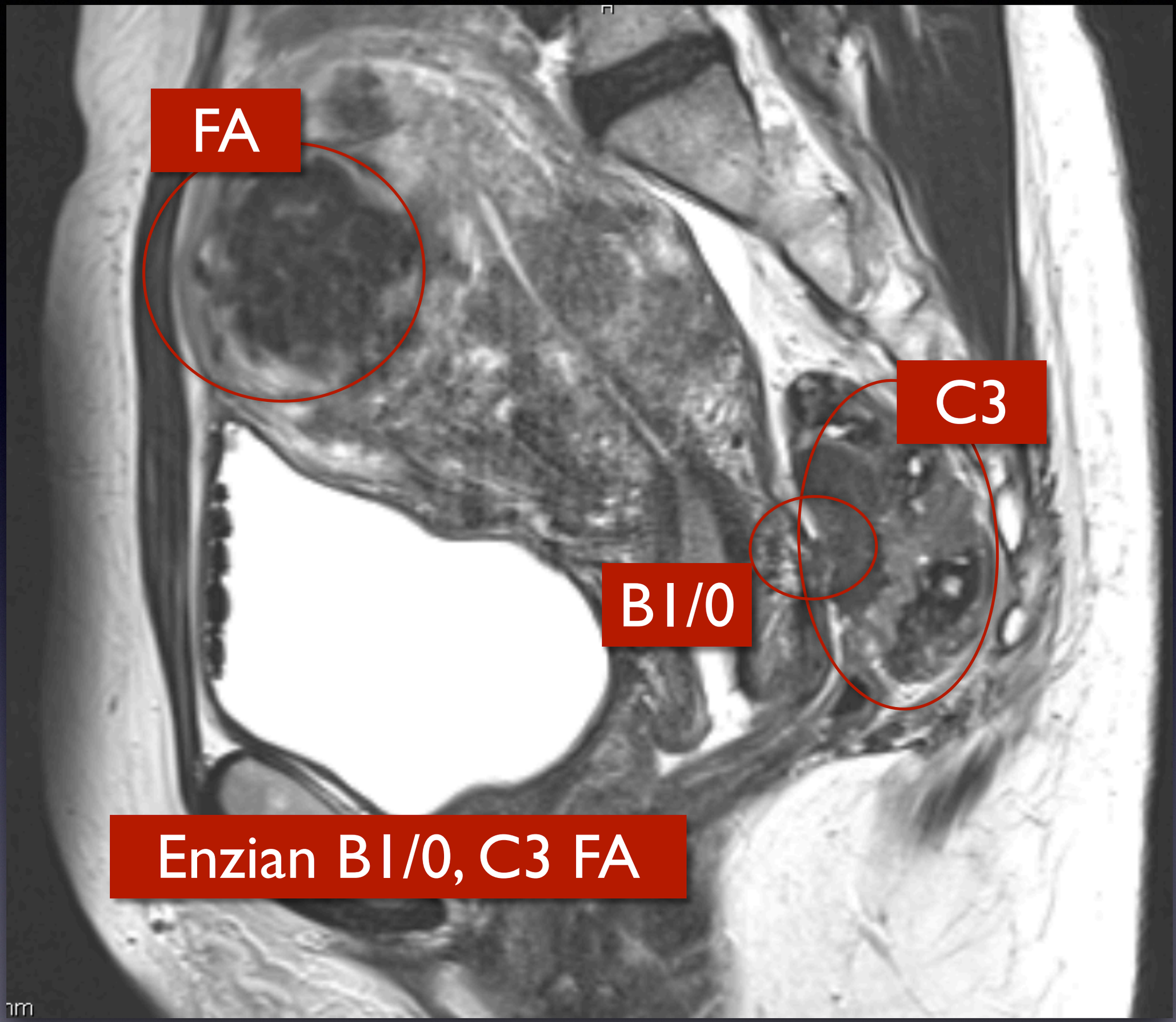
> 3cm

Enzian C3



Enzian FA

Voluson
S8


FA
C3
B1/0
Enzian B1/0, C3 FA

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journal homepage: www.elsevier.com/locate/ejrad

Detection and localization of deep endometriosis by means of MRI and correlation with the ENZIAN score

V. Di Paola*, R. Manfredi, F. Castelli, R. Negrelli, S. Mehrabi, R. Pozzi Mucelli

Department of Radiology, University of Verona, Policlinico "G.B. Rossi", P.le L.A. Scuro 10, 37134 Verona, Italy

- MRI correlates with the ENZIAN score
- Accuracy of 95%
- False negative results (4%)
- Allows a correct preoperative staging.

Di Paola, V., R. Manfredi, F. Castelli, R. Negrelli, S. Mehrabi and R. Pozzi Mucelli (2015). "Detection and localization of deep endometriosis by means of MRI and correlation with the ENZIAN score." Eur J Radiol **84**(4): 568-574.

Archives of Gynecology and Obstetrics (2019) 300:109–116
https://doi.org/10.1007/s00404-019-05157-1

GENERAL GYNECOLOGY

The ENZIAN score as a preoperative MRI-based classification instrument for deep infiltrating endometriosis

Laurin Burla[1] · David Scheiner[1] · Eleftherios Pierre Samartzis[1,3] · Stefan Seidel[4] · Markus Eberhard[3] · Daniel Fink[1] · Andreas Boss[2] · Patrick Imesch[1]

OP	MRI +	MRI −	Sensitivity (%)	Specificity (%)	Accuracy (%)
A +	40	2			
A −	1	22	95.2	95.7	95.4
B +	40	11			
B −	0	14	78.4	100.0	83.1
C +	32	3			
C −	4	26	91.4	86.7	89.2
FA +	4	3			
FA −	10	48	57.1	82.8	80.8
FB +	6	1			
FB −	1	57	85.7	98.3	96.9
FI +	11	4			
FI −	3	47	73.3	94.0	89.2

Human Reproduction, Vol.35, No.7, pp. 1589–1600, 2020
doi:10.1093/humrep/deaa103

human reproduction ORIGINAL ARTICLE *Gynaecology*

Magnetic resonance imaging classification of deep pelvic endometriosis: description and impact on surgical management

Isabelle Thomassin-Naggara[1,2,*], Samia Lamrabet[2], Adrien Crestani[1,3], Asma Bekhouche[1,2], Cendos Abdel Wahab[1,2], Edith Kermarrec[2], Cyril Touboul[1,3], and Emile Daraï[1,3]

Table V Correlation between MRI-based Enzian staging and surgical Enzian staging.

Surgery MRI	A0	A1	A2	A3	Surgery MRI	B0	B1	B2	B3	Surgery MRI	C0	C1	C2	C3
A0	101	8	9	2	B0	4	3	0	0	C0	93	0	10	4
A1	0	6	5	0	B1	1	35	32	9	C1	0	0	0	0
A2	1	3	11	4	B2	0	10	39	17	C2	1	0	8	10
A3	0	0	0	0	B3	0	0	0	0	C3	0	0	1	23
		Kappa = 0.61					Kappa = 0.38						Kappa = 0.81	

Quadratic Kappa were used—A, rectovaginal septum and vaginal locations; B, the USL compartment; C, the rectum and sigmoid colon. Three grades of severity are described in the same way in each compartment: Grade 1: invasion < 1 cm; Grade 2: invasion 1–3 cm; and Grade 3: invasion > 3 cm. 0 was applied if no endometriotic location was quoted.

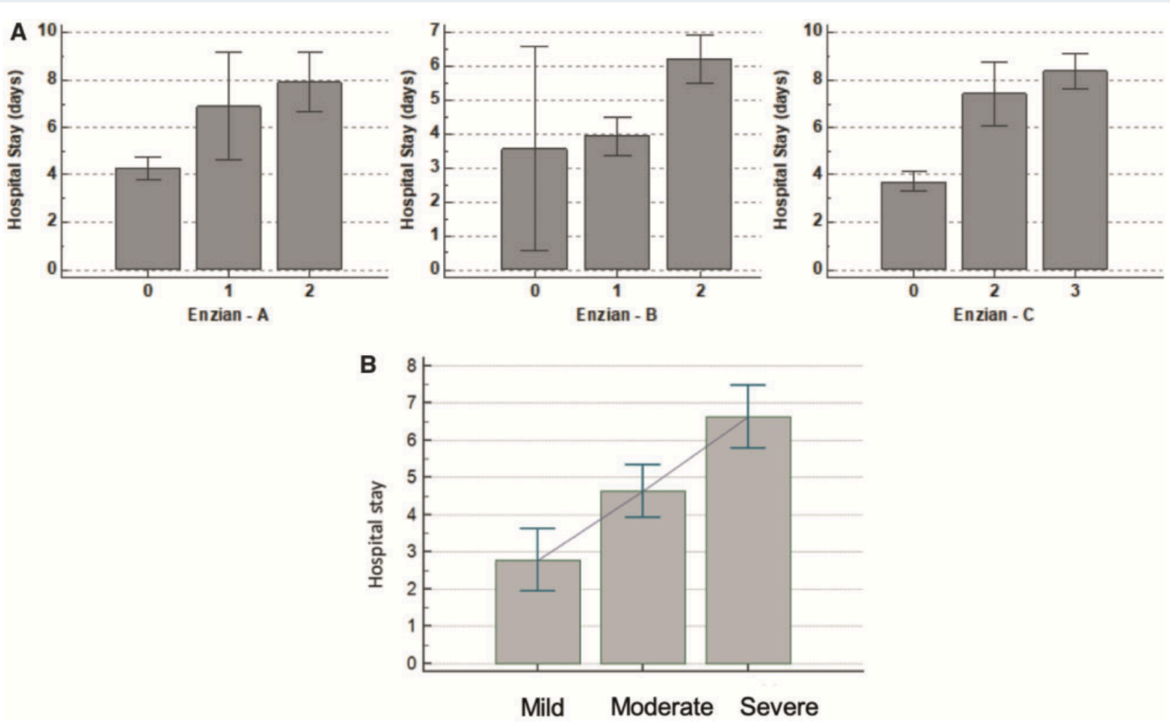


Figure 5. MRI classification and hospital stay (A) MRI-based Enzian classification (B) MRI dPEI classification.

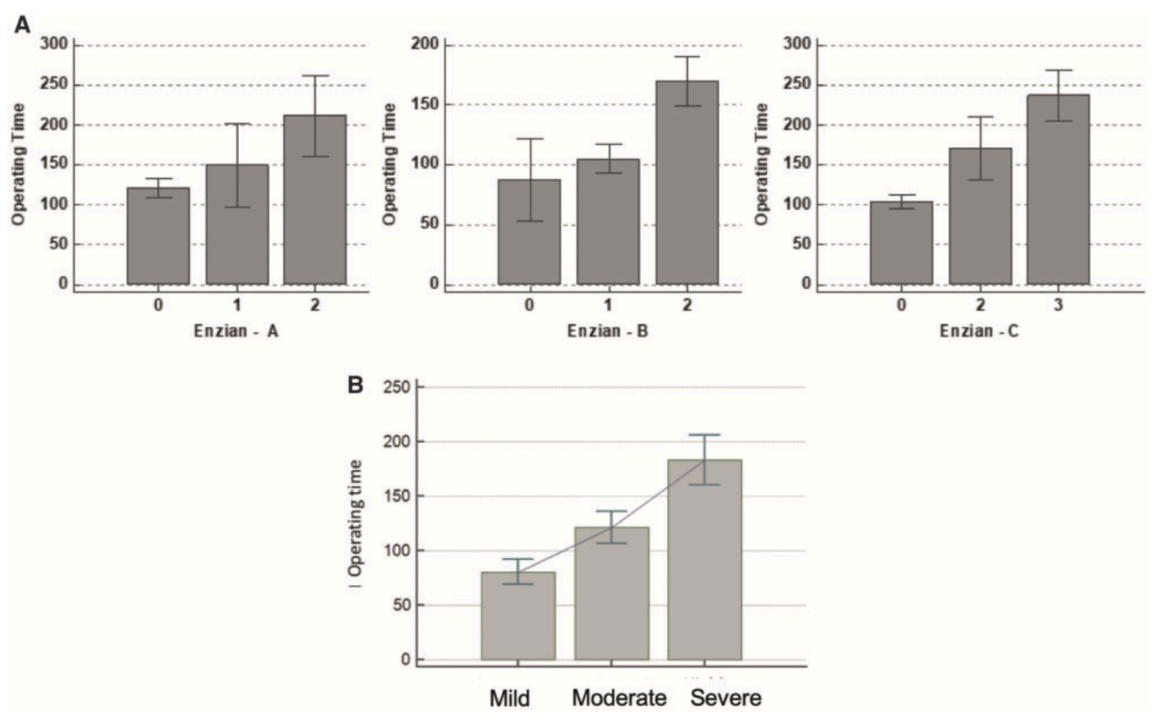


Figure 4. MRI classification and operating time (A) MRI Enzian classification (B) MRI dPEI classification.

Enzian: what do the data show?

PRO

- easy to use for specialists
- respects lesions which are not documented with r-ASRM
- correlates with findings in ultrasound and MRI
- correlates with symptoms
- correlates with complication rate
- preoperative classification
- planning of treatment
- comparison of varying data of diagnostics and treatment in patients with similar anatomical findings

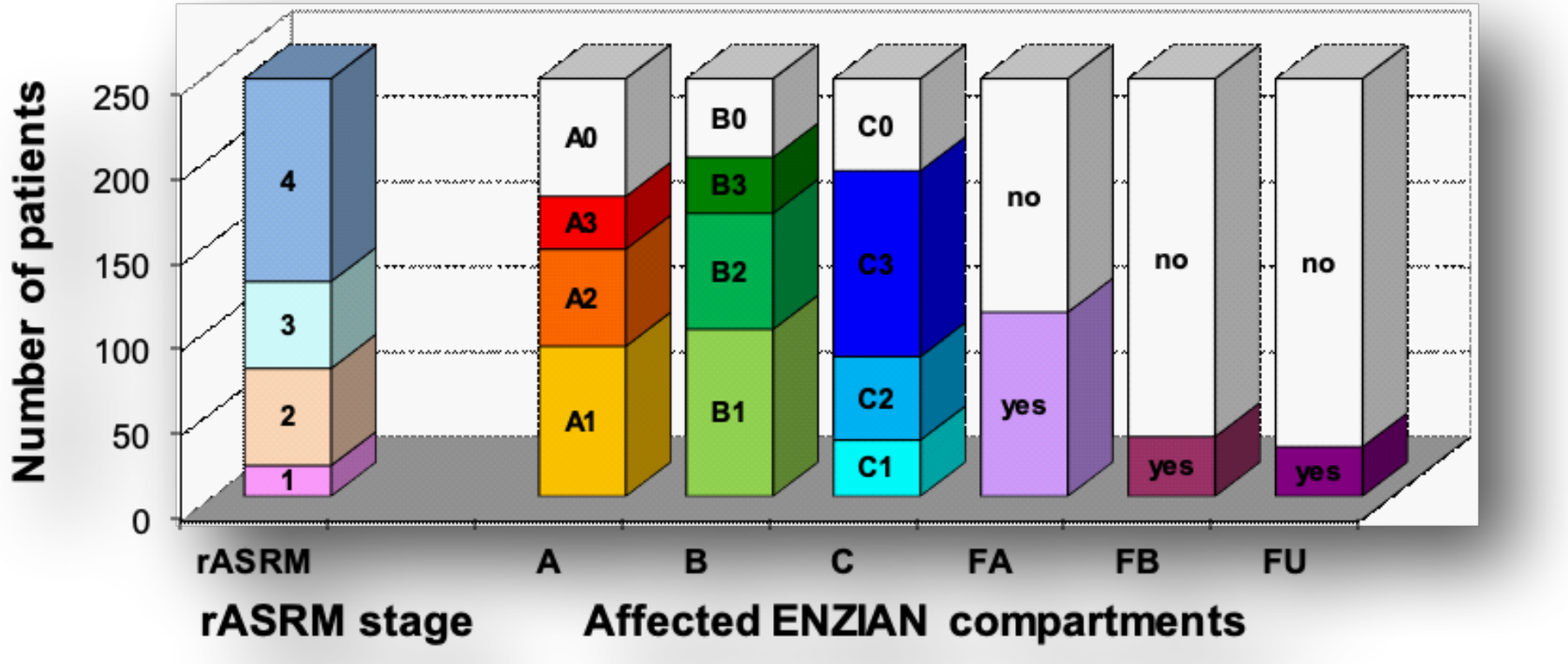
Reproductive BioMedicine Online
Volume 39, Issue 5, November 2019, Pages 845-851

Article

Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis

Eliana Montanari [a, b], Bernhard Dauser [c], Joerg Keckstein [d, e], Elisabeth Kirchner [a], Zoltan Nemeth [a], Gernot Hudelist [a, d]

Enzian and clinical Findings



Montanari, E., B. Dauser, J. Keckstein, E. Kirchner, Z. Nemeth and G. Hudelist (2019). "Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis." Reprod Biomed Online.

Reproductive BioMedicine Online
Volume 39, Issue 5, November 2019, Pages 845-851

Article

Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis

Eliana Montanari [a, b], Bernhard Dauser [c], Joerg Keckstein [d, e], Elisabeth Kirchner [a], Zoltan Nemeth [a], Gernot Hudelist [a, d]

Associations between symptoms and lesions in specific ENZIAN compartments

Compartment - symptom	p-value
ENZIAN A - Dyspareunia	0.462
ENZIAN A - Dyschezia	0.024*
ENZIAN B - Dyspareunia	0.002*
ENZIAN B - Dyschezia	0.517
ENZIAN C - Dyspareunia	1.000
ENZIAN C - Dyschezia	<0.001*
ENZIAN FA - Dyspareunia	0.688
ENZIAN FA - Dyschezia	0.370
ENZIAN FB - Dysuria	<0.001*
ENZIAN FU - Dysuria	0.795

Montanari, E., B. Dauser, J. Keckstein, E. Kirchner, Z. Nemeth and G. Hudelist (2019). "Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis." Reprod Biomed Online.

Correlations between symptom severities and lesion sizes in specific ENZIAN compartments

Symptom – compartment/stage	Correlation coefficient	p-value
Dysmenorrhea – ENZIAN A	0.244	<0.001*
Dysmenorrhea – ENZIAN B	0.108	0.093
Dysmenorrhea – ENZIAN C	0.170	0.008*
Dysmenorrhea – ENZIAN FA		0.005*
Dyspareunia – ENZIAN B	0.127	0.046*
Dyschezia – ENZIAN A	0.152	0.018*
Dyschezia – ENZIAN C	0.334	<0.001*
Dysmenorrhea – rASRM stage	0.119	0.064
Dyspareunia – rASRM stage	0.005	0.936
Dyschezia – rASRM stage	0.004	0.955

Reprod Biomed Online. 2019 Jun 19. pii: S1472-6483(19)30593-0. doi: 10.1016/j.rbmo.2019.06.006. [Epub ahead of print]

Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis.

Montanari E[1], Dauser B[2], Keckstein J[3], Kirchner E[4], Nemeth Z[4], Hudelist G[5].

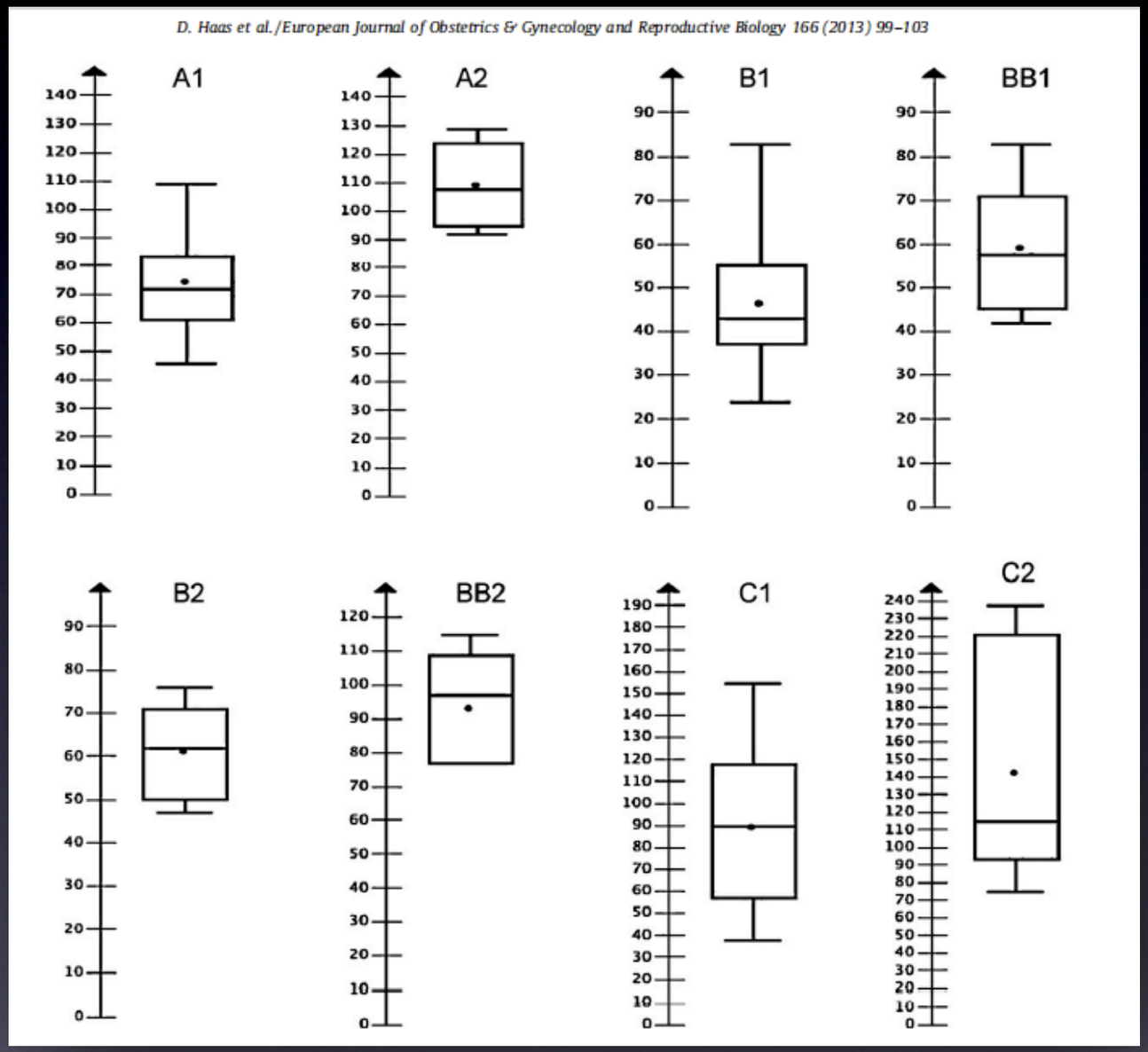
Correlations between:
Number of affected ENZIAN compartments (A, B, C and FA)
and INTENSITY of Dysmenorrhoe and Dyschezia

intensity

dysmenorrhea	dyschezia
rs = 0.256, p < 0.001	rs = 0.161, p = 0.012

Montanari, E., B. Dauser, J. Keckstein, E. Kirchner, Z. Nemeth and G. Hudelist (2019). "Association between disease extent and pain symptoms in patients with deep infiltrating endometriosis." Reprod Biomed Online.

Operative time according to the involved compartments scored with ENZIAN



Haas, D., R. Chvatal, A. Habelsberger, W. Schimetta, W. Wayand, A. Shamiyeh and P. Oppelt (2013). "Preoperative planning of surgery for deeply infiltrating endometriosis using the ENZIAN classification." Eur J Obstet Gynecol Reprod Biol **166**(1): 99-103.

Rectal shaving for deep endometriosis infiltrating the rectum: a 5-year continuous retrospective series

Horace Roman, M.D., Ph.D.,[a,b] Salwa Moatassim-Drissa, M.D.,[a] Noemie Marty, M.D.,[a] Mathilde Milles, M.D.,[a] Aurélie Vallée, M.D.,[a] Eulalie Desnyder, M.D.,[a] Emanuela Stochino Loi, M.D.,[a] and Carole Abo, M.D.[a]

Intraoperative findings and immediate postoperative complications.

Findings	Whole sample N = 122 (%)	< 1 c n = 14 (1	cm (73.7%)	> 3 cm n = 18 (14.8%)	*P* value
Height of rectal nodule					
<5 cm (low)					
5–10 cm (middle)					
>10 cm (upper)					
Operative time (min)					
Operative route					
Open surgery					
Laparoscopy					
Robotic assistance					
Laparoscopy followed by open route					
AFSr score					
Douglas pouch complete obliteration					

le size

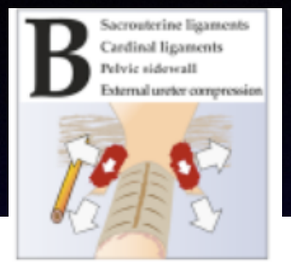
Enzian	C1	C2	C3	
OP time	86.4	165.7	204.7	p< .001
rASRM	76.9	75.9	80.7	
Clavien 1+2	28.5	21.1	16.7	
Clavien 3+4	0	8.9	16.8	p< .001

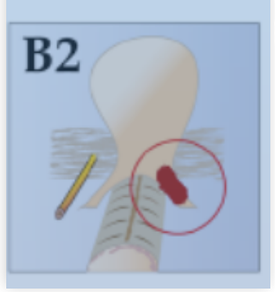
Roman, H. (2013). "Rectal shaving using PlasmaJet in deep endometriosis of the rectum." Fertility and Sterility **100**(5): e33.

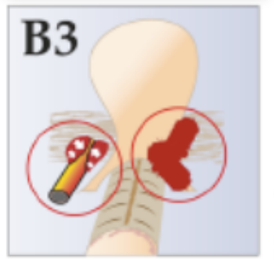
Predictive value of ENZIAN-Classification for

pathologic bladder function

after deep endometriosis surgery







Variables in the Equation

	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
revENZIAN score B	.025			
revENZIAN score B(1)	.137	1.755	.837	3.682
revENZIAN score B(2)	.090	2.211	.883	5.535
revENZIAN score B(3)	.003	5.158	1.718	15.483
Constant	.004	.452		

ariable(s) entered on step 1: revENZIAN score B.

S. Imboden, M. Müller University Bern, 2019

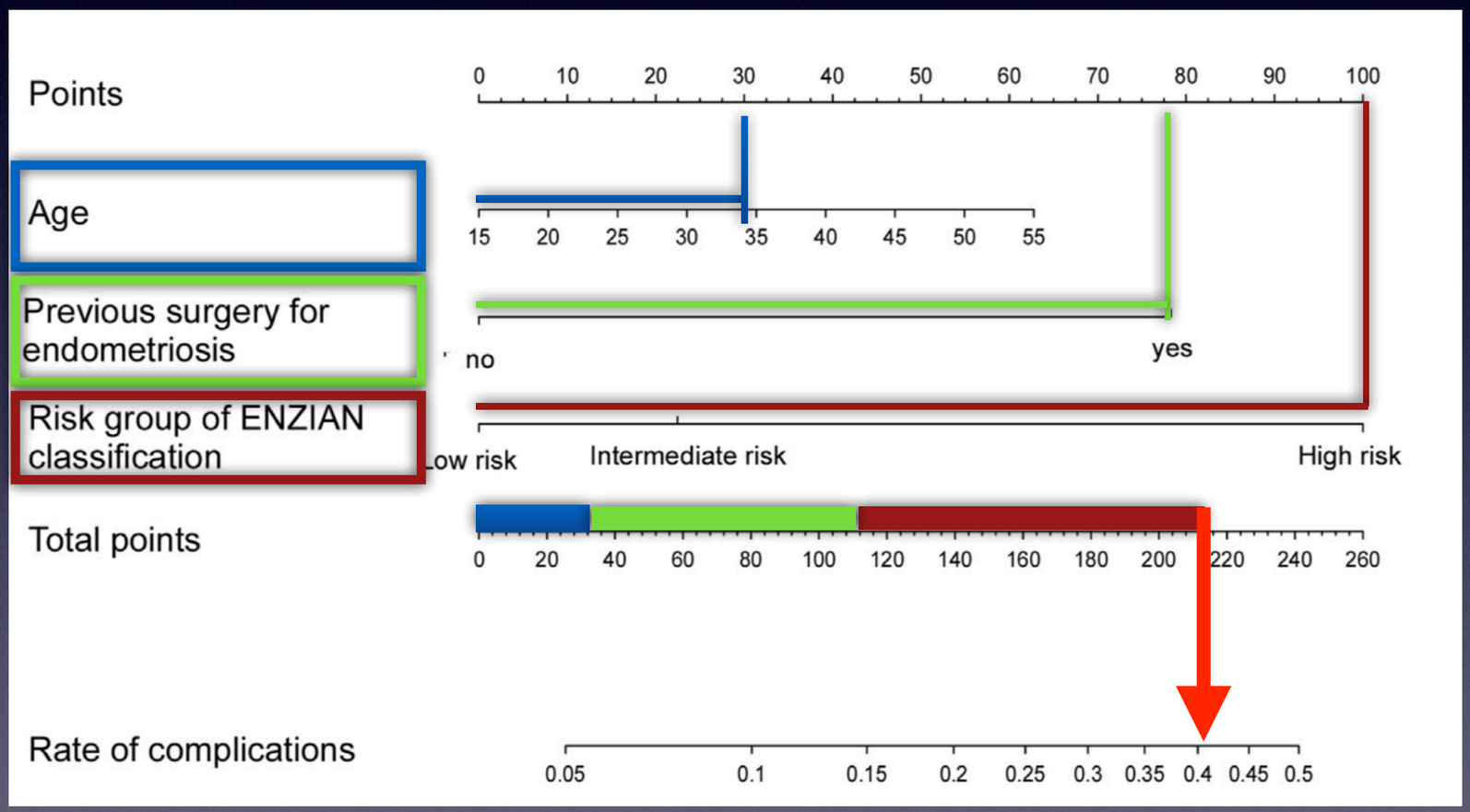
INSELSPITAL
UNIVERSITÄTSSPITAL BERN
HÔPITAL UNIVERSITAIRE DE BERNE

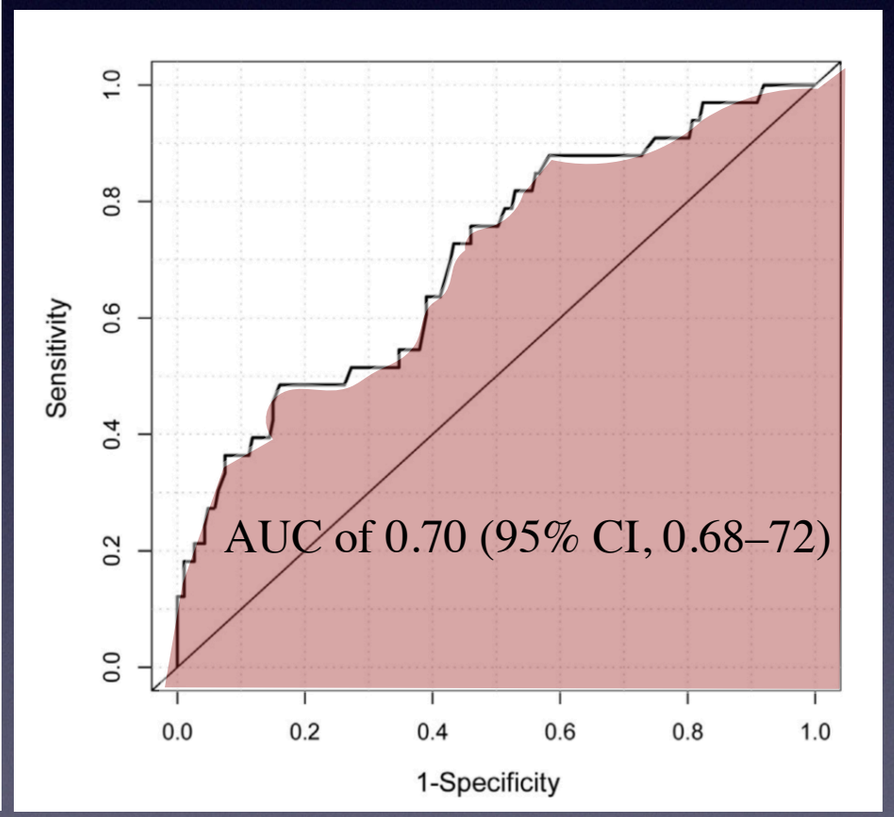
Frauen KLINIK
MATERNITÉ

Nomogram predicting the likelihood of complications after surgery for deep endometriosis without bowel involvement

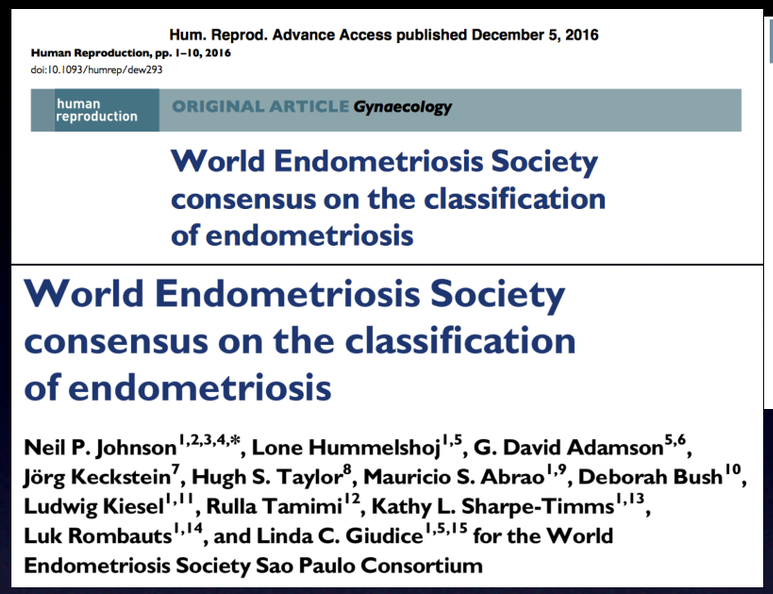
Clothilde Poupon[a], Clémentine Owen[a,*], Alexandra Arfi[a], Jonathan Cohen[a], Sofiane Bendifallah[a,b,c], Emile Daraï[a,b,c]

Age, Enzian risk group, and previous surgery for endometriosis were significantly associated with postoperative complication





Poupon, C., C. Owen, A. Arfi, J. Cohen, S. Bendifallah and E. Darai (2019). "Eur J Obstet Gynecol Reprod Biol X **3**: 100028.

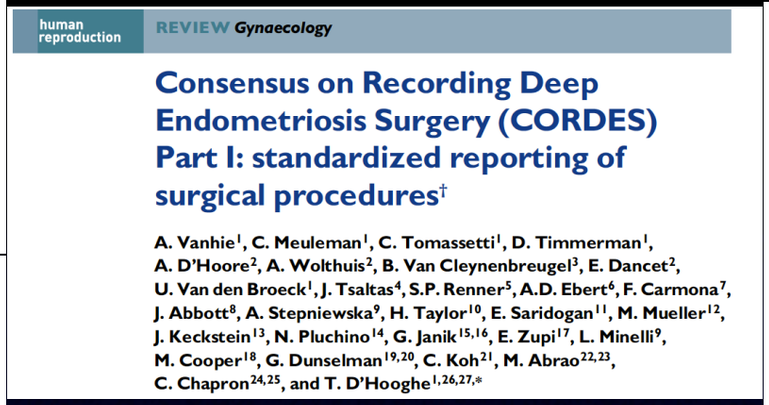

Hum. Reprod. Advance Access published December 5, 2016
Human Reproduction, pp. 1–10, 2016
doi:10.1093/humrep/dew293

human reproduction ORIGINAL ARTICLE *Gynaecology*

World Endometriosis Society consensus on the classification of endometriosis

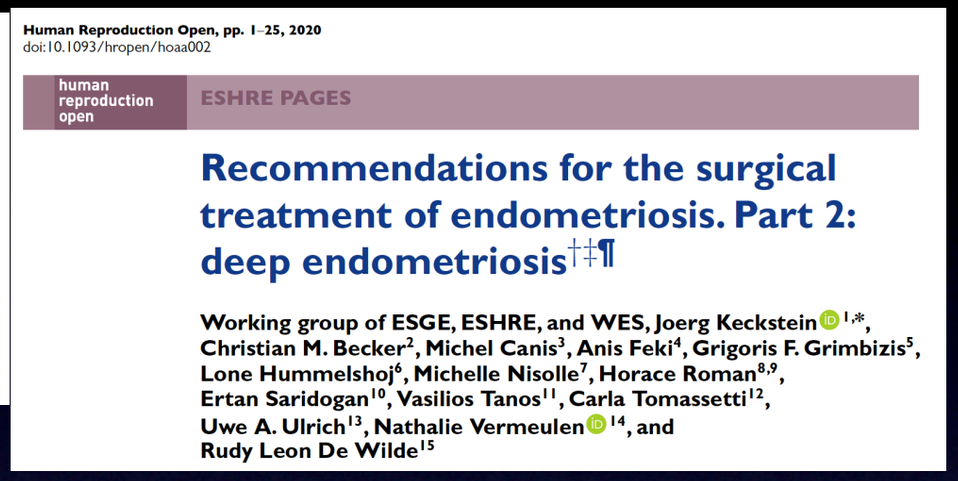
World Endometriosis Society consensus on the classification of endometriosis

Neil P. Johnson[1,2,3,4,*], Lone Hummelshoj[1,5], G. David Adamson[5,6], Jörg Keckstein[7], Hugh S. Taylor[8], Mauricio S. Abrao[1,9], Deborah Bush[10], Ludwig Kiesel[1,11], Rulla Tamimi[12], Kathy L. Sharpe-Timms[1,13], Luk Rombauts[1,14], and Linda C. Giudice[1,5,15] for the World Endometriosis Society Sao Paulo Consortium


human reproduction REVIEW *Gynaecology*

Consensus on Recording Deep Endometriosis Surgery (CORDES) Part I: standardized reporting of surgical procedures†

A. Vanhie[1], C. Meuleman[1], C. Tomassetti[1], D. Timmerman[1], A. D'Hoore[2], A. Wolthuis[2], B. Van Cleynenbreugel[3], E. Dancet[2], U. Van den Broeck[1], J. Tsaltas[4], S.P. Renner[5], A.D. Ebert[6], F. Carmona[7], J. Abbott[8], A. Stepniewska[9], H. Taylor[10], E. Saridogan[11], M. Mueller[12], J. Keckstein[13], N. Pluchino[14], G. Janik[15,16], E. Zupi[17], L. Minelli[9], M. Cooper[18], G. Dunselman[19,20], C. Koh[21], M. Abrao[22,23], C. Chapron[24,25], and T. D'Hooghe[1,26,27,*]


Human Reproduction Open, pp. 1–25, 2020
doi:10.1093/hropen/hoaa002

human reproduction open ESHRE PAGES

Recommendations for the surgical treatment of endometriosis. Part 2: deep endometriosis‡‡¶

Working group of ESGE, ESHRE, and WES, Joerg Keckstein[1,*], Christian M. Becker[2], Michel Canis[3], Anis Feki[4], Grigoris F. Grimbizis[5], Lone Hummelshoj[6], Michelle Nisolle[7], Horace Roman[8,9], Ertan Saridogan[10], Vasilios Tanos[11], Carla Tomassetti[12], Uwe A. Ulrich[13], Nathalie Vermeulen[14], and Rudy Leon De Wilde[15]

ASRM most used Classification

- unsuitable for deep endometriosis
- low correlation with symptoms
- does not allow a prediction of the risk of surgery and prognosis (Johnson, et al., 2017)

Enzian classification of endometriosis

17) If the r-ASRM classification is to be used, the Enzian classification system should be employed when deep endometriosis is also present to give a complete description of the operative findings (GPP).

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
REVISED CLASSIFICATION OF ENDOMETRIOSIS

Patient's Name _____ Date _____

Stage I (Minimal) - 1-5
Stage II (Mild) - 6-15
Stage III (Moderate) - 16-40
Stage IV (Severe) - >40
Total _____

Laparoscopy _____ Laparotomy _____ Photography _____
Recommended Treatment _____
Prognosis _____

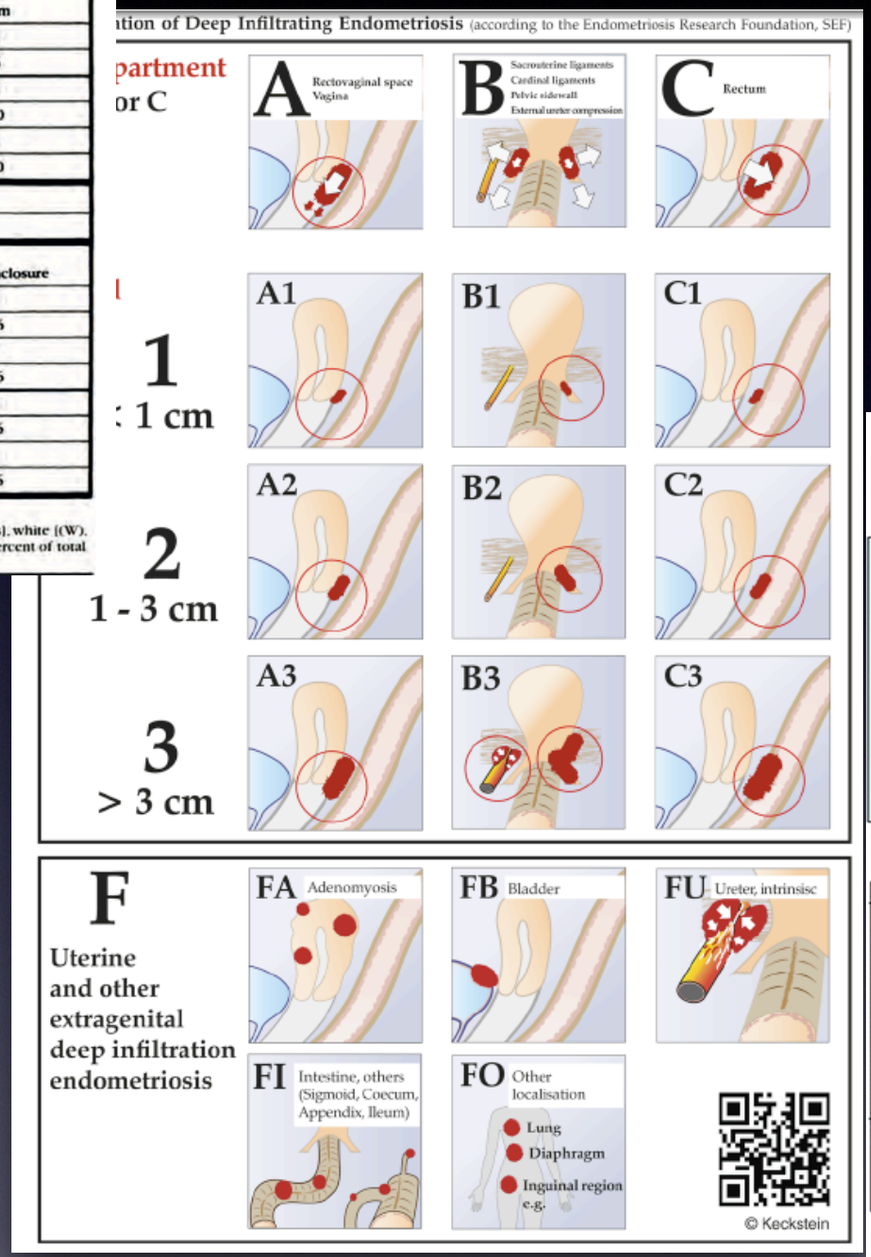
	ENDOMETRIOSIS	<1cm	1-3cm	>3cm
PERITONEUM	Superficial	1	2	4
	Deep	2	4	6
OVARY	R Superficial	1	2	4
	Deep	4	16	20
	L Superficial	1	2	4
	Deep	4	16	20

	POSTERIOR CULDESAC OBLITERATION	Partial	Complete
		4	40

	ADHESIONS	<1/3 Enclosure	1/3-2/3 Enclosure	>2/3 Enclosure
OVARY	R Filmy	1	2	4
	Dense	4	8	16
	L Filmy	1	2	4
	Dense	4	8	16
TUBE	R Filmy	1	2	4
	Dense	4*	8*	16
	L Filmy	1	2	4
	Dense	4*	8*	16

*If the fimbriated end of the fallopian tube is completely enclosed, change the point assignment to 16.

Denote appearance of superficial implant types as red [(R), red, red-pink, flamelike, vesicular blobs, clear vesicles], white [(W), opacifications, peritoneal defects, yellow-brown], or black [(B) black, hemosiderin deposits, blue]. Denote percent of total described as R___%, W___% and B___%. Total should equal 100%.



ENDOMETRIOSIS FERTILITY INDEX (EFI) SURGERY FORM

LEAST FUNCTION (LF) SCORE AT CONCLUSION OF SURGERY

Score	Description		Left	Right
4	= Normal	Fallopian Tube		
3	= Mild Dysfunction			
2	= Moderate Dysfunction	Fimbria		
1	= Severe Dysfunction			
0	= Absent or Nonfunctional	Ovary		

To calculate the LF score, add together the lowest score for the left side and the lowest score for the right side. If an ovary is absent on one side, the LF score is obtained by doubling the lowest score on the side with the ovary.

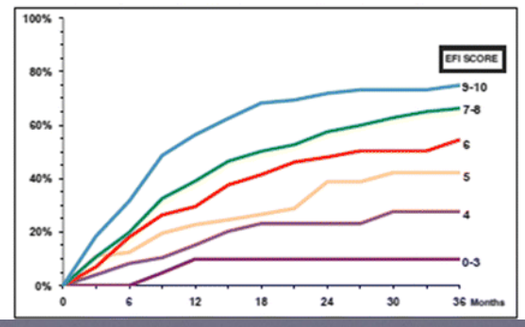
Lowest Score: Left _____ + Right _____ = LF Score _____

ENDOMETRIOSIS FERTILITY INDEX (EFI)

Historical Factors			Surgical Factors		
Factor	Description	Points	Factor	Description	Points
Age			LF Score		
	If age is ≤ 35 years	2		If LF Score = 7 to 8 (high score)	3
	If age is 36 to 39 years	1		If LF Score = 4 to 6 (moderate score)	2
	If age is ≥ 40 years	0		If LF Score = 1 to 3 (low score)	0
Years Infertile			AFS Endometriosis Score		
	If years infertile is ≤ 3	2		If AFS Endometriosis Lesion Score is < 16	1
	If years infertile is > 3	0		If AFS Endometriosis Lesion Score is ≥ 16	0
Prior Pregnancy			AFS Total Score		
	If there is a history of a prior pregnancy	1		If AFS total score is < 71	1
	If there is no history of prior pregnancy	0		If AFS total score is ≥ 71	0
Total Historical Factors			Total Surgical Factors		

EFI = TOTAL HISTORICAL FACTORS + TOTAL SURGICAL FACTORS: Historical _____ + Surgical _____ = EFI Score _____

ESTIMATED PERCENT PREGNANT BY EFI SCORE



Online Classification

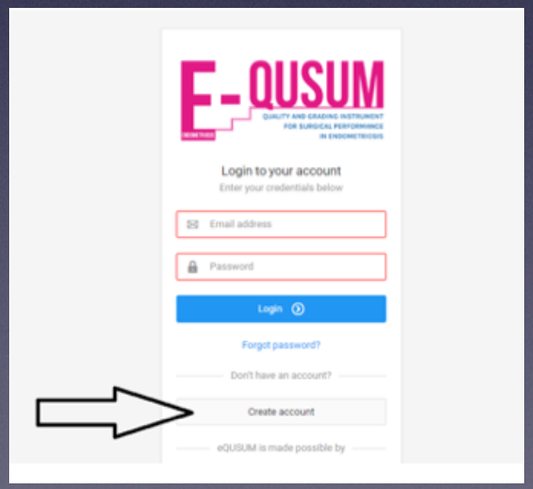
Human Reproduction Open, Vol.00, No.0, pp. 1–10, 2020
doi:10.1093/hropen/hoaa053

human reproduction open

ORIGINAL ARTICLE

EQUSUM: Endometriosis QUality and grading instrument for SUrgical performance: proof of concept study for automatic digital registration and classification scoring for r-ASRM, EFI and Enzian

J. Metzemaekers [1], P. Haazebroek[2], M.J.G.H. Smeets[3], J. English[3], M.D. Blikkendaal[1], A.R.H. Twijnstra[1], G.D. Adamson[4], J. Keckstein[5,6], and F.W. Jansen [1,7,*]



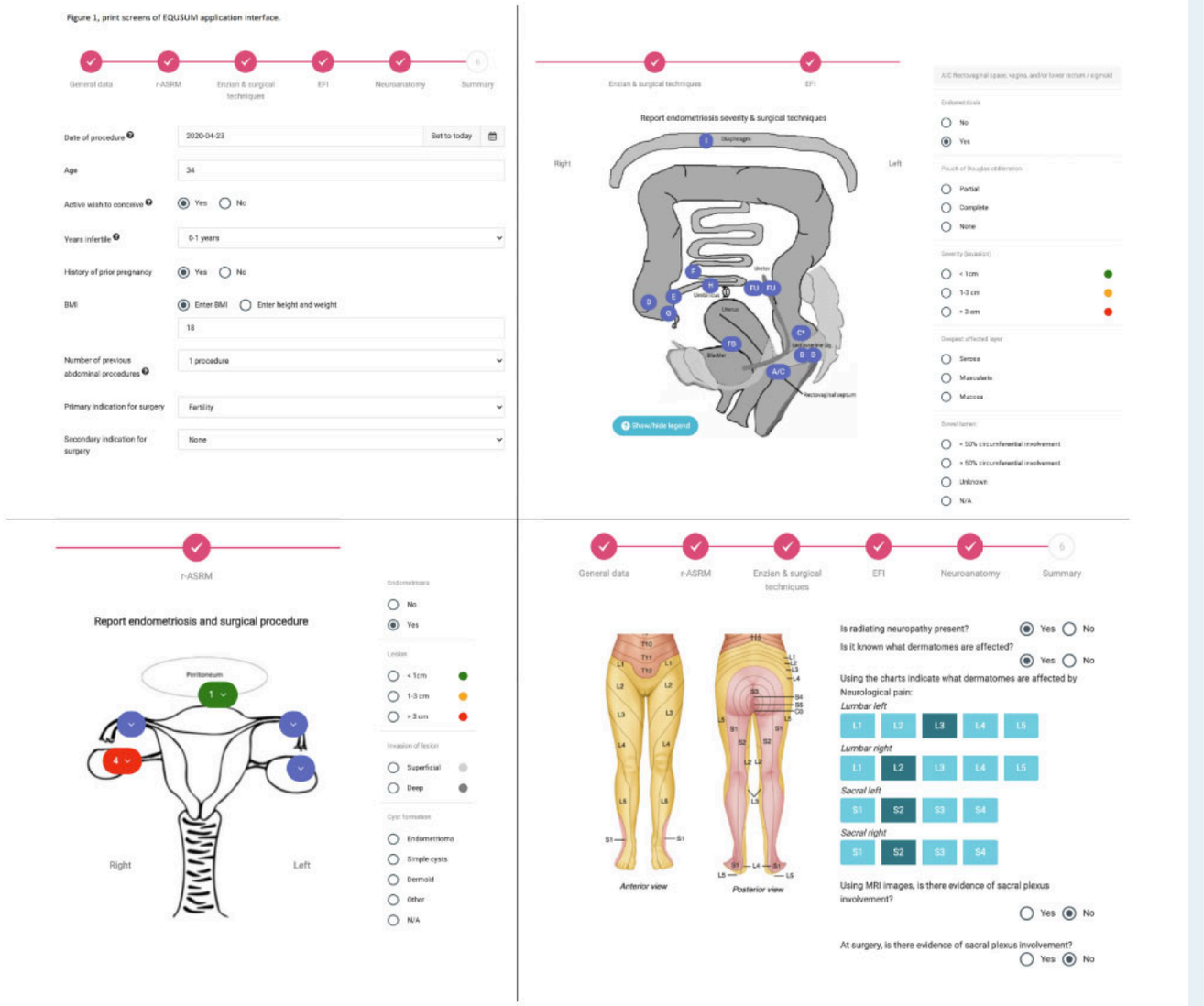


Figure 1. Print screens of EQUSUM interface.

Is electronic classification/staging of endometriosis by the EQUSUM application more accurate and easy to use compared to non-digital classification?

Human Reproduction Open, Vol.00, No.0, pp. 1–10, 2020
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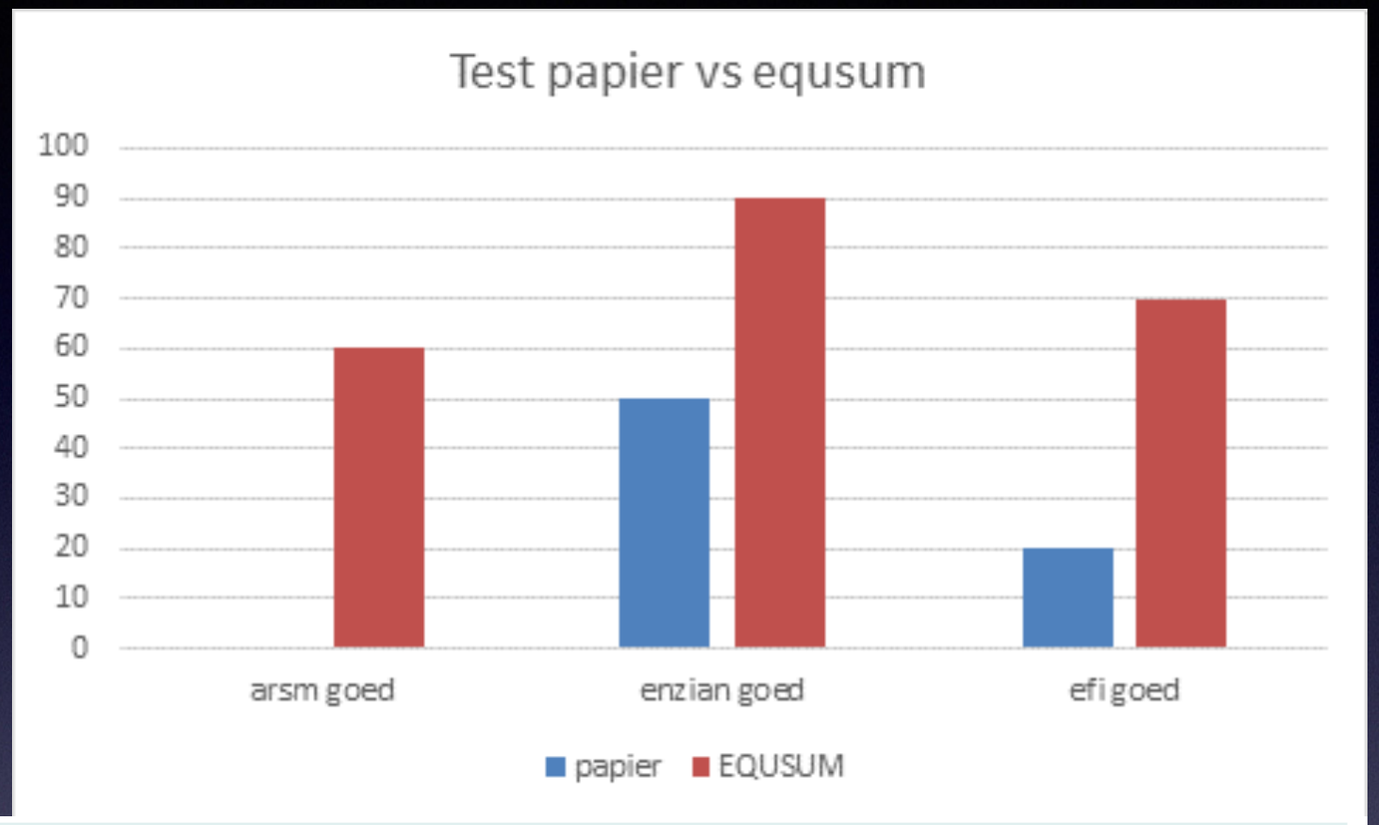
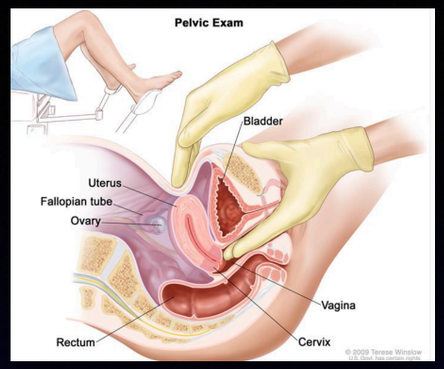


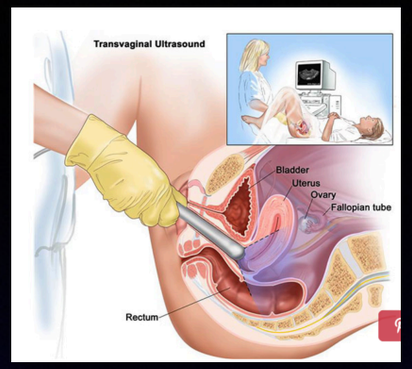
Table II Primary outcome measures.

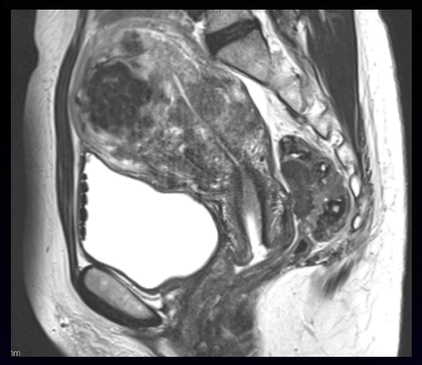
	Classic (n = 20)	EQUSUM (n = 20)	Univariable* Odds ratio (95% CI)	*P*-value
rASRM score right, n (%)	0 (0)	14 (70)	–	<0.01
rASRM stage right, n (%)	2 (10)	15 (75)	27.0 (4.6–159.7)	<0.01
Enzian score right, n (%)	12 (60)	18 (90)	6.0 (1.1–33.3)	0.03
EFI score right, n (%)	5 (25)	17 (85)	17.0 (3.5–83.4)	<0.01

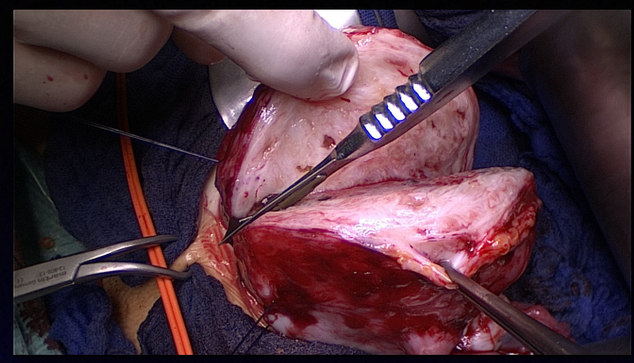
*Odds ratio not possible to calculate for rASRM score because of zero in the equation.
EFI, Endometriosis Fertility Index; rASRM, revised American Society for Reproductive Medicine.

Endometriosis Diagnostics and Classification



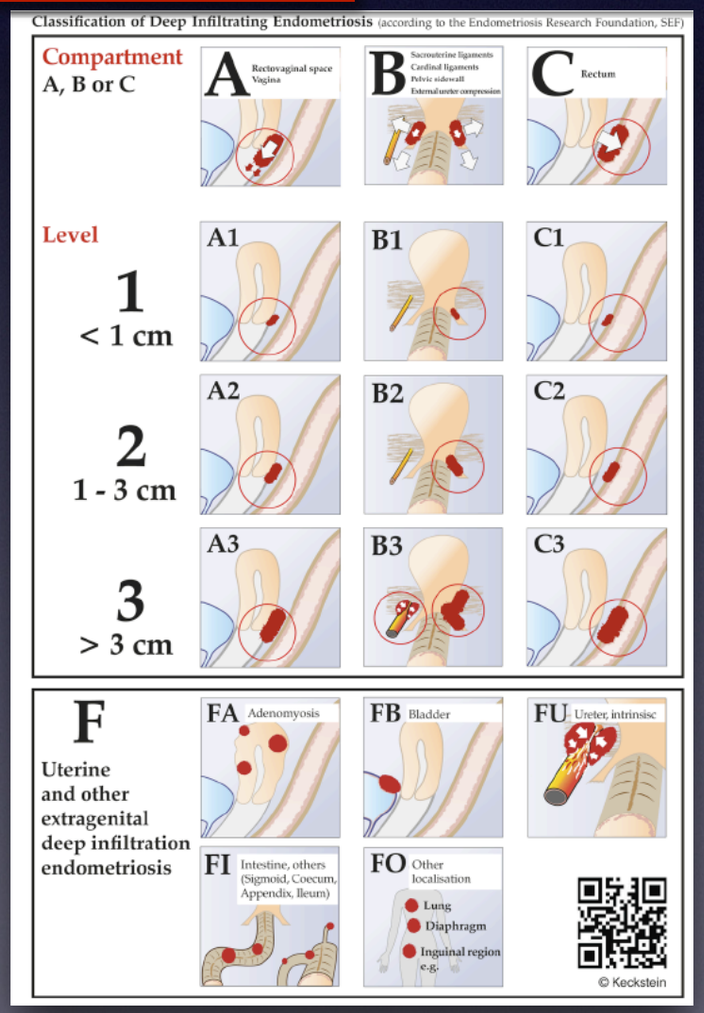




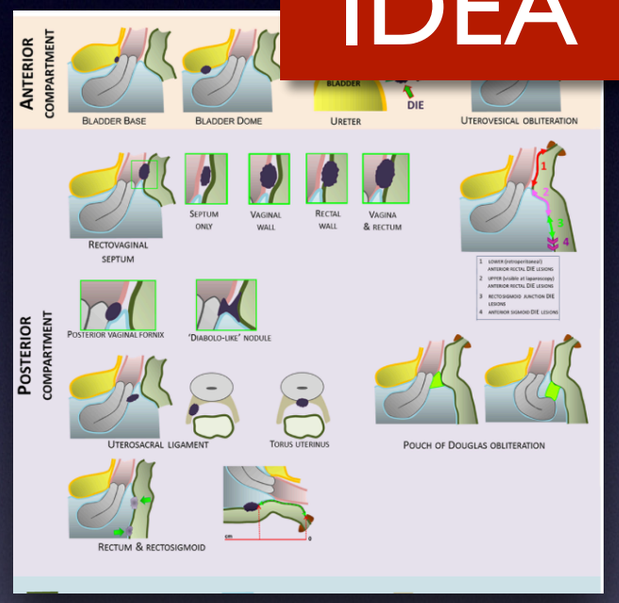


Pre operative
Intra operative
Post operative

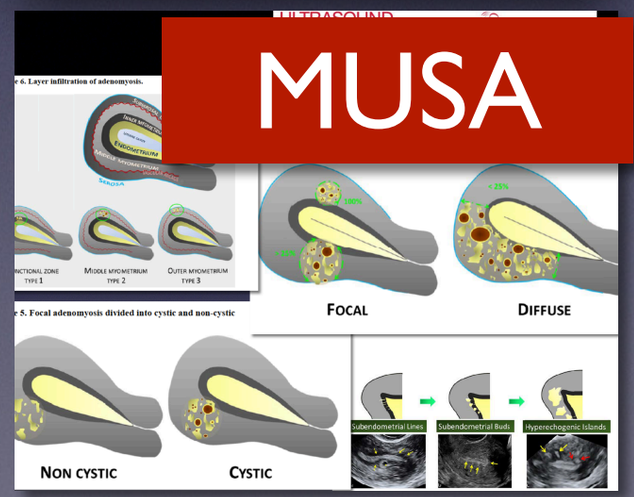
Enzian



IDEA



MUSA



The #Enzian classification:
A comprehensive non-invasive and surgical description system for endometriosis

#Enzian(s) P1, O1/0, T3-/0+, B2/0, Cx, F(diaphragm)

The #Enzian classification:
A comprehensive non-invasive and surgical description system for endometriosis

J. Keckstein
E. Saridogan
U. A. Ulrich
M. Sillem
P. Oppelt
K.W. Schweppe
H. Krentel
C. Exacoustos
M. Malzoni
M. Mueller
H. Roman
G. Condous,
A. Forman
FW. Jansen
A. Bokor
V. Simedrea
E. Janschek
G. Hudelist

Keckstein, J.,et al (2020). "The #Enzian classification: A comprehensive non-invasive and surgical description system for endometriosis." Acta Obstet Gynecol Scand **accepted**.

#Enzian

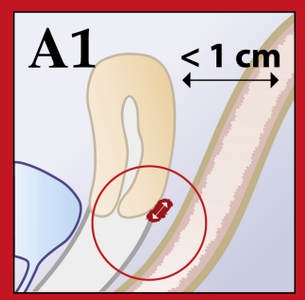
(Classification of Endometriosis)

DEEP ENDOMETRIOSIS

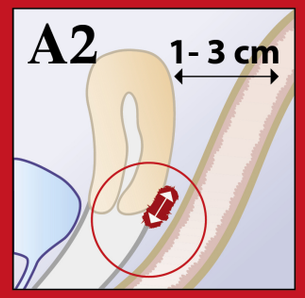
A Rectovaginal space, Vagina

Largest Diameter

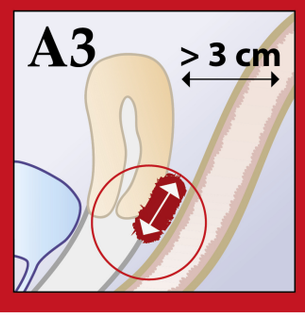
A1 < 1 cm



A2 1- 3 cm

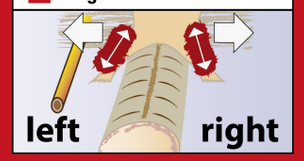


A3 > 3 cm

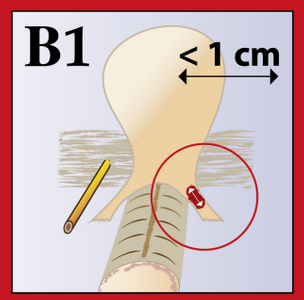


B Sacrouterine ligg., Cardinal ligaments, Pelvic sidewall

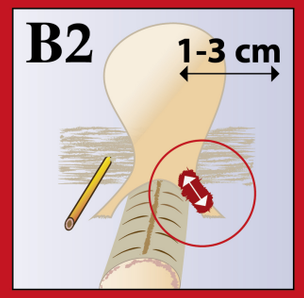
Largest Diameter



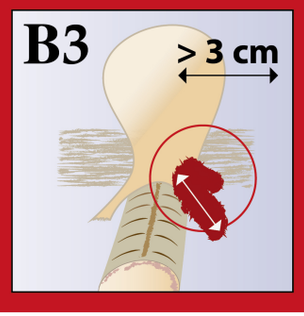
B1 < 1 cm



B2 1-3 cm



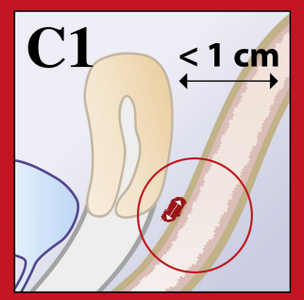
B3 > 3 cm



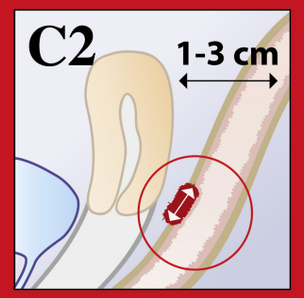
C Rectum

Largest Diameter

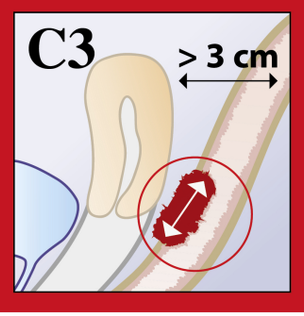
C1 < 1 cm



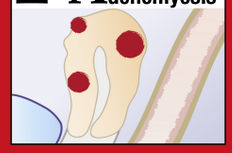
C2 1-3 cm



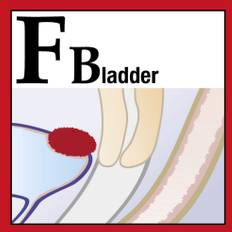
C3 > 3 cm



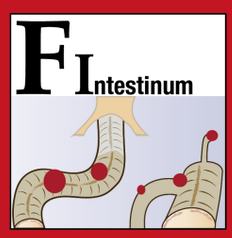
F Adenomyosis



F Bladder



F Intestinum



F Ureter

F (.....) Location

- Diaphragm
- Lung
- Nerve
- .....

A _____ **B** ___ / ___ **C** _____ **F** _____

left right (Location)

Peritoneum

Ovary

Adhesions, tubal patency

Vagina, RVS

USL, cardinal ligg.

Rectum

Adenomyosis

Ureter

Other locations

#Enzian P_, O_/_, T _/_, A _, B_/_, C _, FA, FU, F( )

#Enzian

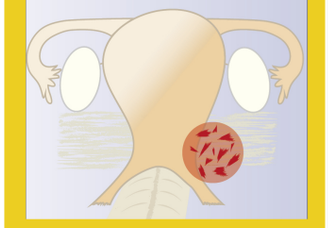
(Classification of Endometriosis)

PERITONEUM

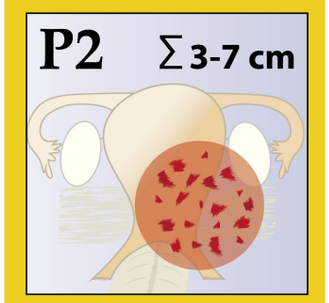
P Peritoneum

Sum of all diameters

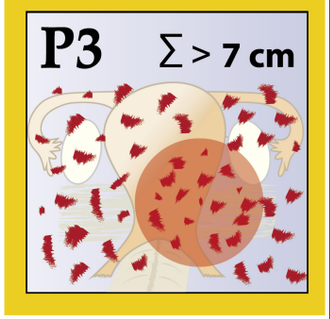
P1 ∑ < 3 cm



P2 ∑ 3-7 cm



P3 ∑ > 7 cm



P_____

P = Peritoneum

#Enzian

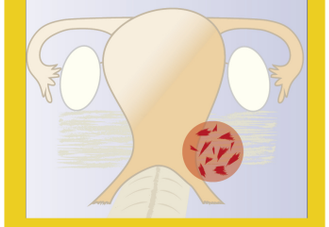
(Classification of Endometriosis)

PERITONEUM

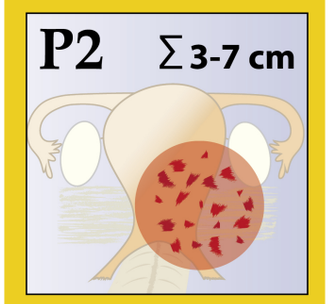
P Peritoneum

■ Sum of all diameters

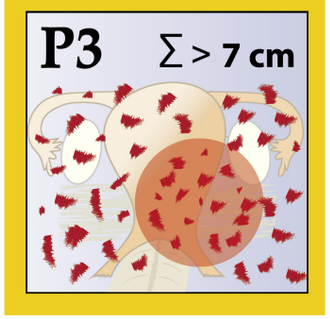
P1 Σ < 3 cm



P2 Σ 3-7 cm



P3 Σ > 7 cm



P_____

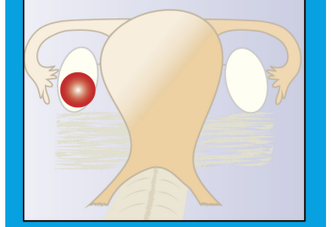
OVARY

O Ovary

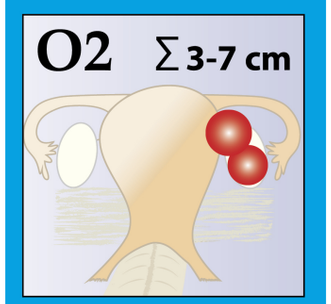
■ Sum of all diameters

left right

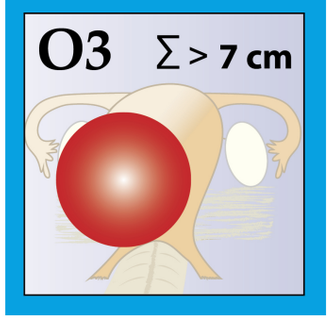
O1 Σ < 3 cm



O2 Σ 3-7 cm



O3 Σ > 7 cm



O___ /___

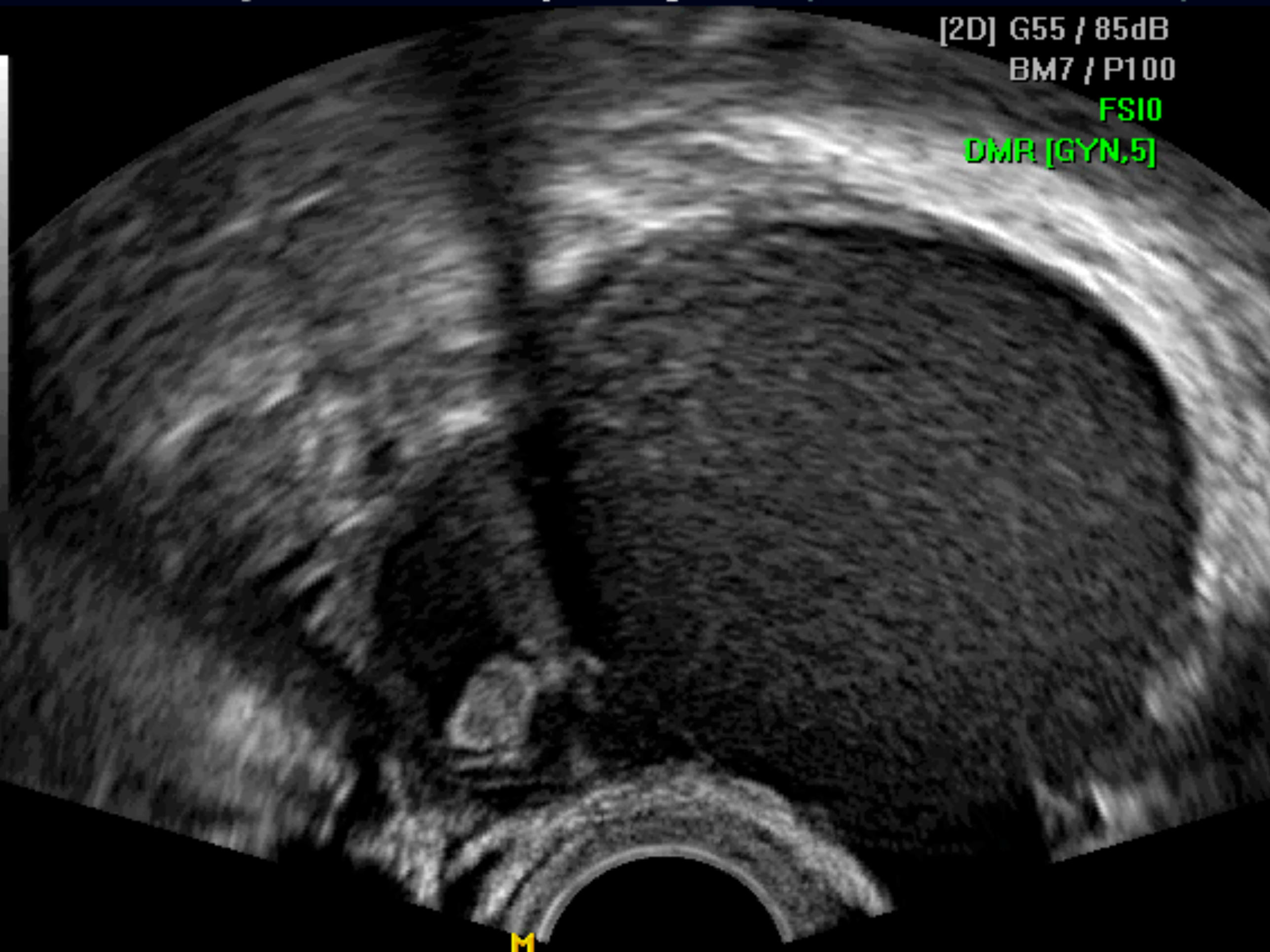
left right

m ovary is missing

x unknown / not visible

P = Peritoneum

O = Ovary


[2D] G55 / 85dB
BM7 / P100
FSI0
DMR [GYN,5]

IOTA

TABLE OF LESIONS

Terms and definitions from the International Ovarian Tumor Analysis (IOTA) group

Unilocular cyst

1

1 A unilocular cyst without septa and without solid parts or papillary structures.

2 If a cyst has only incomplete septa and no real septa, it is recorded as unilocular. An incomplete septum as seen in hydrosalpinges is defined as a thin strand of tissue running across the cyst cavity from one internal surface to the contralateral side, but which is not complete in some scanning planes.

3 If there is irregular internal cyst wall without a solid papillary projection, than the cyst is also unilocular by definition. The height of excrescences should be less than 3 mm.

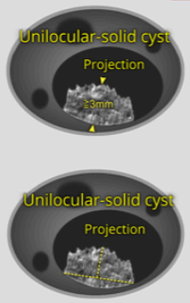
4 The hyperreflective and avascular area ("white ball") in the center of dermoid cyst should not be classified as a solid papillary projection.

5 Similarly, "sludge" on the internal walls is not regarded as a papillary projection.

Unilocular-solid cyst

2

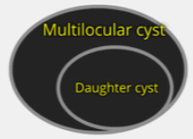
A unilocular cyst with a measurable solid component or at least one papillary structure. This category may include pyo- or hydrosalpinges with the so-called ‚beads-on-a-string' or "cogwheel" appearance if their height is greater than or equal to 3 mm. If the solid components comprise 80% or more of the tumor than the mass is called a solid tumor.



Multilocular cyst

3

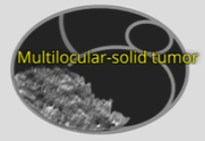
A cyst with at least one septum but no measurable solid components or papillary projections. A septum is not classified as a solid component and is defined as a thin echogenic strand of tissue running accross the cyst cavity from one internal surface to the contralateral side.



Multilocular-solid cyst

4

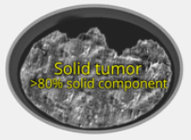
A multilocular cyst with a measurable solid component or at least one papillary projection.



Solid tumor

5

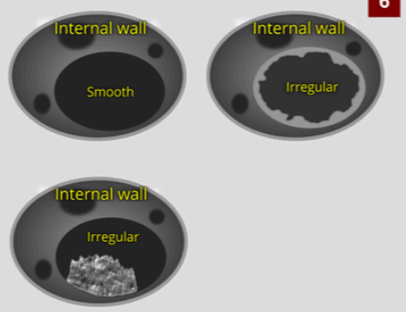
A tumor where the solid components comprise 80% or more of the tumor when assessed in a two-dimensional section. A solid tumor may contain papillary projections protruding into the small cysts of the solid tumor.



Internal cyst wall

6

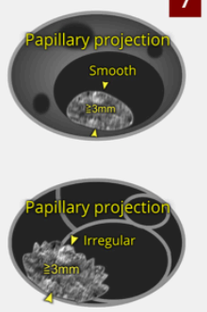
The internal cyst wall is described as being "smooth" or "irregular". If there is a solid papillary projection, then the wall is irregular by definition. In cases of "sludge" (as seen in endometriotic cysts), the internal walls are also called ‚irregular'.



Solid papillary projection

7

Solid papillary projections are defined as any solid projections protruding into the cyst cavity from the cyst wall with a height greater than or equal to 3 mm. The hyperechogenic avascular area of a dermoid cyst or sludge on the internal walls are not regarded as a papillary projection. Solid papillary projections are described as being "smooth" or "irregular" (e.g. califlower-like).



Cystic contents

8

The dominant feature of the cystic contents is described as:

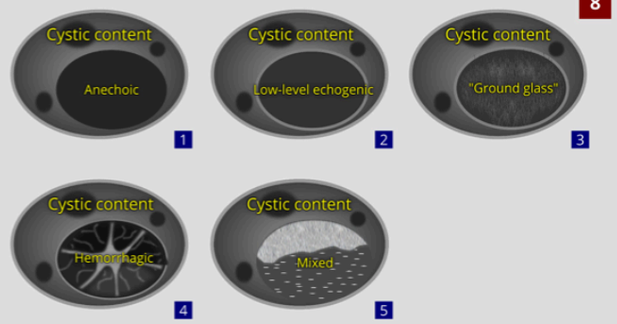
1 anechoic (black)

2 low-level echogenic (i.e.homogeneous low-level echogenic as seen in mucinous tumors)

3 "ground glass" appearance (homogeneously dispersed echogenic cystic contents, as often seen in endometriotic cysts)

4 hemorrhagic (with internal thread-like structures, representing strands)

5 or mixed (as often seen in teratomas).



Subjective assessment of blood flow

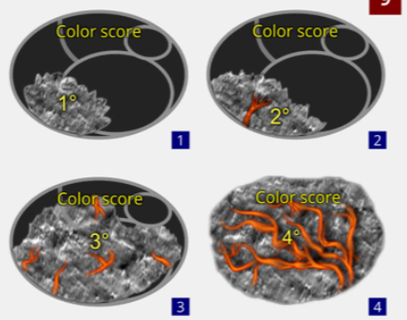
9

1 **Color score of 1** is given when no blood flow within the septa, cyst walls, or solid tumor areas.

2 **Color score of 2** is given when only minimal flow can be detected.

3 **Color score of 3** is given when moderate flow is present.

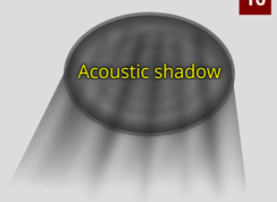
4 **Color score of 4** is given when the adnexal mass appears highly vascular with marked blood flow.



Acoustic shadows

10

The presence of acoustic shadows, defined as loss of acoustic echo behind a sound-absorbing structure, is noted.



#Enzian

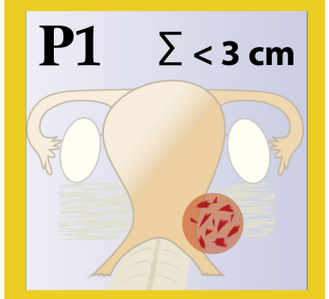
(Classification of Endometriosis)

PERITONEUM

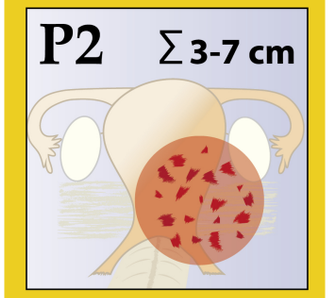
P Peritoneum

- Sum of all diameters

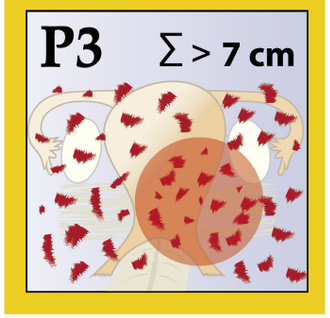
P1 Σ < 3 cm



P2 Σ 3-7 cm



P3 Σ > 7 cm



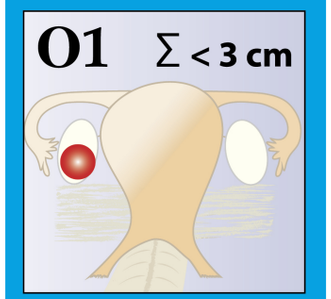
OVARY

O Ovary

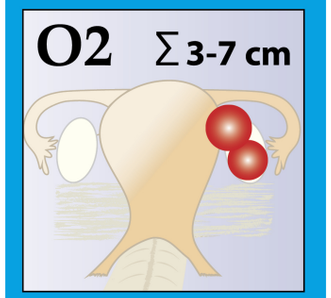
- Sum of all diameters

left right

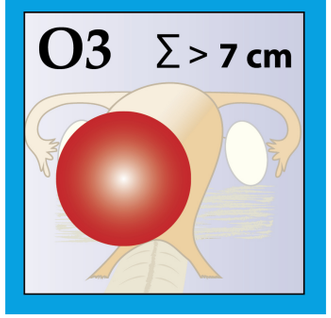
O1 Σ < 3 cm



O2 Σ 3-7 cm



O3 Σ > 7 cm



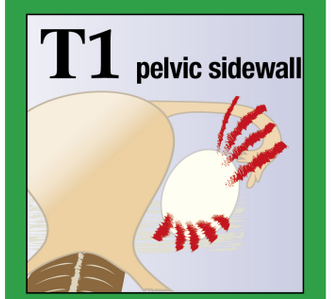
TUBE

T Tubal ovarian condition

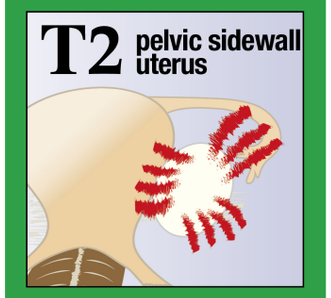
- Adhesions
- Motility
- Patency test

left right

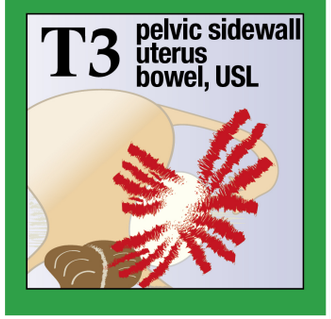
T1 pelvic sidewall



T2 pelvic sidewall uterus



T3 pelvic sidewall uterus bowel, USL



P_____

O___ / ___

left right

m ovary is missing
x unknown / not visible

T___ / ___

left right

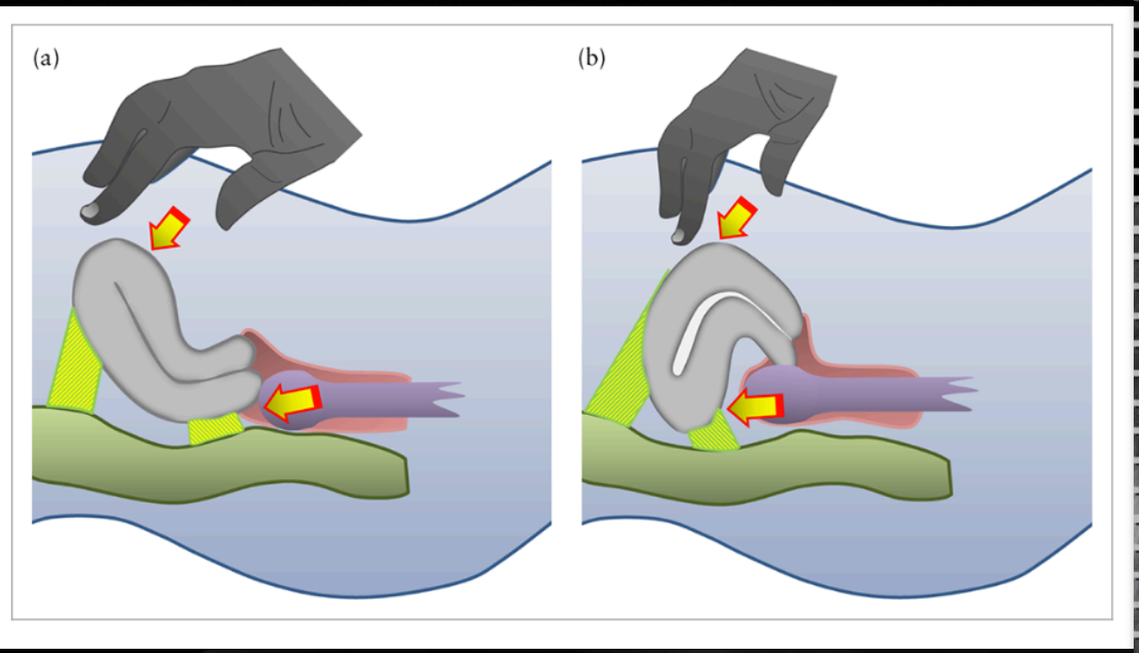
m tube is missing
x unknown / not visible
+ or - Patency test

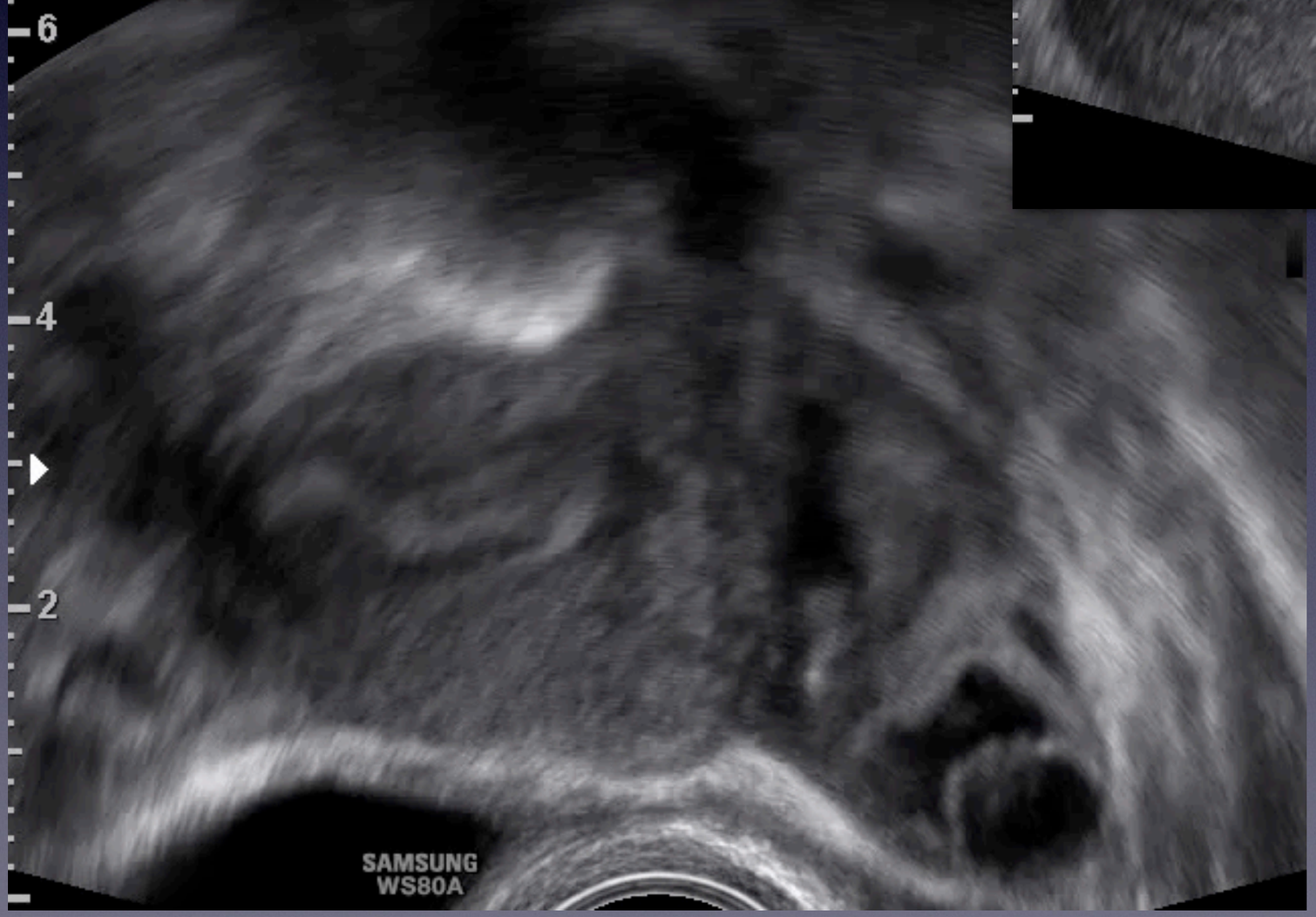
T = Tube

Tubal condition

- Motility
- Adhesions
- Patency test

- Ultraschall Softmarker



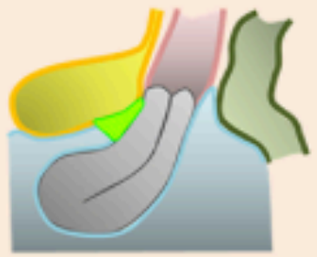


ANTERIOR COMPARTMENT

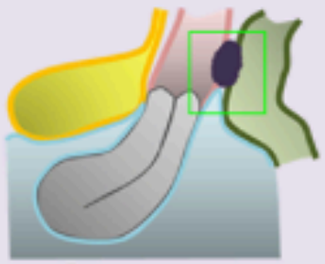
BLADDER BASE

BLADDER DOME

URETER



UTEROVESICAL OBLITERATION



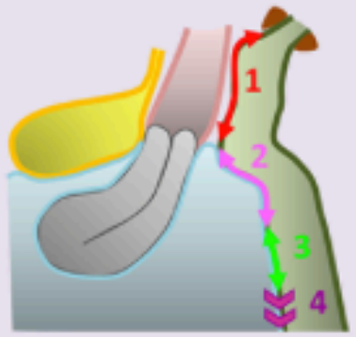
RECTOVAGINAL SEPTUM

SEPTUM ONLY

VAGINAL WALL

RECTAL WALL

VAGINA & RECTUM

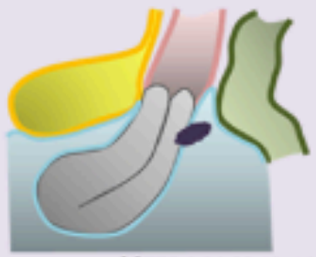


1 LOWER (retroperitoneal) ANTERIOR RECTAL DIE LESIONS
2 UPPER (visible at laparoscopy) ANTERIOR RECTAL DIE LESIONS
3 RECTOSIGMOID JUNCTION DIE LESIONS
4 ANTERIOR SIGMOID DIE LESIONS

POSTERIOR COMPARTMENT

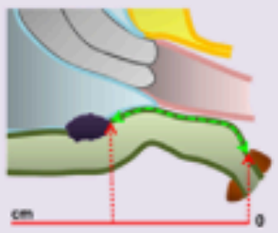
POSTERIOR VAGINAL FORNIX

'DIABOLO-LIKE' NODULE



UTEROSACRAL LIGAMENT

TORUS UTERINUS



RECTUM & RECTOSIGMOID

POU

Consensus Statement

Systematic approach to sonographic evaluation of the pelvis in women with suspected endometriosis, including terms, definitions and measurements: a consensus opinion from the International Deep Endometriosis Analysis (IDEA) group

S. Guerriero, G. Condous ✉, T. van den Bosch, L. Valentin, F. P. G. Leone, D. Van Schoubroeck, C. Exacoustos, A. J. F. Installé, W. P. Martins, M. S. Abrao, G. Hudelist, M. Bazot, J. L. Alcazar, M. O. Gonçalves, M. A. Pascual, S. Ajossa, L. Savelli, R. Dunham, S. Reid, U. Menakaya, T. Bourne, S. Ferrero, M. Leon, T. Bignardi, T. Holland, D. Jurkovic, B. Benacerraf, Y. Osuga, E. Somigliana, D. Timmerman

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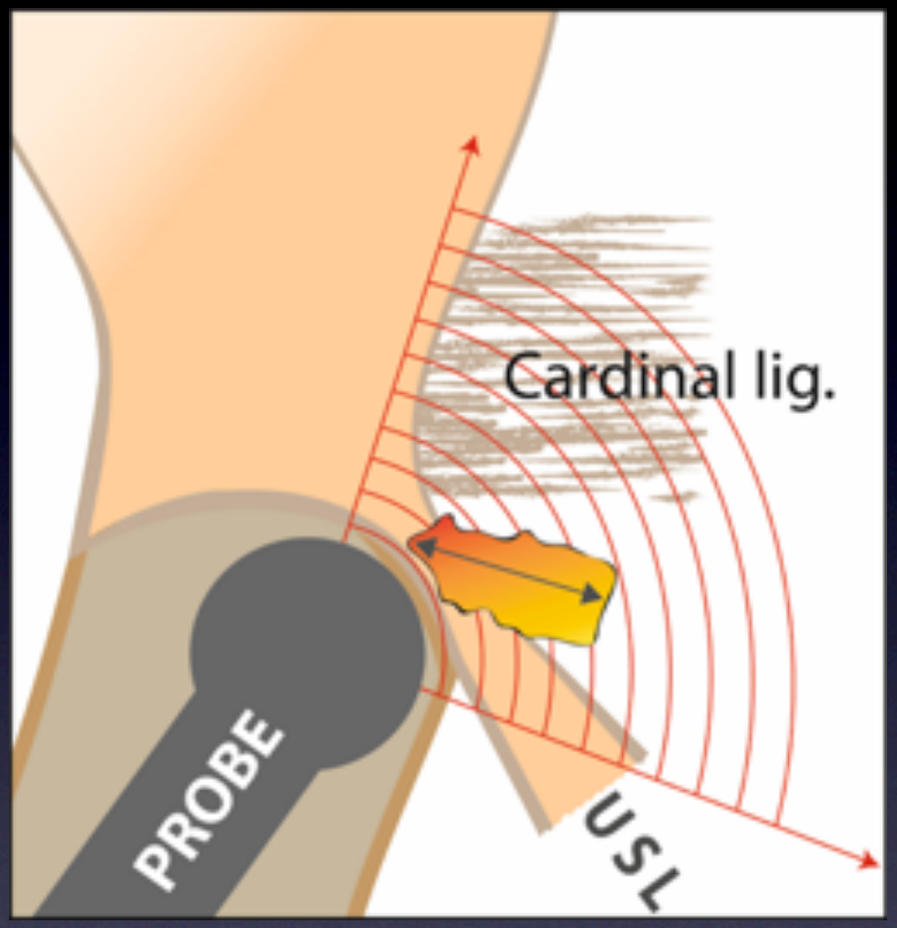
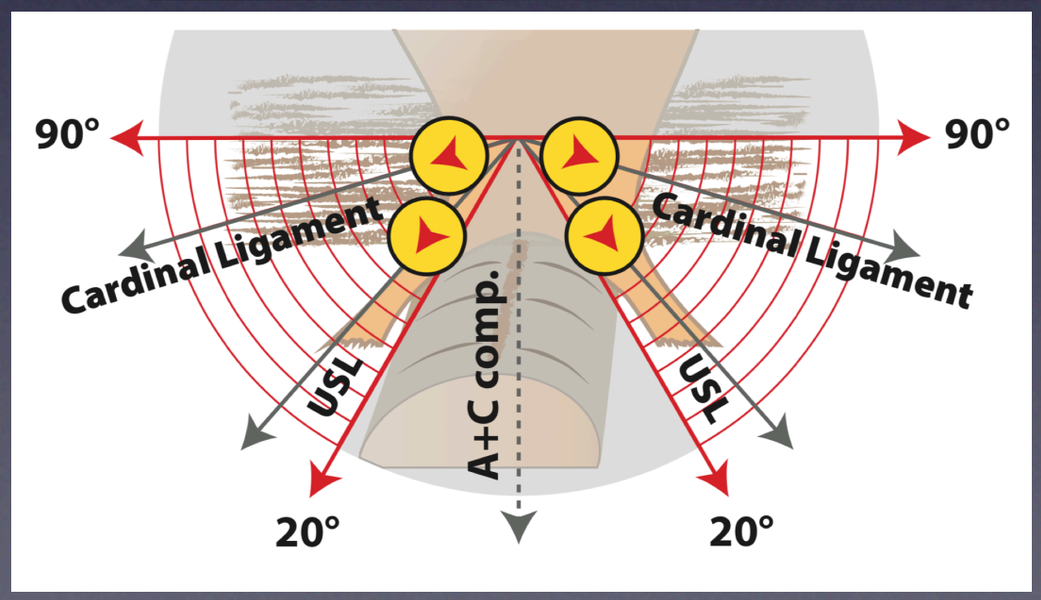
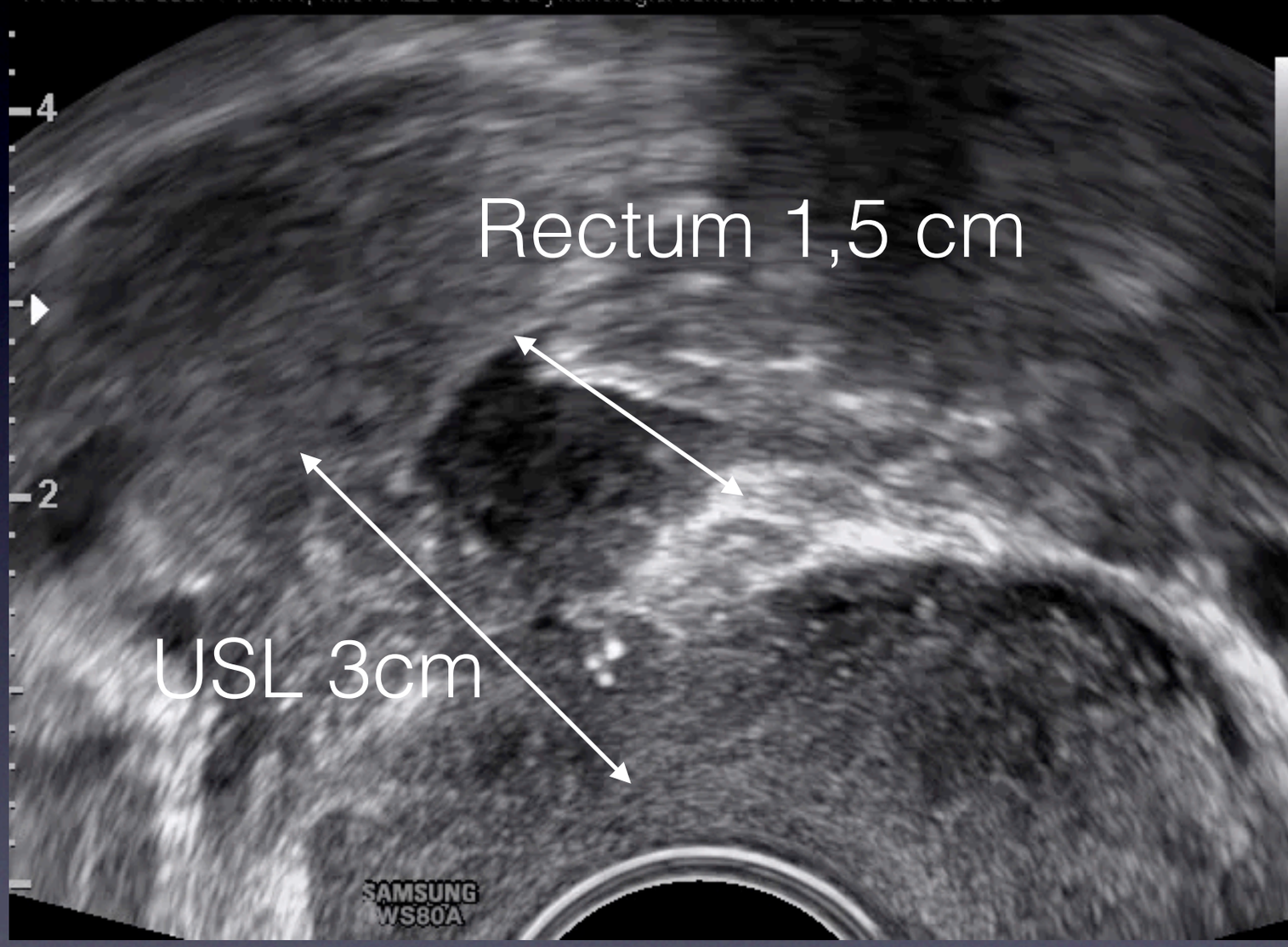
#Enzian**(u)** **by ultrasound**
assessment of the USL and cardinal ligament

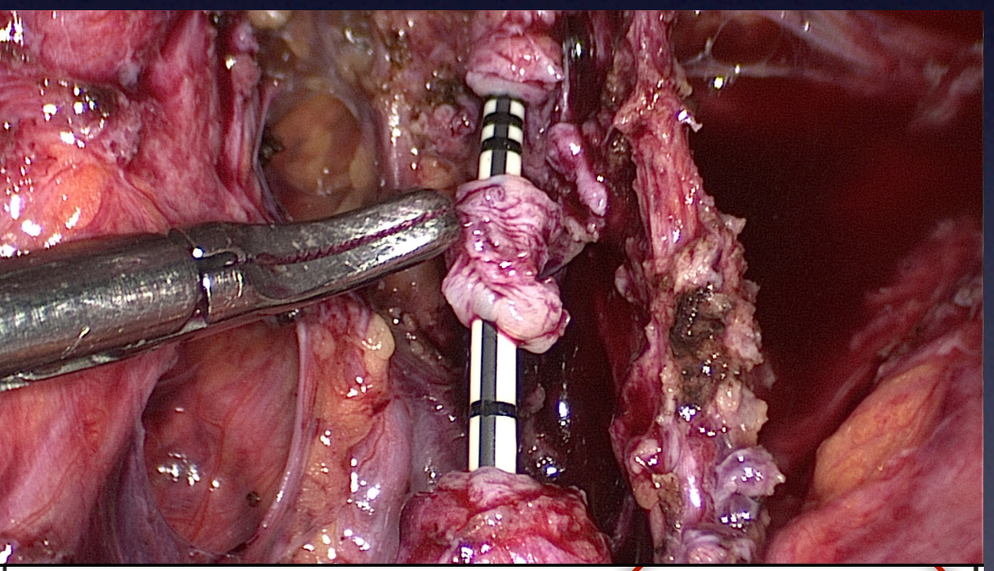


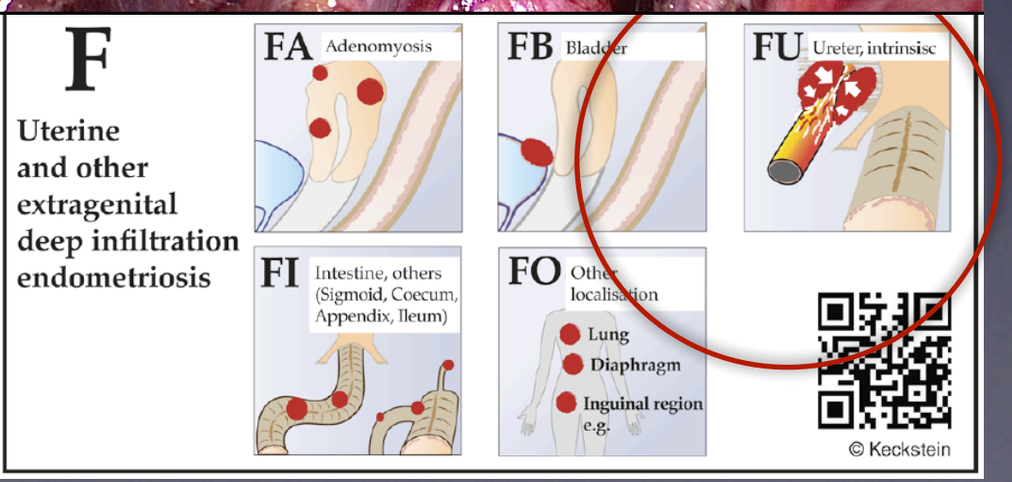


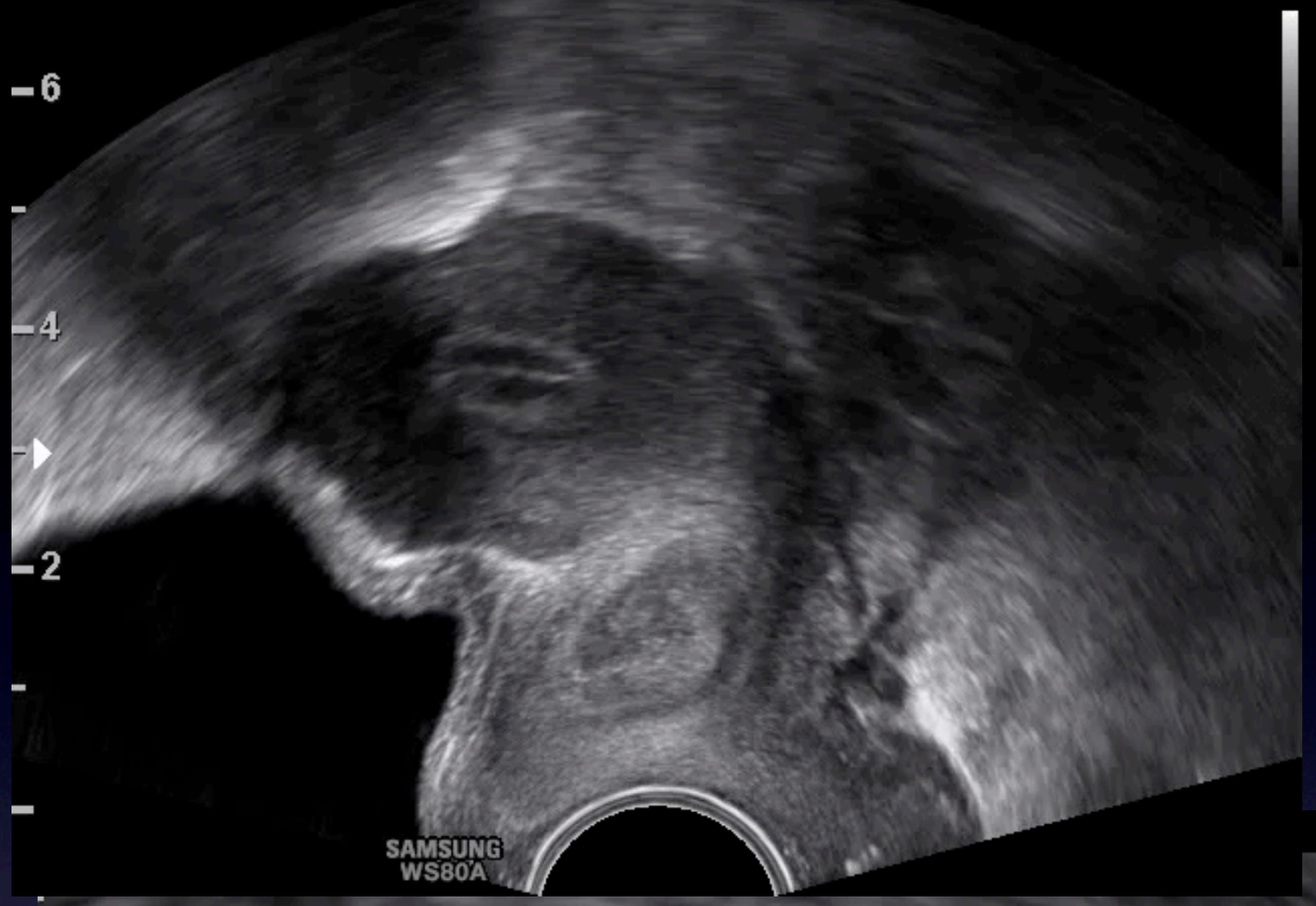


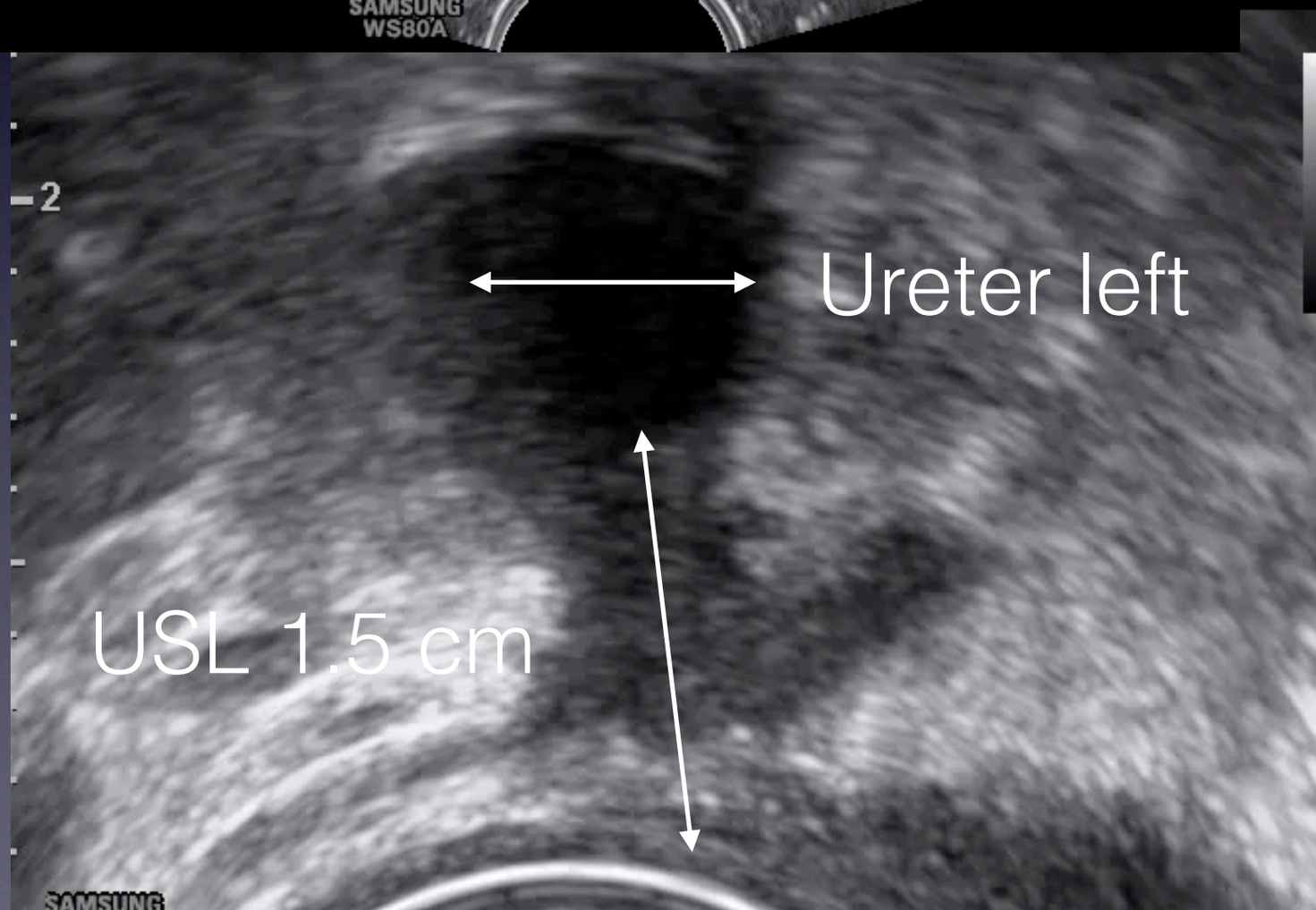
#Enzian B0/2, C2

#Enzian(u) B2/0, FU(left)









#Enzian

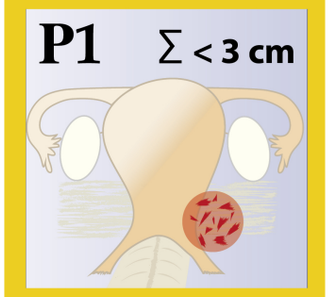
(Classification of Endometriosis)

PERITONEUM

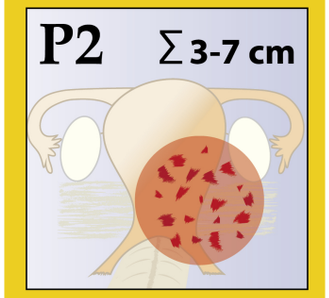
P Peritoneum

- Sum of all diameters

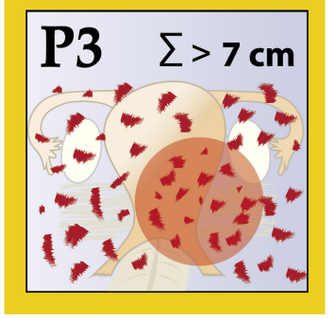
P1 Σ < 3 cm



P2 Σ 3-7 cm



P3 Σ > 7 cm



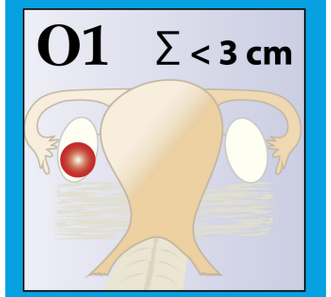
OVARY

O Ovary

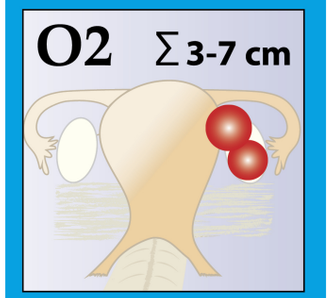
- Sum of all diameters

left right

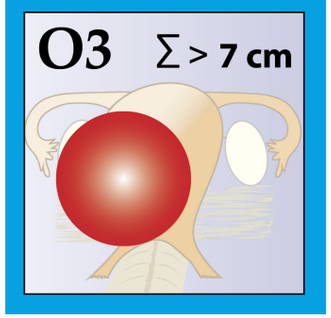
O1 Σ < 3 cm



O2 Σ 3-7 cm



O3 Σ > 7 cm



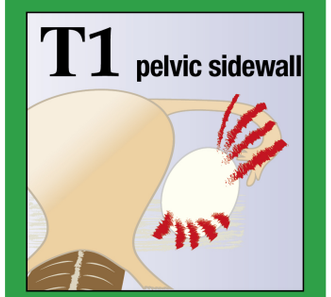
TUBE

T Tubal ovarian condition

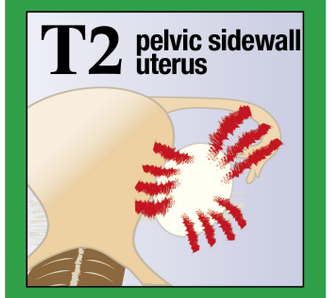
- Adhesions
- Motility
- Patency test

left right

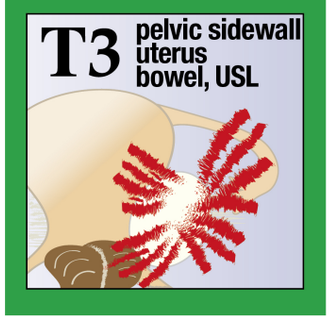
T1 pelvic sidewall



T2 pelvic sidewall uterus



T3 pelvic sidewall uterus bowel, USL

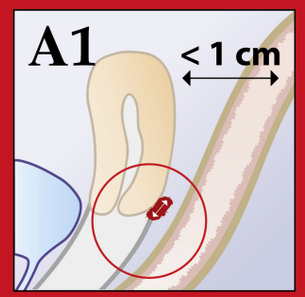


DEEP ENDOMETRIOSIS

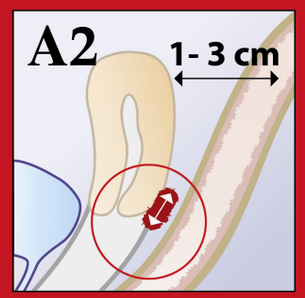
A Rectovaginal space Vagina

- Largest Diameter

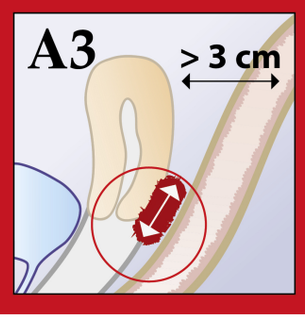
A1 < 1 cm



A2 1- 3 cm

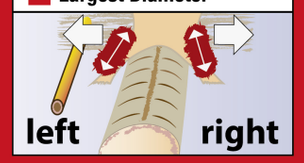


A3 > 3 cm

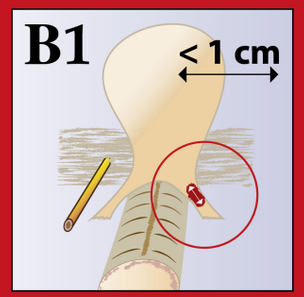


B Sacrouterine ligg. Cardinal ligaments Pelvic sidewall

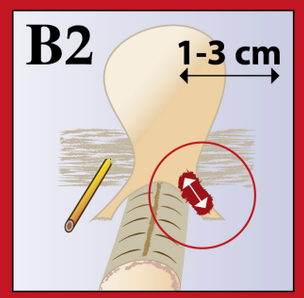
- Largest Diameter



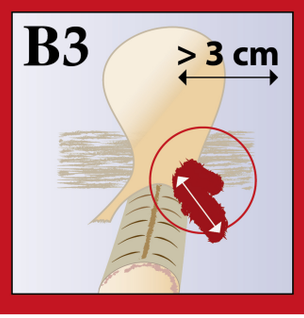
B1 < 1 cm



B2 1-3 cm



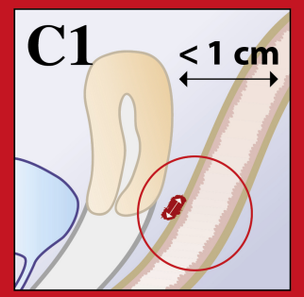
B3 > 3 cm



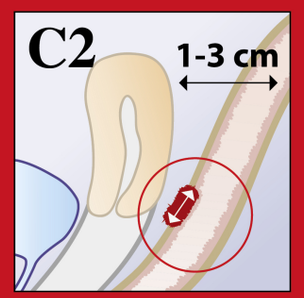
C Rectum

- Largest Diameter

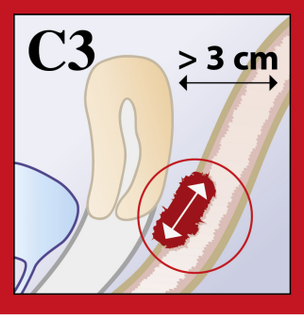
C1 < 1 cm



C2 1-3 cm

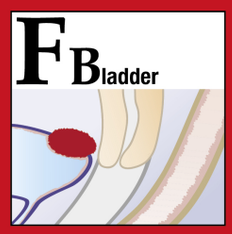


C3 > 3 cm



F Adenomyosis

F Bladder

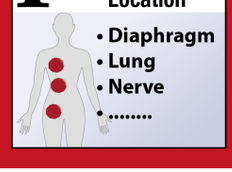


F Intestinum

F Ureter

F (.....) Location

- Diaphragm
- Lung
- Nerve
- .....



P____

O___ / ___ (left / right)

- m ovary is missing
- x unknown / not visible

T___ / ___ (left / right)

- m tube is missing
- x unknown / not visible
- + or - Patency test

A____

B___ / ___ (left / right)

C____

F____ (Location)

#Enzian(u) assessment by ultrasound
#Enzian(m) assessment by MRI
#Enzian(s) assessment by surgery

a) surgical coding only

peritoneal lesions, sum < 3 cm

USL/card.lig., size of lesion -
left: 1-3cm / **right**: no pathology

#Enzian(s) P1, O1/0, T3-/0+, B2/0, Cx, F(diaphragm)

(s) = surgical

left ovary: endometrioma <3cm
right ovary: no pathology

left adnexa: T3, tube not patent/
right adnexa: no adhesions, tube patent

distant location of deep endometriosis, e.g. diaphragm

x = **rectum** not assessable

b) surgical coding including ultrasound findings

#Enzian(s) P1, O1/0, T3-/0+, B2/0, $C1_u$, FA_u, F(diaphragm)

rectal endometriosis <1cm

adenomyosis

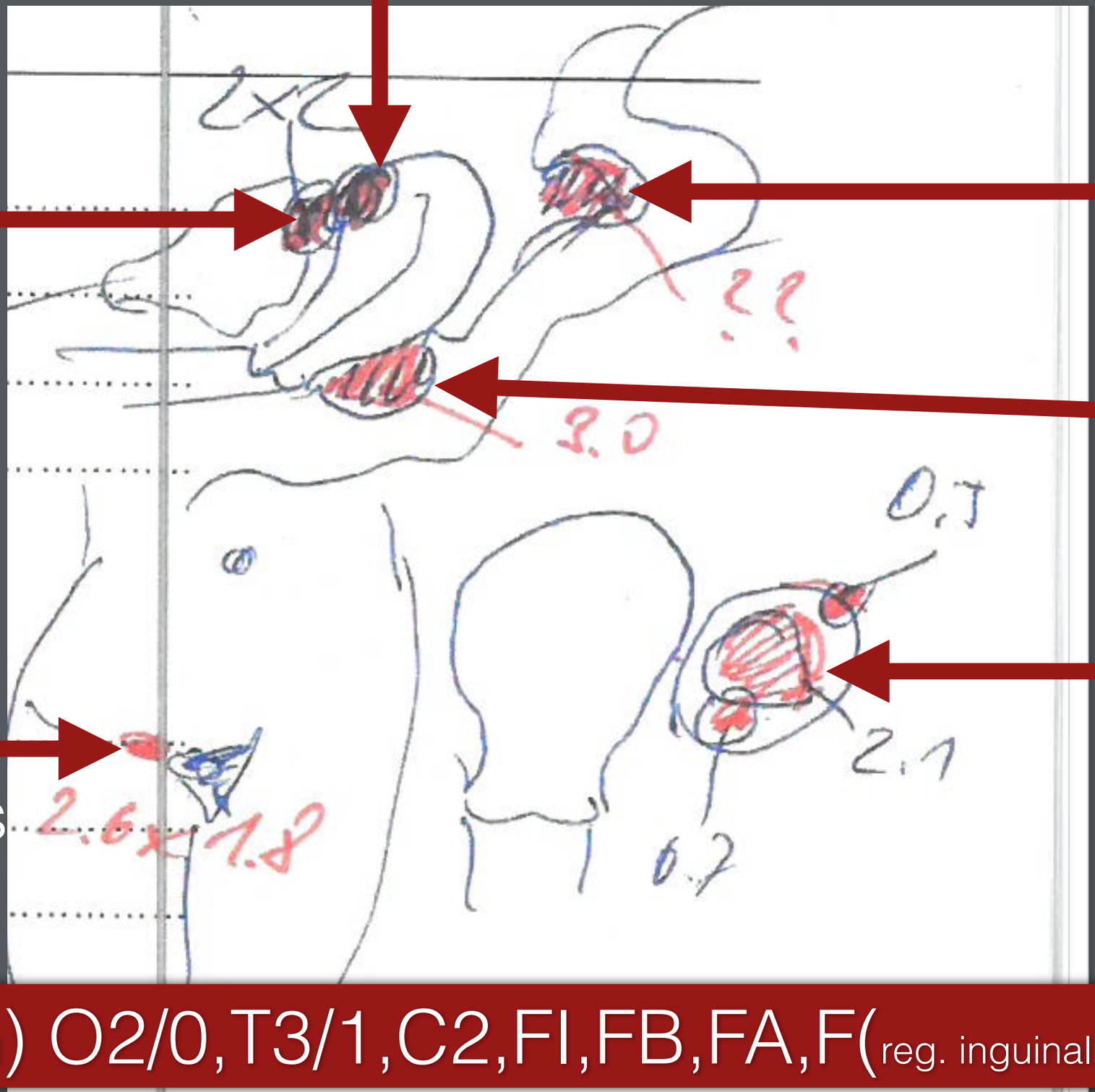
subscript $_u$ = optional code for ultrasound findings, which were not identified surgically

Enzian(m) O2/0,C2,FI,FB,FA,F(reg. inguinalis dext)

How to describe the extent of the disease?

Uterus

Bladder



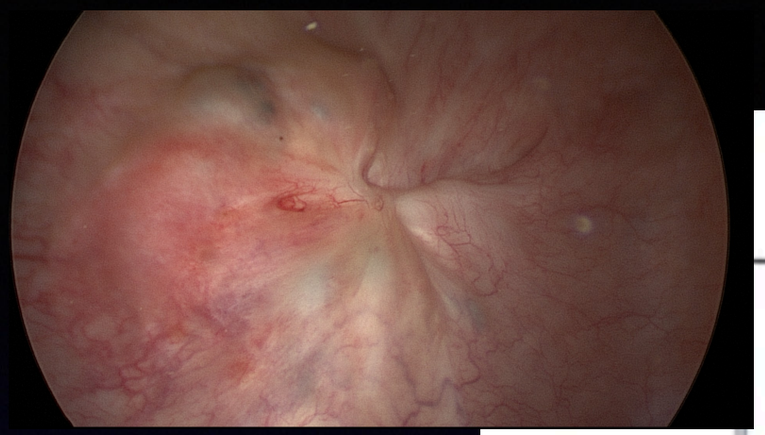
Sigmoid

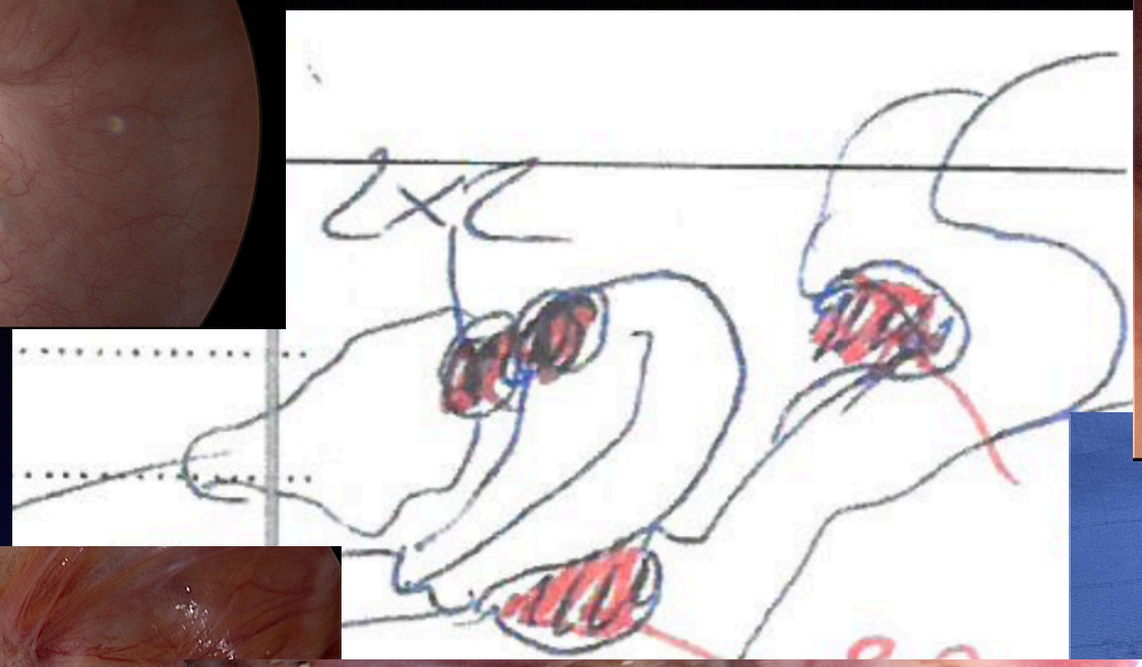
Rectum

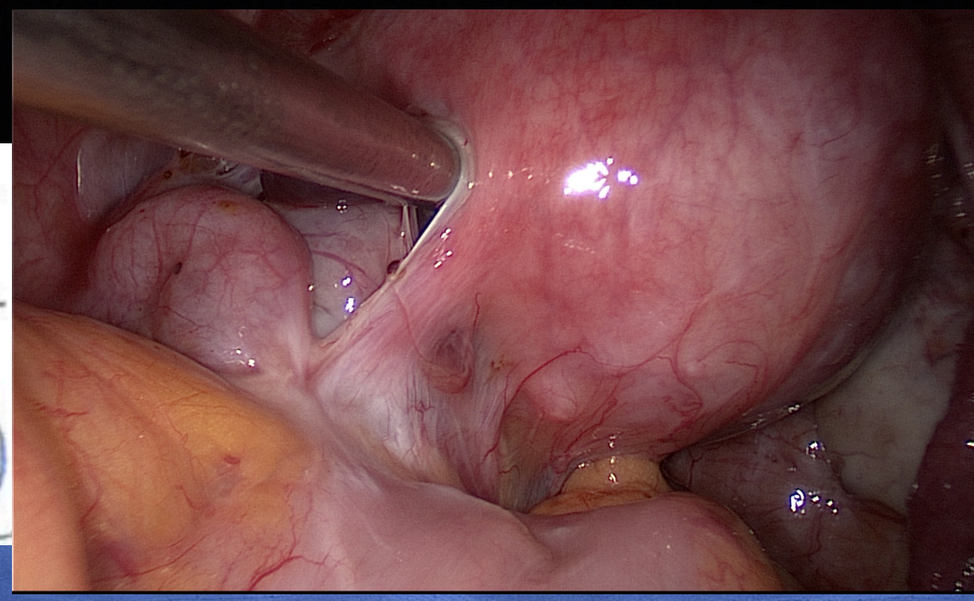
Ovary

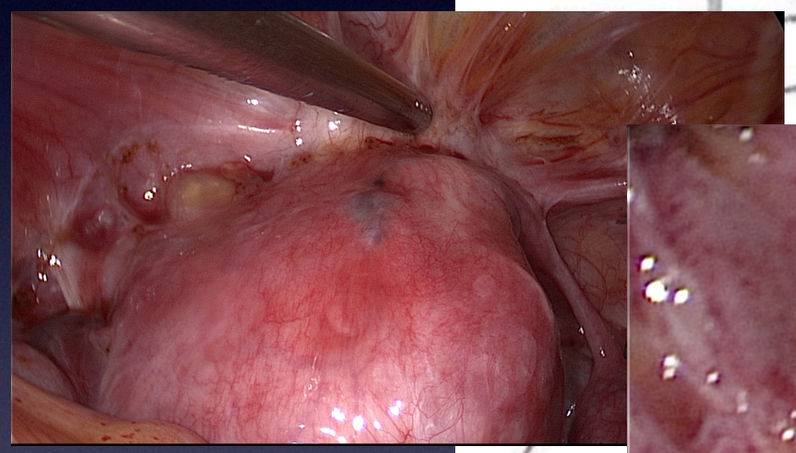
Reg. inguinalis

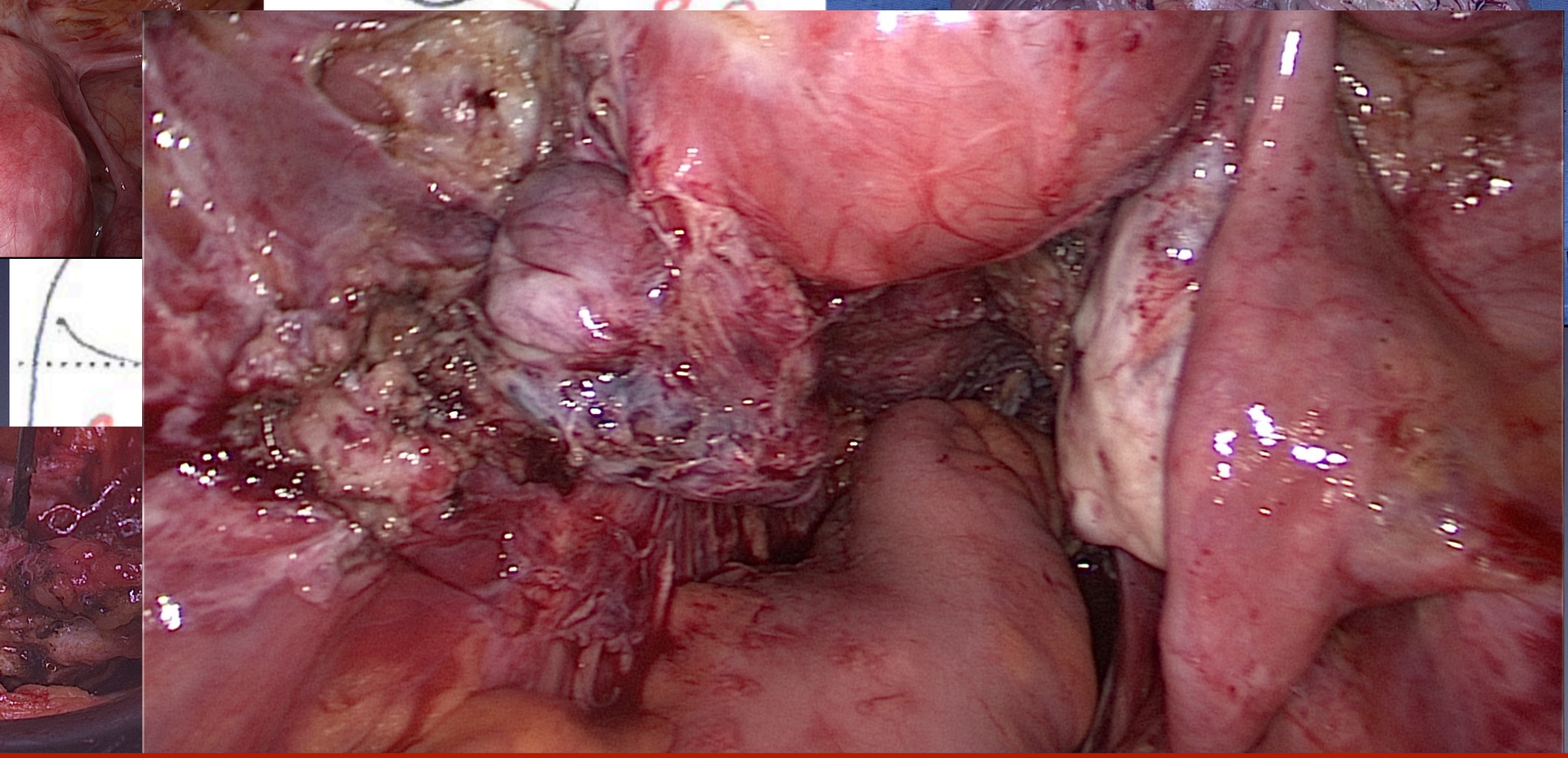
Enzian(u) O2/0,T3/1,C2,FI,FB,FA,F(reg. inguinalis dext)(m)

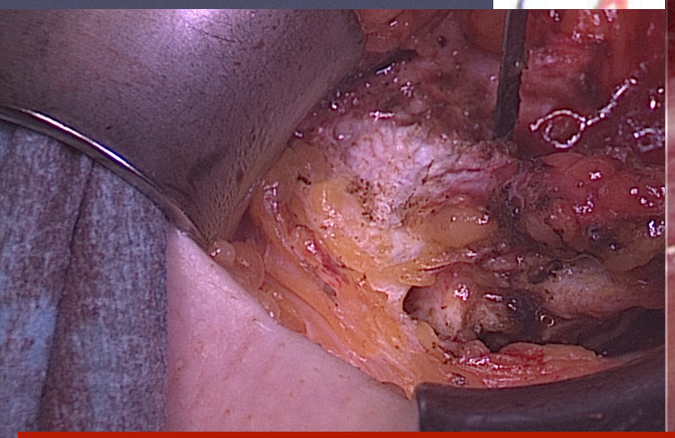












#Enzian(s) P2, O2/O, T3/1, C2, FI(sigma), FA, FB, F (reg. ing. dxt)


Enzian - 2002
#ENZIAN - 2019
SEF - Scientific Endometriosis Foundation
Germany, Austria, Switzerland
Spa
Seehotel Enzian