AGL 2022

51st GLOBAL CONGRESS ON MIGS

December 1–4, 2022 | Gaylord Rockies Resort and Convention Center | Aurora, Colorado

SYLLABUS

ENDO-610: Diagnosing and Evaluating the Extent of Endometriosis with Imaging

SCIENTIFIC PROGRAM CHAIR
ANDREW I. SOKOL, MD

HONORARY CHAIR
CHARLES E. MILLER, MD

PRESIDENT
MAURICIO S. ABRÃO, MD, PHD

Table of Contents

Disclosure of Relevant Financial Relationships

As an ACCME accredited provider, AAGL must ensure balance, independence, and objectivity in all CME activities to promote improvements in health care and not proprietary interests of an ineligible company. AAGL controls all decisions related to identification of CME needs, determination of educational objectives, selection and presentation of content, selection of all persons in a position to control content, selection of educational methods, and evaluation of the activity. Course chairs, planning committee members, faculty, authors, moderators, and others in a position to control the content of this activity are required to disclose all financial relationships with ineligible companies. All relevant financial relationships are appropriately mitigated, and peer review is completed by reviewers who have nothing to disclose. Learners can assess the potential for commercial bias when disclosure, mitigation of conflicts of interest, and acknowledgment of commercial support are provided prior to the activity. Informed learners are the final safeguards in assuring that a CME activity is independent from commercial bias. We believe this mechanism contributes to the transparency and accountability of CME.

Asterisk (*) denotes no financial relationships to disclose.

PLANNER DISCLOSURE

The following members of AAGL have been involved in the educational planning and/or review of this course (listed in alphabetical order by last name).

Linda J. Bell, Admin Support, AAGL*
Linda D. Bradley, MD, Medical Director, AAGL*
Erin T. Carey, MD, MSCR
Honorarium: Med IQ
Research Funding: Eximis
Mark W. Dassel, MD*
Linda Michels, Executive Director, AAGL*
Vadim Morozov, MD
Speaker: AbbVie
Consultant: Medtronic, Lumenis
Erinn M. Myers, MD
Speakers Bureau: Intuitive Surgical
Amy J. Park, MD
Speaker: Allergan
Nancy Williams, COO, CME Consultants*
Harold Y. Wu, MD*
Alessandra DiGiovanni, MD*
Andrea Vidali, MD – Stockholder: Pregmune llc

SCIENTIFIC PROGRAM COMMITTEE

Andrew I. Sokol, MD - Medical Legal Defense: Johnson & Johnson
Angela Chaudhari, MD - Consultant: Johnson & Johnson Cara R. King, DO*
Mario Malzoni, MD – Consultant: KARL STORZ
Jessica Opoku-Anane, MD, MS – Consultant: Boston Scientific; Myovant Sciences; AbbVie
Shailesh P. Puntambekar, MD, PHD*
Frank F. Tu, MD, MPH*
Jonathon M. Solnik, MD – Consultant: Olympus; Medtronic; Stockholder: Field Trip Health, Inc.; Felix Health
Linda D. Bradley, MD, Medical Director*
Linda Michels, Executive Director, AAGL*

FACULTY DISCLOSURE

The following have agreed to provide verbal disclosure of their relationships prior to their presentations. They have also agreed to support their presentations and clinical recommendations with the "best available evidence" from medical literature (in alphabetical order by last name).

Helizabeth Salomao, Ayroza-Ribeiro, MD, PhD*
Alessandra DiGiovanni, MD*
Juan Gilabert Estelles, MD, PhD*
Priyanka Jha, MBBS*
Andrea Vidali, MD – Stockholder: Pregmune llc

ENDO-610: New Insights in the Management of Deep Endometriosis

Chair: *Alessandra DiGiovanni, MD, Andrea Vidali, MD*

Faculty: *Helizabeth Salomao Ayroza-Ribeiro, MD, PhD, Juan Gilabert Estelles, MD, PhD, Priyanka Jha, MBBS*

Course Description

This course provides evidence-based techniques for evaluating adenomyosis and endometriosis with pelvic sonography and MRI, emphasizing the crucial role of strict cooperation between imaging operators and surgeons.

Leading experts from around the world will share their strategies for recognizing and confidently diagnosing these conditions.

Pictures and video both from ultrasound/MRI and surgical procedures will guide participants through technical and practical aspects, emphasizing that findings and features important for guiding preoperative planning and counseling of patients affected by the disease.

Learning Objectives

At the conclusion of this course, the participant will be able to: Improve diagnostic confidence evaluating for endometriosis on abdomino/pelvic sonography and MRI; 2) Discuss the utility of pelvic sonography for the diagnosis of deep endometriosis with emphasis on the most common locations, and when and why ask for MRI where needed; and Discuss which information from US/MRI imaging are relevant to set proper surgical strategy.

Course Outline

9:45 am	Welcome, Introduction and Course Overview	M. A. DiGiovanni/A. Vidali
9:50am	Anterior and Posterior Compartment: US Evaluation	A. DiGiovanni
10:15 am	Role of MREI in Deep Endometriosis: Advantages Over Expert Performed Ultrasound	P. Jha
10:40 am	Towards a Common Language: Latests Proposals for Classification and Staging	H.S. Ayroza-Ribeiro
11:05 am	How Imaging can Affect Surgical Strategy: Pelvic Dye Treatment	J. Gilabert Estelles
11:30 am	How Imaging can Affect Surgical Strategy: Extra Pelvic Dye Treatment	A. Vidali
9:10 am	Questions & Answers	All Faculty
9:30 am	Adjourn	

AGL 2022
51st GLOBAL CONGRESS AURORA, COLORADO - DECEMBER 1-4

ENDO-610

NEW INSIGHTS IN THE MANAGEMENT OF DEEP ENDOMETRIOSIS

ANTERIOR AND POSTERIOR COMPARTMENT : US EVALUATION

Alessandra Di Giovanni, MD
ENDOscopica
MALZONI GROUP

DIAGNOSTIC LPS/SEE &TREAT APPROACH

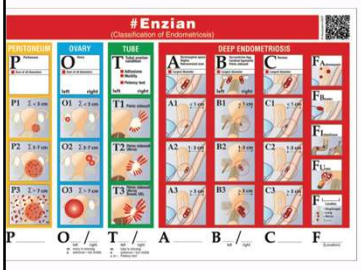
in general. Also according to the Practice Committee of the American Society for Reproductive Medicine (2008), 'endometriosis should be viewed as a chronic disease that requires a life-long management plan with the goal of maximizing the use of medical treatment and avoiding repeated surgical procedures'.

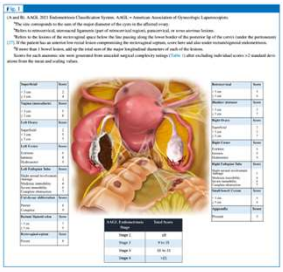
"In conclusion, in the light of recent advances in imaging techniques, both the definition of DE and the use of laparoscopy as the gold standard in the diagnosis of DE, deserve to be revised. Further efforts should be made to improve the knowledge of sonologists and radiologists on imaging criteria for early detection of this debilitating pathology."

"The diagnostic performance of TVS and MRI is similar for detecting DIE involving the rectosigmoid, uterosacral ligaments and rectovaginal septum."

Transvaginal ultrasound *vs* magnetic resonance imaging for diagnosing deep infiltrating endometriosis: systematic review and meta-analysis

US/MRI PRESURGICAL CLASSIFICATION/STAGING





Recommendations (2-3)

Clinical examination, including vaginal examination where appropriate, should be considered to identify deep nodules or endometriomas in patients with suspected endometriosis, although the diagnostic accuracy is low. ⊕○○○

In women with suspected endometriosis, further diagnostic steps, including imaging, should be considered even if the clinical examination is normal. ⊕⊕○○

Recommendation (4)

Clinicians should not use measurement of biomarkers in endometrial tissue, blood, menstrual or uterine fluids to diagnose endometriosis. ⊕⊕⊕○

NICE National Institute for Health and Care Excellence

NICE guideline

Ultrasound

1.5.2 Consider transvaginal ultrasound:

- to investigate suspected endometriosis even if the pelvic and/or abdominal examination is normal
- to identify endometriomas and deep endometriosis involving the bowel, bladder or ureter.

1.5.3 If a transvaginal scan is not appropriate, consider a transabdominal ultrasound scan of the pelvis.

Always TV, consider TR if TV not feasible

Serum CA125

1.5.4 Do not use serum CA125 to diagnose endometriosis.

1.5.5 If a coincidentally reported serum CA125 level is available, be aware that:

- a raised serum CA125 (that is, 35 IU/ml or more) may be consistent with having endometriosis
- endometriosis may be present despite a normal serum CA125 (less than 35 IU/ml).

MRI

1.5.6 Do not use pelvic MRI as the primary investigation to diagnose endometriosis in women with symptoms or signs suggestive of endometriosis.

1.5.7 Consider pelvic MRI to assess the extent of deep endometriosis involving the bowel, bladder or ureter.

1.5.8 Ensure that pelvic MRI scans are interpreted by a healthcare professional with specialist expertise in gynaecological imaging.

Diagnostic laparoscopy

Also refer to section 1.10 on surgical management, and section 1.11 on surgical management if fertility is a priority.

1.5.9 Consider laparoscopy to diagnose endometriosis in women with suspected endometriosis, even if the ultrasound was normal.

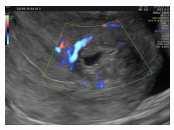
1.5.10 For women with suspected deep endometriosis involving the bowel, bladder or ureter, consider a pelvic ultrasound or MRI before an operative laparoscopy.

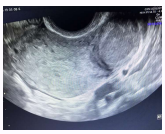
1.5.11 During a diagnostic laparoscopy, a gynaecologist with training and skills in laparoscopic surgery for endometriosis should perform a systematic inspection of the pelvis.

1.5.12 During a diagnostic laparoscopy, consider taking a biopsy of suspected endometriosis.

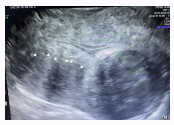
ADENOMYOSIS
ADNEXAL ENDOMETRIOSIS
ADHESIONS
DEEP INFILTRATING ENDOMETRIOSIS

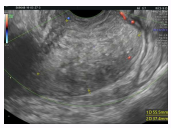

SEVERE DIFFUSE ADENOMYOSIS


NODULAR FOCAL ADENOMYOSIS


CYSTIC FOCAL ADENOMYOSIS


COMBINED DIFFUSE/NODULAR FOCAL ADENOMYOSIS


COMBINED FIBROIDS/ DIFFUSE ADENOMYOSIS


CERVICAL ADENOMYOSIS

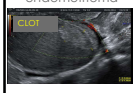
ENDOMETRIOMA EVALUATION
KEY POINTS

UNILOCULAR OR MULTILOCULAR OVARIAN CYST WITH GROUND GLASS CONTENT
REGULAR/IRREGULAR WALLS (no solid component) WITH POOR VASCULARIZATION

AFC/ N° OF LESIONS /POSITION

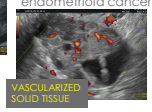
ATYPICAL ENDOMETRIOMA (UNILOCULAR OR MULTILOCULAR SOLID)
LOW RISK OF MALIGNANCY (ENDOMETRIOID/CLEAR CELLS BOT)

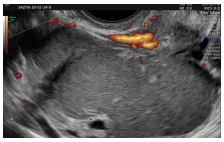
endometrioma



endometrioid BOT

endometrioid cancer





ENDOMETRIOMA IS NOT ALONE

Association with adenomyosis/adhesions/deep endo (20-80%)




deep infiltrating endometriosis

what and where to look for

IT'S ALL ABOUT

ANATOMY

HOW TO DO
MY WAY TO SCAN DEEP INFILTRATING PELVIC ENDOMETRIOSIS

STEPWISE COMBINED TA/TV (and/or TR) US APPROACH

BLADDER
- distance from urethral and ureteral meata/IM segment
- cleavage with anterior adenomyosis

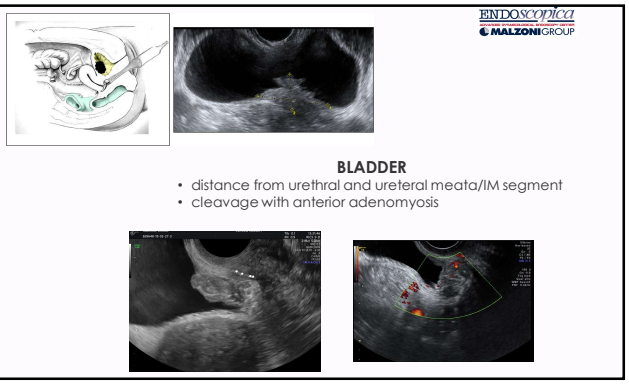
RETRO/PARACERVICAL AREA
- infiltration of torus/USLs
- degree of extension to lateral parametria with distance from intrapelvic ureter (and concomitant kidneys TA evaluation)
- extension to dorsal parametria with distance from presacral plane

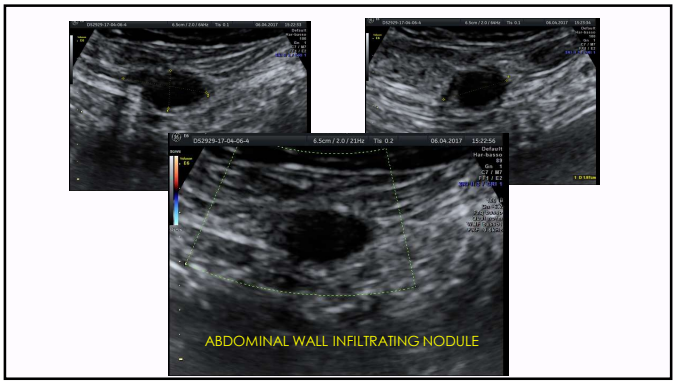
FORNIX AND RVS
- superficial or deep infiltration, isolated (rare) or part of bigger retrocervical nodule
- concomitant infiltration of bowel wall and/or paravaginal – pararectal spaces and grade of extent

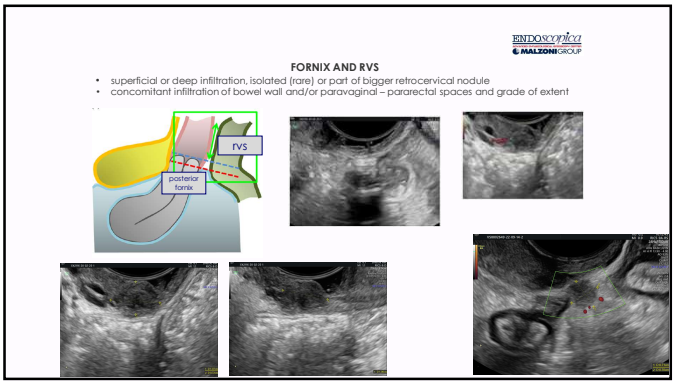
PLEASE NOTE:
measurement of lesions (3 orthogonal diameters) in any compartment is required

BOWEL (combined TA/TV for rectosigmoid, descending colon, right fossa)
- single or multifocal/multicentric lesions
- localization with extimation of distance from the anal verge
- accurate measurement of length, depth and transversal diameter
- % of circumferencial involvement
- % stenosis

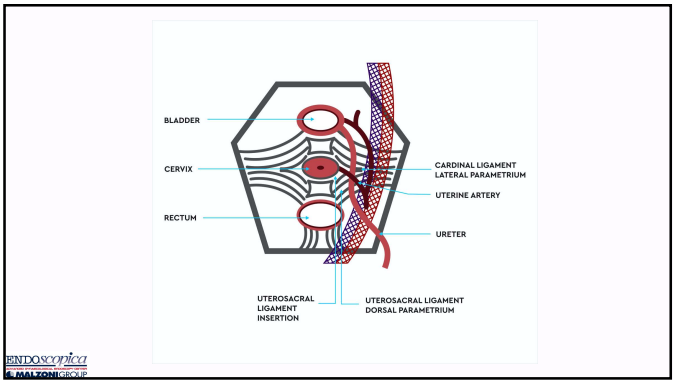
TA evaluation for diaphragm and abdominal wall

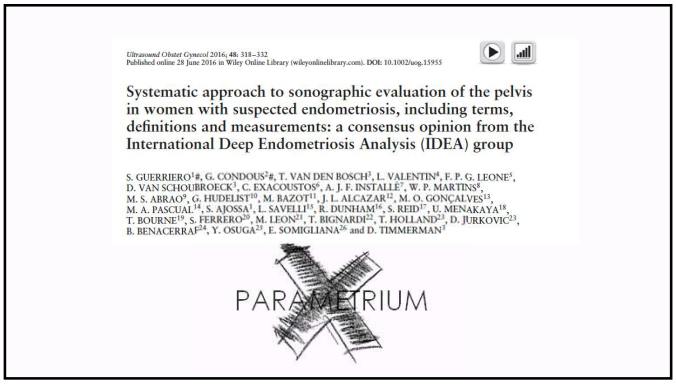






not just 'UTEROSACRAL LIGAMENTS' nodules





Observational Study > Fertil Steril. 2021 Aug;116(2):470-477.
doi: 10.1016/j.fertnstert.2021.03.027. Epub 2021 May 4.

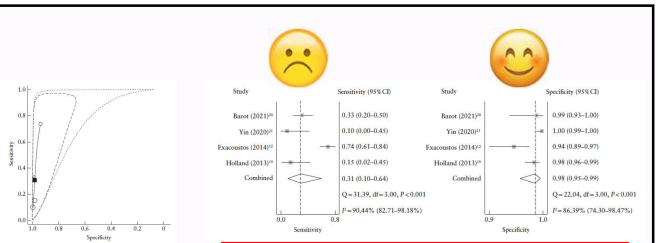
Ureteral endometriosis, the hidden enemy: multivariable fractional polynomial approach for evaluation of preoperative risk factors in the absence of ureteral dilation

Alessandro Arena [1], Simona Del Forno [1], Benedetta Orsini [1], Raffaella Iodice [2], Eugenia Degli Esposti [1], Anna Chiara Aru [1], Federica Manzara [1], Jacopo Lenzi [3], Diego Raimondo [1], Renato Seracchioli [1]

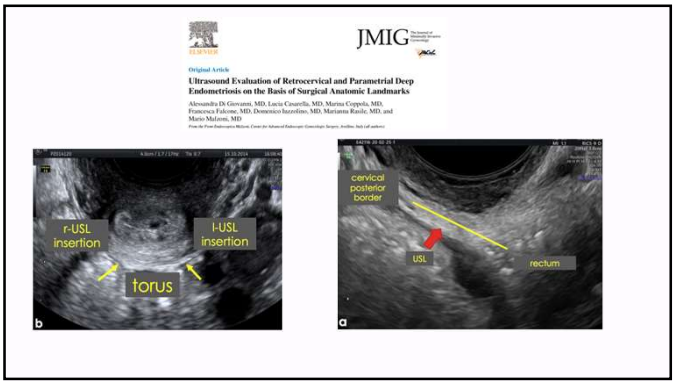
> J Gynecol Obstet Hum Reprod. 2021 Sep;50(7):102116. doi: 10.1016/j.jogoh.2021.102116. Epub 2021 Mar 15.

Sonographic features of endometriosis infiltrating the lateral parametrium

Luca Liban Mariani [1], Matteo Mancarella [2], Lorenzo Novara [2], Nicoletta Biglia [3]



NEED FOR
- standardized exploratory technique
- common terminology to overcome discrepancies in clinical and research settings



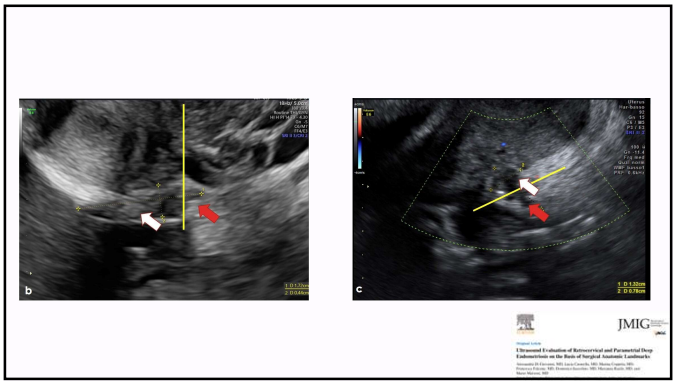
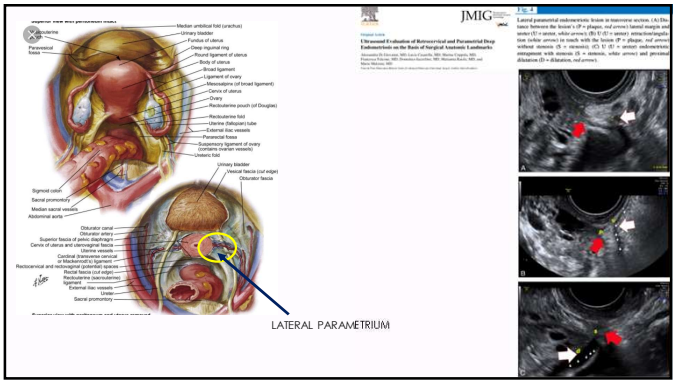


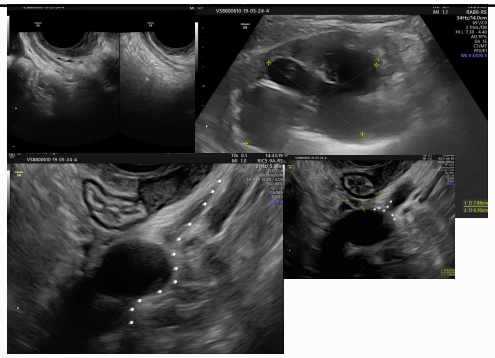
Table 1

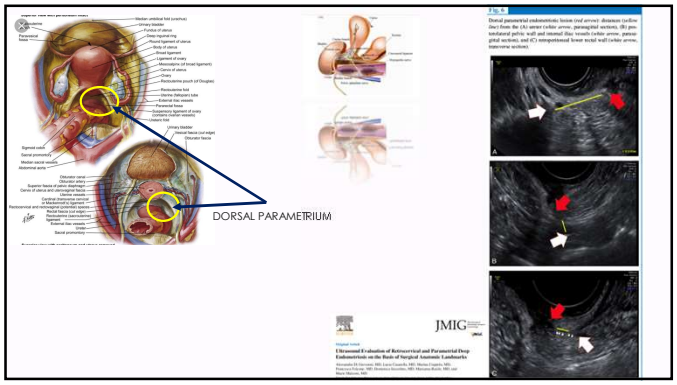
Ultrasound evaluation diagnostic accuracy for endometriotic lesions by site

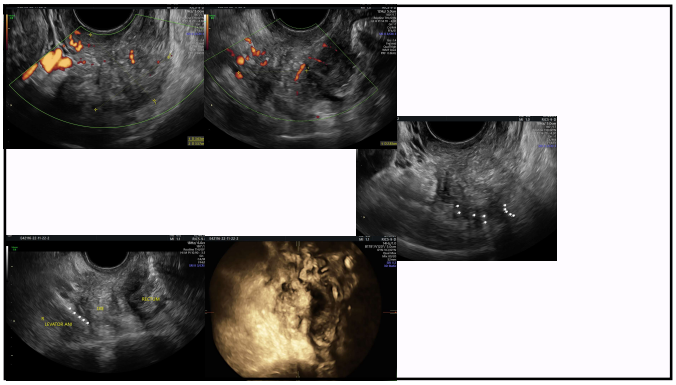
SITE	Surgical prevalence, n (%) (N = 4983)	Sensitivity, % (95% CI)	Specificity, % (95% CI)
Right uterosacral ligament retrocervical insertion	2940 (59)	97.33 (96.63–97.81)	98.22 (97.91–98.97)
Left uterosacral ligament retrocervical insertion	3787 (76)	98.28 (98.26–99.00)	100 (99.53–99.99)
Torus	3637 (73)	98.33 (97.82–98.67)	98.81 (98.09–99.27)
Right parametrium	1694 (34)	97.91 (97.21–98.56)	98.48 (98.04–98.87)
Left parametrium	2043 (41)	98.30 (97.74–98.85)	99.21 (98.75–99.42)

CI = confidence interval.







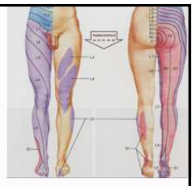


JMIG

Original Article

Five-Year Follow-Up After Laparoscopic Large Nerve Resection for Deep Infiltrating Sciatic Nerve Endometriosis

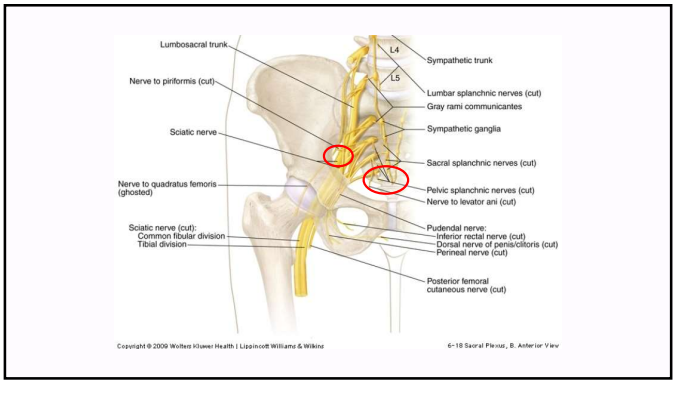
Marc Possover, MD, PhD



Although infiltration of the and the sacral plexus
may be predominantly left-sided, is predominantly right-sided.

At the onset of illness, pain may begin just before menstruation and persist for several days after the end of flow.
Left untreated, neuropathic pain will lose its cyclical nature,
becoming constant and refractory to strong pain medications (opiates and neuroleptics).

Because of nerve damage with axonal destructions,
sciatic pain will be accompanied by
-motor deficits with gait disorder and foot drop, cramping, and/or numbness radiating down the leg
-various neurologic deficits involving the sciatic nerve roots
-positive straight leg raising test (Lasegue)
-reduction/loss of the Achilles reflex
-peripheral neuropathy of the ankle.
-Hoffmann–Tinel sign.



BOWEL

- single or multifocal/multicentric lesions
- localization with extimation of distance from the anal verge
- accurate measurement of length, depth and transversal diameter
- % of circumferencial involvement
- % stenosis

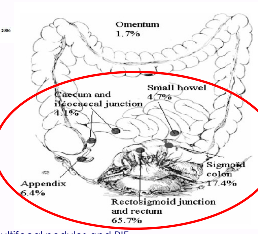
Normal rectosigmoid wall layers: **M** , muscularis (hypoechoic); **SM** , submucosa (hyperechoic);
m, mucosa (hyperechoic); the thin hypoechoic layer between submucosa and mucosa is the musculari mucosae.

ENDOscopica MALZONI GROUP

COMBINED TA/TV APPROACH

Bowel-rectosigmoid

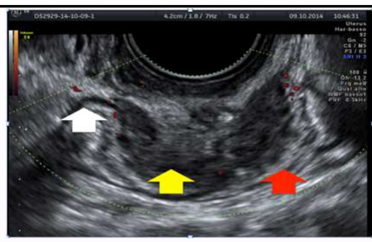
Human Reproduction Vol.21, No.7 pp. 1839–1845, 2006
Advance Access publication March 16, 2006.



CONSIDER:

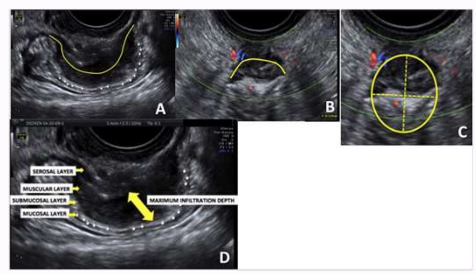
- **MRI:** for multicentric/multifocal nodules and RIF
- **COLONOSCOPY**: in case of rectal bleeding

ENDOscopica MALZONI GROUP

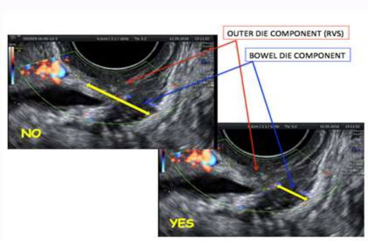


normal muscularis (white arrow); endometriotic infiltration with resulting thickened muscular layer (yellow arrow)
hyperechoic submucosal layer (red arrow) with signs of infiltration (hypoechoic spots)

ENDOscopica MALZONI GROUP



ENDOscopica MALZONI GROUP



ENDOscopica MALZONI GROUP

Table 1

Clinical features of the study patients (n = 296)

Parameter	Value	VAS score, mean ± SD
Age, yr, mean ± SD	35.5 ± 4.7	
BMI, kg/m², mean ± SD	21.9 ± 3.0	
Symptoms, n (%)		
Dysmenorrhea	281 (95)	8.8 ± 1.6
Dyspareunia	225 (76)	7.0 ± 3.0
Dyschezia	240 (81)	7.7 ± 2.6
Constipation	219 (74)	
Bowel occlusion	18 (6)	
Diarrhea	53 (18)	
Rectal bleeding	62 (21)	
Infertility, n (%)		
Primary	71 (24)	
Secondary	15 (5)	
Previous surgery for endometriosis, n (%)		
Total	249 (84)	
≥2 surgeries	124 (42)	

VAS = visual analog scale; BMI = body mass index.

Table 2

Similar diameters of endometriotic nodules as measured by ultrasound and directly in the surgical specimen

Measure	Ultrasound evaluation	Direct measurement on fresh specimen
Longitudinal diameter, mm, mean ± SD	43.19 ± 10.33	42.76 ± 9.86
Transverse diameter, mm, mean ± SD	19.87 ± 6.51	19.64 ± 6.39
Infiltration thickness, mm, mean ± SD	10.79 ± 2.85	10.62 ± 2 .64

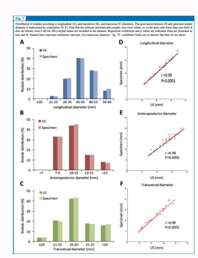
ELSEVIER
JMIG The Journal of Minimally Invasive Gynecology

Original Article

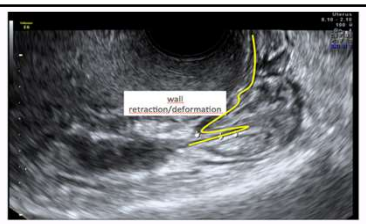
Combined Transvaginal/Transabdominal Pelvic Ultrasonography Accurately Predicts the 3 Dimensions of Deep Infiltrating Bowel Endometriosis Measured after Surgery: A Prospective Study in a Specialized Center

Alessandra Di Giovanni, MD, Lucia Casarella, MD, Marina Coppola, MD, Domenico Iuzzolino, MD, Marianna Rasile, MD, and Mario Malzoni, MD

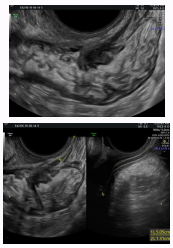
From the Endoscopica Malzoni, Center for Advanced Endoscopic Gynecologic Surgery, Avellino, Italy (all authors).



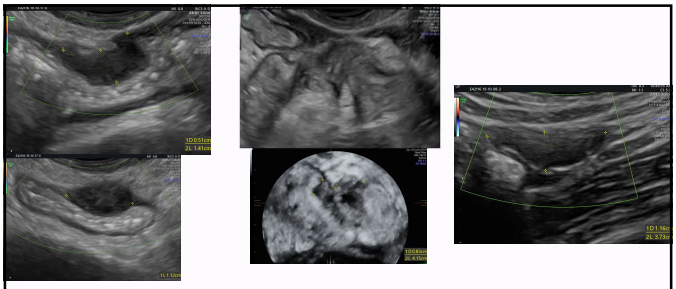
ENDOscopica MALZONI GROUP



Mid-sagittal diameter (lenght) of healthy/normal muscular layer below the infiltrating nodule measured with a curved line (yellow) following muscular layer axis



ENDOscopica
MALZONI GROUP



right iliac fossa

ENDOscopica
MALZONI GROUP

4983 patients undergoing surgery for DIE (2013-2018)

US PRESURGICAL EVALUATION ACCURACY

Table 2 Ultrasound evaluation diagnostic accuracy for endometriotic lesions by site

all-in1: Table 2

Lesion site	Surgical prevalence, n (%) N=4983	Sensitivity % 95% CI	Specificity % 95% CI
Right uterosacral ligament	2940 (59)	97.33 96.63–97.81	98.22 97.91–98.97
Left uterosacral ligament	3787 (76)	98.28 98.26–99.00	100 99.33–99.99
Torus	3637 (73)	98.33 97.82–98.67	98.81 98.09–99.27
Vaginal fornix	1943 (39)	97.35 96.45–97.91	98.42 97.95–98.84
Rectovaginal septum	548 (11)	98.45 97.15–99.26	96.41 96.17–97.21
Right parametrium	1694 (34)	97.91 97.21–98.56	98.48 98.04–98.87
Left parametrium	2043 (41)	98.30 97.74–98.85	99.21 98.75–99.42
Rectum/Rectosigmoid junction	1046 (21)	100 99.46–100	100 99.86–100
Sigmoid	448 (9)	100 99.15–100	100 99.88–100
Ileum/Cecum	49 (1)	82.35 68.64–90.02	98.31 97.94–98.65
Bladder	298 (6)	98.36 96.10–99.28	100 99.75–100

CI=confidence interval.

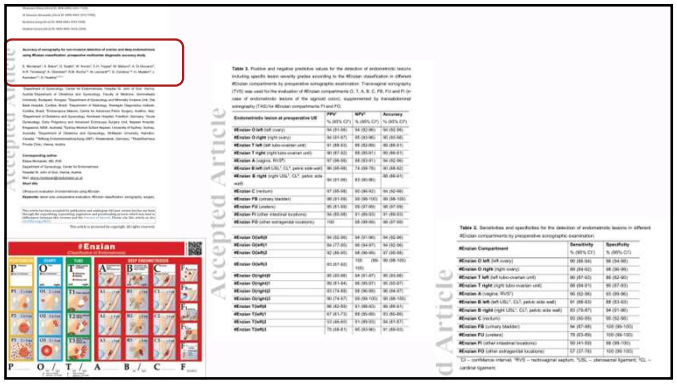
M. Malzoni et al, JMIG 2020

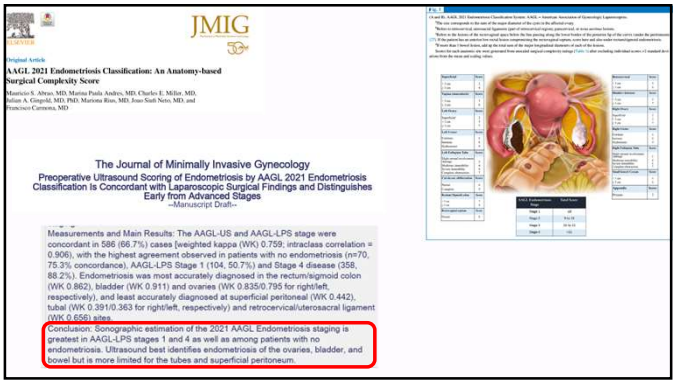
ENDOscopica
MALZONI GROUP

Comparison between sonography-based and surgical evaluation of endometriotic lesions using the #Enzian classification – a retrospective data analysis

#Enzian Compartment	Sensitivity (95% CI*)	Specificity (95% CI*)
#Enzian FB (urinary bladder)	86% (42%-100%)	100% (96%-100%)
#Enzian FI (other intestinal locations)	100% (80%-100%)	100% (95%-100%)
#Enzian FU (ureters)	100% (75%-100%)	100% (95%-100%)
#Enzian FO (other localization)	100% (48%-100%)	98% (92%-100%)
#Enzian A (vagina, retrocervical area, RVS°)	97% (90%-100%)	86% (64%-97%)
#Enzian B left (left USLs°, left parametria)	97% (90%-100%)	70% (47%-87%)
#Enzian B right (right USLs°, right parametria)	100% (95%-100%)	90% (70%-99%)
#Enzian C (rectum)	100% (92%-100%)	96% (86%-100%)
#Enzian O left (left ovary)	100% (91%-100%)	96% (87%-100%)
#Enzian O right (right ovary)	100% (87%-100%)	100% (94%-100%)

Di Giovanni et al, 2021
EUROPEAN J of ULTRASOUND





JMIG

Original Article

AAGL 2021 Endometriosis Classification: An Anatomy-based Surgical Complexity Score

The Journal of Minimally Invasive Gynecology

Preoperative Ultrasound Scoring of Endometriosis by AAGL 2021 Endometriosis Classification Is Concordant with Laparoscopic Surgical Findings and Distinguishes Early from Advanced Stages

--Manuscript Draft--

Measurements and Main Results: The AAGL-US and AAGL-LPS stage were concordant in 586 (66.7%) cases [weighted kappa (WK) 0.759; intraclass correlation = 0.906), with the highest agreement observed in patients with no endometriosis (n=70, 75.3%, concordance), AAGL-LPS Stage 1 (104, 50.7%) and Stage 4 disease (358, 88.2%). Endometriosis was most accurately diagnosed in the rectum/sigmoid colon (WK 0.862), bladder (WK 0.911) and ovaries (WK 0.835/0.795 for right/left, respectively), and least accurately diagnosed at superficial peritoneal (WK 0.442), tubal (WK 0.391/0.363 for right/left, respectively) and retrocervical/uterosacral ligament (WK 0.656) sites.

Conclusion: Sonographic estimation of the 2021 AAGL Endometriosis staging is greatest in AAGL-LPS stages 1 and 4 as well as among patients with no endometriosis. Ultrasound best identifies endometriosis of the ovaries, bladder, and bowel but is more limited for the tubes and superficial peritoneum.

STAGING/CLASSIFICATIONS ADVANTAGES

- ✓ Surgeons/clinicians/radiologists/sonographers

COMMON LANGUAGE

- ✓ EASIER and MORE REPRODUCIBLE disease STAGING
- ✓ Potential REDUCTION in scientific BIASES

ADVANCED EVALUATION
KEY POINTS

OPTIMAL KNOWLEDGE OF PELVIC ANATOMY

OPTIMAL KNOWLEDGE OF PELVIC DISEASES

HIGH LEVEL EXPERTISE IN PELVIC US TECHINIQUE
WITH SPECIFIC TRAINING IN DIE

STRICT COOPERATION WITH EXPERT DEDICATED PELVIC SURGEON(S)

CENTRALIZATION OF PATIENTS' MANAGEMENT IN REFERRAL CENTERS

Alessandra Di Giovanni. MD

ENDOscopica
MALZONI GROUP

Thank you!

ENDOscopica
MALZONI GROUP

Role of MRI in Deep Endometriosis: Advantages Over Expert Performed Ultrasound

Priyanka Jha MBBS
Associate Professor
University of California San Francisco

Disclosures

- None

Learning objectives

- Understand the role for MRI in patients with US diagnosis of endometriosis
- Role of MRI in challenging cases and problem solving
- Focus on neural and thoracic endometriosis

Difference between MRI and US

- Ultrasound
  - Focused evaluation
  - Find what you look for; where you look for it

- MRI
  - Bird's eye view
  - Search pattern helpful
  - What to look for and where?

Strengths of MRI

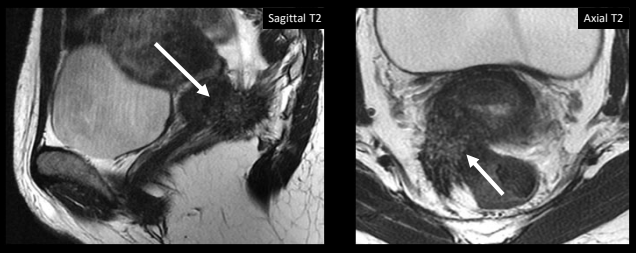
- Tissue characterization and soft tissue contrast
- Anatomic resolution
- Neurological evaluation
- Sites where US can not reach

MRI technique

Hemorrhage in Endometriomas and glandular implants	Anatomic Distortion from scarring and fibrosis
Hemorrhage sensitive sequences T1- weighted sequences with FS	Global view of the pelvis Multiplanar T2-weighted sequences
Diffusion weighted sequences Post contrast sequences	• Malignancy arising in endometriosis • Sometimes helpful in assessing muscularis invasive disease: Bowel and bladder
MR enterography sequences	• Small bowel focused evaluation • Less frequently utilized

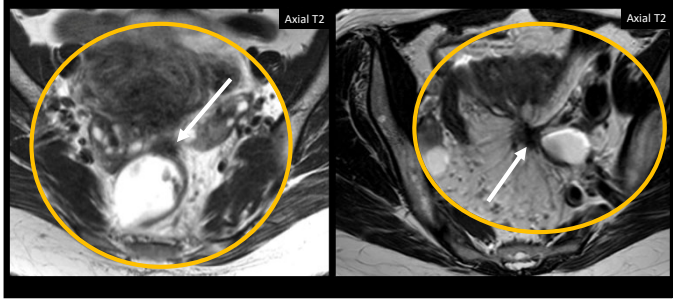
MRI appearance of endometriosis implants

- Spiculated T2-hypointense structure with surrounding fibrotic response



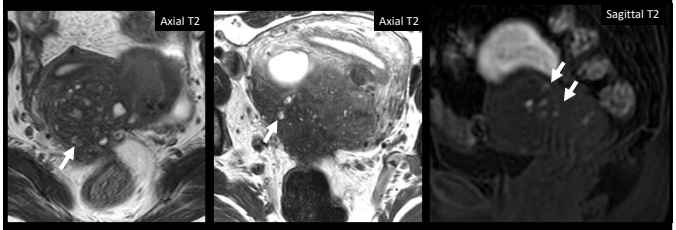
MRI appearance of endometriosis implants

- Variable size



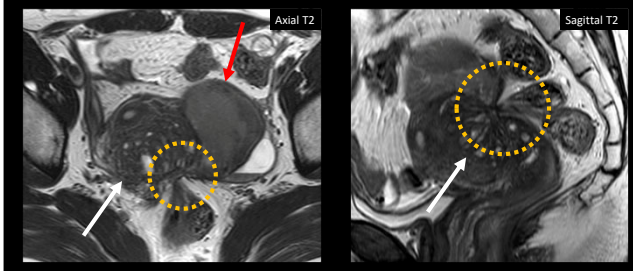
Active glandular components

- T1 and T2-hyperintense foci within the endometriosis plaques



Architectural distortion from endometriosis

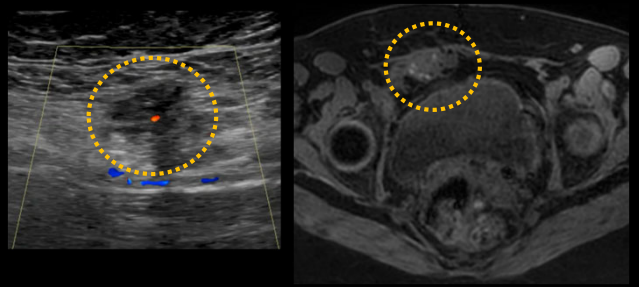
- Tethering and puckering of multiple structures: uterus, ovaries, small and large bowel



Tissue characterization

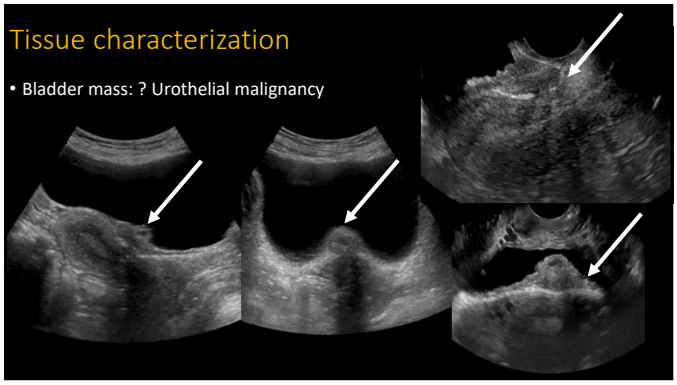
Abdominal wall lesion and tissue characterization

- Abdominal mass with cyclical pain; history of prior C- section



Tissue characterization

- Bladder mass: ? Urothelial malignancy

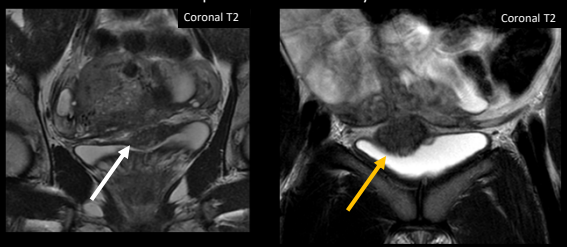


MRI for tissue characterization

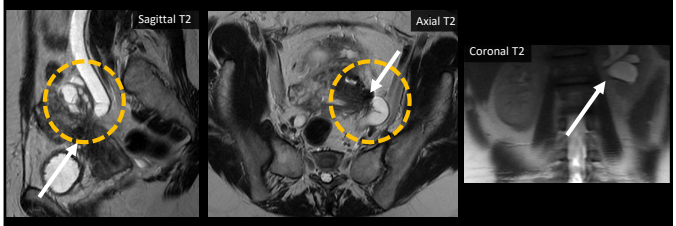
- T1 hyperintense foci within the endometriosis plaques

Urinary involvement

- Full thickness infiltration of the detrusor muscle; resembles a mural mass
- Surgical planning: depth of detrusor invasion
- Distance from the ureteral meata
- Assess whether ureteral reimplantation is necessary

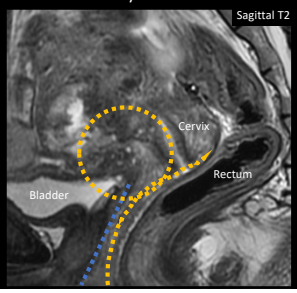


Urinary involvement and surgical planning



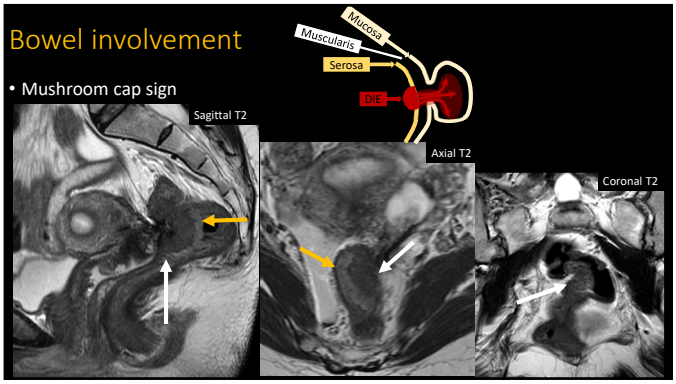
Anterior compartment

- Vesicouterine disease can occasionally obliterate the anterior cul-de-sac



Bowel involvement

- Mushroom cap sign



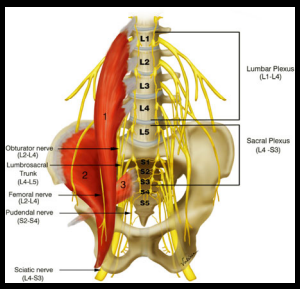
Neural involvement by deep endometriosis

Neural involvement with endometriosis

- Abdominal imagers read endometriosis MRI
- Neuro-imagers are less familiar with endometriosis
- Operate in silos
- Being aware of the neural findings within the realms of the female pelvis essential
- Inflammation + scarring/fibrosis → Permanent damage!

Neural involvement with endometriosis

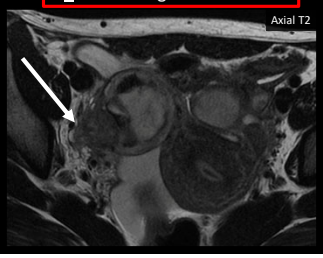
- Plexuses:
  - Inferior hypogastric
  - Lumbosacral
- Large nerves
  - Sciatic nerve
  - Obturator nerve
  - Femoral nerve
  - Pudendal nerve



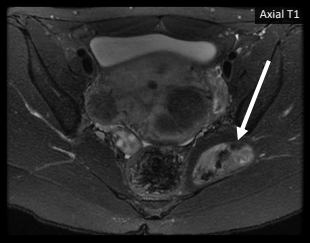
Reference: Filho et al. What abdominal radiologists should know about extragenital endometriosis-associated neuropathy. Abdominal Radiology . 2020 Jun;45(6):1818-1828.

MRI patterns of neural involvement

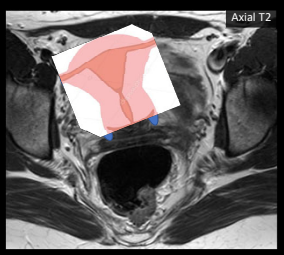
Infiltrative spiculated tissue ± hemorrhagic internal foci

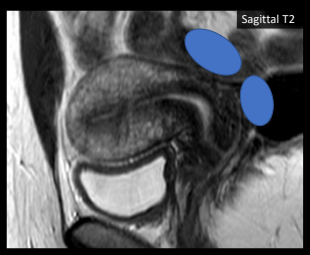


Extra-adnexal endometrioma along the course of nerves



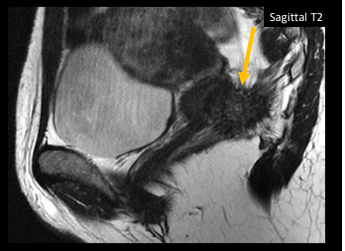
Normal inferior epigastric plexus



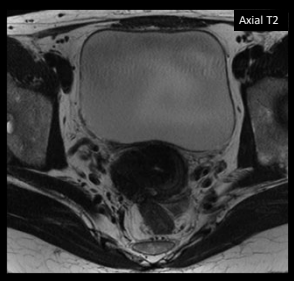


Neural involvement: Inferior hypogastric nerve

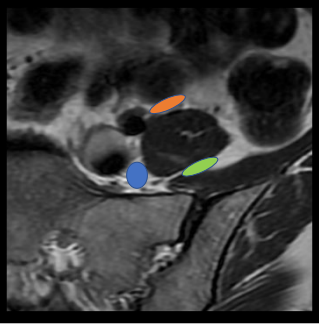
- This just happens to be the most common site of endometriosis!



Inferior hypogastric neural plexus



Psoas muscle and why its important to DE evaluation



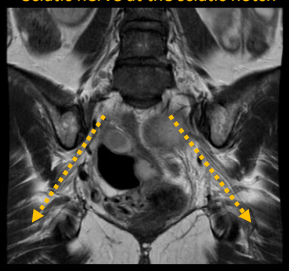
Femoral nerve

Obturator nerve

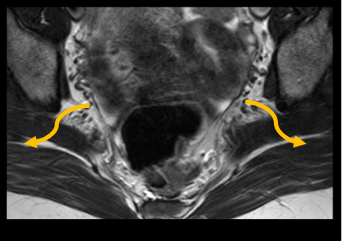
Sciatic nerve roots

Sciatic nerve: Normal appearance and course

- Most common DE nerve involvement→
  - Sciatic nerve at the sciatic notch

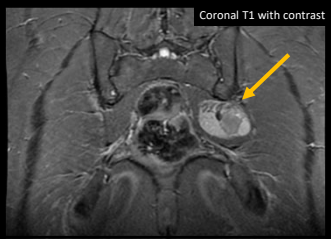


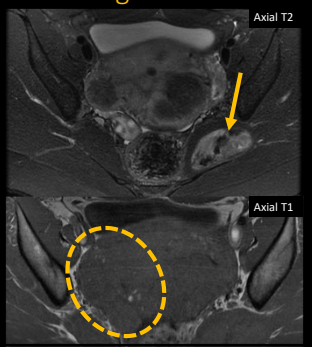
- Can get involved with endometriosis:
  - When arising from nerve roots
  - At its exit from the sciatic notch



Sciatic notch endometrioma with malignant degeneration

- Enhancement atypical for endometrioma
- Endometrial stromal carcinoma



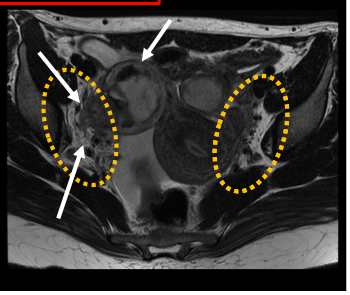


Obturator nerve

- Obturator foramen →
  - Along pelvic side wall
- Longstanding cases →
  - Obturator internus atrophy
- Surgical planning →
  - Invasion vs mass effect

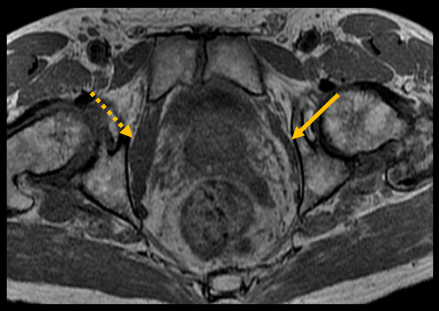
Direct infiltration into obturator foramen

Mass effect on obturator foramen

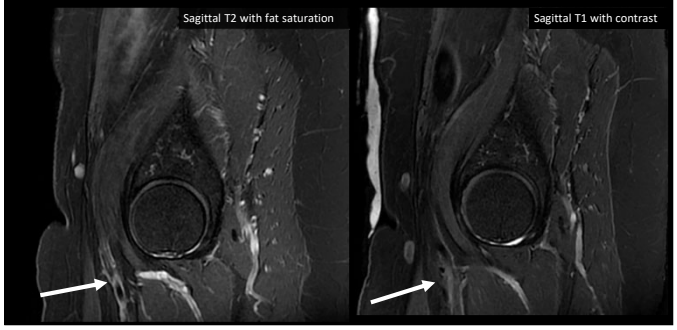


Obturator nerve

- Denervation atrophy

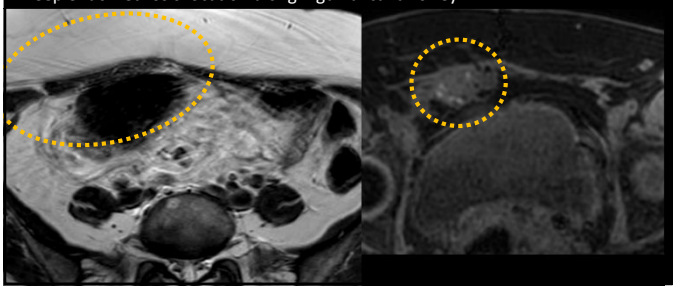


Femoral nerve



Ilioinguinal and iliohypogastric nerve involvement

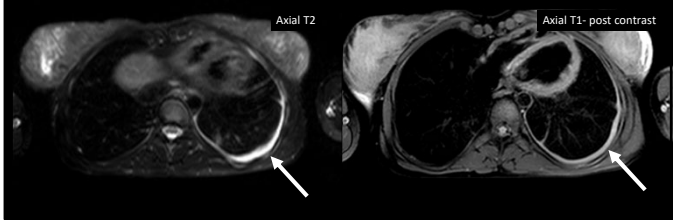
- Deep endometriosis location along inguinal canal is key



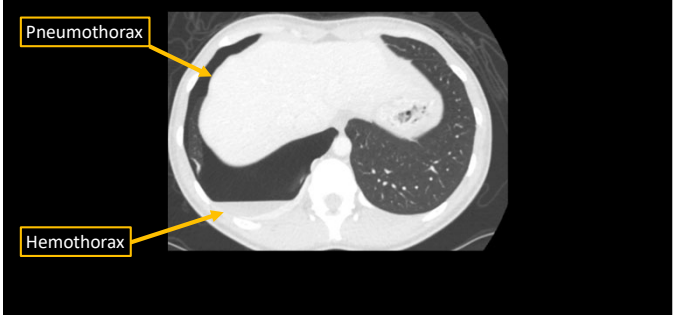
Thoracic deep endometriosis

Thoracic endometriosis

- Patient presented with recurrent hemopneumothorax
- MRI: diffuse T2 hyperintense tissue with homogeneous enhancement; no discrete plaque



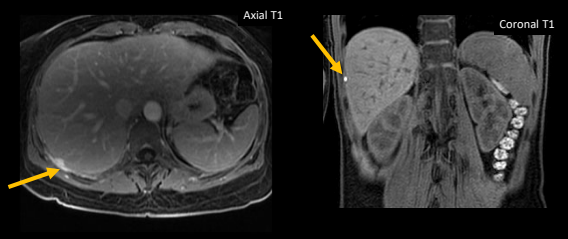
Recurrent catamenial pneumohemothorax



Recurrent catamenial pneumohemothorax

- Implants on pleural surface
- Hemorrhagic fluid on chest tube

Extra-pelvic deep endometriosis



Take home points

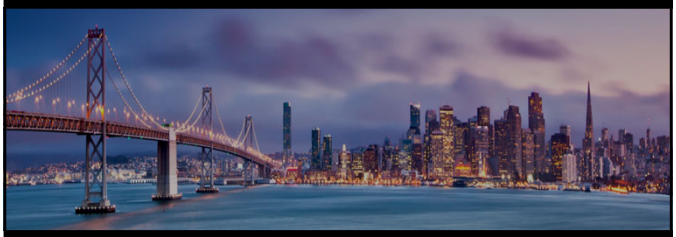
- MRI is complementary to US for deep endometriosis
- In addition to an expert performed ultrasound, MRI can add value by:
  - Tissue characterization
  - Surgical planning
  - Extrapelvic disease- upper abdomen, thoracic and neural endometriosis
- Ultimately, is there a best test?

Take home points

- MRI is complementary to US for deep endometriosis
- In addition to an expert performed ultrasound, MRI can add value by:
  - Tissue characterization
  - Surgical planning
  - Extrapelvic disease- upper abdomen, thoracic and neural endometriosis
- Regional variations based on infrastructure and expertise

Thank you for your attention!

jhap@stanford.edu

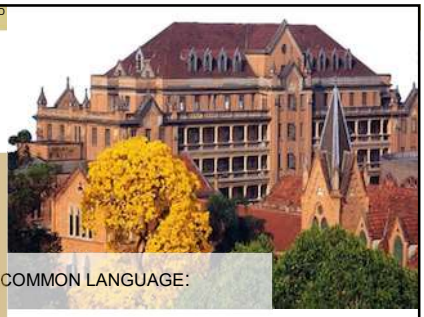


AGL 2022 51st GLOBAL CONGRESS ON MIGS
December 1-4, 2022 | Aurora, CO | congress.aagl.org

AGL 2022 51st GLOBAL CONGRESS ON MIGS
December 1-4, 2022 | Aurora, CO | congress.aagl.org

Profa. Dra. Helizabet Salomão Abdalla Ayroza Ribeiro
M.D PHD Santa Casa School of Medicine São Paulo Brasil
President of Endometriosis Brazilian Society SBE

DIAGNOSING AND



TOWARDS A COMMON LANGUAGE:

LATEST PROPOSALS FOR CLASSIFICATION AND STAGING

Profa. Dra. Helizabet Salomão Abdalla Ayroza Ribeiro
M.D PHD Santa Casa School of Medicine São Paulo Brasil
President of Endometriosis Brazilian Society SBE

TOWARDS A COMMON LANGUAGE
BY IMAGING IN
ENDOMETRIOSIS

LITERATURE ⋯⋯▶ *SURGICAL TREATMENT*

DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

2002

Relation between pain symptoms and the anatomic location of deep infiltrating endometriosis

FERTILITY AND STERILITY®
VOL. 78, NO. 4, OCTOBER 2002

Arnaud Fauconnier, M.D.,[a,b] Charles Chapron, M.D.,[a] Jean-Bernard Dubuisson, M.D.,[a] Marco Vieira, M.D.,[a] Bertrand Dousset, M.D.,[c] and Gérard Bréart, M.D.[b]

CONCLUSION(S)
The types of pelvic pain are related to the anatomic location of DIE. Knowledge of the characteristics of pelvic pain symptoms is important in the preoperative assessment of patients with suspected DIE.

DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

2002

Chapron C, Dubuisson JB, … Dousset B
Routine clinical examination is not sufficient for diagnosing and locating deeply infiltrating endometriosis.
J Am Assoc Gynecol Laparosc 2002; 9(2):115-9

CONCLUSION
High locations of DIE lesions at the level of uterosacral ligaments, bottom of the pouch of Douglas, and upper one-third of the posterior vaginal wall explain why results of routine clinical examination are so poor. The term "deep endometriosis infiltrating the rectovaginal septum" is generally incorrect in the true anatomic sense.

DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

CLINICAL EXAMINATION

Vaginal Touch: **Pain on cervical mobilization and posterior cul de sac**

Retal Touch : **Intestinal and Parametrial lesion?**

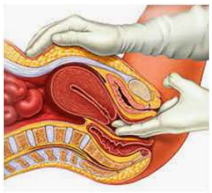
Ribeiro et al, 2006

LESION LOCATION

Limitation of the extent of the lesion in asymptomatic patients

Chapron 2002, Abrao 2007

JUST THE CLINICAL EXAMINATION IS NOT SUFFICIENT



2004

Deep Pelvic Endometriosis: MR Imaging for Diagnosis and Prediction of Extension of Disease[1]

Bazot M, Darai E, Hourani R, Thomassin I, Cortez A, Uzan S, et al. Radiology 2004

2004

Diagnostic accuracy of transvaginal sonography for deep pelvic endometriosis

Bazot M, Thomassin I, Hourani R, Cortez A, Darai E. Ultrasound Obstet Gynecol. 2004

(n=104) Hum Reprod . Abrão e cols, 2007

Table III. Sensitivity, specificity, positive and negative predictive values and accuracy of TVUS, digital vaginal examination and MRI in the diagnosis of deep retrocervical and rectosigmoid endometriosis in the 104 patients submitted to laparoscopy.

Site	Method	Sensitivity	Specificity	PPV	NPV	Accuracy
Recto-sigmoid	TVUS	98.1% (53/54)	100% (50/50)	100% (53/53)	98% (50/51)	99%(103/104)
	MRI	83.3% (45/54)	98% (49/50)	97.8% (45/46)	84.4% (49/58)	90.3%(94/1041)
	Vaginal-digital exam	72.2% (39/54)	54% (27/50)	62.9% (39/62)	64.2% (27/42)	63.4% (66/104)
	P-value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Retro-cervical	TVUS	95.1% (39/41)	98.4% (62/63)	98% (39/40)	97% (62/64)	97% (101/104)
	MRI	76% (31/41)	68% (43/63)	61%(31/51)	81%(43/53)	71% (74/104)
	Digital vaginal exam	68.3% (28/41)	46% (29/63)	45.1% (28/62)	69% (29/42)	54.8% (57/104)
	P-value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

(n=92) Fertil Steril. Bazot et al, 2009

Pelvic endometriosis: correlation of TVS results with surgical and pathologic findings.

TVS	Sensitivity	Specificity	PPV	NPV	Accuracy
USLs	78.3% (65/83)	66.7% (6/9)	95.6% (65/68)	25% (6/24)	77.2% (71/92)
Vagina	46.7% (14/30)	95% (59/62)	82.4% (14/17)	78.7% (59/75)	79.3% (73/92)
RV septum	9% (1/11)	98.7% (80/81)	50% (1/2)	88.9% (80/90)	88% (81/92)
Intestine	93.6% (59/63)	100% (29/29)	100% (59/59)	87.9% (29/33)	95.6% (88/92)

Locations of deep infiltrating endometriosis: correlation between MRI and surgical and pathologic findings.

MRI	Sensitivity	Specificity	PPV	NPV	Accuracy
USLs	84.4% (70/83)	88.9% (8/9)	98.6% (70/71)	38% (8/21)	84.8% (78/92)
Vagina	80% (24/30)	85.5% (53/62)	72.7% (24/33)	89.8% (53/59)	83.7% (77/92)
RV septum	54.5% (6/11)	98.7% (80/81)	85.7% (6/7)	94.1% (80/85)	93.5% (86/92)
Intestine	87.3% (55/63)	93.1% (27/29)	96.5% (55/57)	77.1% (27/35)	89.1% (82/92)

2010

Transvaginal ultrasonography with bowel preparation is able to predict the number of lesions and rectosigmoid layers affected in cases of deep endometriosis, defining surgical strategy

Goncalves MODC, Podgaec S, Dias JA, Gonzalez M, Abrao MS. Hum Reprod. 2010

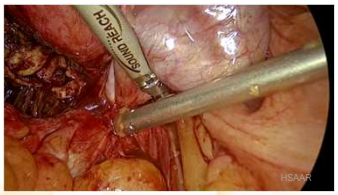
RM X TVG USG

Study	Year	Country	Design of Study	Number of Patients	Gold Standard	Interval TVUS x MRI	Interval TVUS / MRI x Gold Standard	Inclusion Criteria	Methods	Bowel Preparation
Abrão	2007	Brazil	Transversal	104	Surgery Histology	Not Cited	3 months	clinical suspicion of endometriosis	Vaginal examination, TVS and MRI	TVS: yes MRI: no
Bazot	2009	France	Longitudinal	92	Surgery Histology	Not Cited	Not Cited	clinical suspicion of endometriosis	Vaginal and rectal examination, TVS, MRI, RES	TVS: no MRI: no
Cazalis	2012	France	Transversal	25	Surgery Histology	Not Cited	Not Cited	clinical suspicion of endometriosis	TAS, TVS, RES, and MRI	TVS: no MRI: no
Maggiore	2016	Italy	Transversal	286	Surgery Histology	Not Cited	3 months	clinical suspicion of endometriosis	TVS with rectal enema and MRI with rectal enema	TVS: yes MRI: no
Saba	2012	Italy	Transversal	59	Surgery Histology	Not Cited	8 days	suspected clinical or suspected endometriosis physical examination	TVS and MRI	TVS: yes MRI: no
Vimercati	2012	Italy	Transversal	90	Surgery Histology	Not Cited	Not Cited	clinical suspicion or suspected endometriosis image examination	TVS and ColonoMRI	TVS: no MRI: yes

TAS: transabdominal sonography; TVS: transvaginal sonography; MRI: magnetic resonance imaging; RES: rectal endoscopic sonography

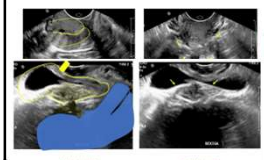
DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

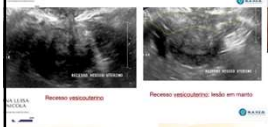
A.S.S., 42 ANOS
CISTOSCOPIA
13 DE OUTUBRO DE 2022



DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

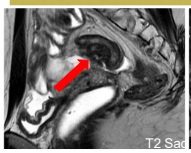
MRI + USG = GOOD SURGERY

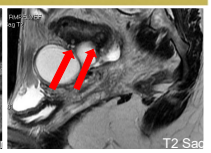


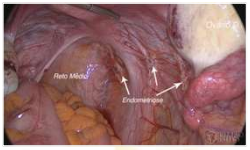


DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

BOWEL MULTIPLE LESION

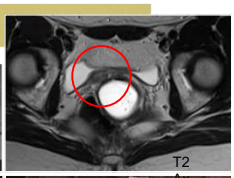






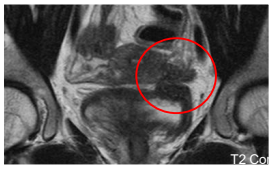
DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

Ureter



DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

BLADDER - ANTERIOR COMPARTMENT



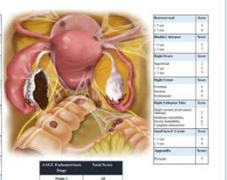
DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

JMIG

Original Article

AAGL 2021 Endometriosis Classification: An Anatomy-based Surgical Complexity Score

Mauricio S. Abrao, MD, Marina Paula Andres, MD, Charles E. Miller, MD, Julian A. Gingold, MD, PhD, Mariona Rius, MD, Joan Sisti Neto, MD, and Francisco Carmona, MD



DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

JMIG

Original Article

AAGL 2021 Endometriosis Classification: An Anatomy-based Surgical Complexity Score

Table 4

Performance of optimal cutoff points in AAGL score

Statistic	%	95% CI
A vs B/C/D		
AUROC	0.977	
Optimal cutoff	8.3	
Sensitivity	94.2	92.6–95.5
Specificity	93.2	88.6–96.3
PPV	98.7	97.8–99.2
NPV	74.8	69.8–79.2
Accuracy	94.0	92.6–95.3
A/B vs C/D		
AUROC	0.955	
Optimal cutoff	15.1	
Sensitivity	90.3	87.8–92.4
Specificity	86.3	83.2–89.1
PPV	88.8	86.6–90.7
NPV	88.1	85.4–90.3
Accuracy	88.5	86.6–90.2
A/B/C vs D		
AUROC	0.909	
Optimal cutoff	20.7	
Sensitivity	84.4	80.7–87.7
Specificity	80.2	77.2–82.9
PPV	70.3	67.2–73.2
NPV	90.2	88.1–92.1
Accuracy	81.7	79.4–83.8

AAGL = American Association of Gynecologic Laparoscopists; AUROC = area under the receiver operating characteristic curve; CI = confidence interval; NPV = negative predictive value; PPV = positive predictive value.
Optimal cutoff points are given for the cutoff points that maximize the sum of specificity and sensitivity.

Limitations

The 2021 AAGL Endometriosis Classification score has some structural limitations. Similar to all other classification systems for endometriosis [8,9,19,20], the score is constructed from the input of a group of expert surgeons. Although there is a high internal consistency among the respondent scores, the high level of experience among the survey respondents likely minimizes the difficulty experienced by the typical surgeon in practice when confronted with endometriosis. An alternative classification score constructed from survey responses of less specialized surgeons would have potentially reflected surgical difficulty in general gynecologic practice to a greater degree but would have suffered from poor internal consistency.

Although the score is constructed as a linear model (i.e., the total score is a sum of the points assigned from each involved anatomic site), surgeon rankings of difficulty are not likely linear when compressed to a scale of 0 to 10. For example, treatment of 2 lesions worth 4 points each may not be meaningfully "equivalent" in surgical complexity to the treatment of 1 lesion worth 8 points. However, the decision to construct the AAGL score as a linear model was made intentionally to facilitate clinical use among a range of surgeons, including those with only pen and paper on hand.

AAGL 2022 GLOBAL CONGRESS ON MIGS
December 1–4, 2022 | Aurora, CO | congress.aagl.org

DIAGNOSING AND EVALUATING- THE EXTENT OF ENDOMETRIOSIS WITH IMAGING

JMIG

Original Article

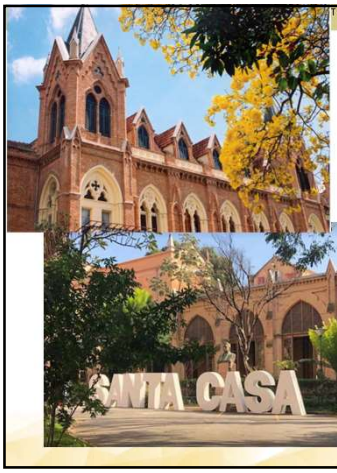
AAGL 2021 Endometriosis Classification: An Anatomy-based Surgical Complexity Score

TOWARDS A COMMON LANGUAGE:

LATEST PROPOSALS FOR CLASSIFICATION AND STAGING

AAGL 2022 GLOBAL CONGRESS ON MIGS
December 1–4, 2022 | Aurora, CO | congress.aagl.org

T OF ENDOMETRIOSIS WITH IMAGING



OBRIGADA
helizabetsalomao@gmail.com

AAGL 2022 GLOBAL CONGRESS ON MIGS
December 1–4, 2022 | Aurora, CO | congress.aagl.org

CIRURGIA EM EQUIPE

COLÓGICA E ENDOMETRIOSE - SANTA CASA DE SÃO PAULO

ENDO 610 - Diagnosing and Evaluating the Extent of Endometriosis with Imaging

How Imaging can Affect Surgical Strategy

Juan Gilabert Estelles, Professor of the University of Valencia (Spain), MD, PhD

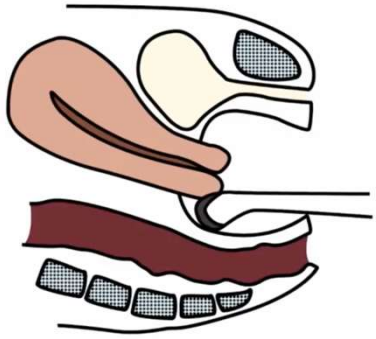
AAGL 2022 51st GLOBAL CONGRESS ON MIGS
December 1-4, 2022 | Aurora, CO | congress.aagl.org

Disclosure

"**I have no financial relationships to disclose**"

Objectives

- To demonstrate the capability of pelvic ultrasound for the **topographic diagnosis** of deep endometriosis
- To acquire a **systematic sonographic technique** for the accurate **mapping** of the disease
- To implement strategies for recognizing **difficult conditions for surgical planning**
- To summarize the **technical aspects of ultrasound examination** and that are important for guiding preoperative planning and counseling of patients



ULTRASOUND EXAMINATION IN ENDOMETRIOSIS

Technique

5 + 5

Hospital General UNIVERSITARI DE VALENCIA

EXAMINATION FOR ENDOMETRIOSIS- IDEA GROUP 2016

- International Deep Endometriosis Analysis Group
- Similar to IOTA Group; Proposal of a DYNAMIC and SYSTEMATIC ultrasound evaluation in different steps for Deep Endometriosis:

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

Dynamic ultrasonography		
	Routine evaluation of uterus and adnexa (+ sonographic signs of adenomyosis/presence or absence of endometrioma)	First step
	Evaluation of transvaginal sonographic 'soft markers' (i.e. site-specific tenderness and ovarian mobility)	Second step
	Assessment of status of POD using real-time ultrasound-based 'sliding sign'	Third step
	Assessment for DIE nodules in anterior and posterior compartments	Fourth step

...OUR PROPOSAL FOR US EXAMINATION SINCE 2012

Hospital General UNIVERSITARI DE VALENCIA

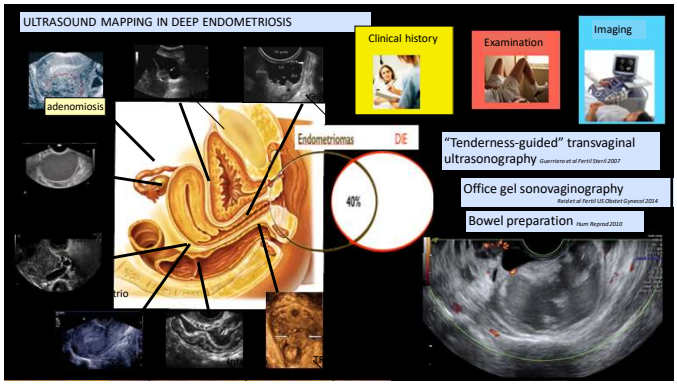
TECHNIQUE 5 + 5

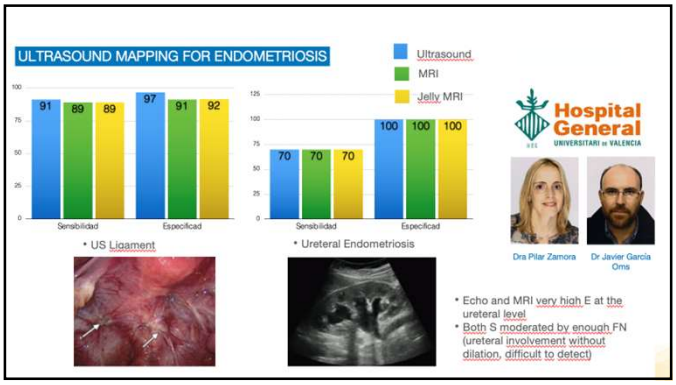
5 PREPARATIONS BEFORE EXAMINATION

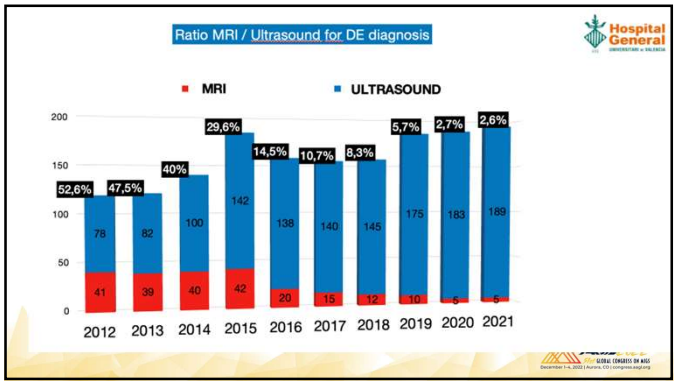
1: Bowel preparation
2: Do not void the bladder before examination
3: Abundant gel covering the vaginal probe
4: Adequate position of the patient
5: Examination during menstruation (if possible)

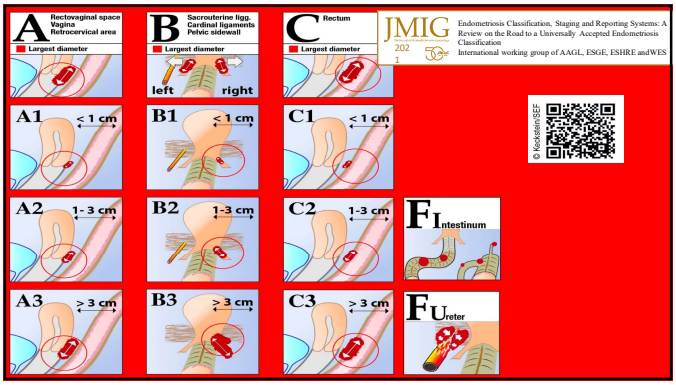
5 STEPS DURING EXAMINATION

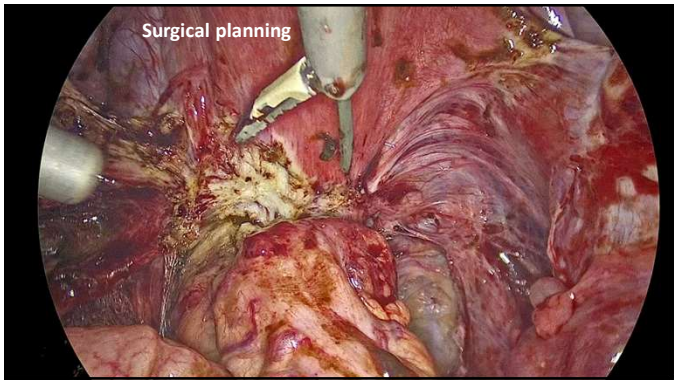
Step 1: Kidney ultrasound
Step 2: General evaluation of uterus and ovaries (adenomiosis, OMAs)
Step 3: Indirect ultrasound signs of Deep ENDO
Step 4: Direct ultrasound signs for Deep ENDO
Evaluation of DE nodules by compartment
Step 5: Evaluation of painful points

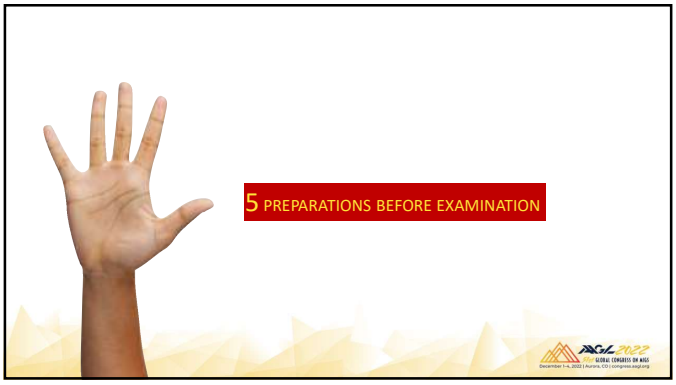

ULTRASOUND MAPPING IN DEEP ENDOMETRIOSIS
Clinical history
Examination
Imaging
adenomiosis
Endometriomas
DIE
40%
"Tenderness-guided" transvaginal ultrasonography Guerriero et al Fertil Steril 2007
Office gel sonovaginography Reid et al Fertil US Obstet Gynecol 2024
Bowel preparation Hum Reprod 2010


ULTRASOUND MAPPING FOR ENDOMETRIOSIS
Ultrasound
MRI
Jelly MRI
91 89 89
97 91 92
70 70 70
100 100 100
Sensibilidad
Especificad
Hospital General
UNIVERSITARI DE VALENCIA
Dra Pilar Zamora
Dr Javier García Orms
• US Ligament
• Ureteral Endometriosis
• Echo and MRI very high E at the ureteral level
• Both S moderated by enough FN (ureteral involvement without dilation, difficult to detect)

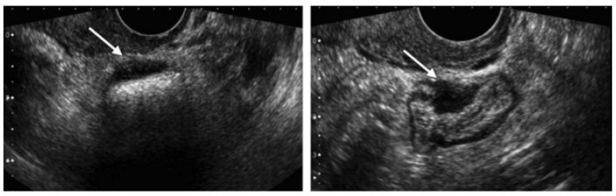

Ratio MRI / Ultrasound for DE diagnosis
Hospital General
MRI
ULTRASOUND
52,6% 47,5% 40% 29,6% 14,5% 10,7% 8,3% 5,7% 2,7% 2,6%
78 82 100 142 138 140 145 175 183 189
41 39 40 42 20 15 12 10 5 5
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021


A Rectovaginal space Vagina Retrocervical area
B Sacrouterine ligg. Cardinal ligaments Pelvic sidewall
C Rectum
Largest diameter
left
right
JMIG
Endometriosis Classification, Staging and Reporting Systems: A Review on the Road to a Universally Accepted Endometriosis Classification
International working group of AAGL, ESGE, ESHRE and WES
A1 < 1 cm
B1 < 1 cm
C1 < 1 cm
A2 1-3 cm
B2 1-3 cm
C2 1-3 cm
A3 > 3 cm
B3 > 3 cm
C3 > 3 cm
FIntestinum
FUreter


Surgical planning


5 PREPARATIONS BEFORE EXAMINATION

1. BOWEL PREPARATION



Without preparation

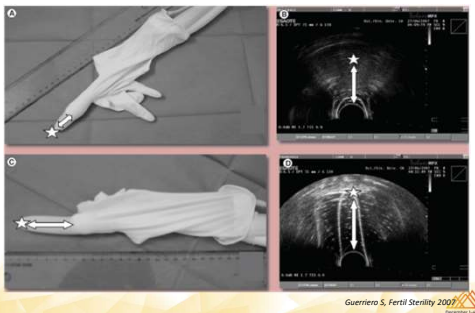
With preparation

2. DO NOT VOID THE BLADDER BEFORE THE EXAM

Void bladder

Full bladder (Same case)

3. ABUNDANT GEL COVERING THE VAGINAL PROBE



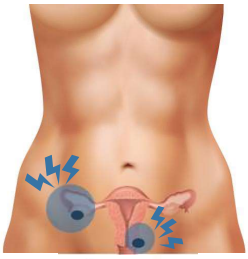
Guerriero S, Fertil Sterility 2003

4. ADEQUATE POSITION OF THE PATIENT

Greater opening of the pelvis and descent of the pelvic viscera if:
foot-supported leg warmers (worse with thigh-supported leg warmers) (Star)
Buttocks protrude from the lower edge of the stretcher and drop down (Arrows)

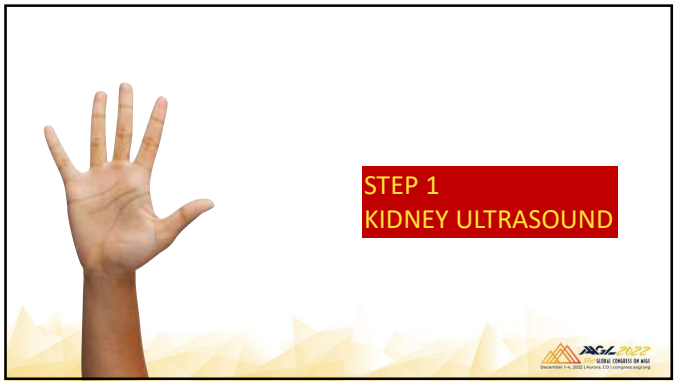
→ BETTER VISUALIZATION
LESS PAIN DURING EXPLORATION

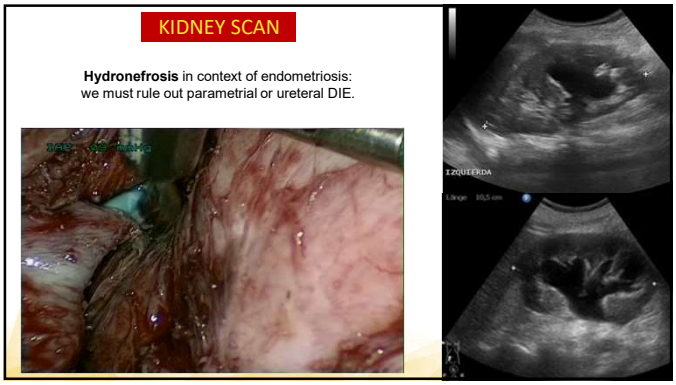
5. EXAMINATION DURING MENSTRUATION (IF POSSIBLE)

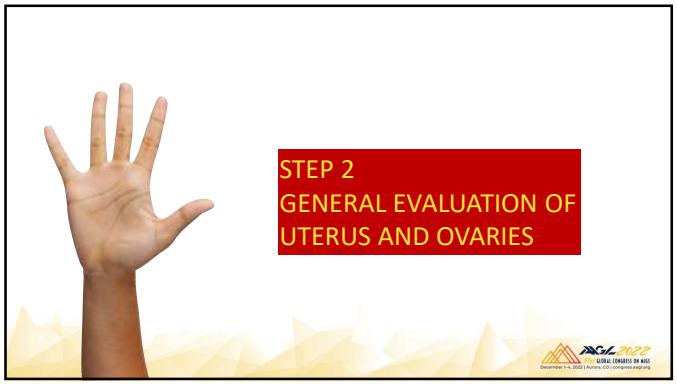


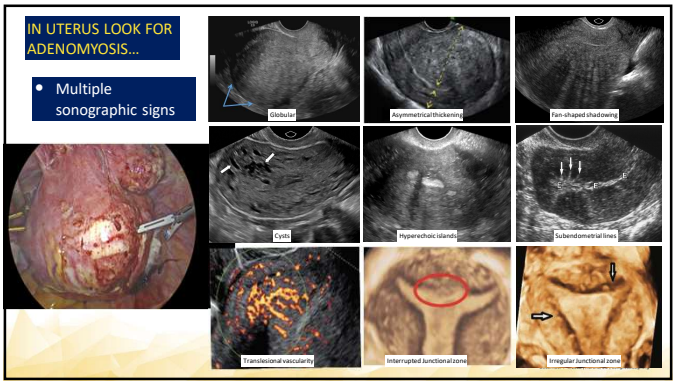
BETTER EXPOSURE OF PAINFUL POINTS TO FOCALIZE THE ULTRASOUND EXAMINATION (“Tenderness Guide Technique”)

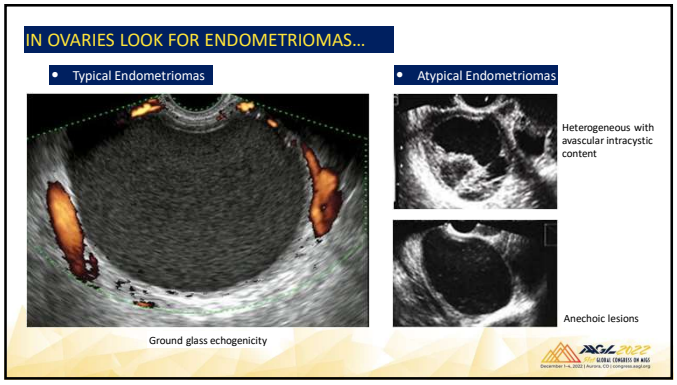
5 STEPS DURING EXAMINATION

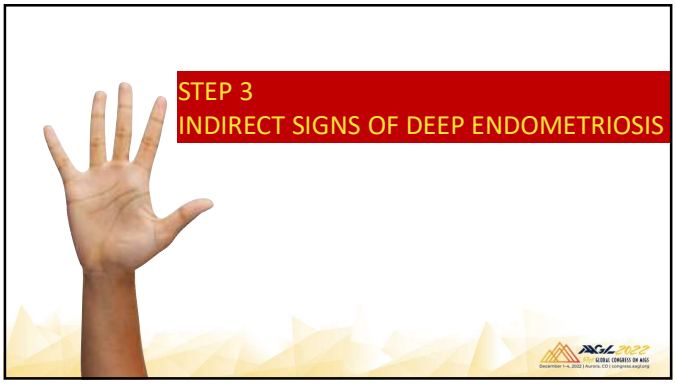

STEP 1
KIDNEY ULTRASOUND


KIDNEY SCAN
Hydronefrosis in context of endometriosis:
we must rule out parametrial or ureteral DIE.
IZQUIERDA


STEP 2
GENERAL EVALUATION OF
UTERUS AND OVARIES


IN UTERUS LOOK FOR ADENOMYOSIS…
Multiple sonographic signs
Globular
Asymmetrical thickening
Fan-shaped shadowing
Cysts
Hyperechoic islands
Subendometrial lines
Translesional vascularity
Interrupted junctional zone
Irregular junctional zone


IN OVARIES LOOK FOR ENDOMETRIOMAS…
Typical Endometriomas
Ground glass echogenicity
Atypical Endometriomas
Heterogeneous with avascular intracystic content
Anechoic lesions


STEP 3
INDIRECT SIGNS OF DEEP ENDOMETRIOSIS

INDIRECT SONOGRAPHIC SIGNS (STATIC IMAGES)

LAPAROSCOPIC FINDINGS OF DIE:

SONOGRAPHIC TRANSLATION IN PELVIC ORGANS

…Abnormal morphology

…Abnormal placement

LAPAROSCOPIC FINDINGS OF DIE:

"It´s all blocked…"

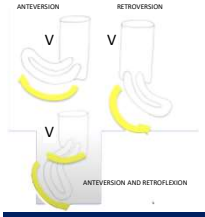
INDIRECT SONOGRAPHIC SIGNS (DYNAMIC IMAGES)

SONOGRAPHIC TRANSLATION IN PELVIC ORGANS

…Absence of mobility

Sliding sign

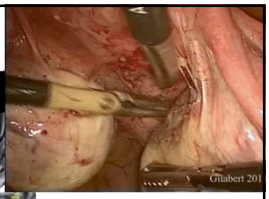
Anteverted and retroflexed UTERUS (AVRF)



1) Anteversion. Uterus moves towards the bladder
2) Retroversion. Uterus moves away of the bladder
3) Anteversion and Retroflexion. Lower uterus moves to the bladder and fundus moves away from it

- Some authors refer to AVRF uterus as "Question mark sign"
- It is highly suggestive of DE, even more if posterior adenomiosis is detected

OVARIAN ADHESIONS - "LOW OVARY"

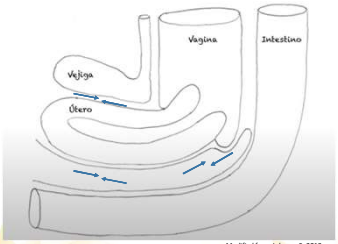


The visualization of a low ovary in a longitudinal section is highly suggestive of the presence of an attached ovary. Press lightly with the probe to check that it is fixed

In cross-section we can better see the location of the structure attached to the ovary. We see the same image as the previous one, but in a transverse section, where we see that the ovary is adhered to the left LUS (arrow)

PELVIC ADHESIONS – PELVIC MOBILITY – SLIDING OF PELVIC VISCERA

SLIDING SIGNS (SD)



Modified from Johnson S, 2019

Evaluation of anterior compartment

"ANTERIOR SLIDING SIGN"
Sliding or mobility between bladder-uterur

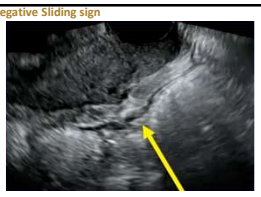
Evaluation of posterior compartment

"HIGH POSTERIOR SD"
Sliding or mobility between uterus-rectum

"LOW POSTERIOR SD"
Sliding or mobility between cervix/vagina-retum
(Free or blocked Douglas)

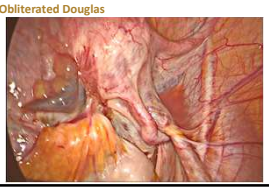
Positive Sliding Sign

Negative Sliding sign



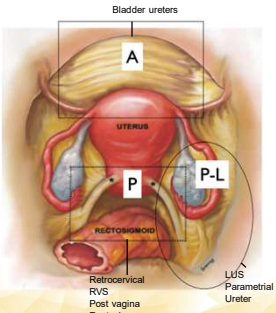
Free Douglas

Obliterated Douglas



STEP 3
DIRECT ULTRASOUND SIGNS FOR DEEP ENDOMETRIOSIS (COMPARTMENT EVALUATION OF ENDO NODULES)

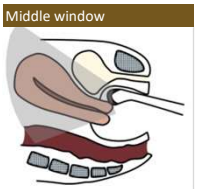
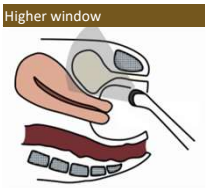
EXAMINATION BY COMPARMENTS



EXAMINATION OF COMPARTMENTS BY ”WINDOWS

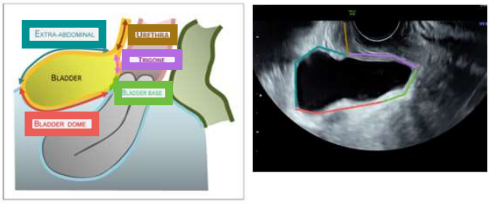
EXAMINATION OF COMPARTMENTS BY ”WINDOWS

Examination sequence according to the position of the probe

Middle window	Lower window	Higher window
		
Vaginal probe in anterior fornix	Vaginal probe in posterior fornis	Vaginal probe close to the introitus
• Detailed evauation of middle compartment • Initial evaluation of Post. And Ant compartment • Evaluation of indirect signs of DE	• Detailed evaluation of post. Compartment	• Detailed evaluation of Ant. compartment

ANTERIOR COMPARTMENT

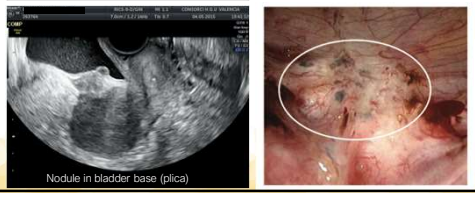
Bladder (Probe in anterior fornix/anterior introitus)



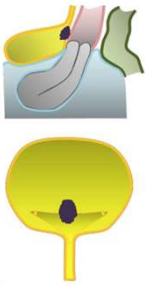
In addition to detecting DE bladder nodules, is interesting to report their exact location

Location provides information for planning surgery

- Simpler nodule excision
- (Large nodules sometimes require dissection of the Retzius to close the defect)



- More difficult nodule exeresis (requires vesicouterine dissection)



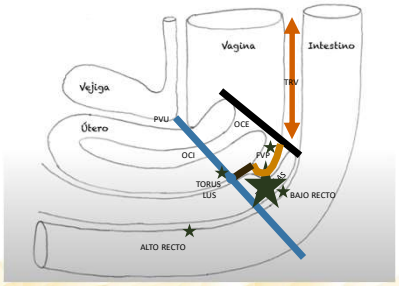
- Exeresis involves subsequent suture at the entry level of the ureter into the bladder (frequent ureteral reimplantation)

POSTERIOR COMPARTMENT

- TORUS
- USL
- POSTERIOR VAGINAL FORNIX
- RECTUM

LOCATIONS OF POSTERIOR DEEP ENDOMETRIOSIS

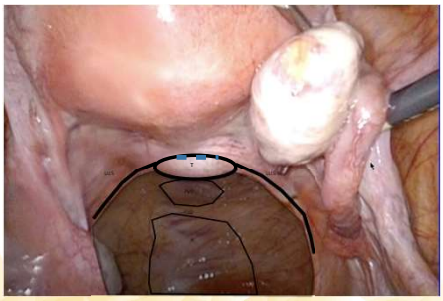
(Ultrasound vision)



1) TORUS (T)
2) UTEROSACRAL LIG. (LUS)
3) POSTERIOR VAGINAL FORNIX (FVP)
4) RECTUM (R)

POSTERIOR DEEP ENDO LOCATIONS

(REAL VISION)



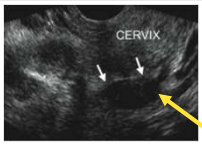
1) TORUS (T)

2) UTEROSACRAL LIG. (LUS)

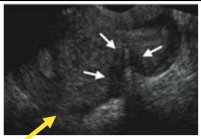
3) POSTERIOR VAGINAL FORNIX (FVP)

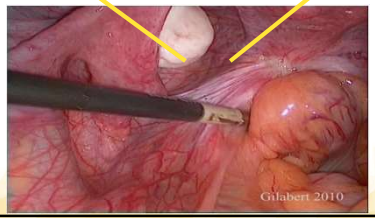
4) RECTUM (R)

TORUS-UTEROSACRAL LIG.



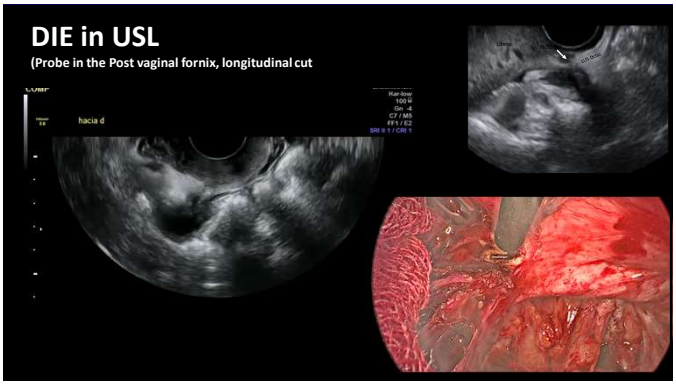
TORUS





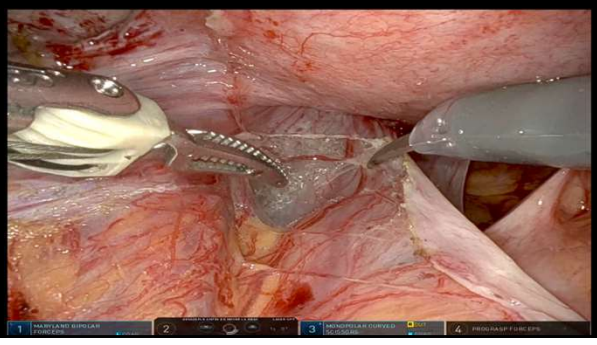
DIE in USL

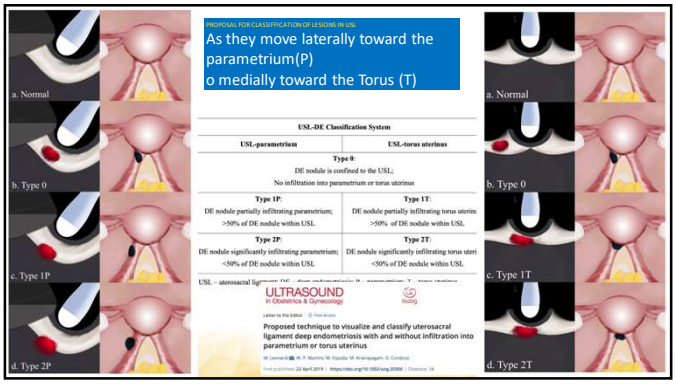
(Probe in the Post vaginal fornix, longitudinal cut



DIE in USL

(





PROPOSAL FOR CLASSIFICATION OF LESIONS IN USL

As they move laterally toward the parametrium(P)

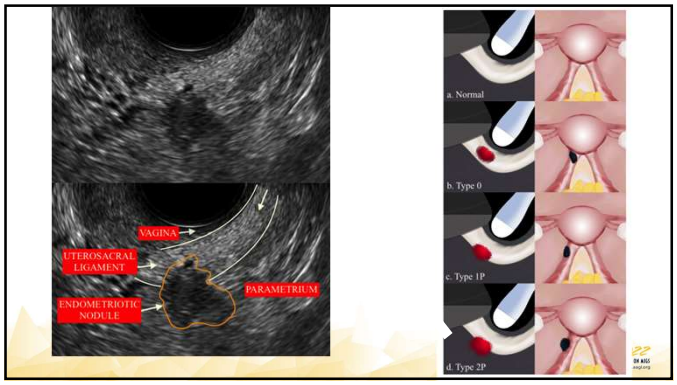
o medially toward the Torus (T)

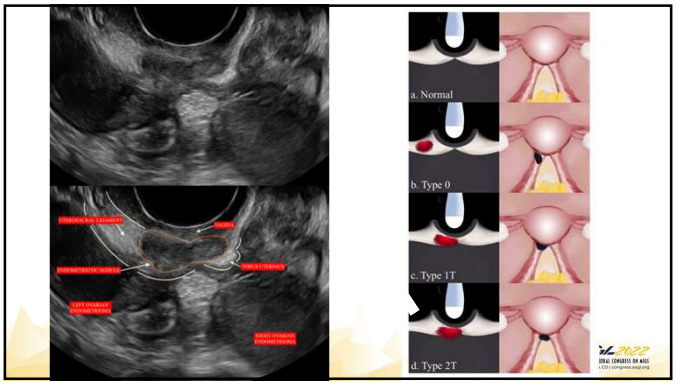
USL-DE Classification System	
USL-parametrium	USL-torus uterinus
Type 0: DE nodule is confined to the USL; No infiltration into parametrium or torus uterinus	
Type 1P: DE nodule partially infiltrating parametrium; >50% of DE nodule within USL	Type 1T: DE nodule partially infiltrating torus uterin >50% of DE nodule within USL
Type 2P: DE nodule significantly infiltrating parametrium; <50% of DE nodule within USL	Type 2T: DE nodule significantly infiltrating torus uteri <50% of DE nodule within USL

USL – uterosacral ligament; DE – deep endometriosis; P – parametrium; T – torus uterinus

ULTRASOUND in Obstetrics & Gynecology

Proposed technique to visualize and classify uterosacral ligament deep endometriosis with and without infiltration into parametrium or torus uterinus





RECTUM

Bowel DIE (Morphology)

regular outline (absence of spikes)

"Comet sign" (lateral narrowing like a tail)

"Indian headdress sign"(spikes'towards bowel lumen)

"Pulling sleeve sign"(extrinsic retraction and visible mucosal folds)

Bowel DIE (Measurament)

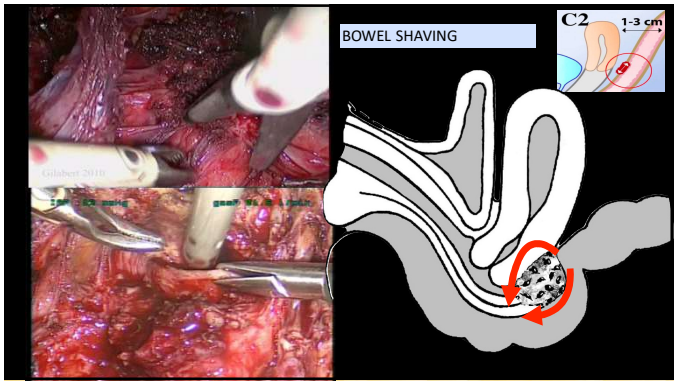
Three orthogonal measurements should be taken: mid-sagittal, anteroposterior and transverse.

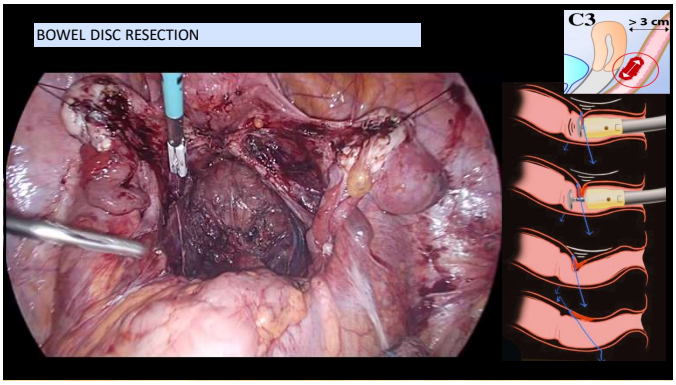
In cases of multifocal lesions of deep infiltrating endometriosis in the bowel, the total length of the bowel segment involved (from caudal to cephalic aspect) should be measured

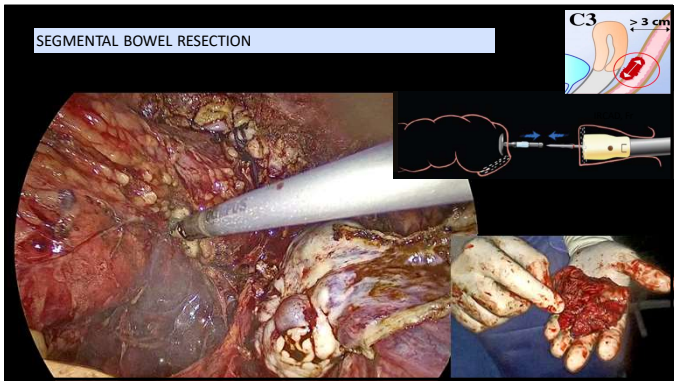
Selection of surgical technique

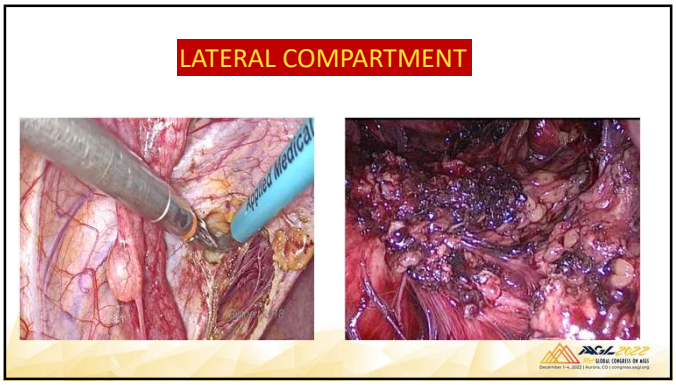
	Long. diameter	% circumpherence	Infiltration	Single/Multiple
"Shaving"/Discoid				
Segmental resection				
	>3cm	>50%	Submucosa	Multiple

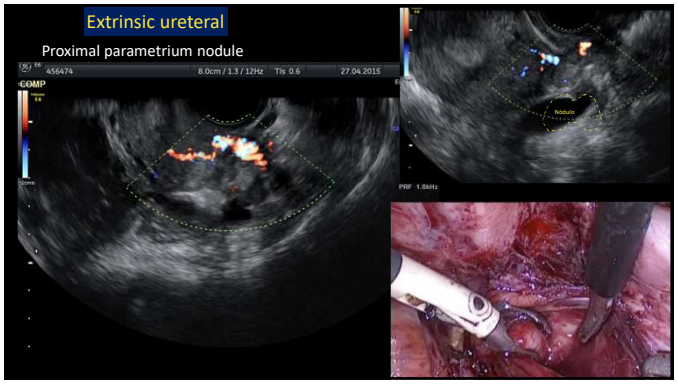
High Risk of Segmental resection

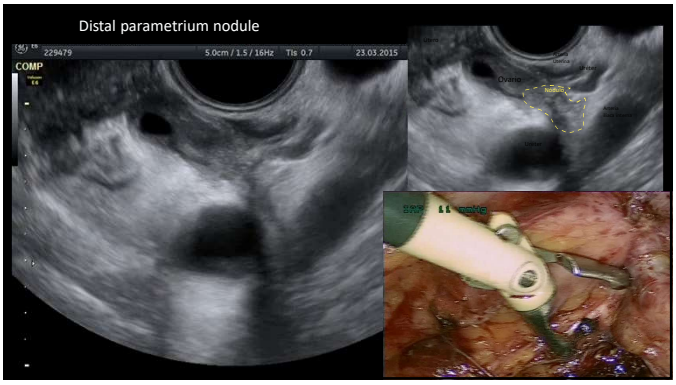

BOWEL SHAVING
C2
1-3 cm


BOWEL DISC RESECTION
C3
> 3 cm

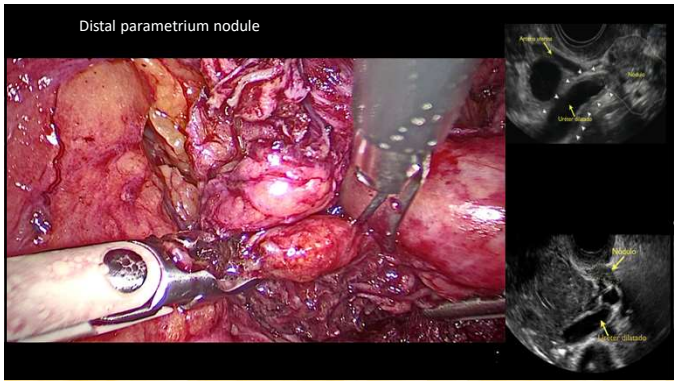

SEGMENTAL BOWEL RESECTION
C3
> 3 cm


LATERAL COMPARTMENT

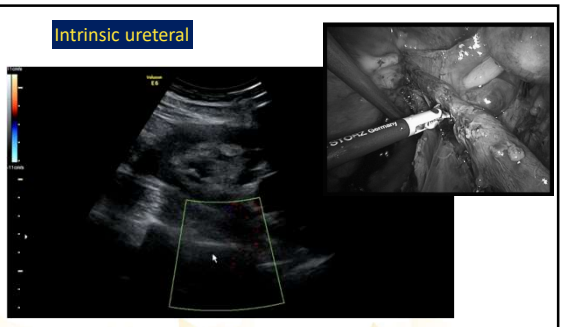

Extrinsic ureteral
Proximal parametrium nodule


Distal parametrium nodule

Distal parametrium nodule

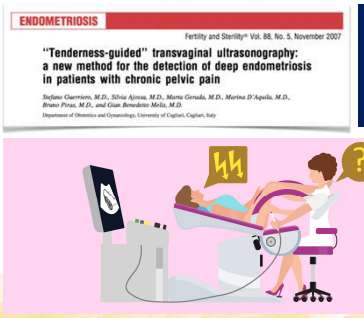


Intrinsic ureteral



STEP 5
EVALUATION OF PAINFUL POINTS

Tenderness Guided Technique



"Pain guide ultrasound": Exam during menstruation that focus on trigger painful points

CONCLUSIONS

CONCLUSIONS I

TECHNIQUE 5 + 5

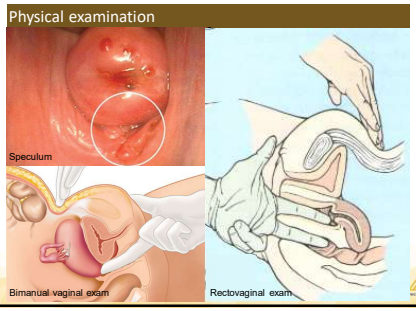
5 PREPARATIONS BEFORE EXAMINATION

1: Bowel preparation
2: Do not void the bladder before examination
3: Abundant gel covering the vaginal probe
4: Adequate position of the patient
5: Examination during menstruation (if possible)

CONCLUSIONS II

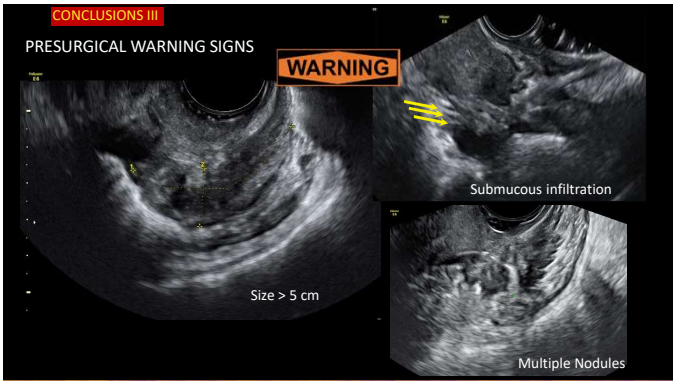
Never forget physical examination

Physical examination



CONCLUSIONS III

PRESURGICAL WARNING SIGNS



Acknowledgments

- Javier Garcia-Oms, Head of Section, Hospital General Universitario Valencia, MD.
- Pilar Zamora, Gynecologist, Hospital General Universitario Valencia, MD.

References

Leonardi M, Martin E, Reid S, Blanchette G, Condous G. Deep endometriosis transvaginal ultrasound in the workup of patients with signs and symptoms of endometriosis: a cost analysis. BJOG. 2019 Nov;126(12):1499-1506. doi: 10.1111/1471-0528.15917. Epub 2019 Sep 18.

Neil P Johnson, Lone Hummelshoj, G David Adamson et al. World Endometriosis Society consensus on the classification of endometriosis. Hum Reprod 2017 Feb;32(2):315-324. doi: 10.1093/humrep/dew293. Epub 2016 Dec 5.

Stefano Guerriero 1, Silvia Ajossa, Marta Gerada, Marina D'Aquila, Bruno Piras, Gian Benedetto Melis. "Tenderness-guided" transvaginal ultrasonography: a new method for the detection of deep endometriosis in patients with chronic pelvic pain. Fertil Steril 2007 Nov;88(5):1293-7. doi: 10.1016/j.fertnstert.2006.12.060. Epub 2007 Jun 4.

Guerriero S, Condous G, van den Bosch T et al. 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. Ultrasound Obstet Gynecol 2016 Sep;48(3):318-32. doi: 10.1002/uog.15955. Epub 2016 Jun 28.

Jörg Keckstein, Gernot Hudelist. Classification of deep endometriosis (DE) including bowel endometriosis: From r-ASRM to #Enzian-classification. Best Pract Res Clin Obstet Gynaecol 2021 Mar;71:27-37. doi: 10.1016/j.bpobgyn.2020.11.004. Epub 2020 Dec 11.

Thank you very much for your attention

50TH GLOBAL CONGRESS ON MIGS

AAGL 2021

NOVEMBER 14-17 ■ Austin, Texas

AAGL 2022 51st GLOBAL CONGRESS ON MIGS

December 1–4, 2022 | Aurora, CO | congress.aagl.org

Extrapelvic Diaphragmatic Endometriosis : Strategies for the MIGS

Andrea Vidali MD

Disclosure

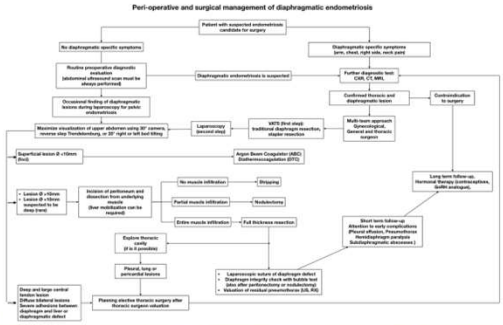
- Stockholder : Pregmune llc. . WWW.pregmune.com

Extrapelvic Endometriosis : locations

- Digestive
- Respiratory (diaphragm , chest , lung)
- Umbilical
- Abdominal wall (iatrogenic)

Diaphragmatic endometriosis is often a surprise diagnosis

- Accidental finding at diagnostic laparoscopy
- Most series in the literature are small
- Very few centers of excellence
- Most likely under-reported (surgeons do not look?)
  - Kumakiri J, Kumakiri Y, Miyamoto H, Kikuchi I, Arakawa A, Kitade M, Takeda S (2010) Gynecologic evaluation of catamenial pneumothorax associated with endometriosis. J Minim Invasive Gynecol 17(5):593–599



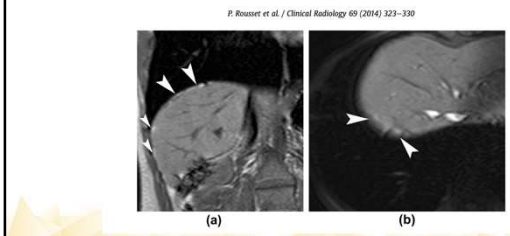
Ceccaroni, M., Roviglione, G., Farulla, A., Bertoglio, P., Clarizia, R., Viti, A., … Terzi, A. C. (2021). Minimally invasive treatment of diaphragmatic endometriosis: a 15-year single referral center's experience on 215 patients. Surgical Endoscopy. doi:10.1007/s00464-020-08186-z

Diaphragmatic Endometriosis

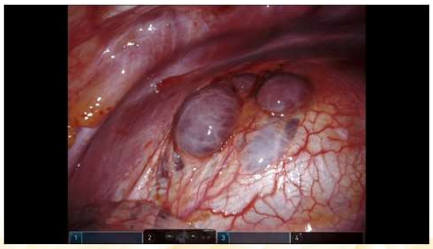
- Majority of cases are silent (70%)
- Symptoms usually non specific : shoulder, right upper quadrant, arm or chest pain.
  - Kumakiri J, Kumakiri Y, Miyamoto H, Kikuchi I, Arakawa A, Kitade M, Takeda S (2010) Gynecologic evaluation of catamenial pneumothorax associated with endometriosis. J Minim Invasive Gynecol 17(5):593–599
  - Fukuoka M, Kurihara M, Haga T, Ebana H, Kataoka H, Mizobuchi T, Tatsumi K (2015) Clinical characteristics of catamenial and non-catamenial thoracic endometriosis-related pneumothorax. Respirology 20(8):1272.

Imaging

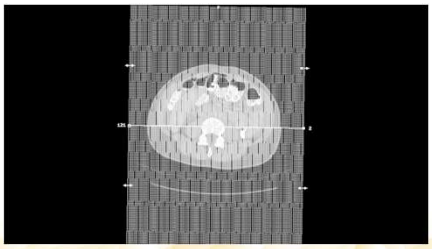
- There is a lack of high-quality evidence to determine which imaging modality is the most optimal for the evaluation of thoracic endometriosis, and radiologic findings can vary extensively. Radiologic imaging may reveal normal findings despite thoracic endometriosis being present .
- although T2 shading is a characteristic feature of pelvic endometriotic cysts. Because ofthe presence of air closetothe diaphragm, true lesions must be distinguished from susceptibility artefacts. The abrupt transition between the air-filled lung and the diaphragm distorts the local magnetic field, and this increases the signal intensity on T1-weighted and other MRI images.
- Susceptibility artefacts can be distinguished from true lesions based on their linear shape parallel to the diaphragm, their fluctuation across different sequences, and their shape changes in different acquisition planes
  - Rousset P, Rousset-Jablonski C, Alifano M, Mansuet-Lupo A, Buy JN, Revel MP. Thoracic endometriosis syndrome: CT and MRI features. Clin Radiol. 2014 Mar;69(3):323-30. doi: 10.1016/j.crad.2013.10.014. Epub 2013 Dec 11. PMID: 24331768.



Your Typical Severe Endometriosi VATS View

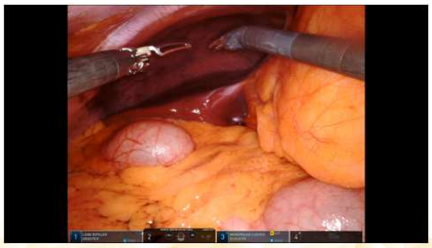


Severe Disease



Diaphragmatic Endometriosis: Strategies For The MIGS

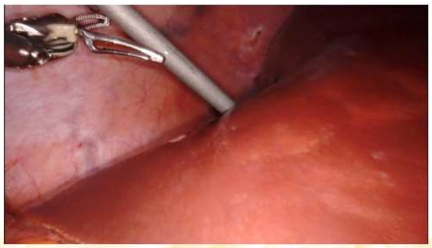
Simple Diaphragmatic Peritonectomy



Our Approach if you suspect superficial disease

- If imaging negative start in dorsal supine
- Consider double lumen intubation

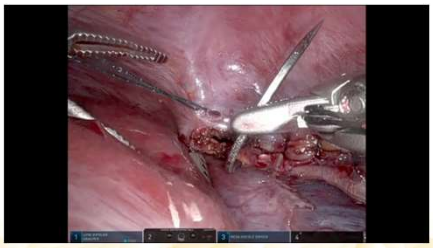
Look for hidden disease



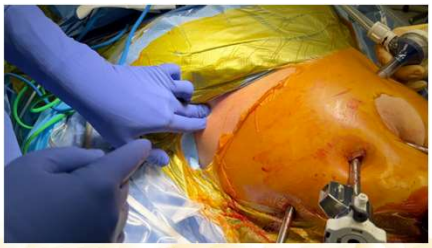
Liver mobilization

Liver Mobilization 2

Avoiding a Chest Tube



Place a pigtail under direct visualization.



References

- Kumakiri J, Kumakiri Y, Miyamoto H, Kikuchi I, Arakawa A, Kitade M, Takeda S.(2010) Gynecologic evaluation of catamenial pneumothorax associated with endometriosis. J Minim Invasive Gynecol 17(5):593–599
- Fukuoka M, Kunihara M, Haga T., Ebana H, Kataoka H, Mizobuchi T, Tatsumi K.(2015) Clinical characteristics of catamenial and non-catamenial thoracic endometriosis-related pneumothorax. Respirology 20(8):1272
- Rousset P, Rousset-Jablonski C, Alifano M, Mansuet-Lupo A, Buy JN, Revel MP. Thoracic endometriosis syndrome: CT and MRI features. Clin Radiol. 2014 Mar;69(3):323-30. doi: 10.1016/j.crad.2013.10.014. Epub 2013 Dec 11. PMID: 24331768.
- Alifano M, Jablonski C, Kadiri H, Falcoz P, Gompel A, Camilleri-Broet S, Regnard JF. Catamenial and noncatamenial, endometriosis-related or nonendometriosis-related pneumothorax referred for surgery. Am J Respir Crit Care Med. 2007 Nov
- Joseph J, Sahn SA (1996) Thoracic endometriosis syndrome: new observations from an analysis of 110 cases. Am J Med 100:164–170
- Andres MP, Arcoverde FVL, Souza CCC, Fernandes LFC, Abrão MS, Kho RM. Extrapelvic Endometriosis: A Systematic Review. J Minim Invasive Gynecol. 2020 Feb;27(2):373-389. doi: 10.1016/j.jmig.2019.10.004. Epub 2019 Oct 13. PMID: 31618674.
- Gil, Y., & Tulandi, T. (2019). Diagnosis and Treatment of Catamenial Pneumothorax: A Systematic Review. Journal of Minimally Invasive Gynecology. doi:10.1016/j.jmig.2019.08.005
- Nezhat C, Lindheim SR, Backhus L, Vu M, Vang N, Nezhat A, Nezhat C. Thoracic Endometriosis Syndrome: A Review of Diagnosis and Management. JSLS. 2019 Jul-Sep;23(3):e2019.00029. doi: 10.4293/JSLS.2019.00029. PMID: 31427853; PMCID: PMC6684338.
- Ceccaroni, M., Roviglione, G., Farulla, A., Bertoglio, P., Clarizia, R., Viti, A., ... Terzi, A. C. (2021). Minimally invasive treatment of diaphragmatic endometriosis: a 15-year single referral center's experience on 215 patients. Surgical Endoscopy. doi:10.1007/s00464-020-08186-z

CULTURAL AND LINGUISTIC COMPETENCY & IMPLICIT BIAS

The California Medical Association (CMA) announced new standards for Cultural Linguistic Competency and Implicit Bias in CME. The goal of the standards is to support the role of accredited CME in advancing diversity, health equity, and inclusion in healthcare. These standards are relevant to ACCME-accredited, CMA-accredited, and jointly accredited providers located in California. AAGL is ACCME-accredited and headquartered in California.

CMA developed the standards in response to California legislation (Business and Professions (B&P) Code Section 2190.1), which directs CMA to draft a set of standards for the inclusion of cultural and linguistic competency (CLC) and implicit bias (IB) in accredited CME.

The standards are intended to support CME providers in meeting the expectations of the legislation. CME provider organizations physically located in California and accredited by CMA CME or ACCME, as well as jointly accredited providers whose target audience includes physicians, are expected to meet these expectations beginning January 1, 2022. AAGL has been proactively adopting processes that meet and often exceed the required expectations of the legislation.

CMA CME offers a variety of resources and tools to help providers meet the standards and successfully incorporate CLC & IB into their CME activities, including FAQ, definitions, a planning worksheet, and best practices. These resources are available on the CLC and IB standards page on the CMA website.

Important Definitions:

Cultural and Linguistic Competency (CLC) – The ability and readiness of health care providers and organizations to humbly and respectfully demonstrate, effectively communicate, and tailor delivery of care to patients with diverse values, beliefs, identities and behaviors, in order to meet social, cultural and linguistic needs as they relate to patient health.

Implicit Bias (IB) – The attitudes, stereotypes and feelings, either positive or negative, that affect our understanding, actions and decisions without conscious knowledge or control. Implicit bias is a universal phenomenon. When negative, implicit bias often contributes to unequal treatment and disparities in diagnosis, treatment decisions, levels of care and health care outcomes of people based on race, ethnicity, gender identity, sexual orientation, age, disability and other characteristics.

Diversity – Having many different forms, types or ideas; showing variety. Demographic diversity can mean a group composed of people of different genders, races/ethnicities, cultures, religions, physical abilities, sexual orientations or preferences, ages, etc.

Direct links to AB1195 (CLC), AB241 (IB), and the B&P Code 2190.1:

Bill Text – AB-1195 Continuing education: cultural and linguistic competency.
Bill Text – AB-241 Implicit bias: continuing education: requirements.
Business and Professions (B&P) Code Section 2190.1

CLC & IB Online Resources:

Diversity-Wheel-as-used-at-Johns-Hopkins-University-12.png (850×839) (researchgate.net)
Cultural Competence In Health and Human Services | NPIN (cdc.gov)
Cultural Competency – The Office of Minority Health (hhs.gov)
Implicit Bias, Microaggressions, and Stereotypes Resources | NEA
Unconscious Bias Resources | diversity.ucsf.edu
Act, Communicating, Implicit Bias (racialequitytools.org)
https://kirwaninstitute.osu.edu/implicit-bias-training
https://www.uptodate.com/contents/racial-and-ethnic-disparities-in-obstetric-and-gynecologic-care-and-role-of-implicitbiases
https://www.contemporaryobgyn.net/view/overcoming-racism-and-unconscious-bias-in-ob-gyn
https://pubmed.ncbi.nlm.nih.gov/34016820/