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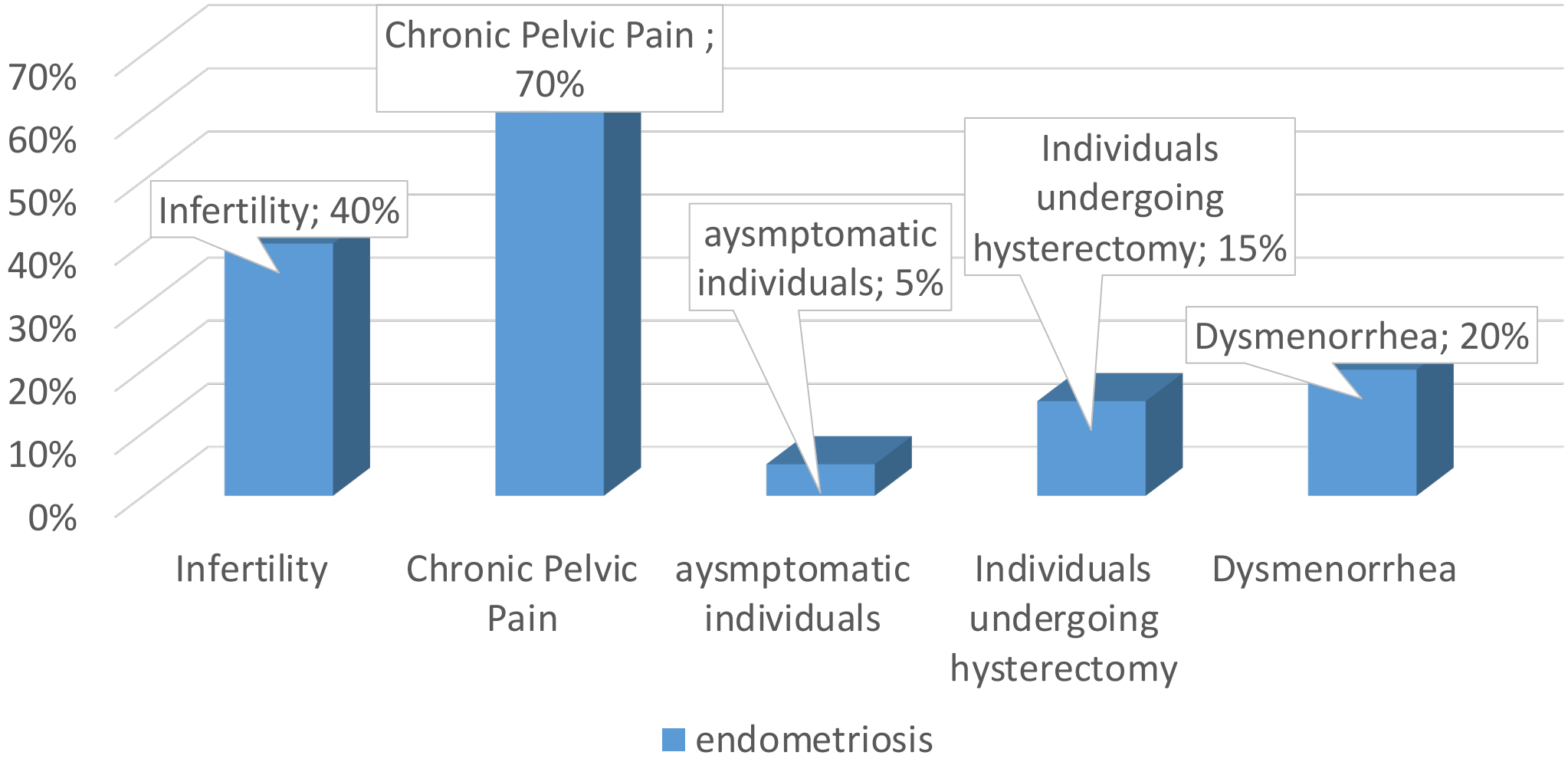
SONOGRAPHIC EVALUATION IN WOMEN WITH SUSPECTED ENDOMETRIOSIS

AYŞE SEYHAN

Veri Sınıflandırma Tipi: Genel / General

Prevalence of Endometriosis



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Diagnosis and Mapping of implants are important

Median delay since onset of symptoms 12 years

understanding of the location of disease

Severity of disease

Veri Sınıflandırma Tipi: Genel / General

Delay in Diagnosis of Endometriosis

Look before you Leap

1190 patients undergoing 1st IVF

↓

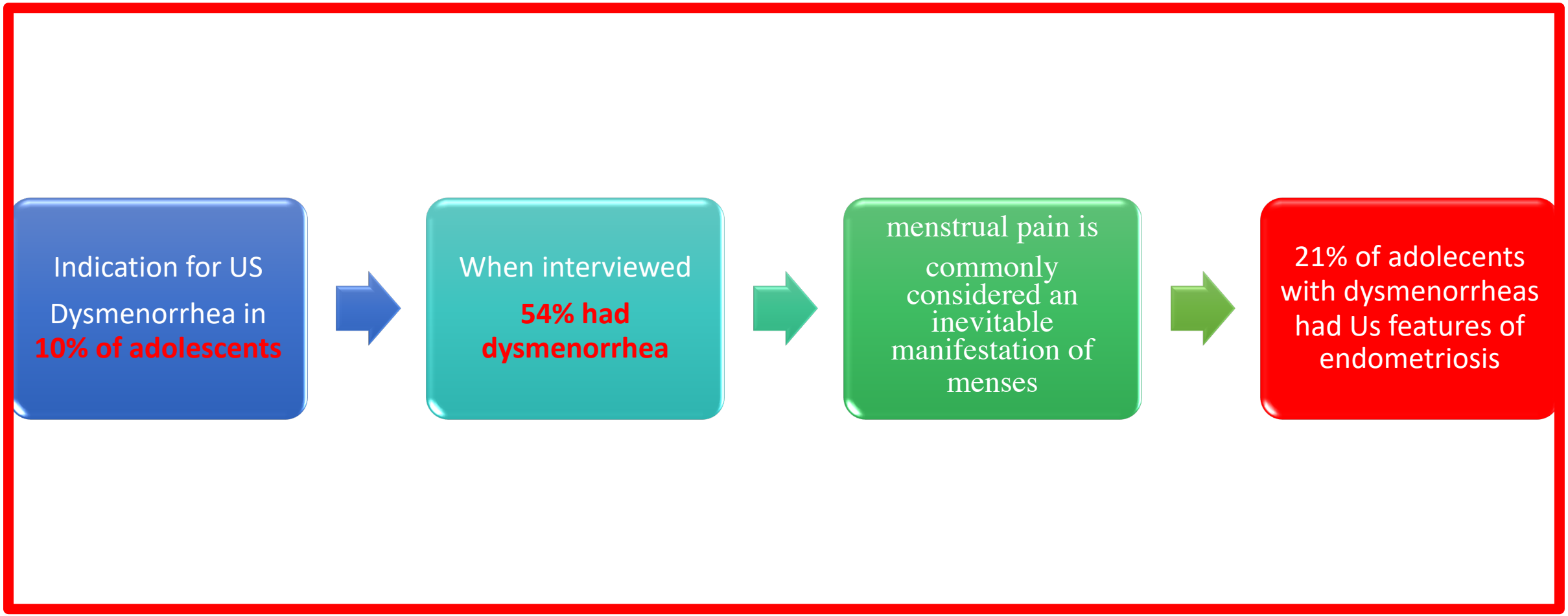
22% endometrioma or endometriosis

↓

Of those 76% were previously unaware of their endometriosis

Alson et al FS 2022

Veri Sınıflandırma Tipi: Genel / General



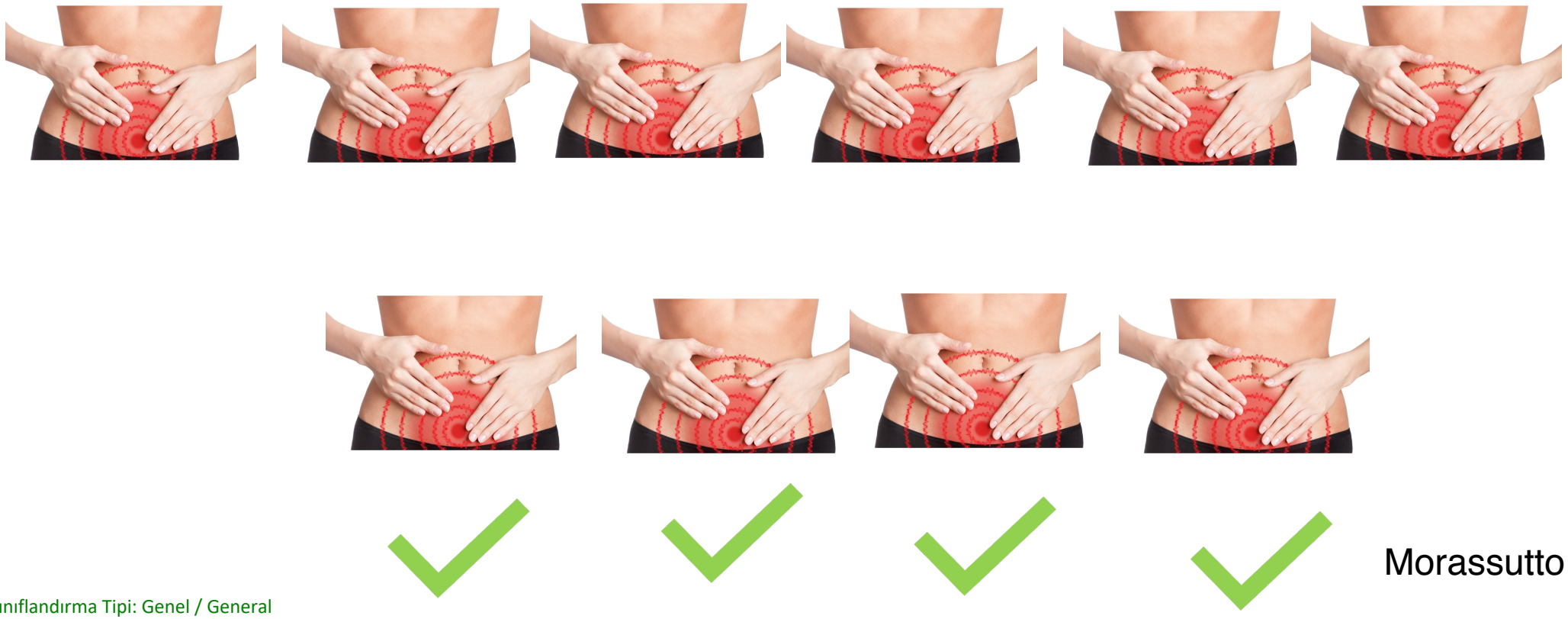
Martire et al FS 2020

Veri Sınıflandırma Tipi: Genel / General

Teenagers are seen by at least three specialists before receiving an accurate endometriosis diagnosis.

Veri Sınıflandırma Tipi: Genel / General

6 out of 10 cases were not identified before the active search of the disease!!!!



Morassutto 2017 PLOS

Veri Sınıflandırma Tipi: Genel / General

Main signs of endometriosis in young women

- prolonged use of NSAIDs
- family history for endometriosis,
- frequent absenteeism from school or work
- during menstruation and prescription of estro-progestin contraceptives

before 18 years of age to treat severe primary dysmenorrhea.

Veri Sınıflandırma Tipi: Genel / General

Diagnostic laparoscopies were still routinely performed in infertility workups notably for diagnosing and treating endometriosis found in 35%–40% of women with infertility

Veri Sınıflandırma Tipi: Genel / General

Human Reproduction Open, pp. 1–26, 2022
https://doi.org/10.1093/hropen/hoac009

human reproduction open

ESHRE PAGES

ESHRE guideline: endometriosis†

The members of the Endometriosis Guideline Core Group, Christian M. Becker [1,*], Attila Bokor[2], Oskari Heikinheimo [3], Andrew Horne [4], Femke Jansen[5], Ludwig Kiesel[6], Kathleen King[7], Marina Kvaskoff [8], Annemiek Nap[9], Katrine Petersen[10], Ertan Saridogan[11,12], Carla Tomassetti[13,14], Nehalennia van Hanegem[15], Nicolas Vulliemoz[16], and Nathalie Vermeulen [17]; on behalf of the ESHRE Endometriosis Guideline Group‡

Clinicians are recommended to use imaging (ultrasound (US) or MRI) in the diagnostic work-up for endometriosis, but they need to be aware that a negative finding does not exclude endometriosis, particularly superficial peritoneal disease (Bazot *et al.*, 2009; Manganaro *et al.*, 2012; Guerriero *et al.*, 2014; Thomeer *et al.*, 2014; Nisenblat *et al.*, 2016b; Moura *et al.*, 2019).

Veri Sınıflandırma Tipi: Genel / General

What happenned after decreased diagnostic L/S

Key findings

Incidence of endometriosis declined from 30.2 per 10,000 person-years in 2006 to 17.4 per 10,000 person-years in 2015. Declines appeared to be independent of age, race and ethnicity, and diagnosing modality and provider. The prevalence of

sart | Society For Assisted Reproductive Technology

11% in a cohort of 400,059 ART cycles

Christ JP AJOG 2021

Veri Sınıflandırma Tipi: Genel / General

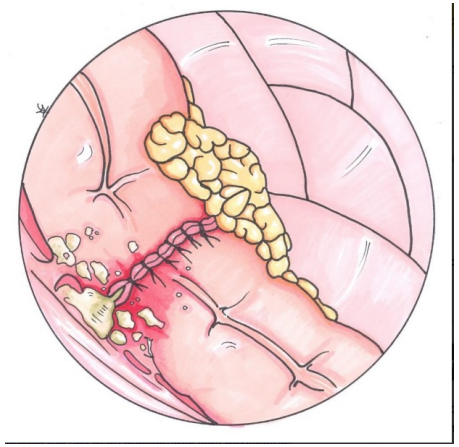
Why is it important to map the lesions ?

- the surgical planning
- risk assessment of women before undergoing surgery for rectosigmoid DE.
- Lesion length measurements with TVS can aid the clinician in counselling and consenting women with DE.

Veri Sınıflandırma Tipi: Genel / General

rectosigmoid deep endometriosis

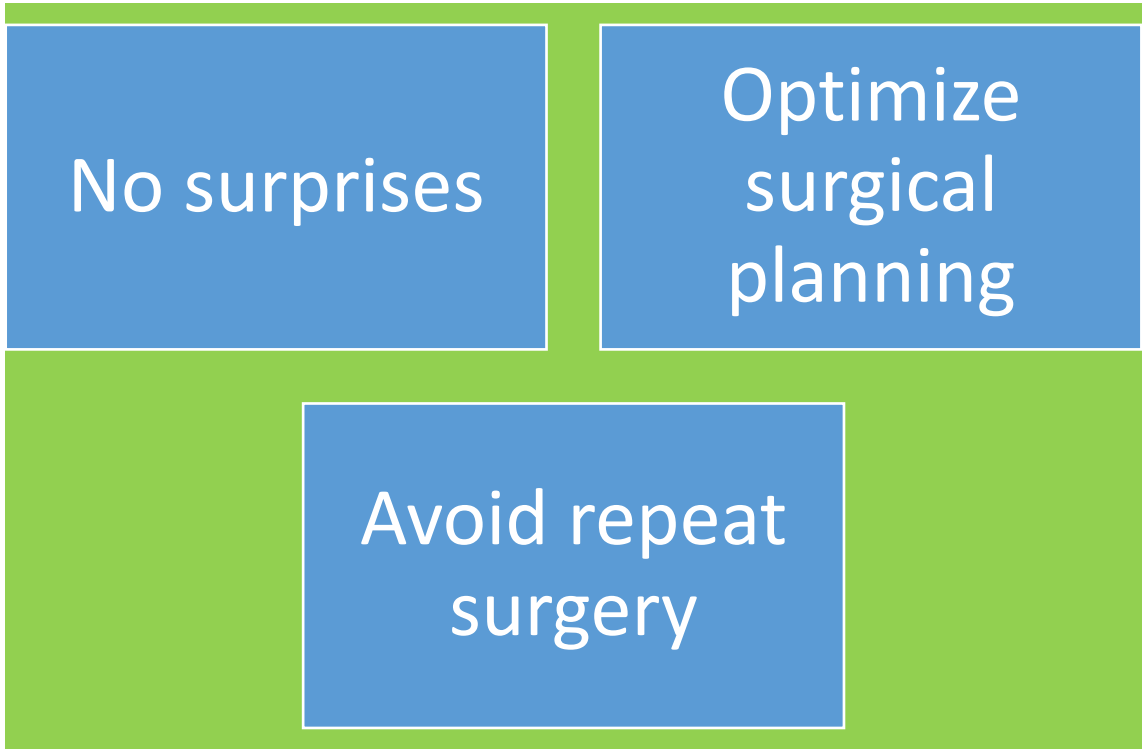
Gynecologist+general surgeon

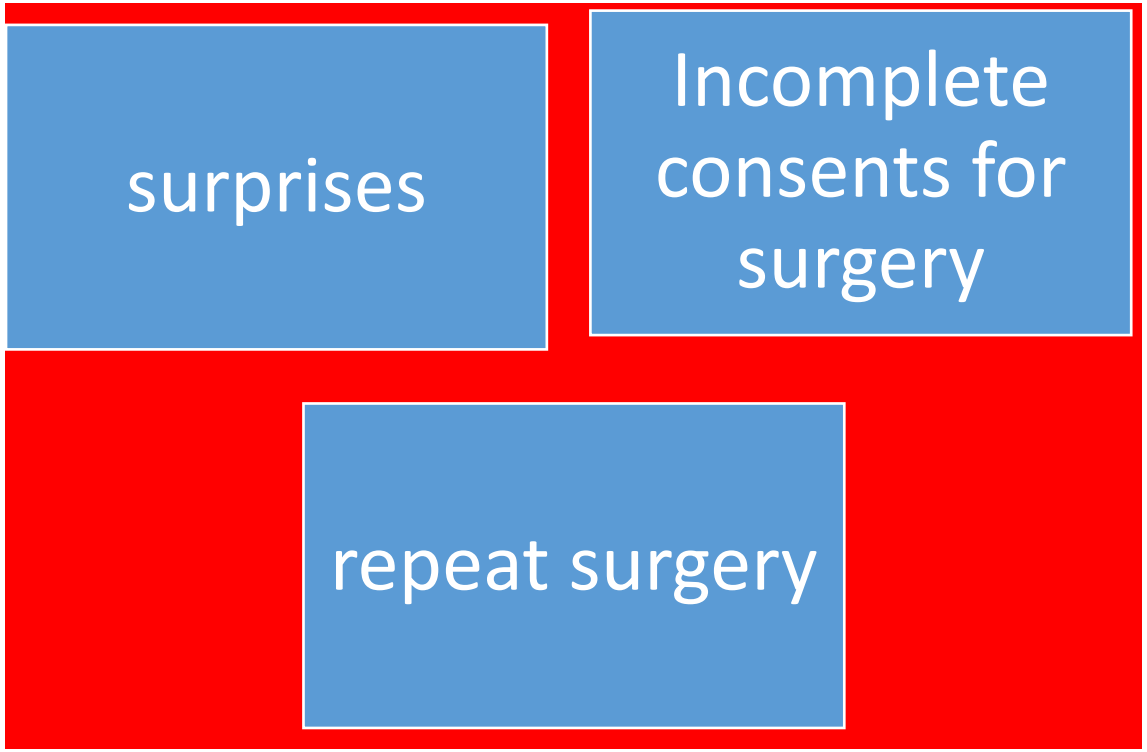


Serious Complications (anastomotic leakage & development of rectovaginal fistula

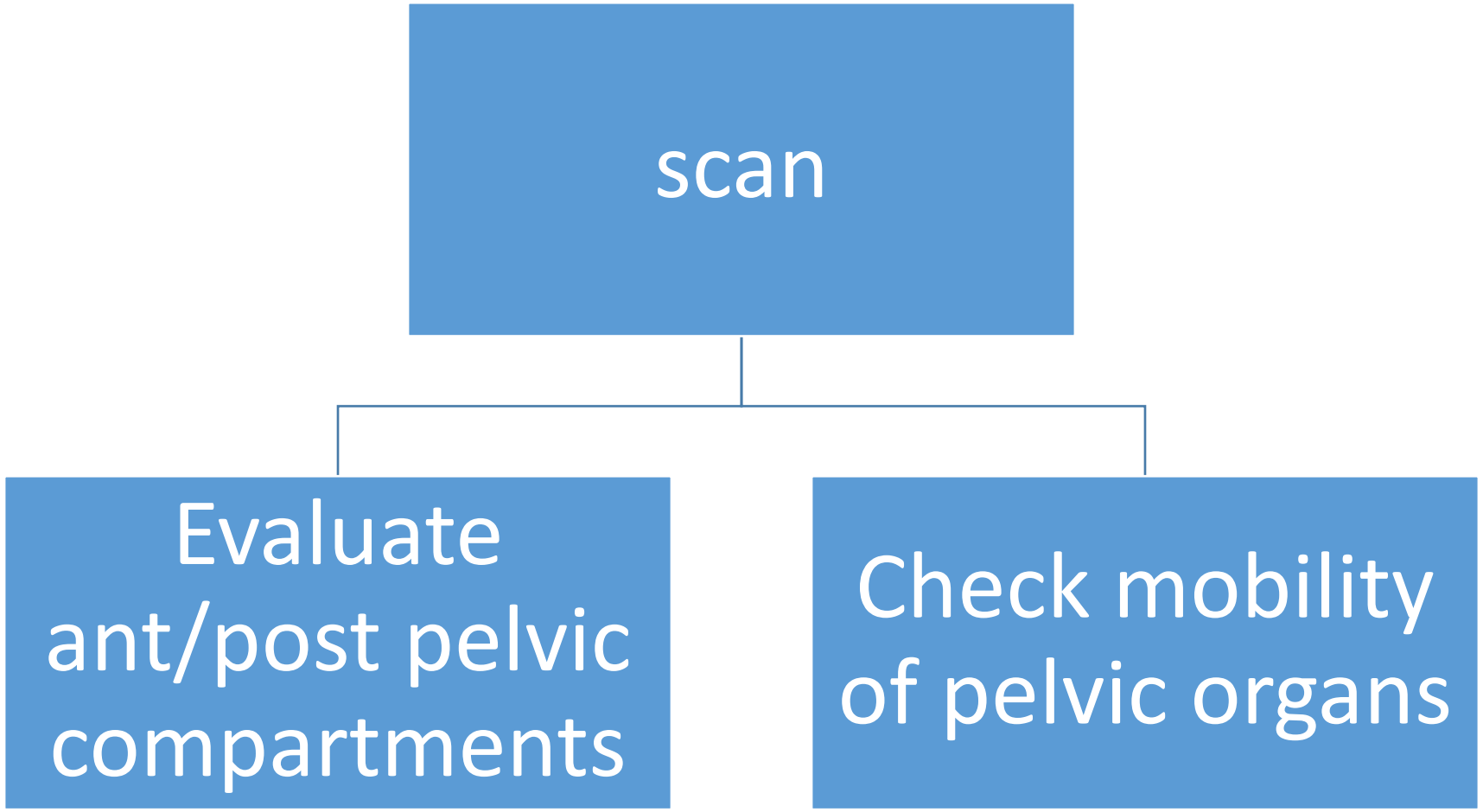
Veri Sınıflandırma Tipi: Genel / General

TVUS for DIE





Veri Sınıflandırma Tipi: Genel / General



Veri Sınıflandırma Tipi: Genel / General

Need of Consensus Opinion

- To perform US in a standardized manner
- To standardize the measurement of endometriotic lesions
- To standardize terminology used when describing the location of DIE and the sonographic features of DIE

Veri Sınıflandırma Tipi: Genel / General

Ultrasound Obstet Gynecol 2016; 48: 318–332
Published online 28 June 2016 in Wiley Online Library (wileyonlinelibrary.com). **DOI:** 10.1002/uog.15955

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[1]#, G. CONDOUS[2]#, T. VAN DEN BOSCH[3], L. VALENTIN[4], F. P. G. LEONE[5], D. VAN SCHOUBROECK[3], C. EXACOUSTOS[6], A. J. F. INSTALLÉ[7], W. P. MARTINS[8], M. S. ABRAO[9], G. HUDELIST[10], M. BAZOT[11], J. L. ALCAZAR[12], M. O. GONÇALVES[13], M. A. PASCUAL[14], S. AJOSSA[1], L. SAVELLI[15], R. DUNHAM[16], S. REID[17], U. MENAKAYA[18], T. BOURNE[19], S. FERRERO[20], M. LEON[21], T. BIGNARDI[22], T. HOLLAND[23], D. JURKOVIC[23], B. BENACERRAF[24], Y. OSUGA[25], E. SOMIGLIANA[26] and D. TIMMERMAN[3]

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

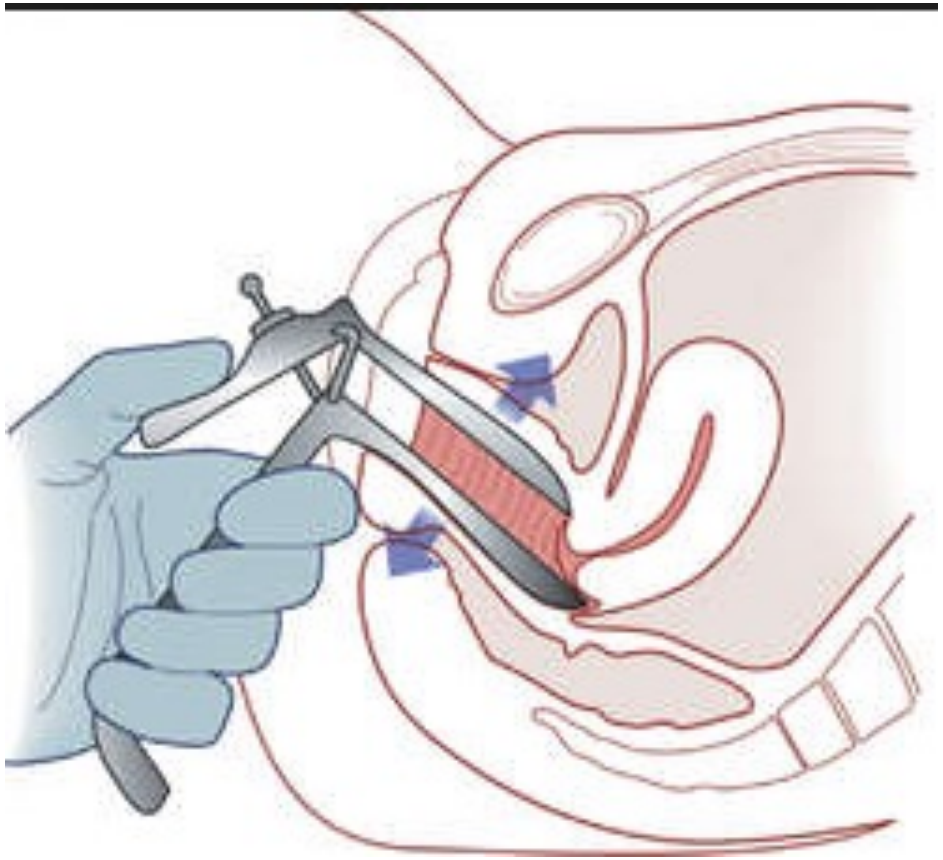
Veri Sınıflandırma Tipi: Genel / General

HISTORY

- age; height; weight; ethnic origin; parity;
- bleeding pattern (regular, irregular or absent); last menstrual period;
- pain (dysmenorrhea,dyspareunia, dysuria, dyschezia, chronic pelvic pain);
- hematochezia and/or hematuria. The onset and duration, VAS
- Subfertility including duration of subfertility; treatment for infertility
- and outcome of fertility treatment;
- previous surgery for endometriosis, previous non-surgical treatment for endometriosis (type, duration, effect);
- previous myomectomy or Cesarean delivery
- Family history of endometriosis

Veri Sınıflandırma Tipi: Genel / General

PELVIC EXAMINATION



- The pelvic examination should include speculum examination (direct visualization of vaginal or cervical DIE) and vaginal palpation.
- Mobility, fixation and/or tenderness of the uterus should be evaluated carefully.
- Site-specific tenderness in the pelvis should also be evaluated.

Veri Sınıflandırma Tipi: Genel / General

Routine Evaluation of the Uterus and the Adnexae 1ST STEP

- The mobility of the uterus : normal, reduced or fixed
- Sonographic signs of adenomyosis
- The presence or absence of endometriomas

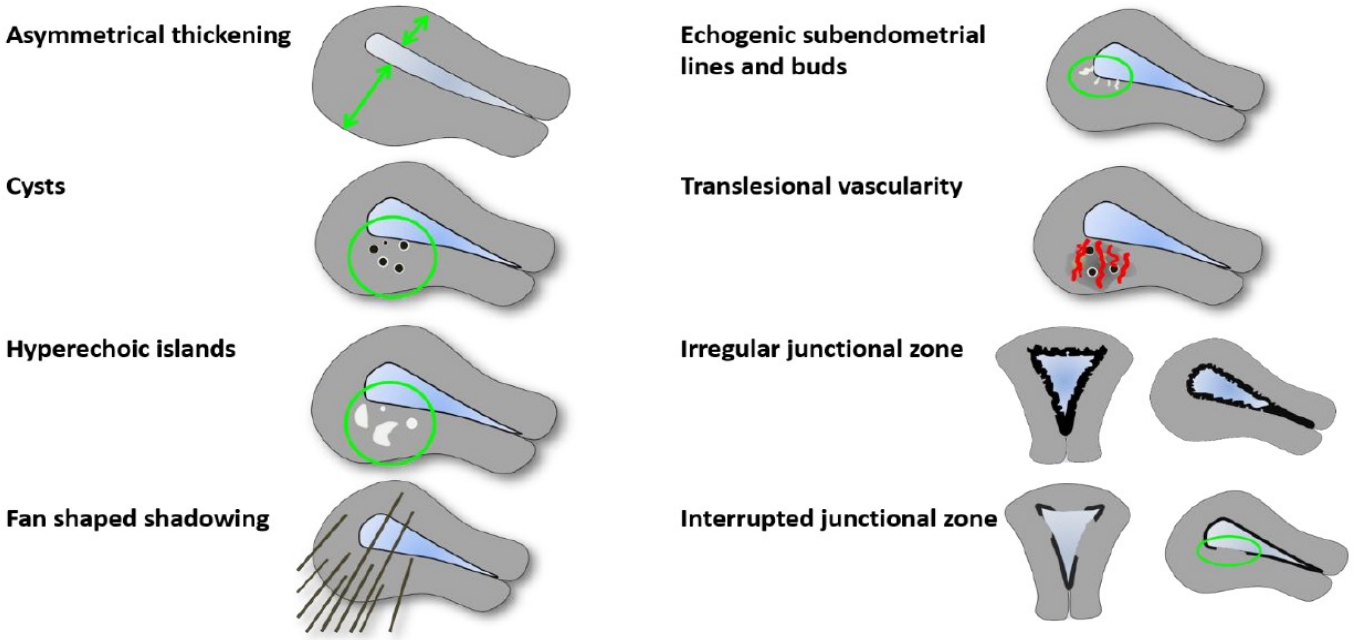
Veri Sınıflandırma Tipi: Genel / General

Ultrasound Obstet Gynecol 2015
Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.14806

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

T. VAN DEN BOSCH*#, M. DUEHOLM†#, F. P. G. LEONE‡, L. VALENTIN§, C. K. RASMUSSEN†, A. VOTINO¶, D. VAN SCHOUBROECK*, C. LANDOLFO**, A. J. F. INSTALLÉ†††‡‡‡, S. GUERRIERO§§, C. EXACOUSTOS¶¶, S. GORDTS***, B. BENACERRAF†††, T. D'HOOGHE‡‡‡, B. DE MOOR†††‡‡‡, H. BRÖLMANN§§§, S. GOLDSTEIN¶¶¶, E. EPSTEIN^, T. BOURNE*~ and D. TIMMERMAN*

Figure 20: Schematic drawings illustrating the ultrasound features currently considered to be typical of adenomyosis.



Veri Sınıflandırma Tipi: Genel / General

The Association of Adenomyosis with Endometriosis Severity

Endometriosis Severity	Stage	Adenomyosis (n = 82)	No Adenomyosis (n = 152)	p Value
Endometriosis,* %† (n)		74.4 (61)	66.4 (101)	.24
Endometriosis stage, %‡ (n)	Stage I	27.9 (17)	60.8 (62)	<.001
	Stage II	13.1 (8)	13.7 (14)	
	Stage III	18.0 (11)	15.7 (16)	
	Stage IV	41.0 (25)	9.8 (10)	
Endometriomas, %† (n)		39.0 (32)	15.1 (23)	<.001
Bilateral endometriomas, %† (n)		14.6 (12)	2.6 (4)	.001
Deep infiltrating endometriosis, %† (n)		42.5 (34)	19.7 (30)	<.001

Veri Sınıflandırma Tipi: Genel / General

Sonographic Characteristics Of Endometriomas

	Age categories (years)					
	18–24 N = 78 (8%)	25–29 N = 201 (20%)	30–34 N = 233 (23%)	35–39 N = 185 (18%)	40–44 N = 158 (16%)	≥45 N = 150 (15%)
Tender mass on scan	36 (46%)	81 (40%)	93 (40%)	67 (36%)	48 (30%)	41 (27%)
Type of tumour						
Unilocular	59 (76%)	143 (71%)	165 (71%)	128 (69%)	94 (59%)	76 (51%)
Unilocular-solid	3 (4%)	12 (6%)	16 (7%)	12 (6%)	11 (7%)	17 (11%)
Multilocular	11 (14%)	37 (18%)	42 (18%)	31 (17%)	39 (25%)	41 (27%)
Multilocular-solid	3 (4%)	6 (3%)	9 (4%)	12 (6%)	12 (8%)	14 (9%)
Purely solid	2 (3%)	3 (1%)	1 (0%)	2 (1%)	2 (1%)	2 (1%)
Echogenicity						
Anechoic	2 (3%)	6 (3%)	4 (2%)	6 (3%)	8 (5%)	16 (11%)
Homogeneous low-level	9 (12%)	17 (8%)	31 (13%)	21 (11%)	23 (15%)	26 (17%)
Ground glass	60 (77%)	162 (81%)	187 (80%)	140 (76%)	111 (70%)	93 (62%)
Haemorrhagic	2 (3%)	4 (2%)	1 (0%)	3 (2%)	6 (4%)	2 (1%)
Mixed	3 (4%)	9 (4%)	9 (4%)	13 (7%)	8 (5%)	11 (7%)
No cyst fluid	2 (3%)	3 (1%)	1 (0%)	2 (1%)	2 (1%)	2 (1%)

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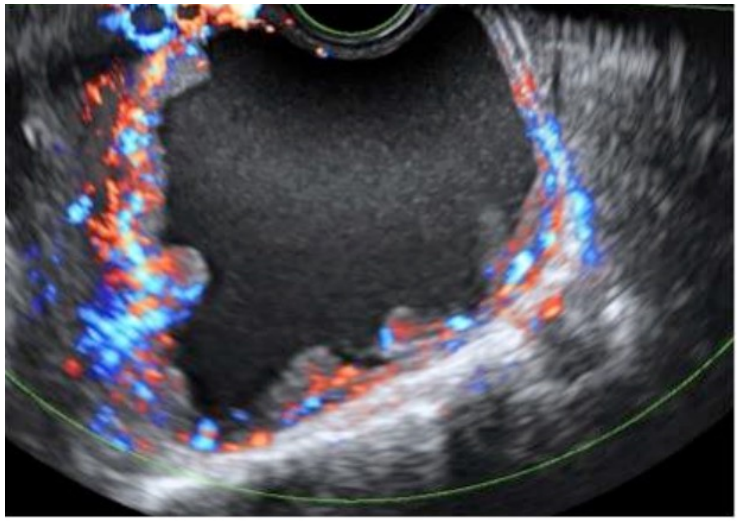
Presence of papillations	2 (3%)	12 (6%)	17 (7%)	16 (9%)	14 (9%)	21 (14%)
Number of papillations						
0	76 (97%)	189 (94%)	216 (93%)	169 (91%)	144 (91%)	129 (86%)
1	2 (3%)	7 (3%)	14 (6%)	12 (6%)	9 (6%)	15 (10%)
2	0 (0%)	3 (1%)	1 (0%)	2 (1%)	1 (1%)	2 (1%)
3	0 (0%)	1 (1%)	0 (0%)	1 (1%)	2 (1%)	2 (1%)
>3	0 (0%)	1 (1%)	2 (1%)	1 (1%)	2 (1%)	2 (1%)
Largest papillation height (mm), if present	19.5 (13.0)	7.5 (5.0)	8.0 (8.0)	10.0 (6.0)	8.5 (4.0)	7.0 (5.0)
Blood flow within papillations, if present	1 (50%)	4 (33%)	3 (18%)	5 (31%)	1 (7%)	9 (43%)
Presence of solid component	8 (10%)	21 (10%)	26 (11%)	26 (14%)	25 (16%)	33 (22%)
Proportion solid component, if present	0.4 (0.5)	0.3 (0.3)	0.3 (0.4)	0.4 (0.3)	0.4 (0.3)	0.3 (0.4)

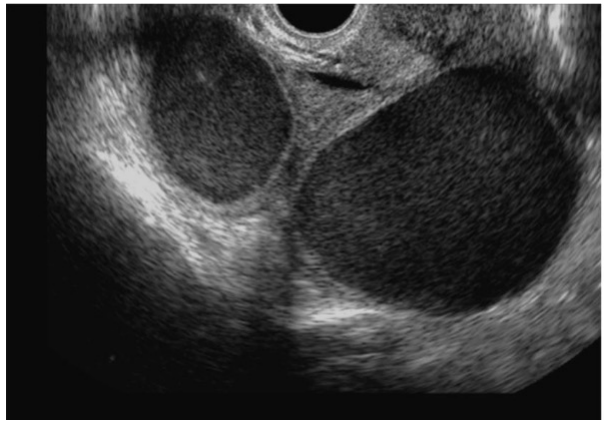
Veri Sınıflandırma Tipi: Genel / General

Largest diameter of lesion, mm	50.0 (31.0)	53.0 (32.0)	55.0 (35.0)	51.0 (29.0)	53.5 (35.0)	56.0 (34.0)
Colour score						
No colour	30 (38%)	73 (36%)	96 (41%)	68 (37%)	61 (39%)	52 (35%)
Minimal colour	37 (47%)	87 (43%)	92 (39%)	82 (44%)	68 (43%)	60 (40%)
Moderate colour	9 (12%)	32 (16%)	42 (18%)	29 (16%)	26 (16%)	37 (25%)
Abundant colour	2 (3%)	9 (4%)	3 (1%)	6 (3%)	3 (2%)	1 (1%)

Veri Sınıflandırma Tipi: Genel / General



- Size- mean of three orthogonal Planes
- the number of endometriomas
- ultrasound appearance should be noted



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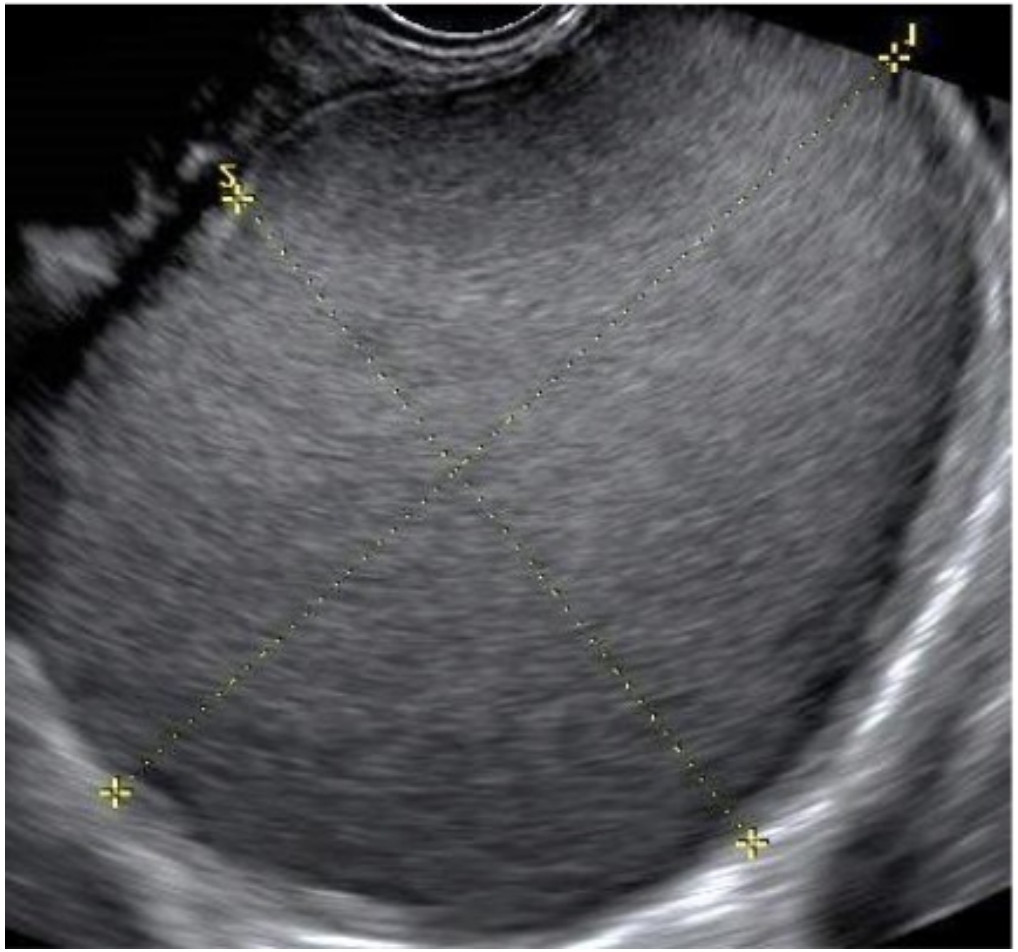
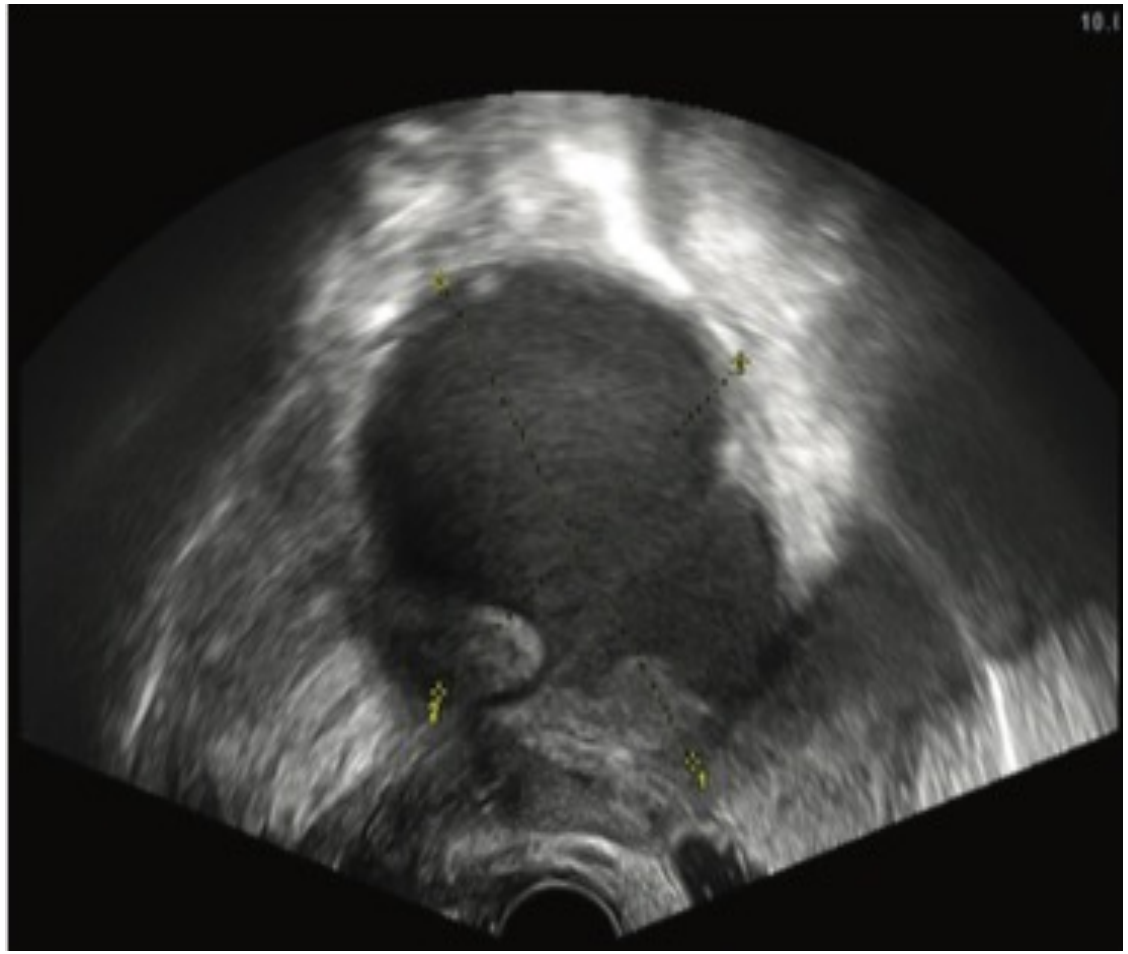
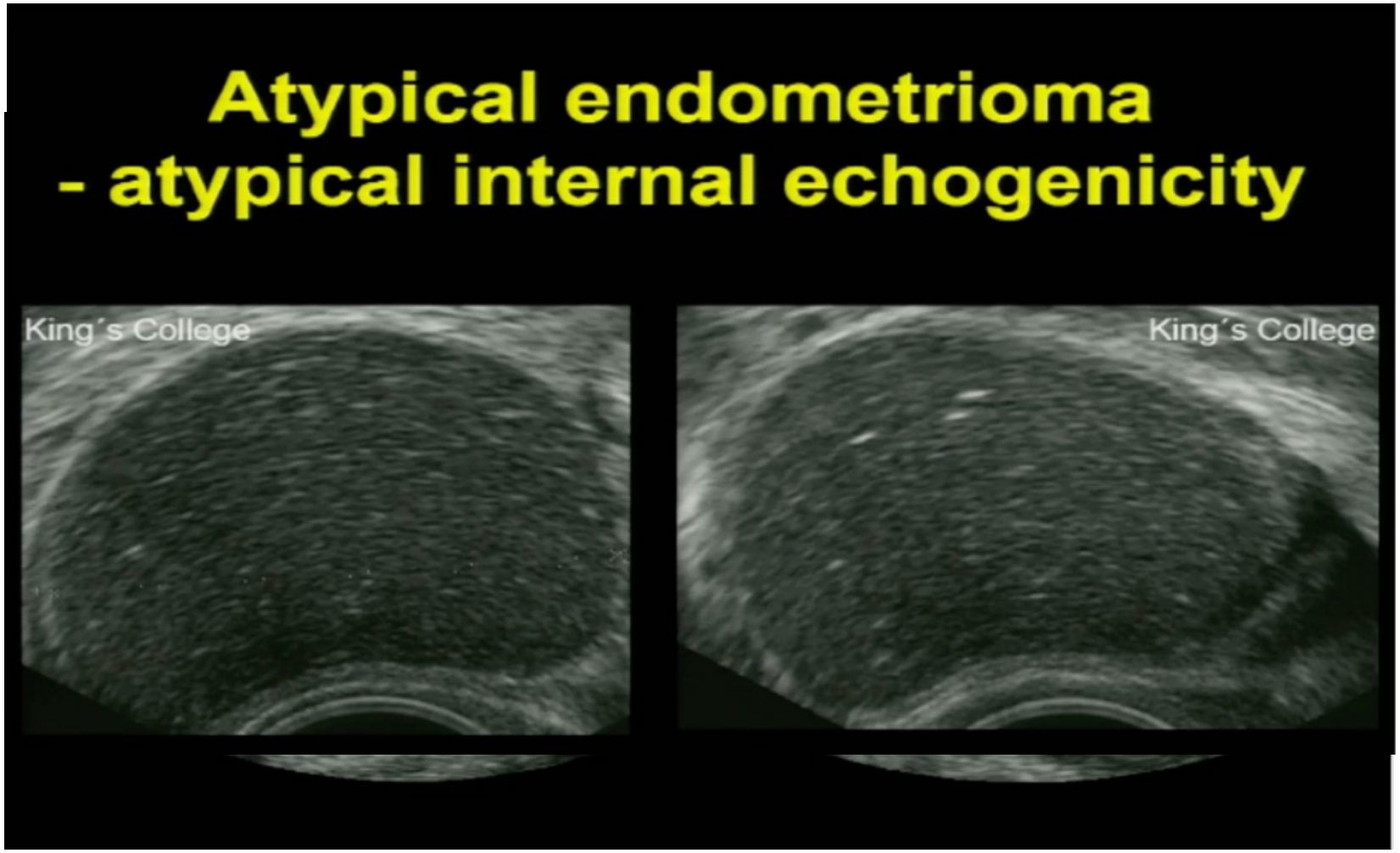


- a unilocular cyst with ground glass echogenicity of cyst content
- Cyst with homogeneous internal low-level echoes



amorphous sludge attached to the cyst wall. Such sludge may be misinterpreted as a solid component.

Veri Sınıflandırma Tipi: Genel / General



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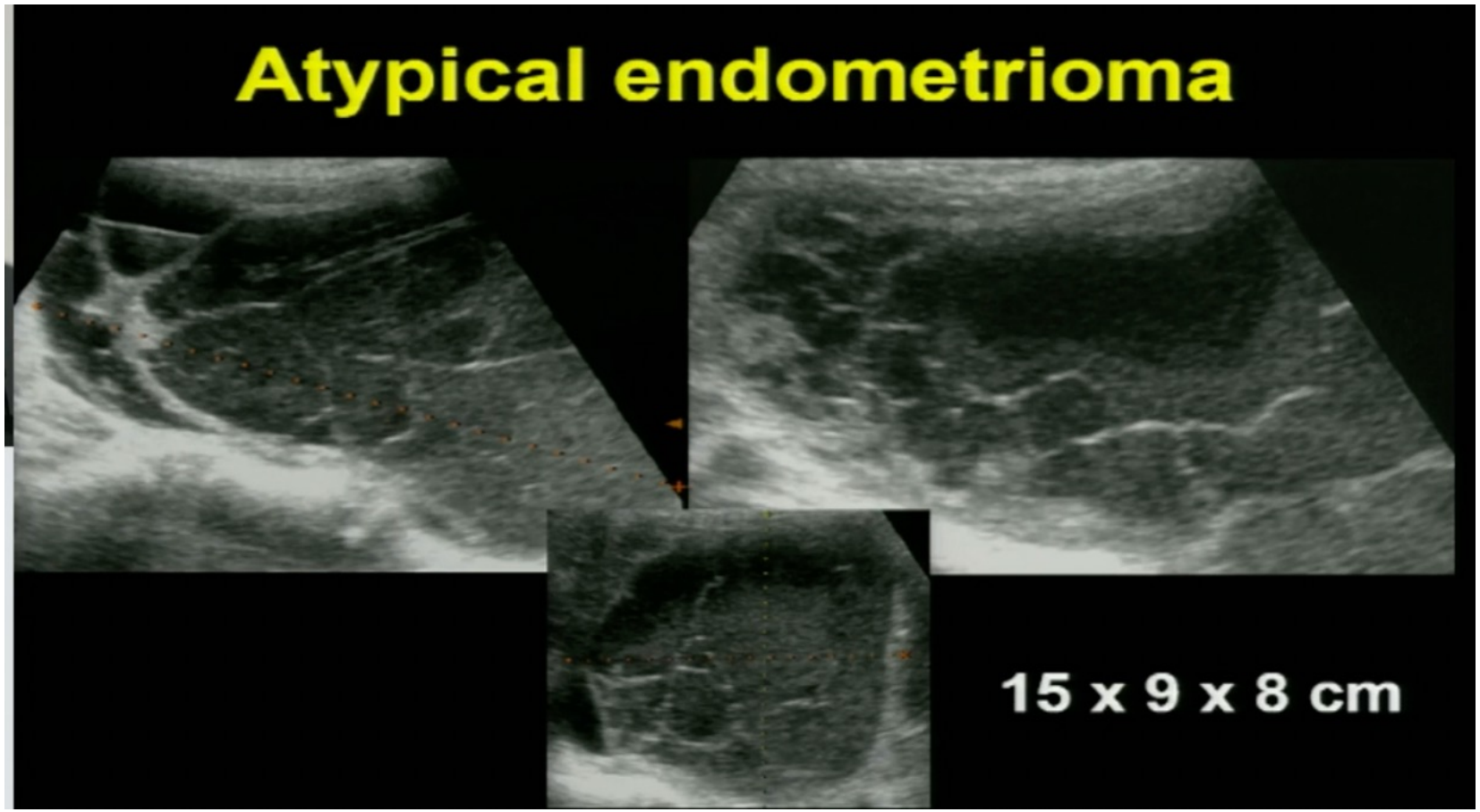
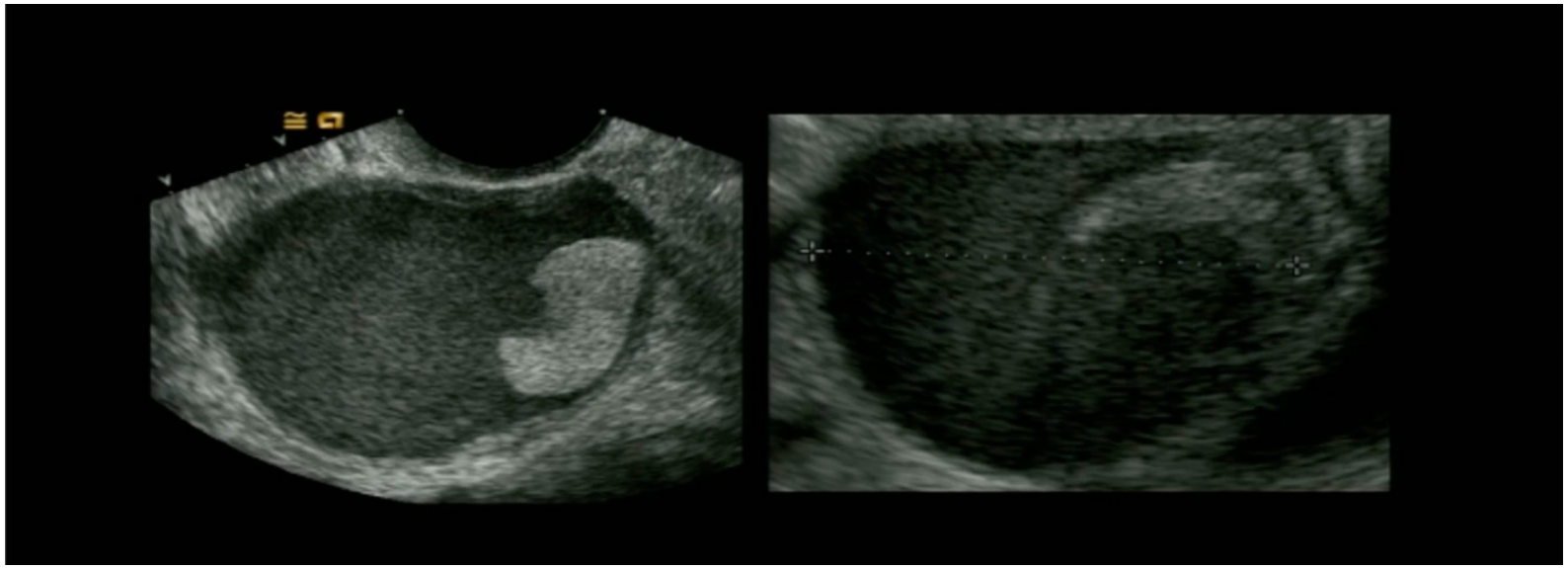


Veri Sınıflandırma Tipi: Genel / General

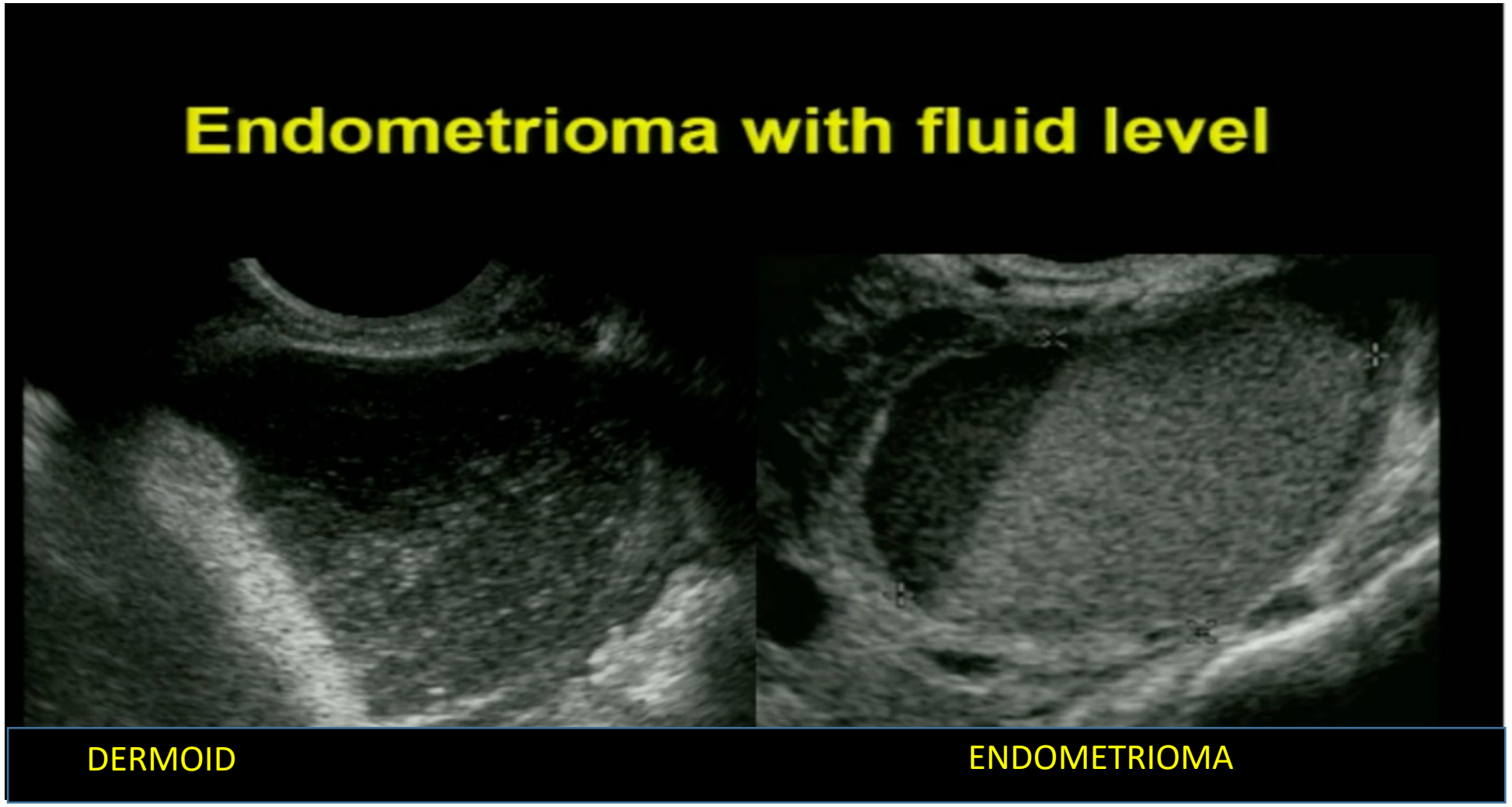
Atypical endometrioma



- Solid component ?

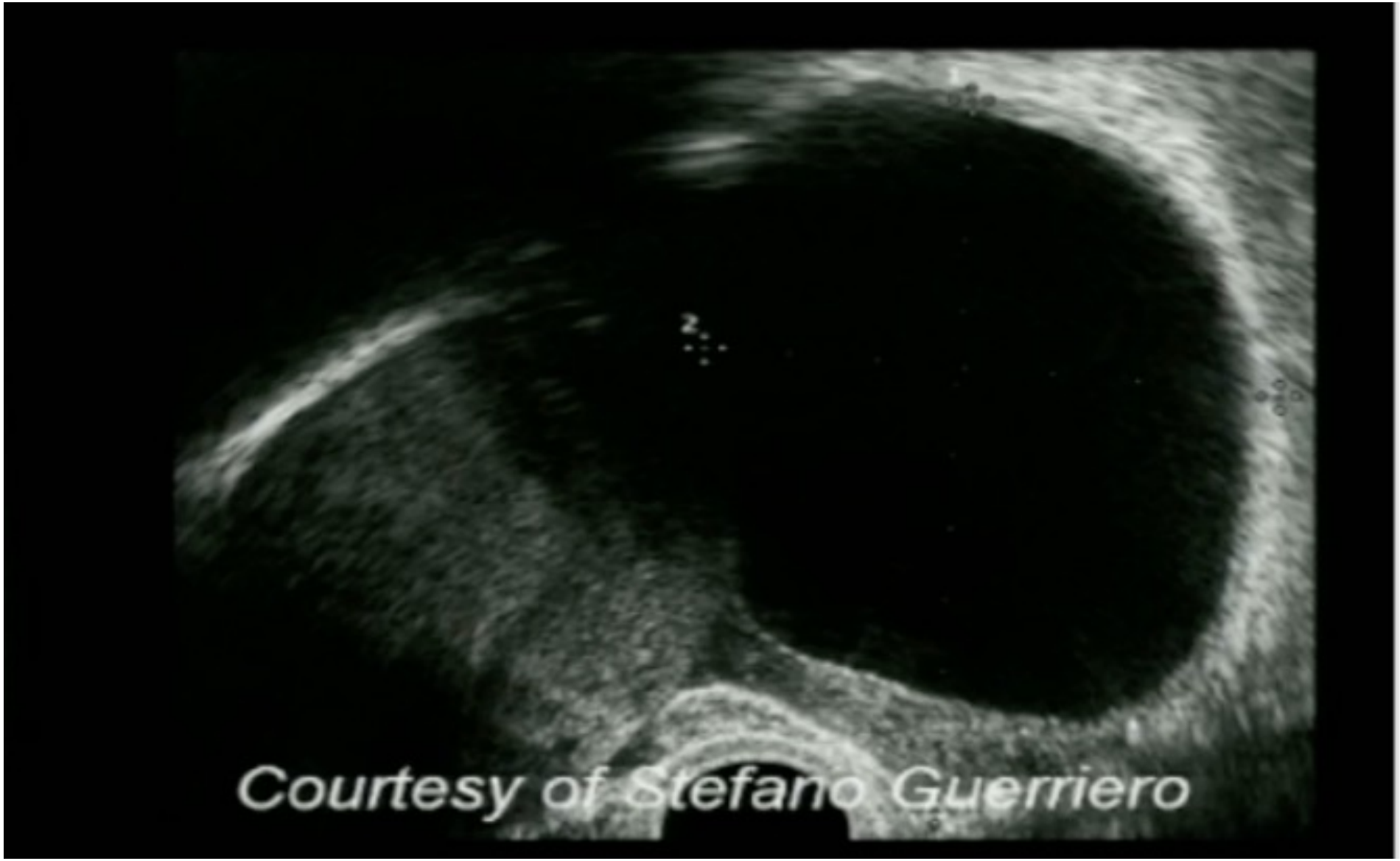
  - Nope, retracted blood clot

Veri Sınıflandırma Tipi: Genel / General



- Dermoid or endometrioma ? Fat floats

Veri Sınıflandırma Tipi: Genel / General



Clear looking unilocular cyst

Veri Sınıflandırma Tipi: Genel / General

Grade and disease location in patients with pelvic endometriosis.

Characteristics	Absence of kissing ovaries (n = 282)	Presence of kissing ovaries (n = 27)	*P*
Stage of the disease[a]			
Minimal	48 (17)	0	.01
Mild	72 (25.5)	0	<.001
Moderate	91 (32.3)	3 (11.1)	.02
Severe	71 (25.2)	24 (88.9)	<.0001
Fallopian tube involvement	93 (33.0)	25 (92.6)	<.0001
Completely obliterated cul-de-sac	62 (22.0)	17 (63.0)	<.0001
Mono-/bilateral ureteral endometriosis	9 (3.2)	5 (18.5)	.05
Uterosacral ligaments endometriosis	59 (20.9)	19 (70.4)	<.0001
Bladder endometriosis	9 (3.2)	1 (3.7)	.60
Bowel endometriosis	7 (2.5)	5 (18.5)	<.01

- Kissing ovaries

Ghezzi et al FS 2005

Veri Sınıflandırma Tipi: Genel / General

Isolated Ovarian Endometrioma: A History Between Myth and Reality

One hundred eighty-six patients (73%) had adhesions, and 134 patients (53%) showed signs of myometrial adenomyosis on TVS. Thirty-eight patients *(15%) exhibited only a single isolated endometrioma with a mobile ovary and no other signs of pelvic endometriosis/adenomyosis at TVS.*

Exacoustos et al 2018 JMIG

Veri Sınıflandırma Tipi: Genel / General

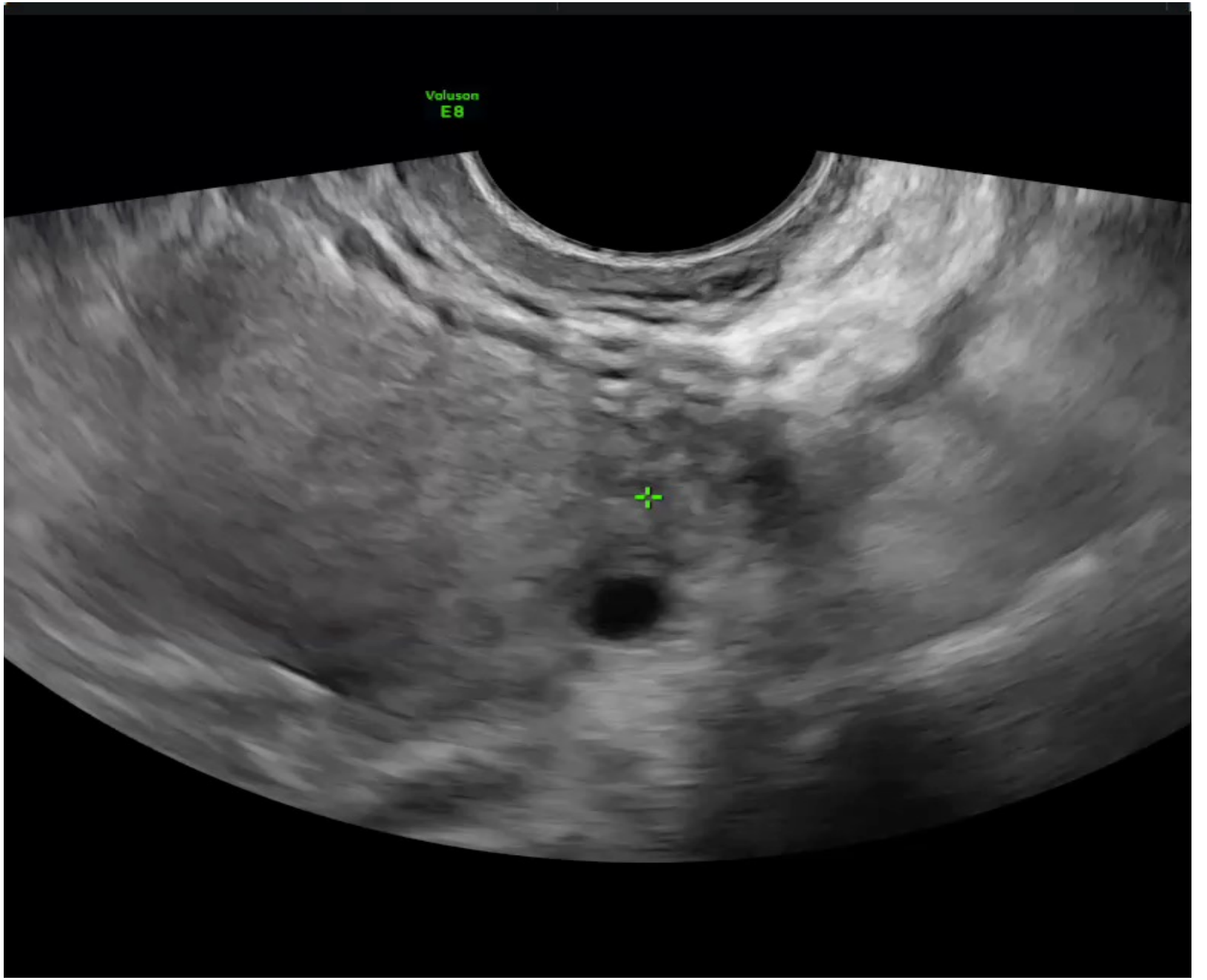
Evaluation of transvaginal sonographic ‘soft markers’ Second step

- Site-specific tenderness
- fixed ovaries

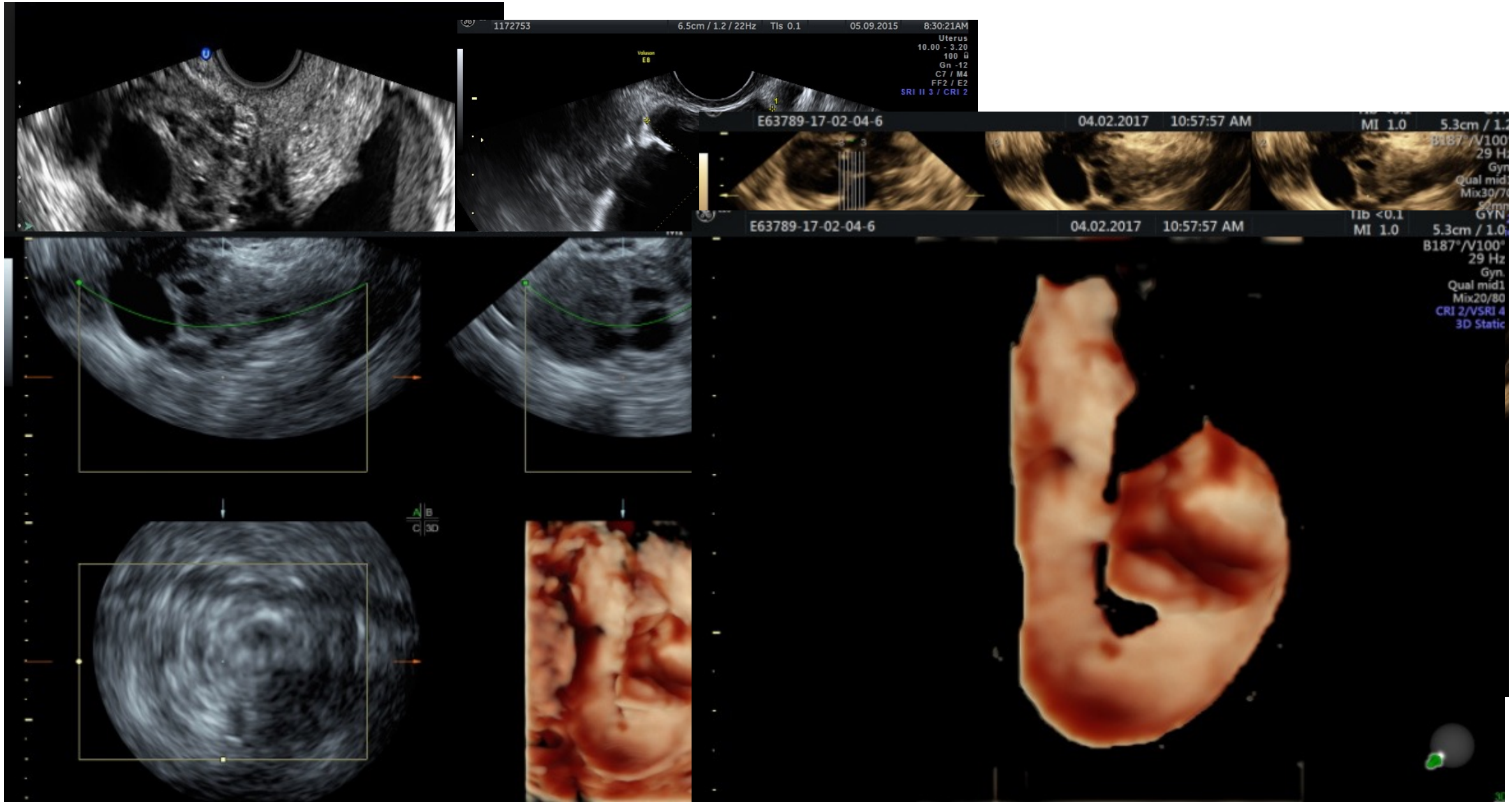
- Apply pressure between the uterus and ovary, assess if the ovary is fixed to the uterus medially, to the pelvic side wall laterally or to the USLs

- Search for hydro/hematosalpinx
- Presence of loculated peritoneal fluid in the pelvis.

Veri Sınıflandırma Tipi: Genel / General



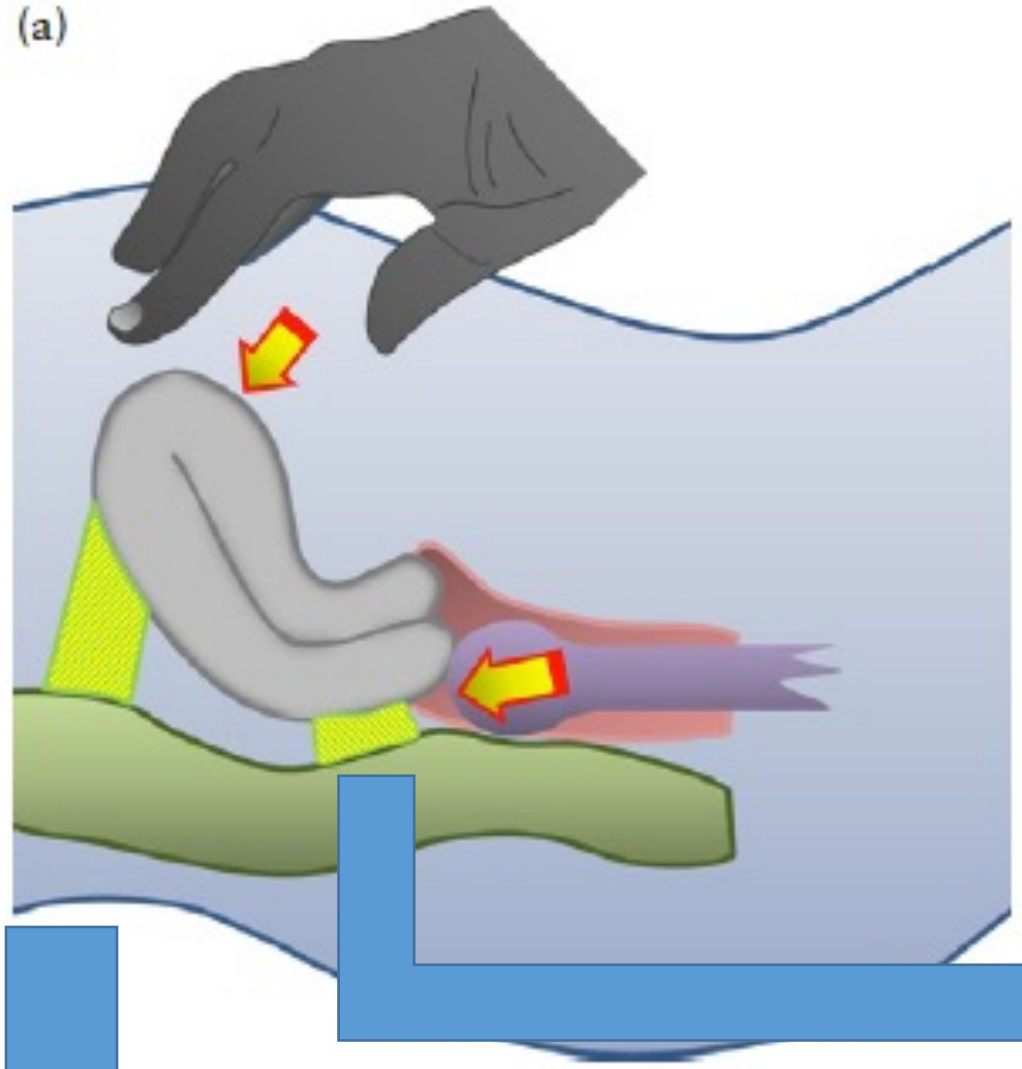
Veri Sınıflandırma Tipi: Genel / General



Veri Sınıflandırma Tipi: Genel / General

Assessment of status of POD using real-time ultrasound-based ‘sliding sign’ Third STEP

Veri Sınıflandırma Tipi: Genel / General

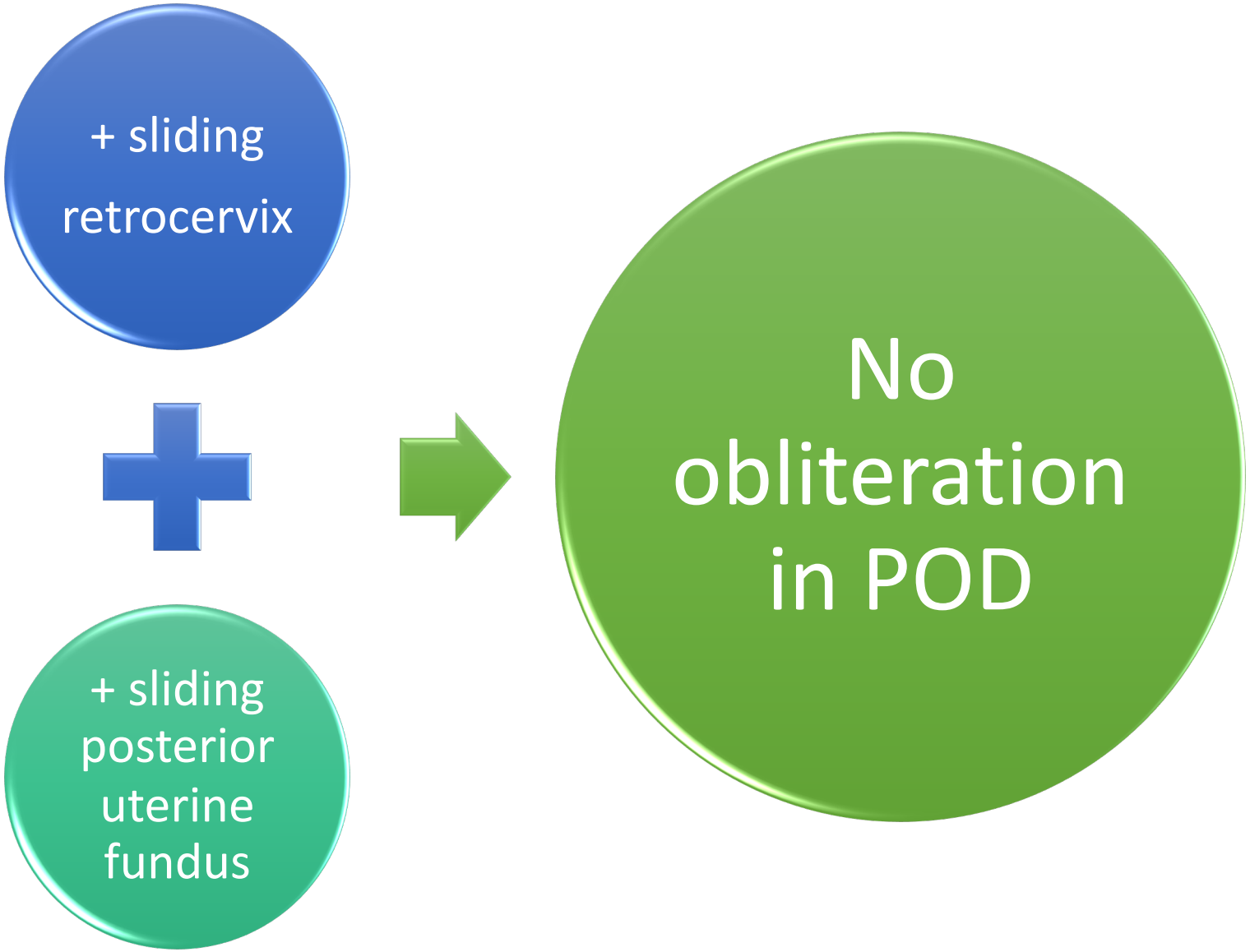


SLIDING SIGN

the anterior rectum glides freely across the posterior aspect of the cervix (retrocervical region) and posterior vaginal wall.

ballot the uterus between the palpating hand and the transvaginal probe (which is held in the other hand), to assess whether the anterior bowel glides freely over the posterior aspect of the upper uterus/fundus.

Veri Sınıflandırma Tipi: Genel / General



Veri Sınıflandırma Tipi: Genel / General

Veri Sınıflandırma Tipi: Genel / General

Veri Sınıflandırma Tipi: Genel / General

Assessment of DIE nodules STEP 4

Veri Sınıflandırma Tipi: Genel / General

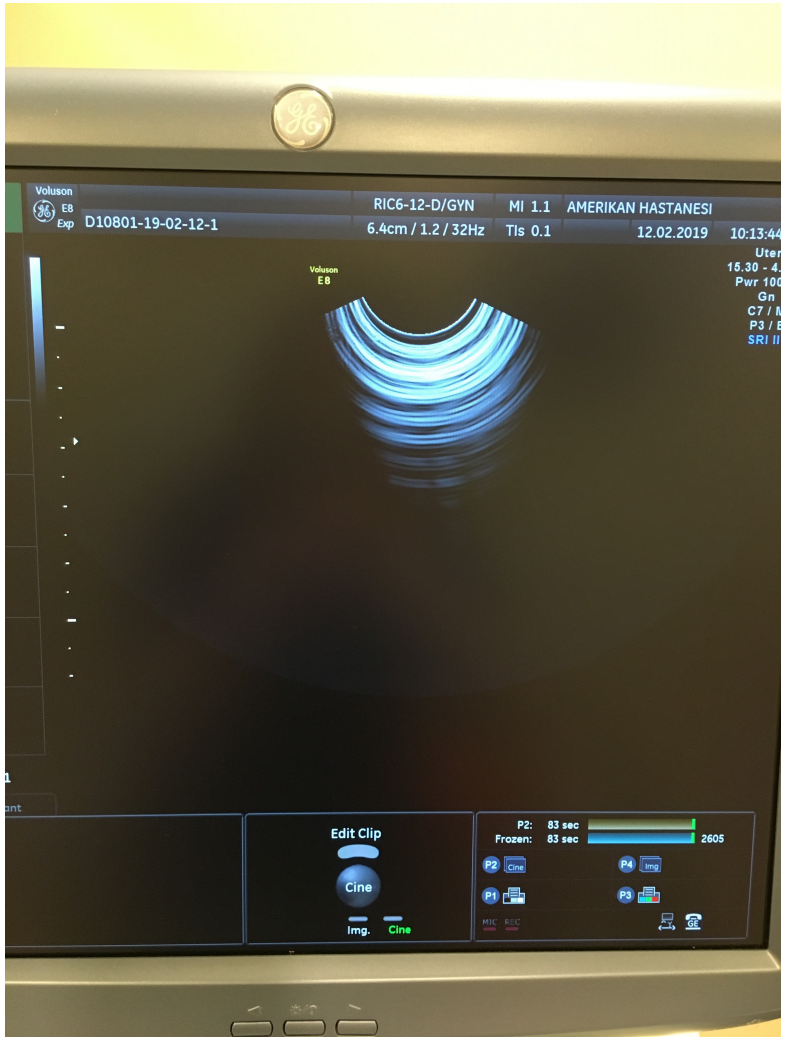
on the evening before the pelvic scan and within an hour or 2 before the ultrasound

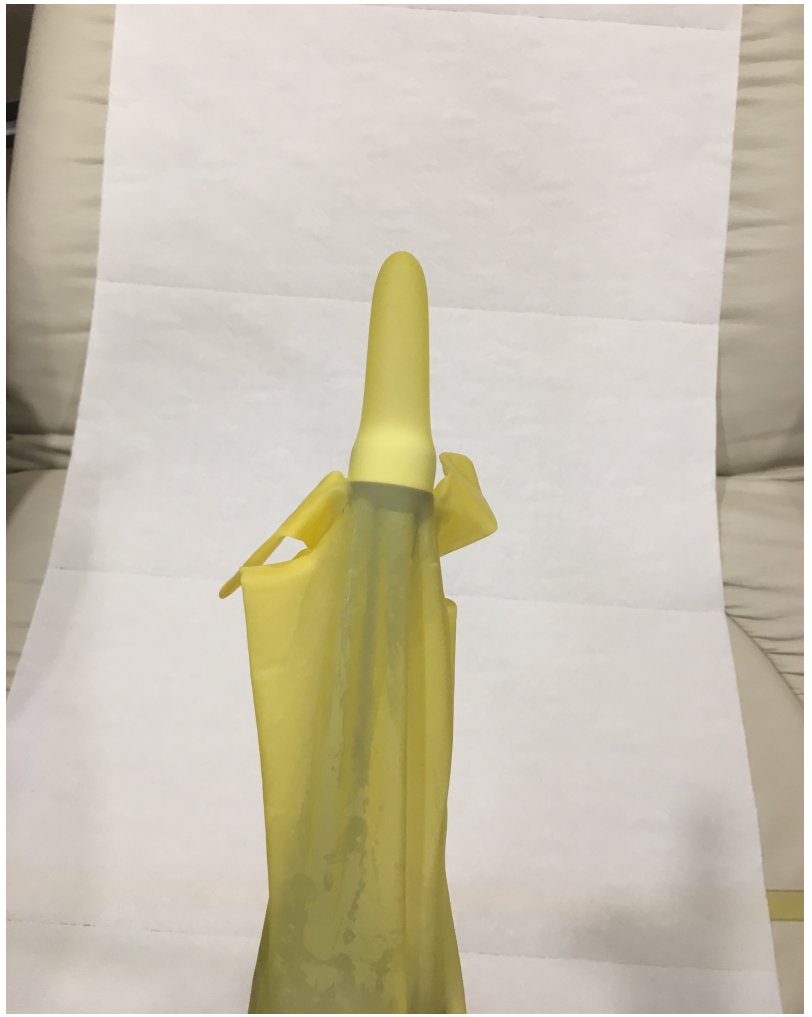
Bladder should not totally empty

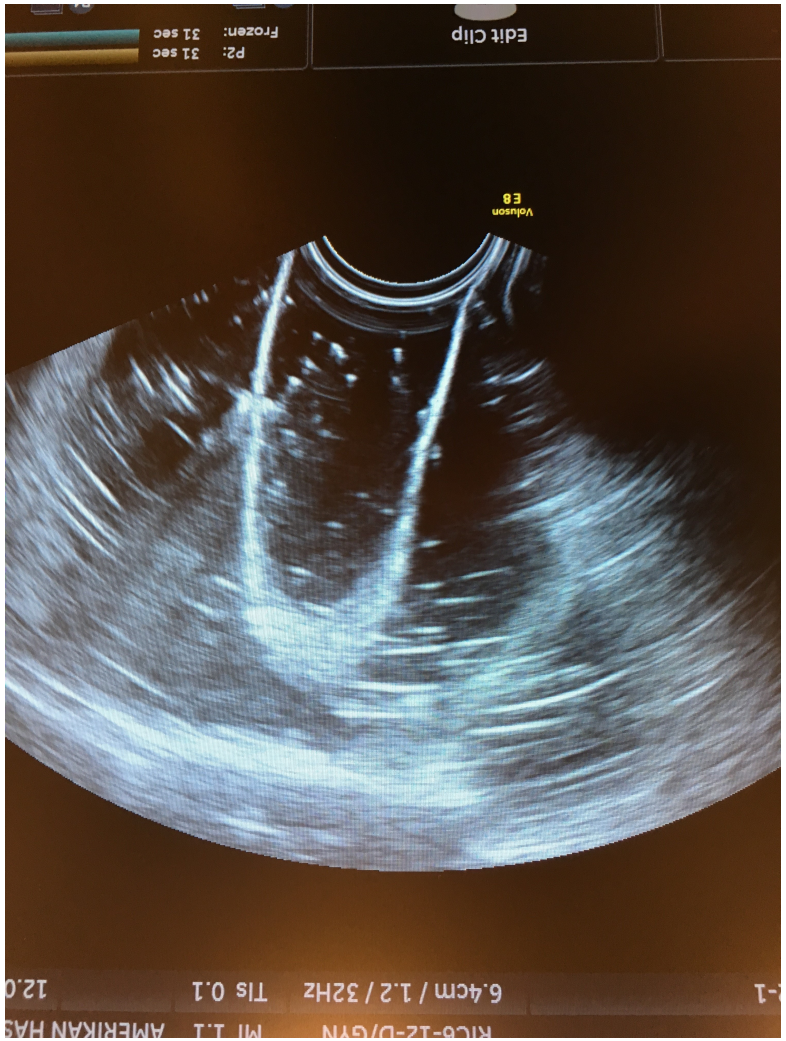
Veri Sınıflandırma Tipi: Genel / General

- Spacious- quiet examination room
- Dedicated nurse
- Lidocaine vaginal gel

Veri Sınıflandırma Tipi: Genel / General

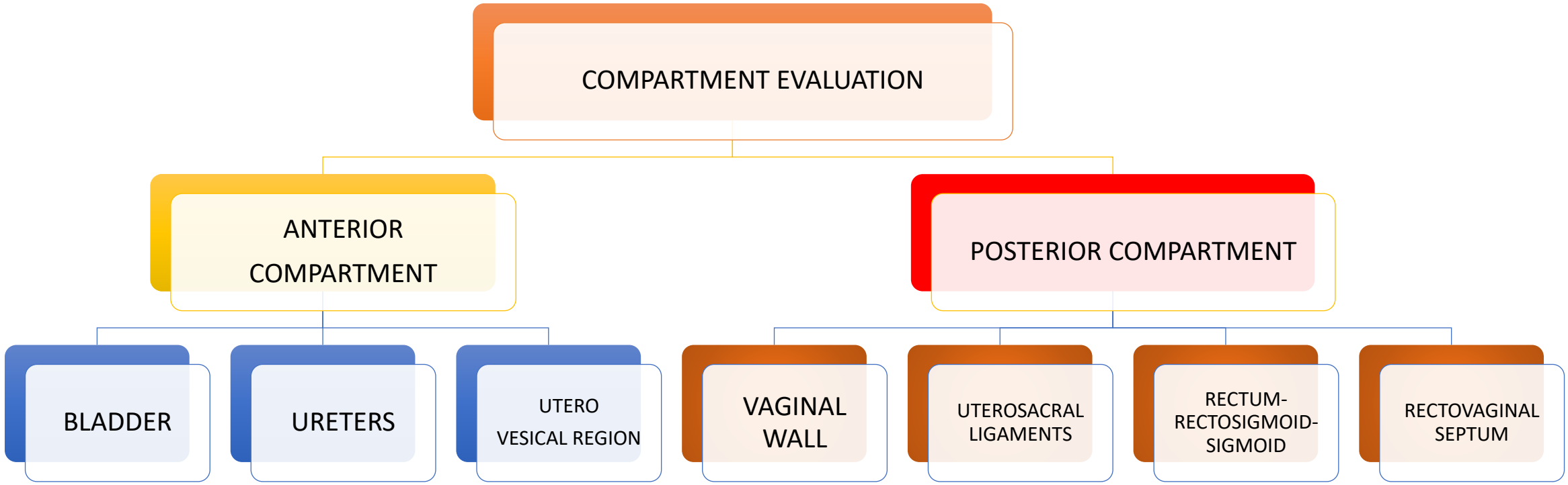






create an acoustic window between the transvaginal probe and the surrounding vaginal structures.

Veri Sınıflandırma Tipi: Genel / General



Veri Sınıflandırma Tipi: Genel / General

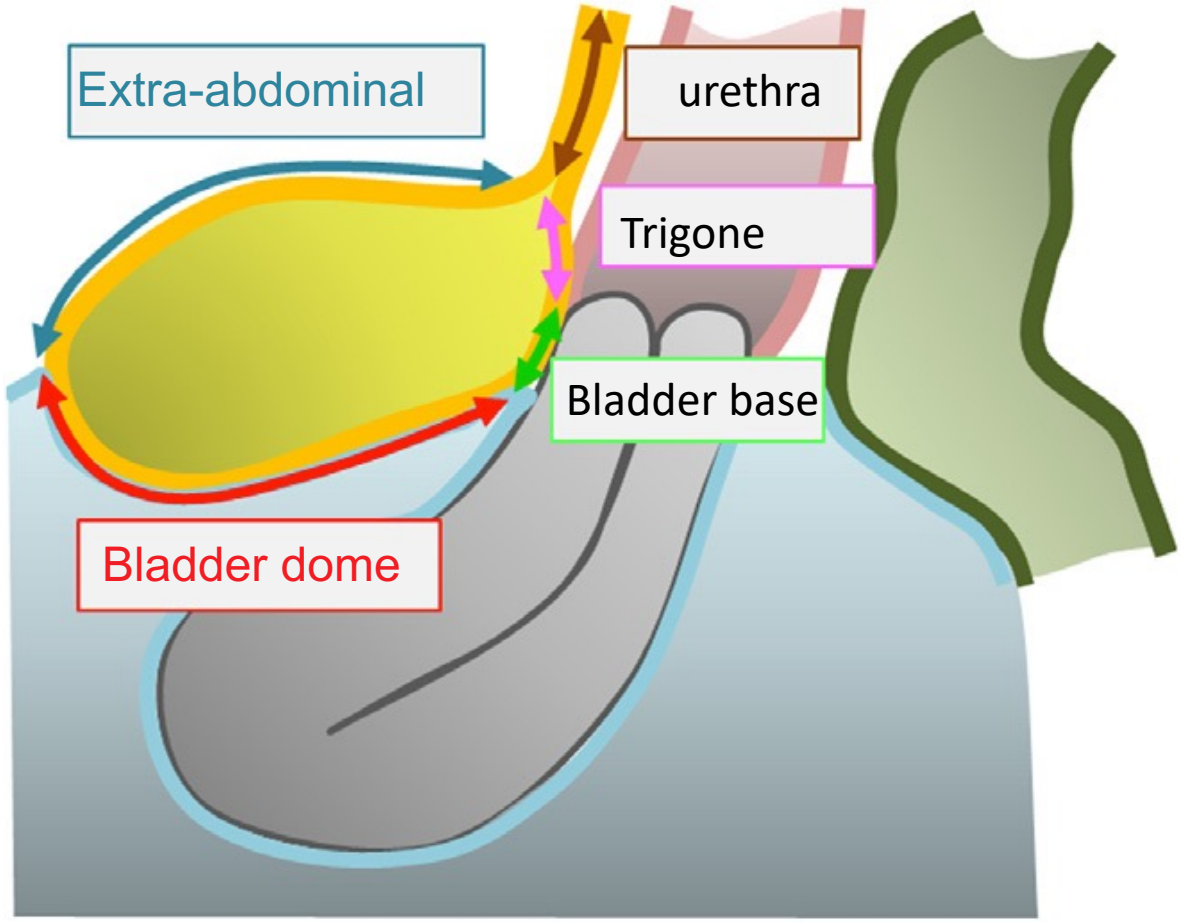
General Rule

- deep-infiltrating endometriosis (DIE) of hollow organs induces a retraction of margins with a subsequent irregular profile of both external and internal surfaces (i.e., bladder, bowels, and vagina),

- DIE of dense organs (i.e., peritoneal and retroperitoneal organs) maintains a nodular hypoechoic structure.

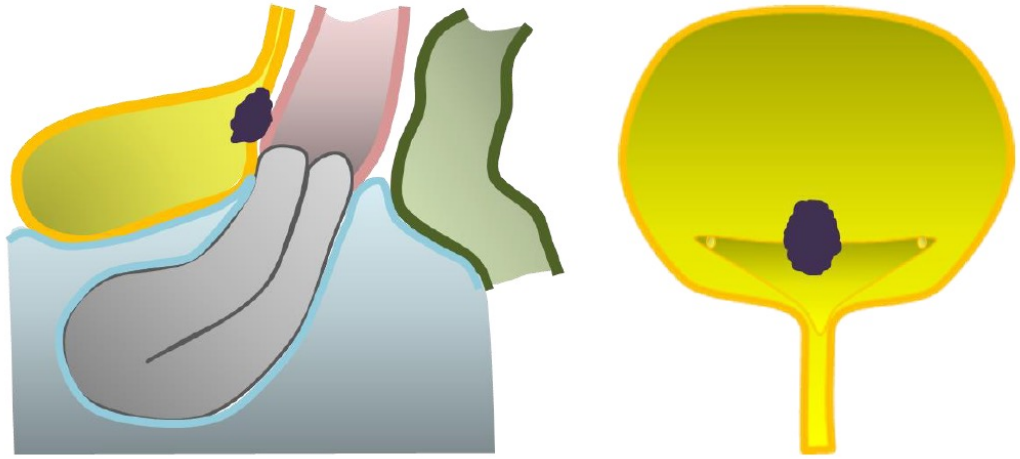
Veri Sınıflandırma Tipi: Genel / General

ANTERIOR COMPARTMENT



Veri Sınıflandırma Tipi: Genel / General

S4 (a) trigonal zone of bladder



S4 (b) base of bladder

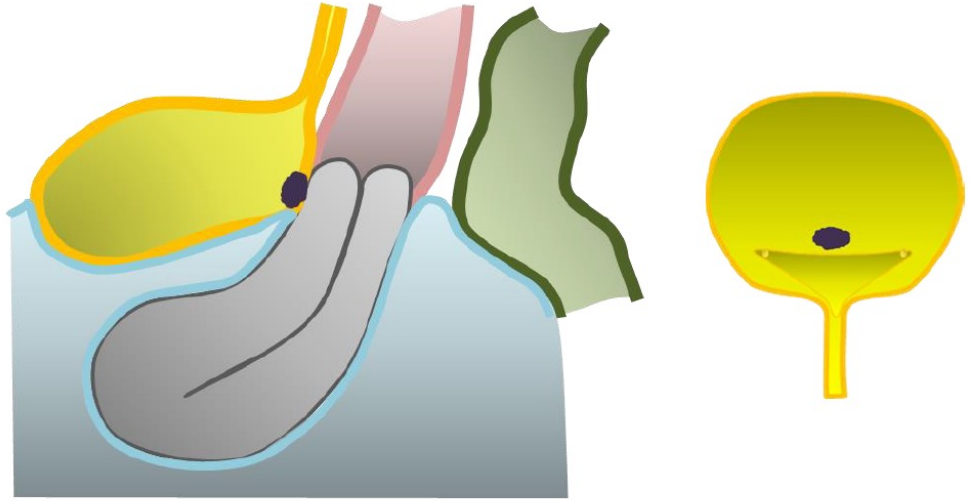
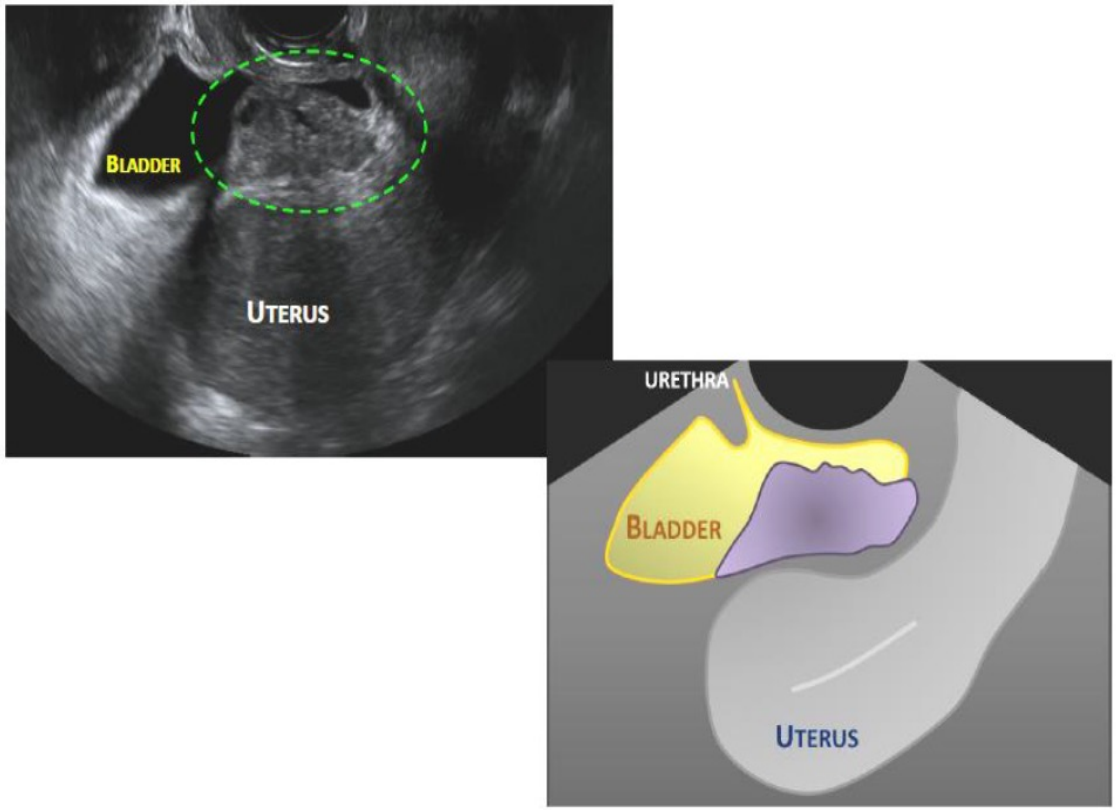


Figure S5 Schematic drawing and ultrasound image demonstrating the most frequent location of endometriotic bladder nodules: the bladder base.



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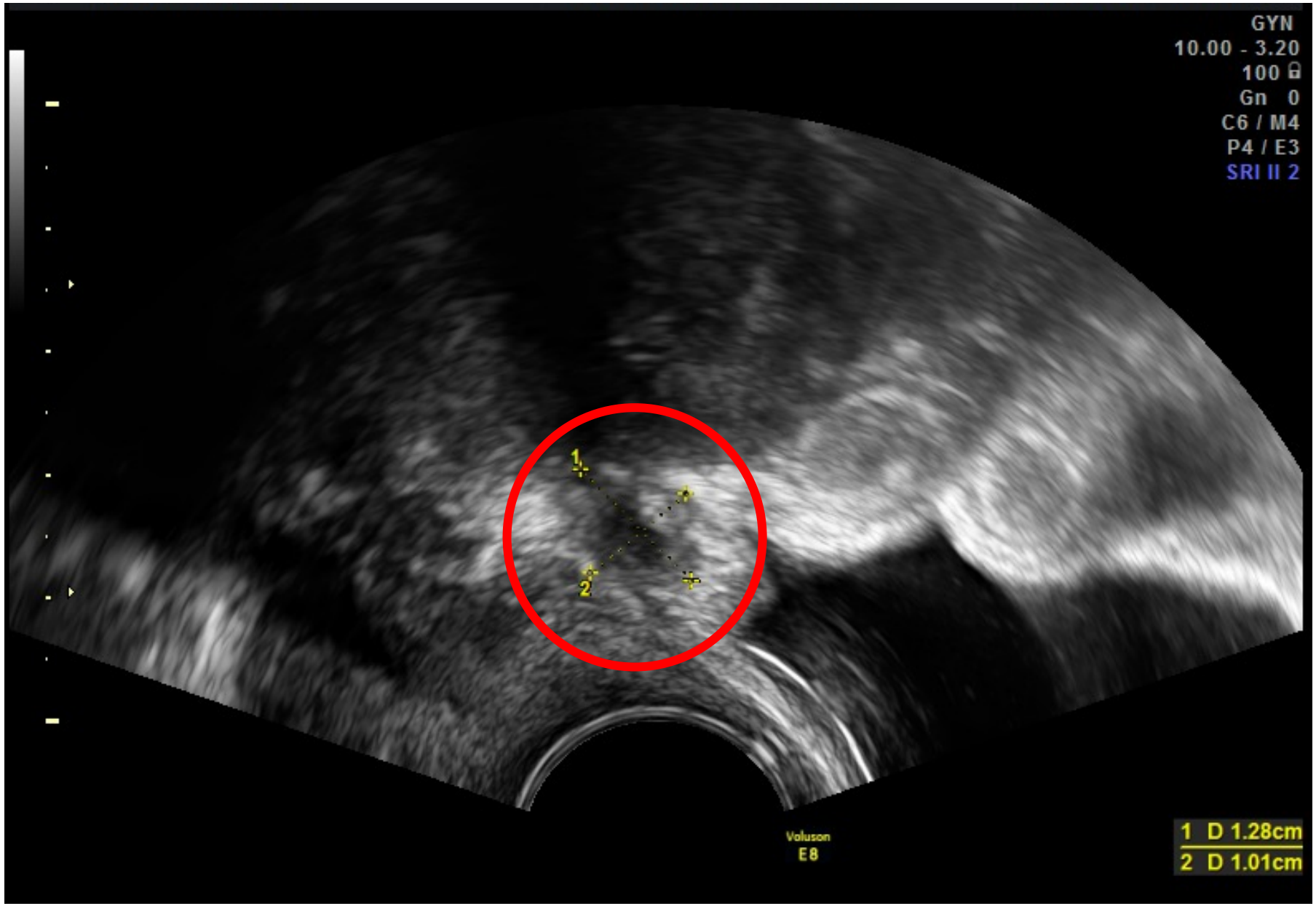

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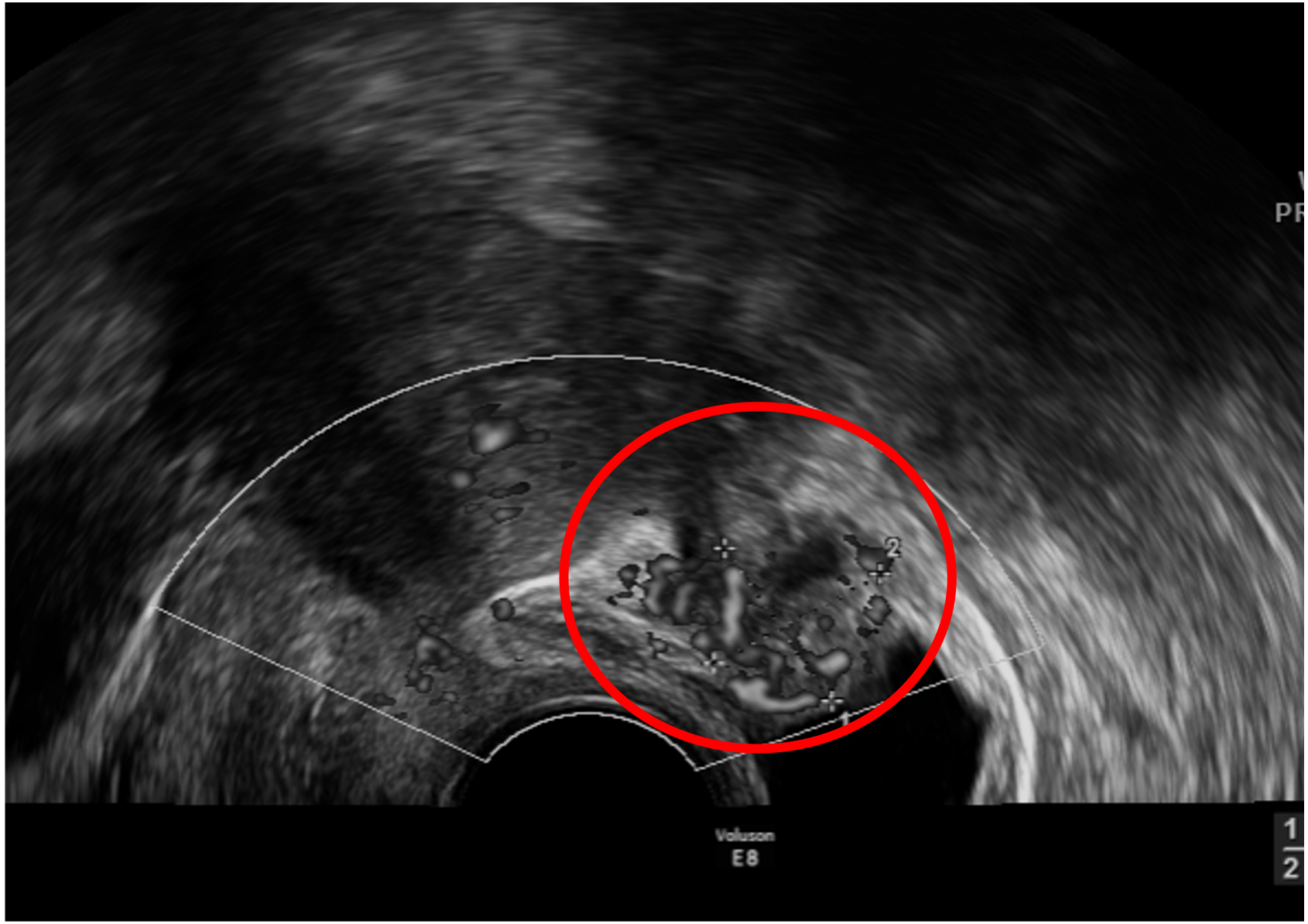

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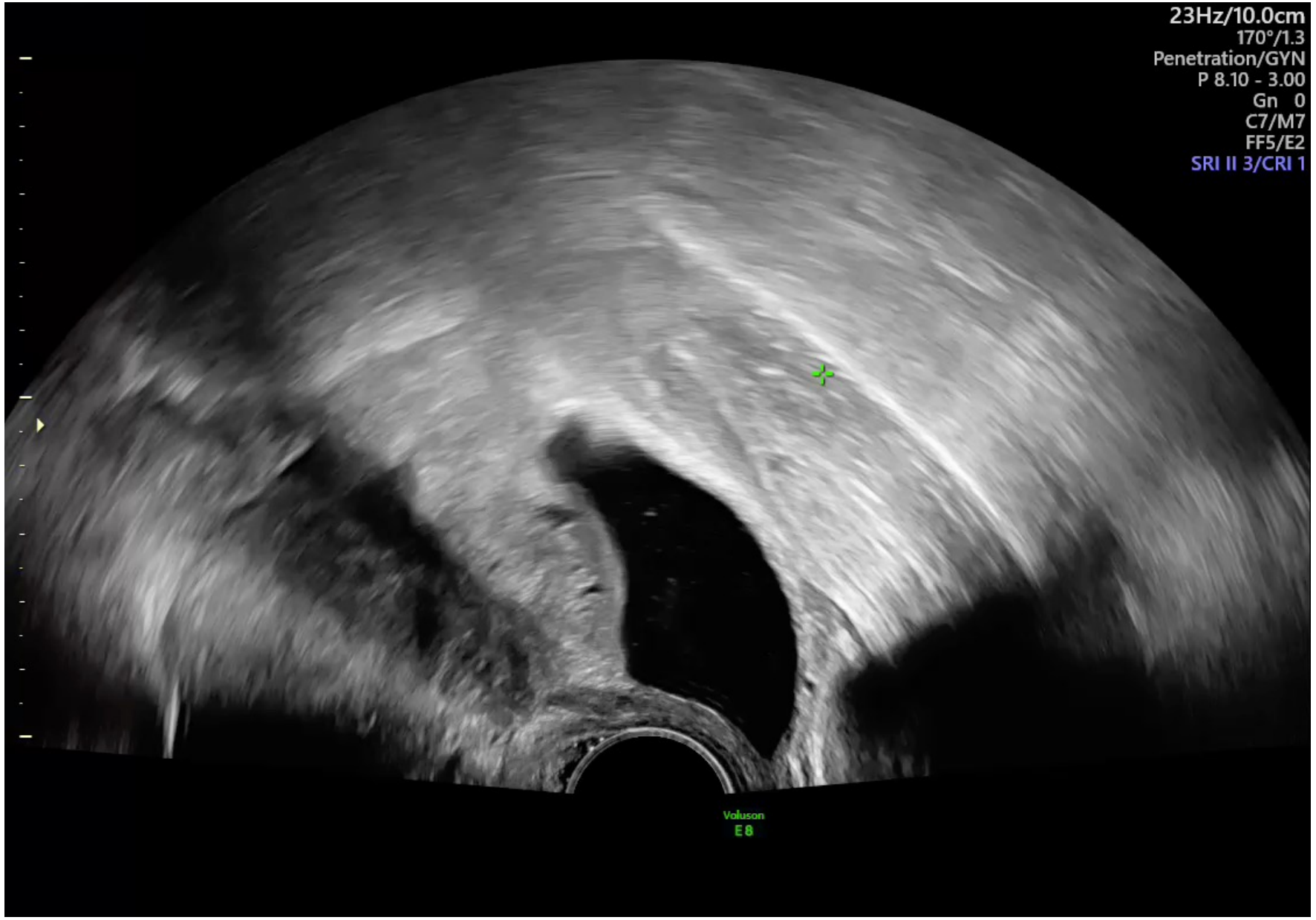

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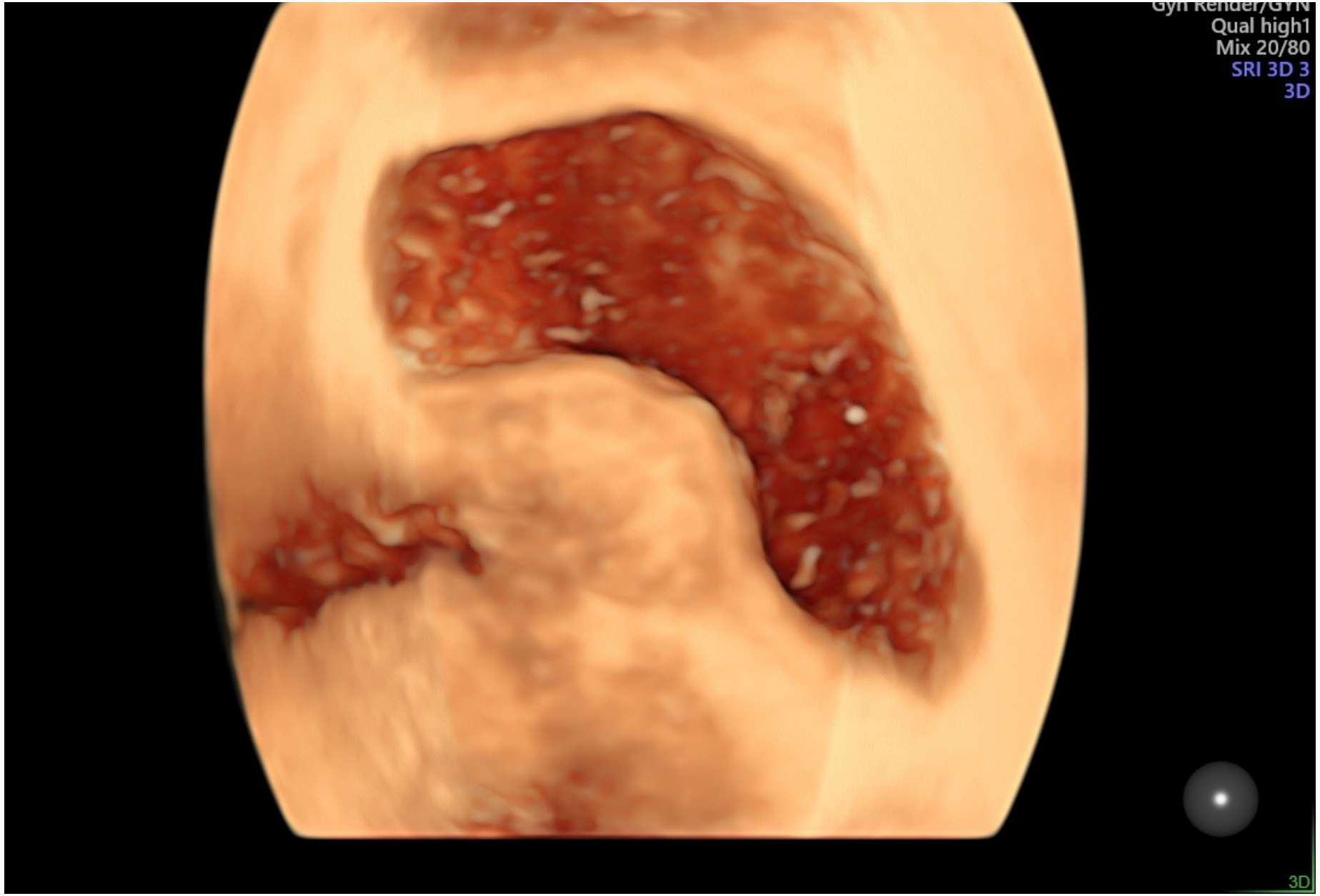
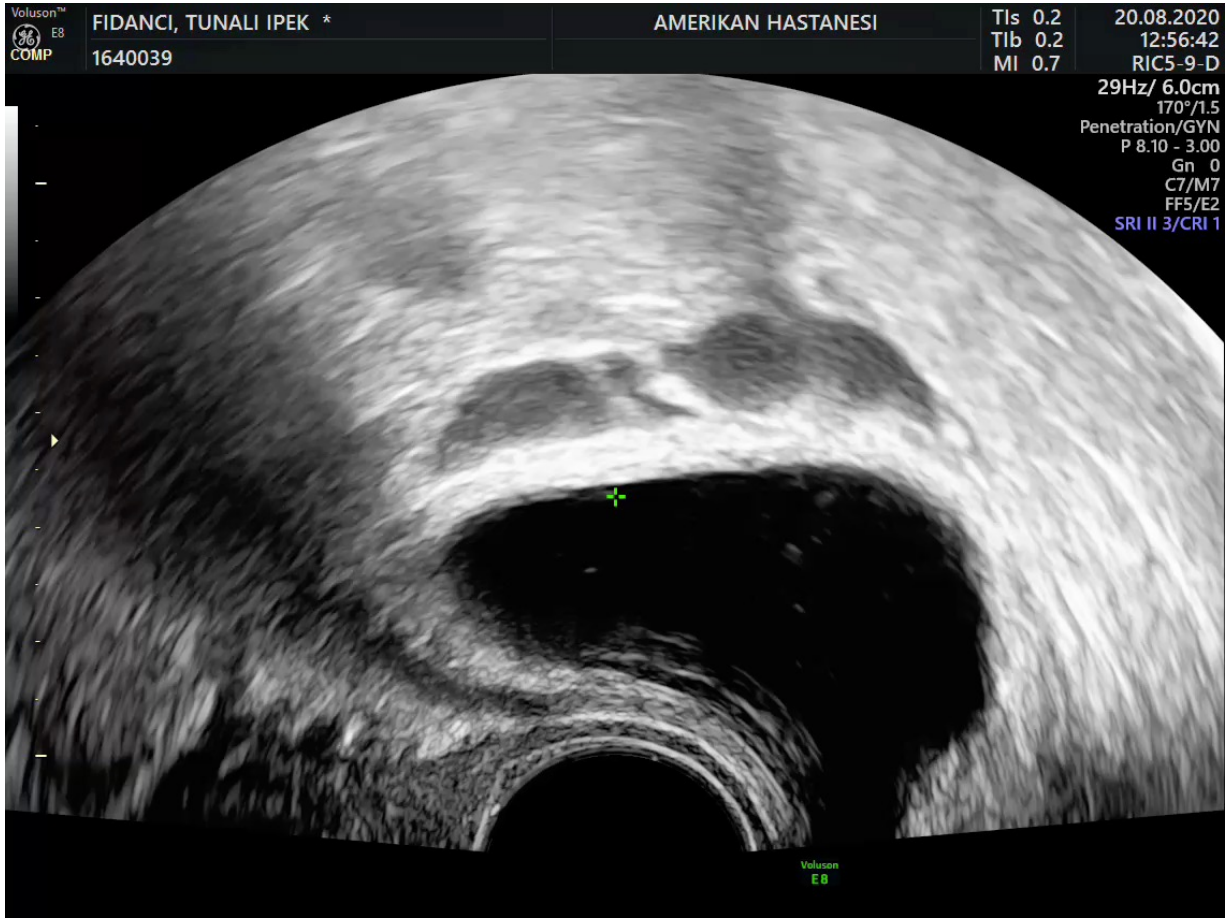


Veri Sınıflandırma Tipi: Genel / General

Ureters

- Move the probe to lateral pelvic wall
- From intravesical segment to the level of bifurcation
- Always check for kidneys



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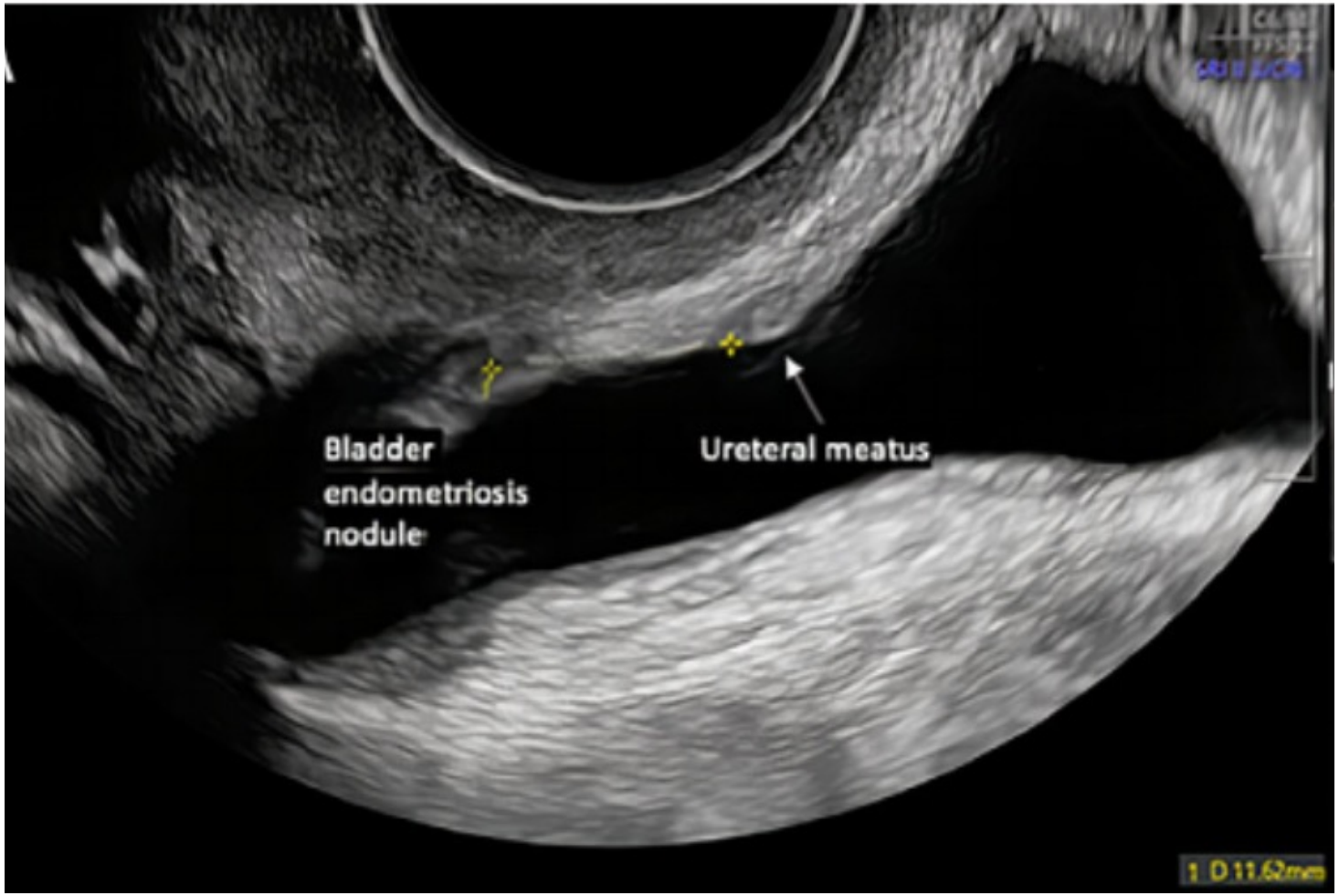
Veri Sınıflandırma Tipi: Genel / General



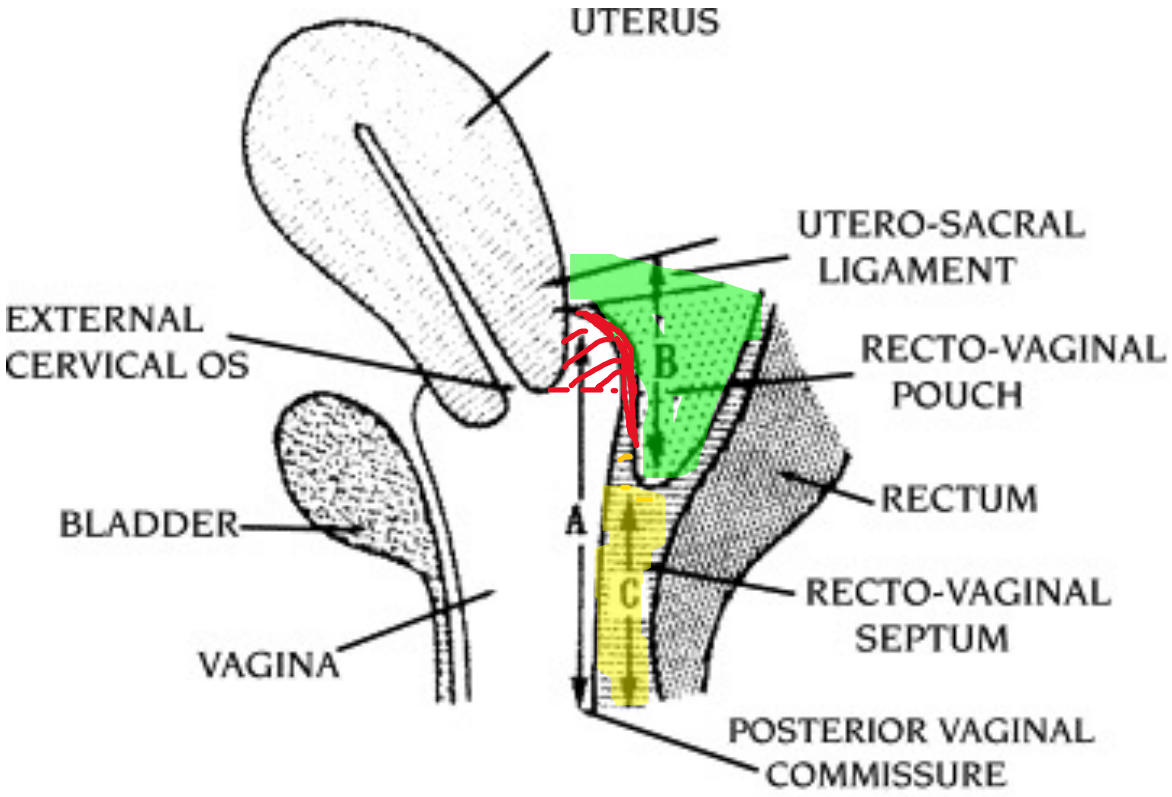
The distance between the lateral part of bladder endometriosis and the ureteric orifices is important !!!

Veri Sınıflandırma Tipi: Genel / General

POSTERIOR COMPARTMENT

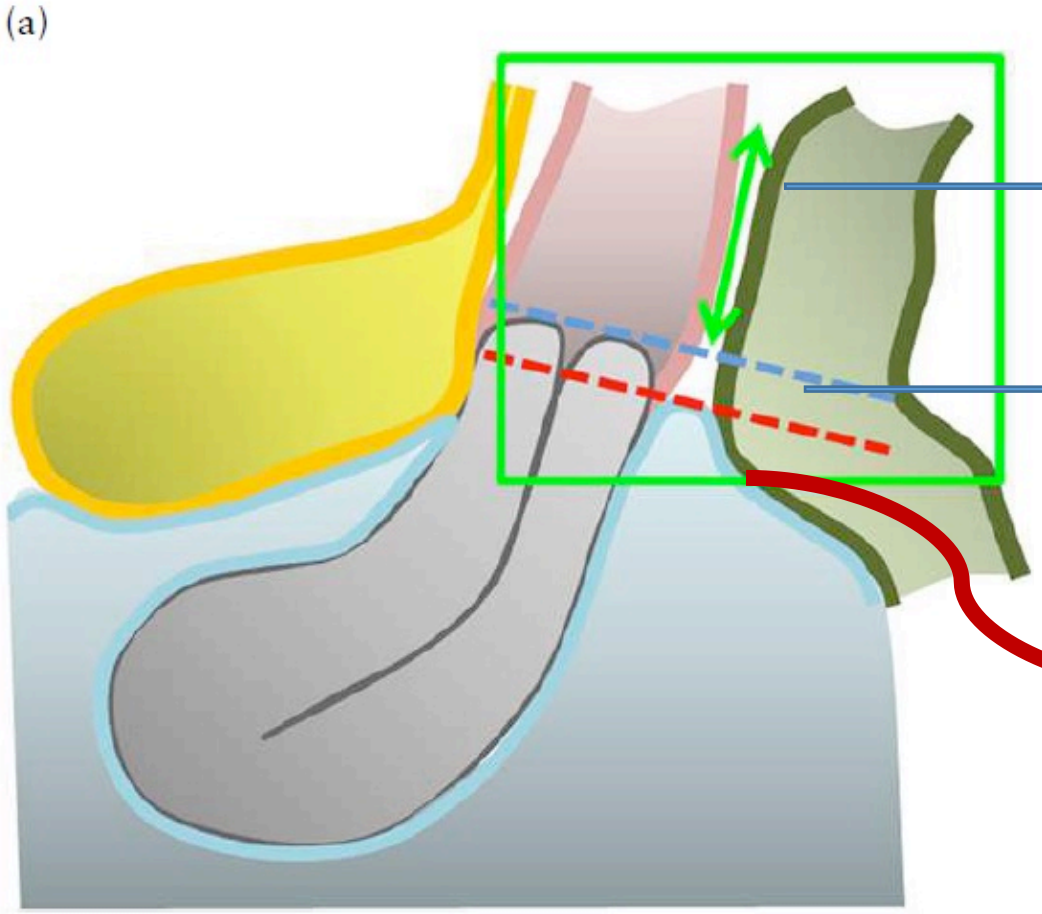
- Rectovaginal Septum
- Vaginal Wall
- Uterosacral ligaments
- Rectum, rectosigmoid, sigmoid

below the peritoneal reflection



Veri Sınıflandırma Tipi: Genel / General

Rectovaginal Septum

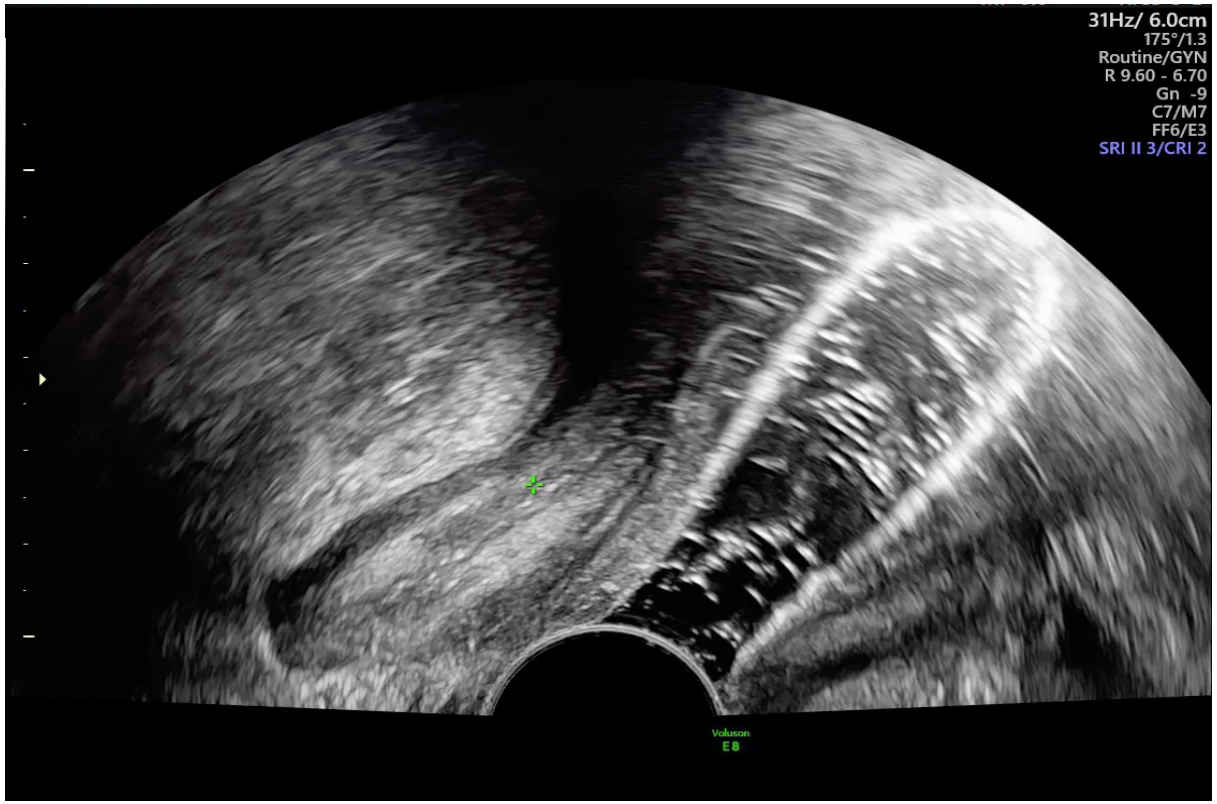


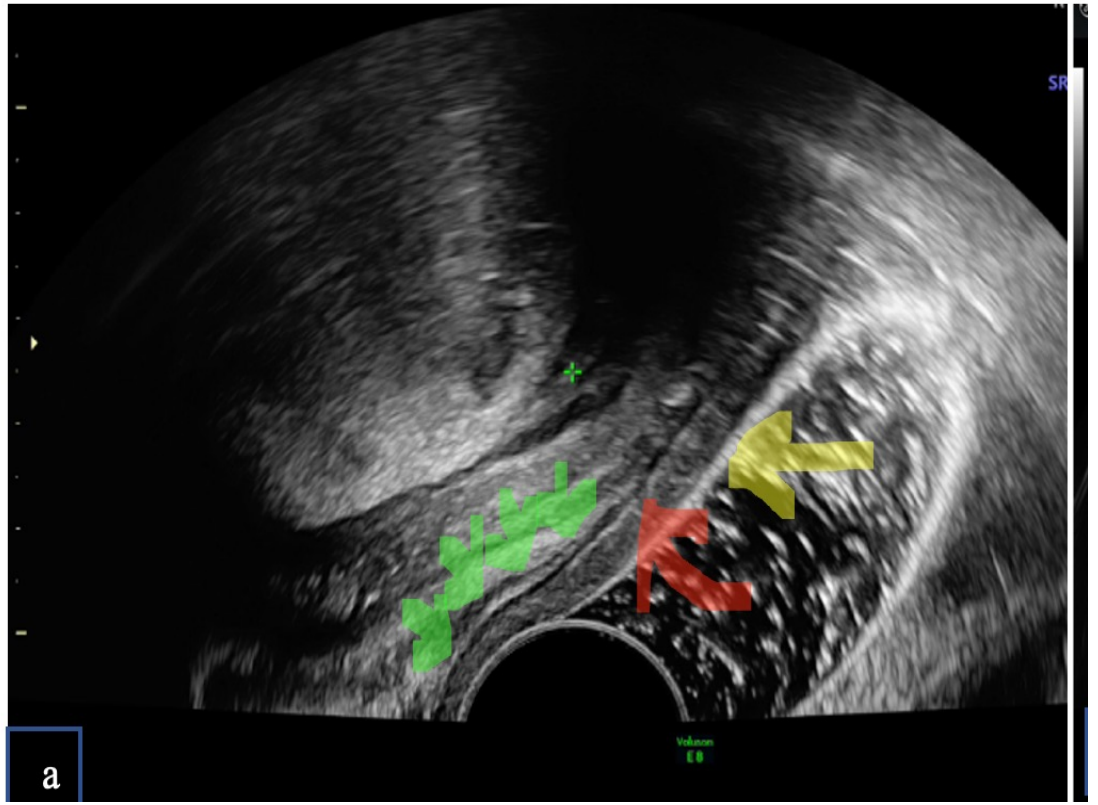
RVS

Posterior Vaginal Fornix

Lower margin of rectouterine peritoneal pouch

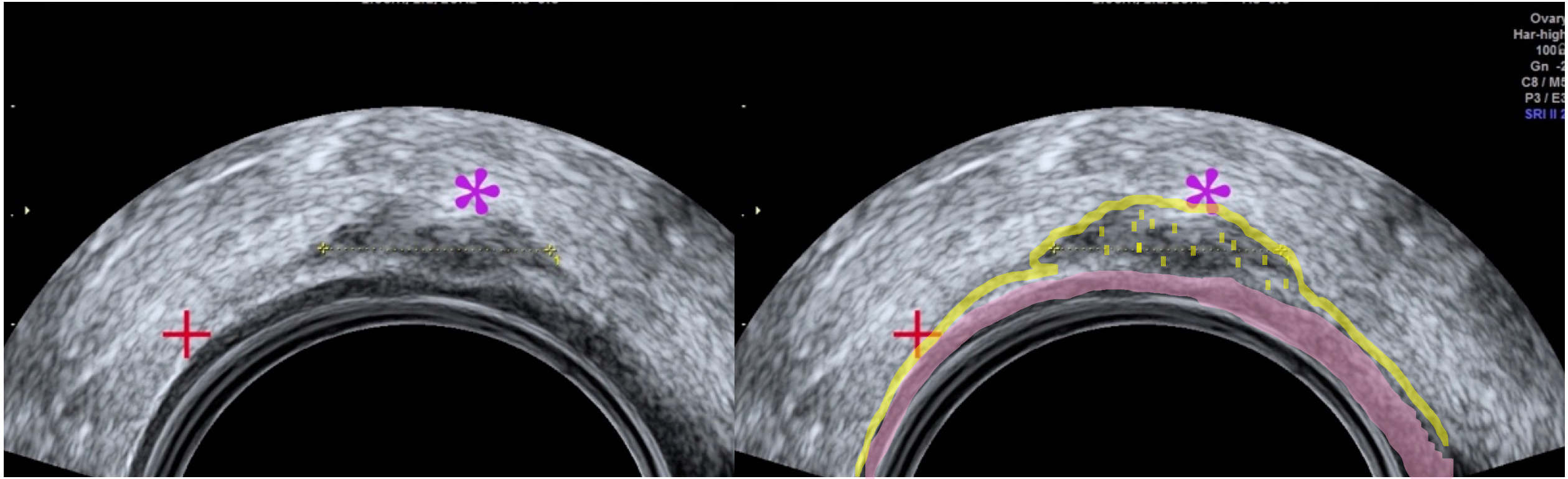
Veri Sınıflandırma Tipi: Genel / General





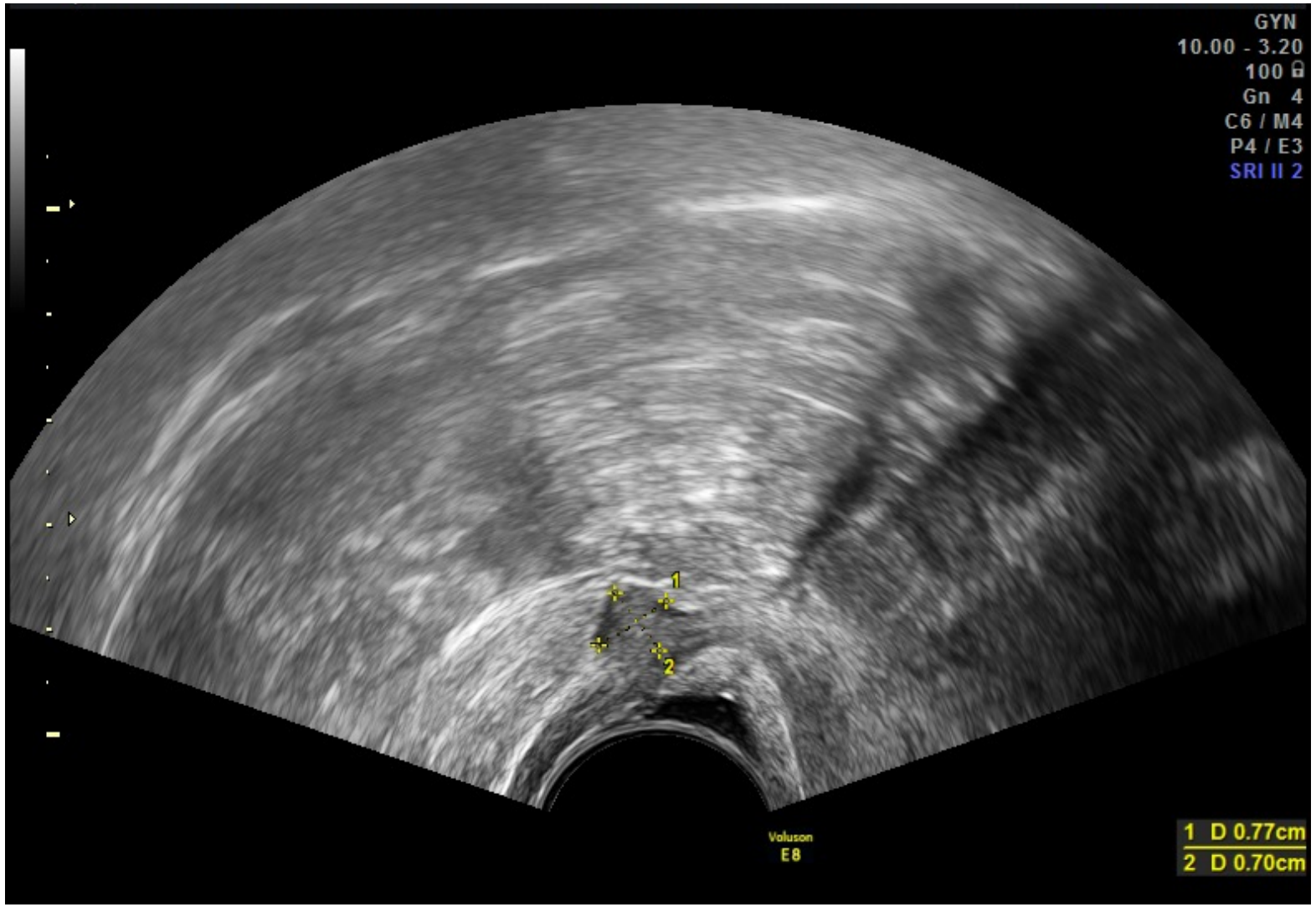
Prob önündeki hipoekojen jel, hiperekojen eldiven (sarı ok), hipoekojen vajen duvarı (kırmızı ok), hiperekojen RVS katmanı (yeşil oklar)

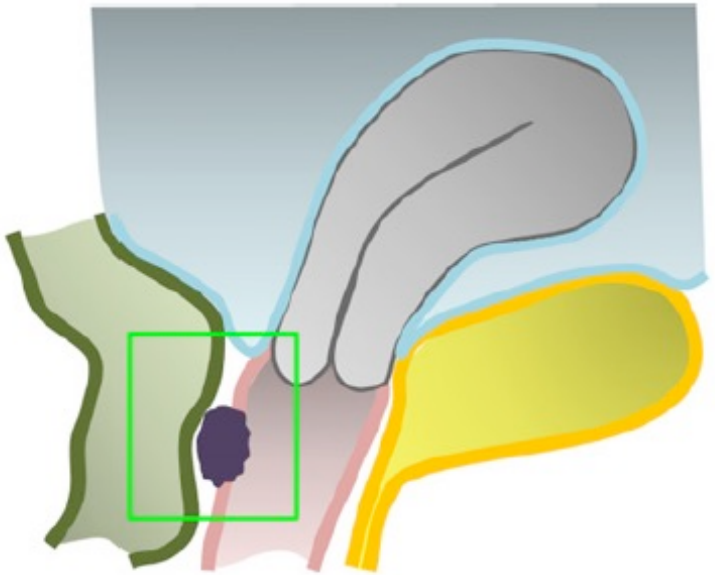
Veri Sınıflandırma Tipi: Genel / General



- Hypoechogenic: vagina
- Hyperechogenic: RVS

Veri Sınıflandırma Tipi: Genel / General





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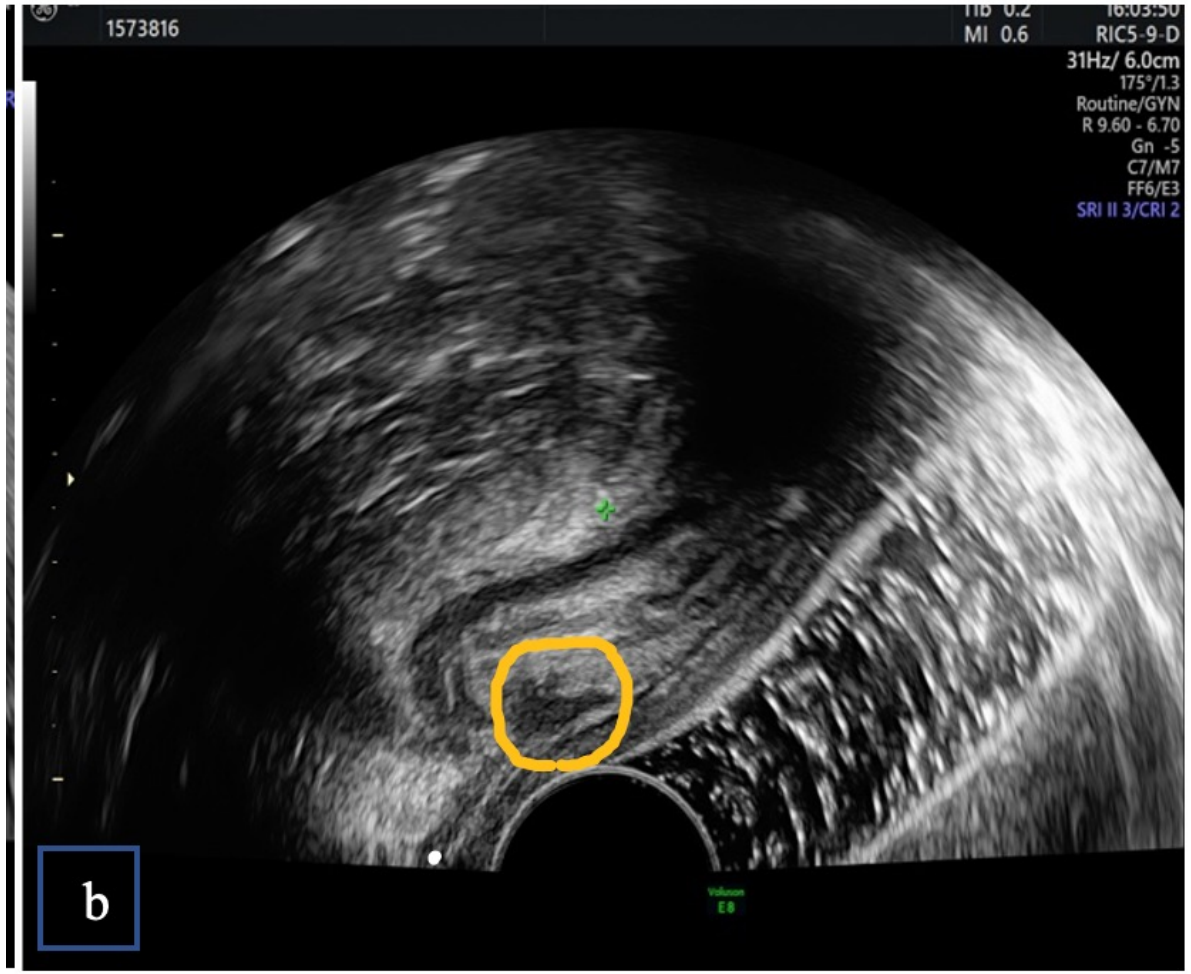
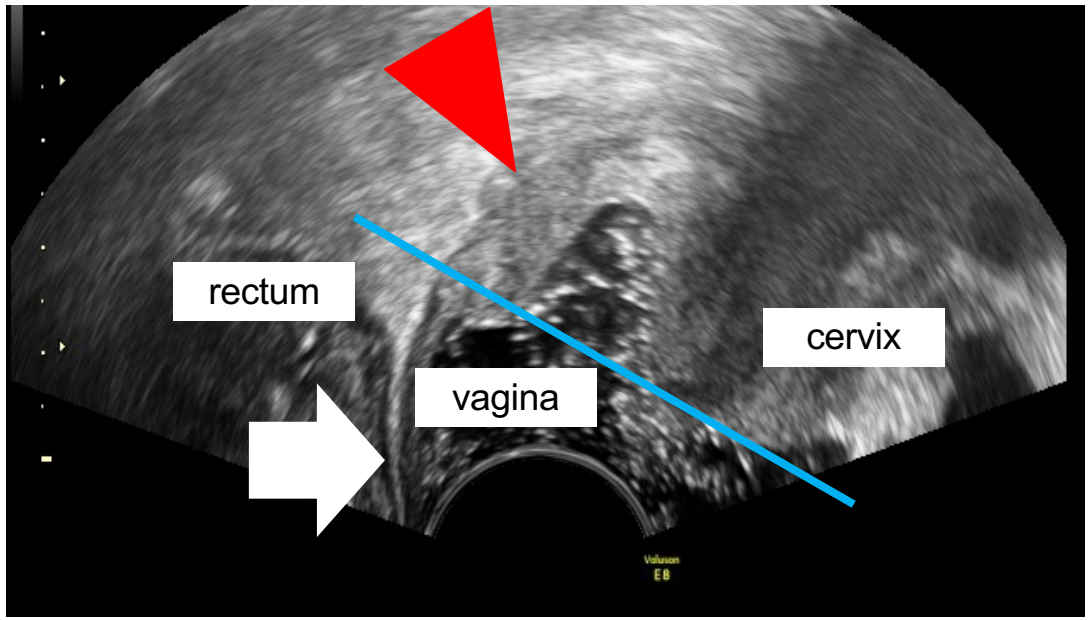


Rektovajinal septum ve anterior rektal duvarı birlikte tutan hipoekojen (daire içinde izlenen) DİE nodülü

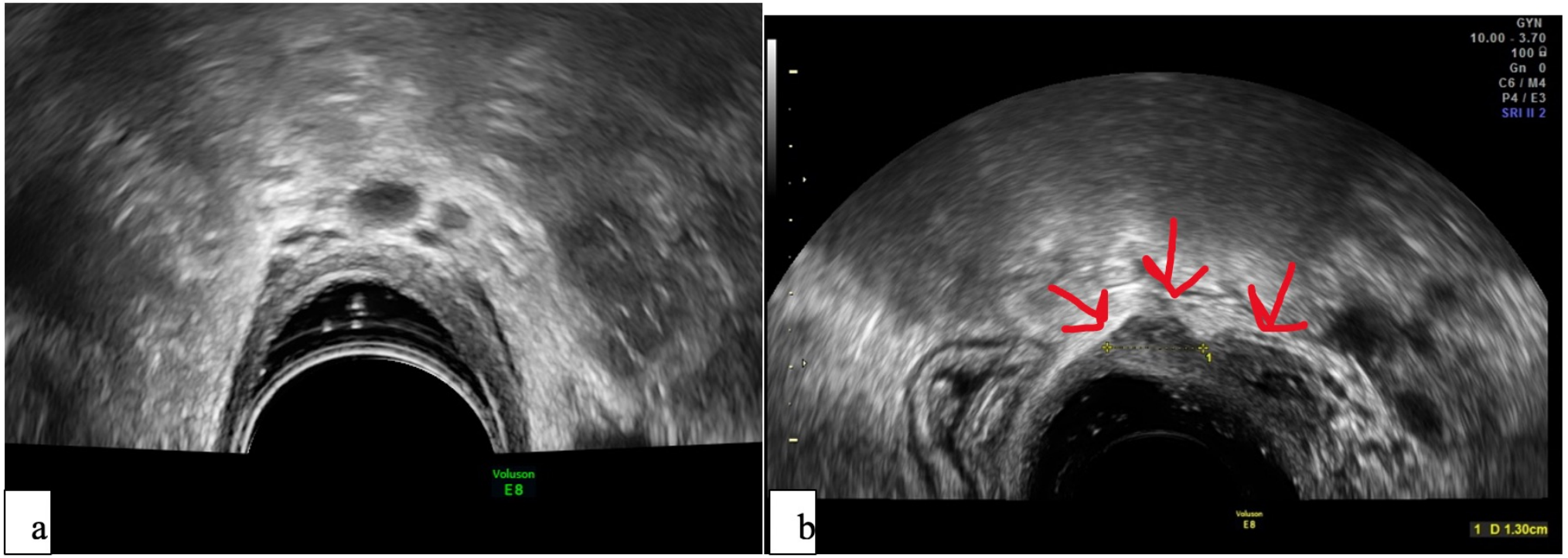
Veri Sınıflandırma Tipi: Genel / General

Forniceal – vaginal DIE



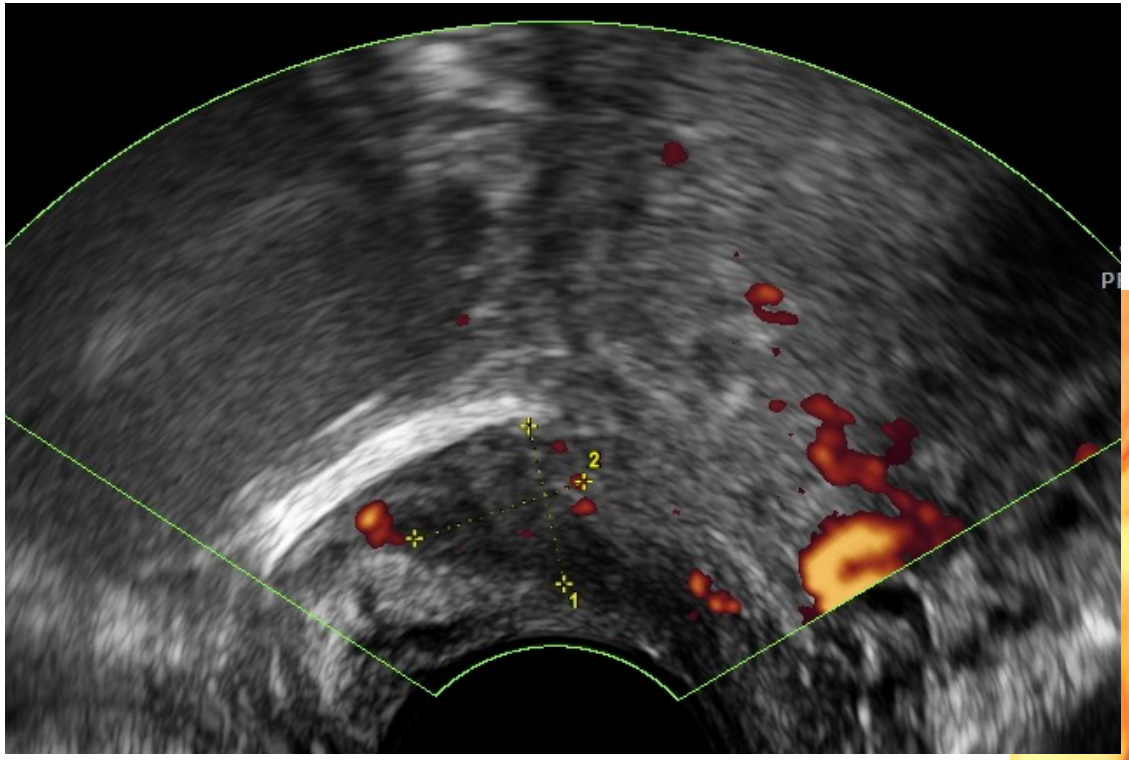
nodular thickening of the vaginal wall that causes pain under a gentle pressure with the probe the posterior or lateral-posterior upper third of the vagina

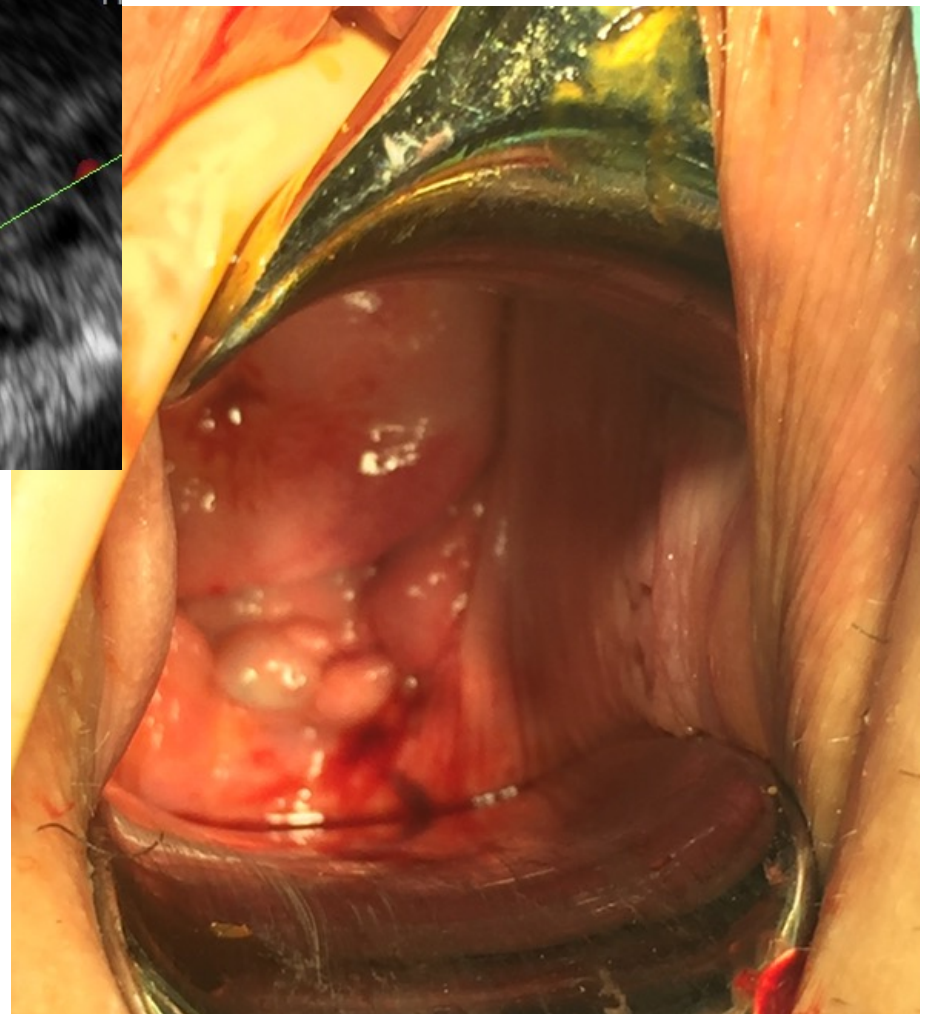
Veri Sınıflandırma Tipi: Genel / General



a) Normal, ince hipoekojen vajinal duvar b) Posterior vajinal fornikste, hipoekojen ince vajinal duvarda kalınlaşma ve işaretli/oklarla gösterilen alanda hipoekojen nodül imajı

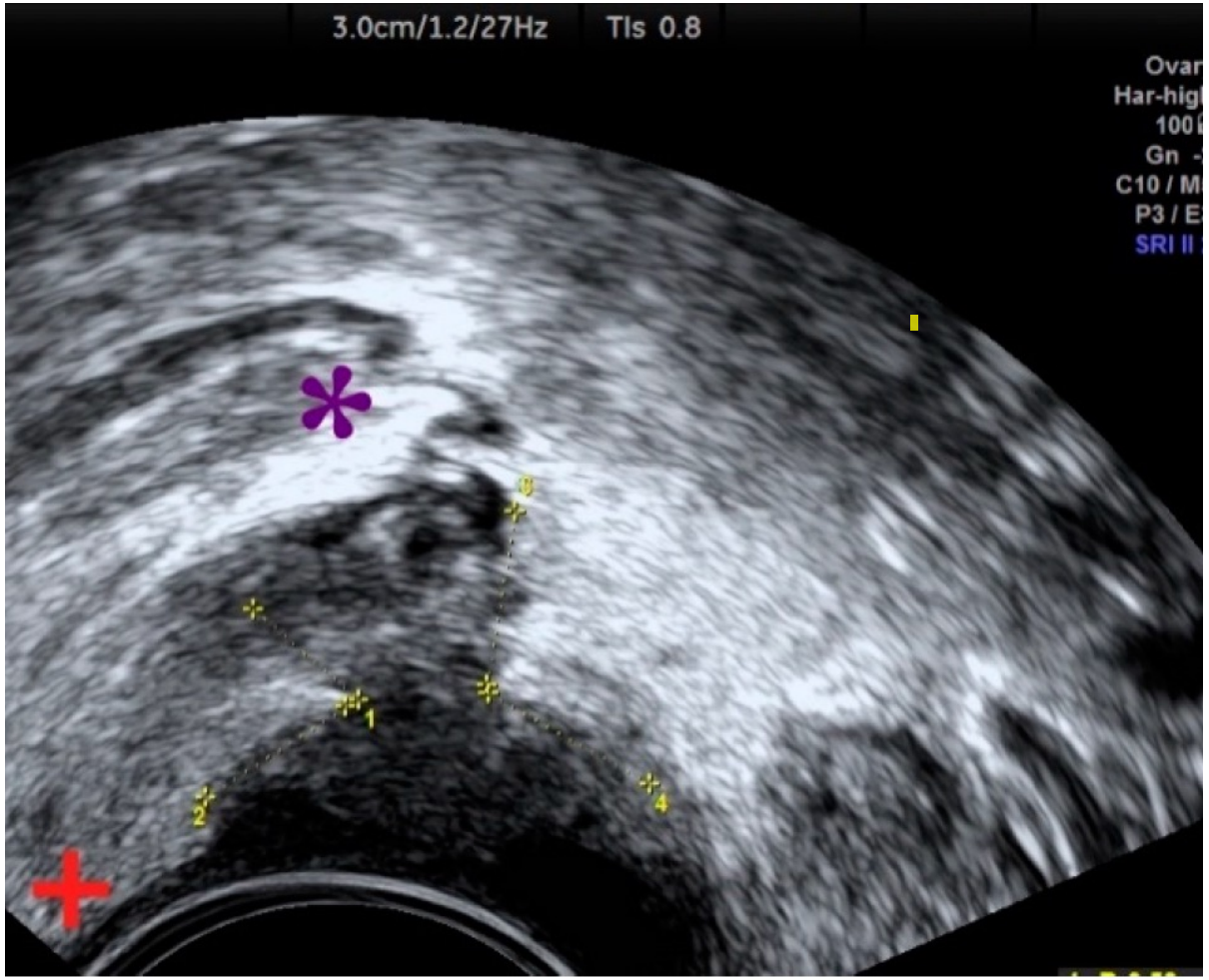
Veri Sınıflandırma Tipi: Genel / General

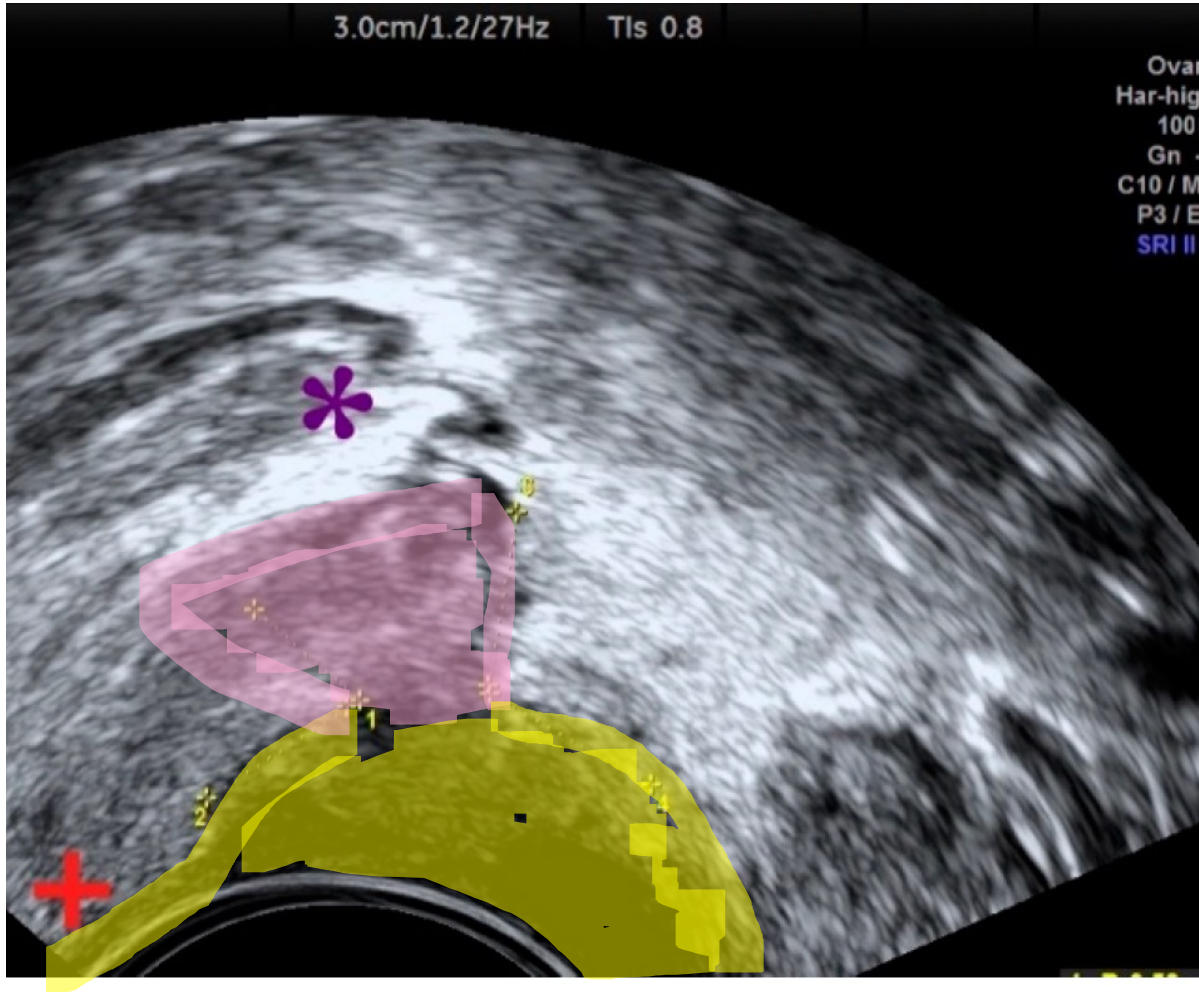




- a hypoechoic lesion with a negative/minimal color Doppler signaling.

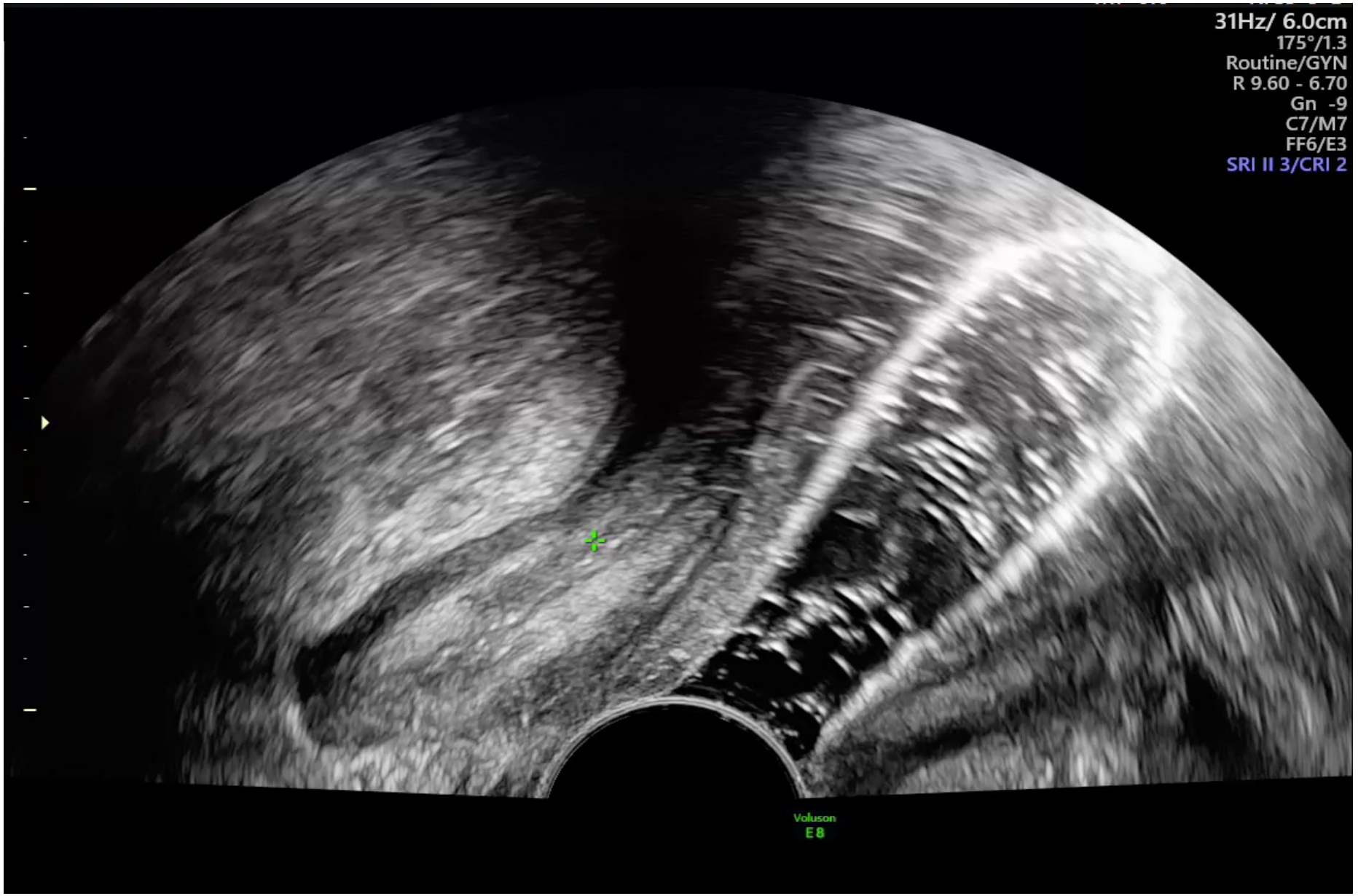
Veri Sınıflandırma Tipi: Genel / General





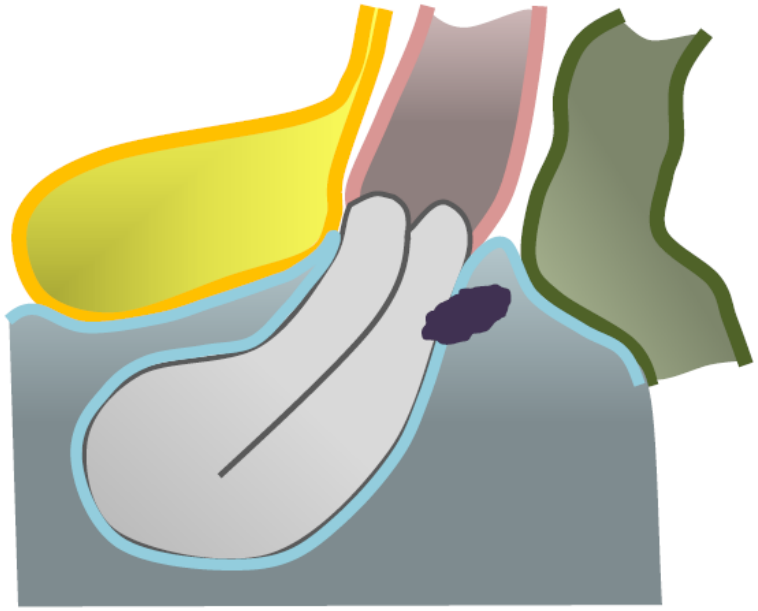
nodule infiltrating the posterior vaginal fornix and the anterior wall of the rectum.
(+) the vaginal wall,(*) the bowel

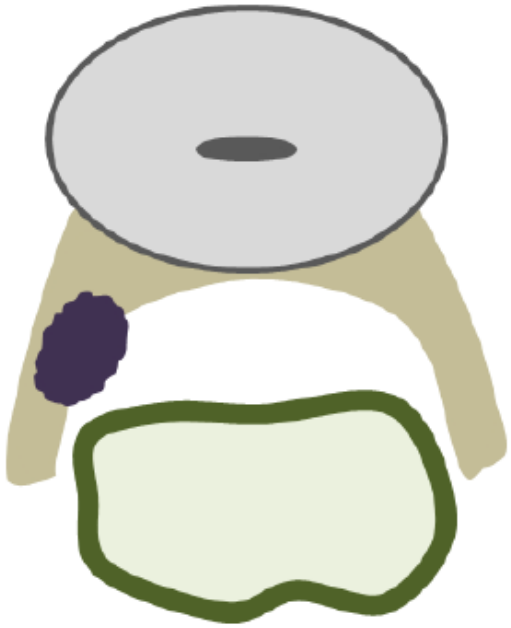
Veri Sınıflandırma Tipi: Genel / General

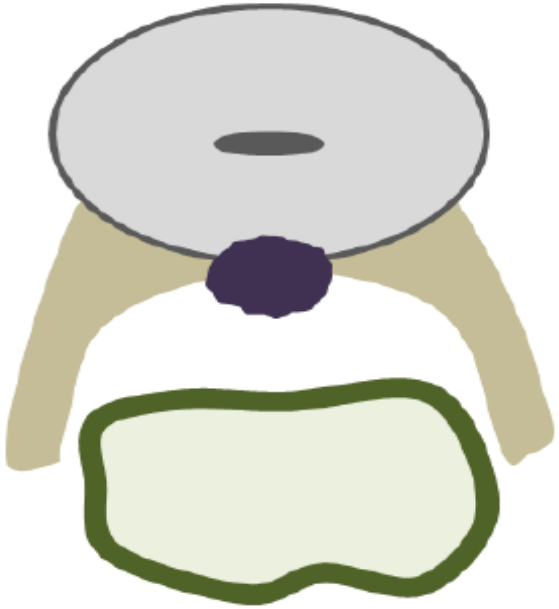


Veri Sınıflandırma Tipi: Genel / General

Uterosacral ligaments







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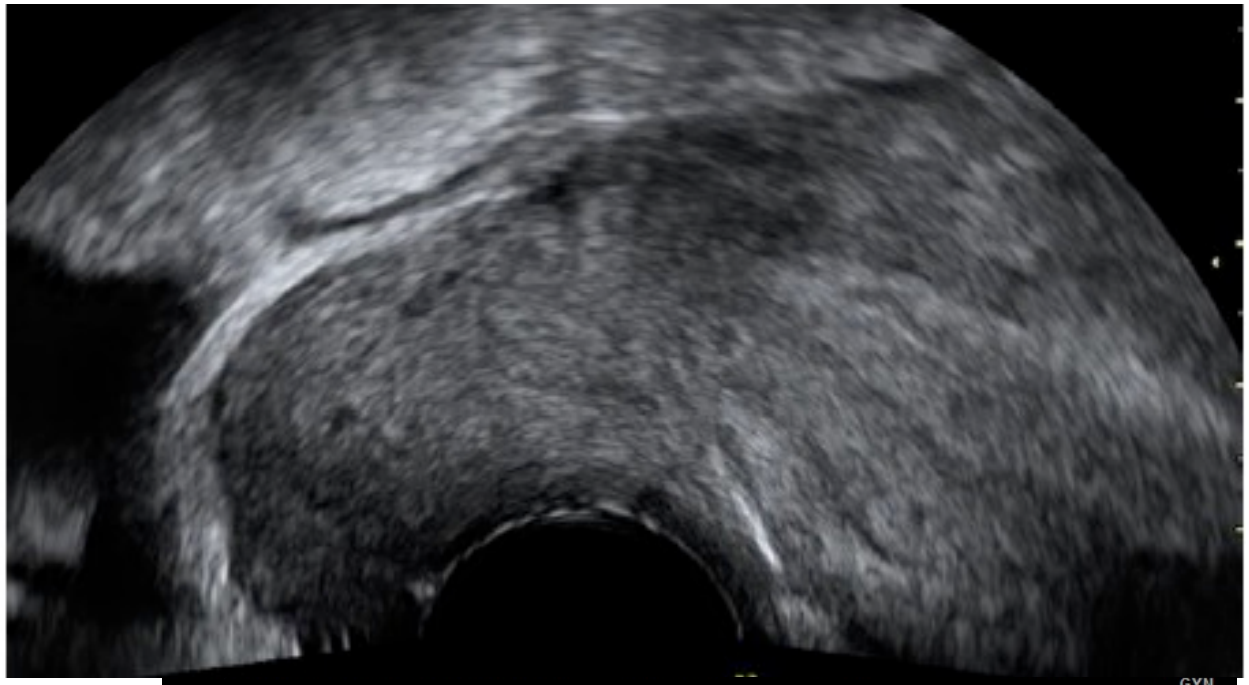
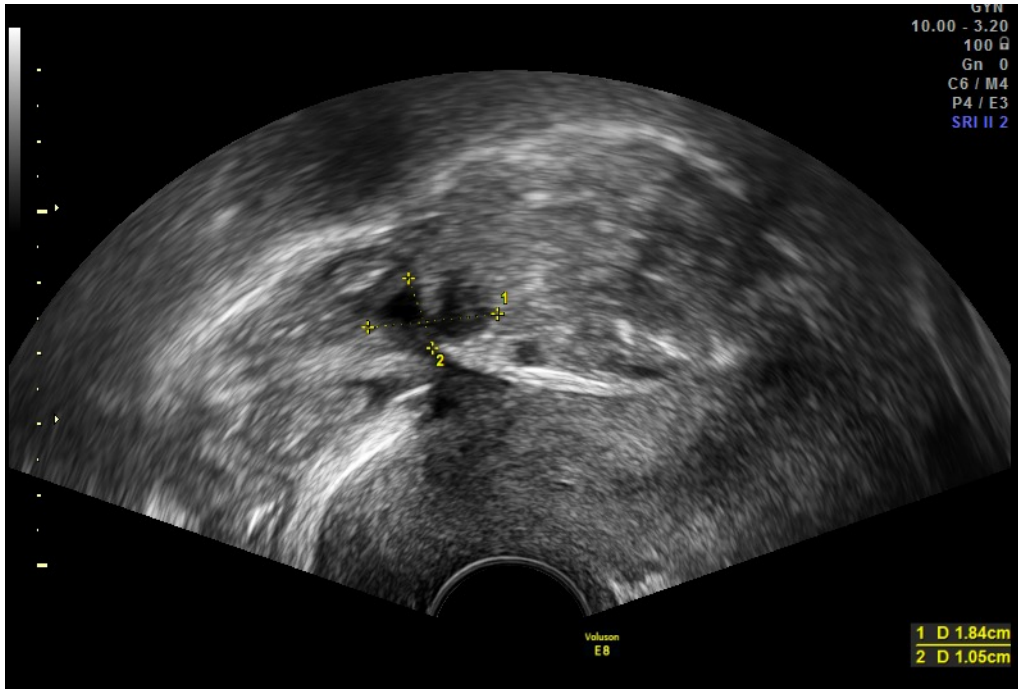
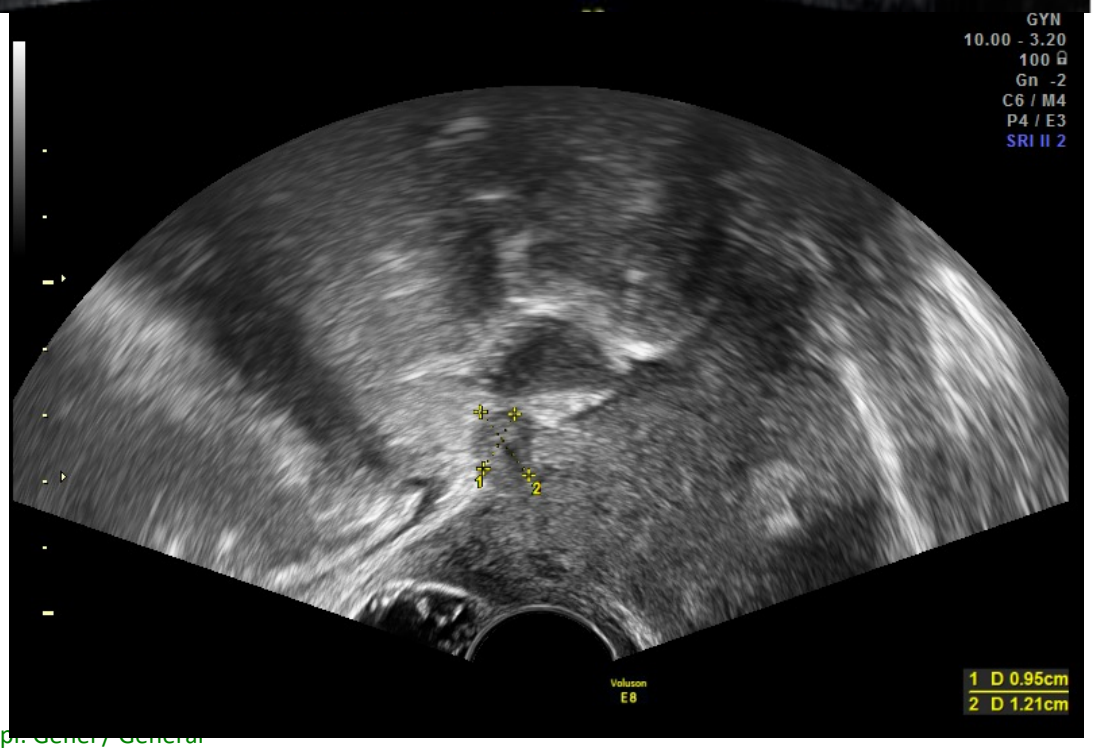
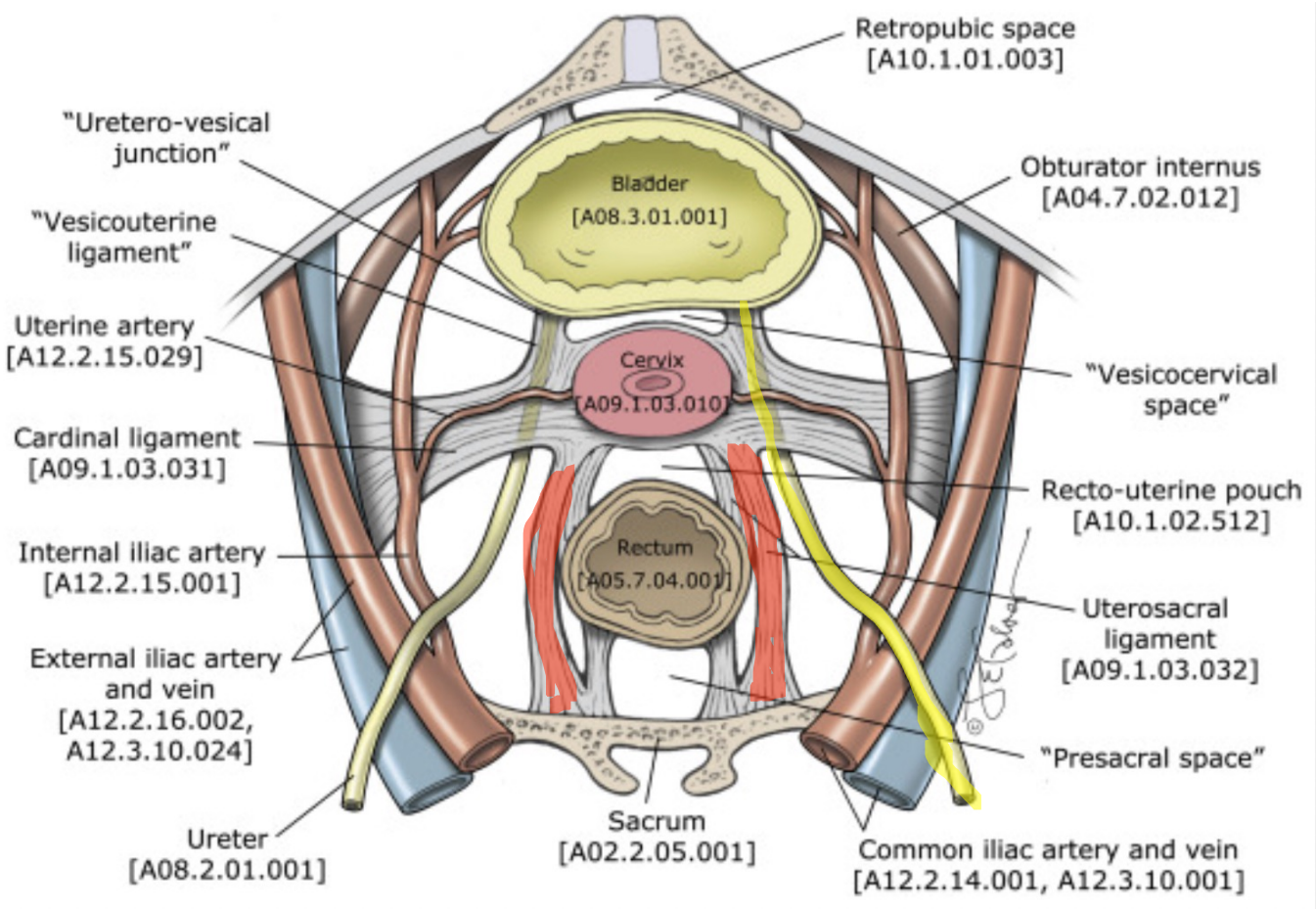






- place probe into the posterior fornix, at the midline, in a sagittal plane
- sweep inferolateral to the cervix
- Hyphoechoic thickening

Veri Sınıflandırma Tipi: Genel / General



Üreter - USL servikal kısmı arasındaki mesafe 0.9± 0.4 cm

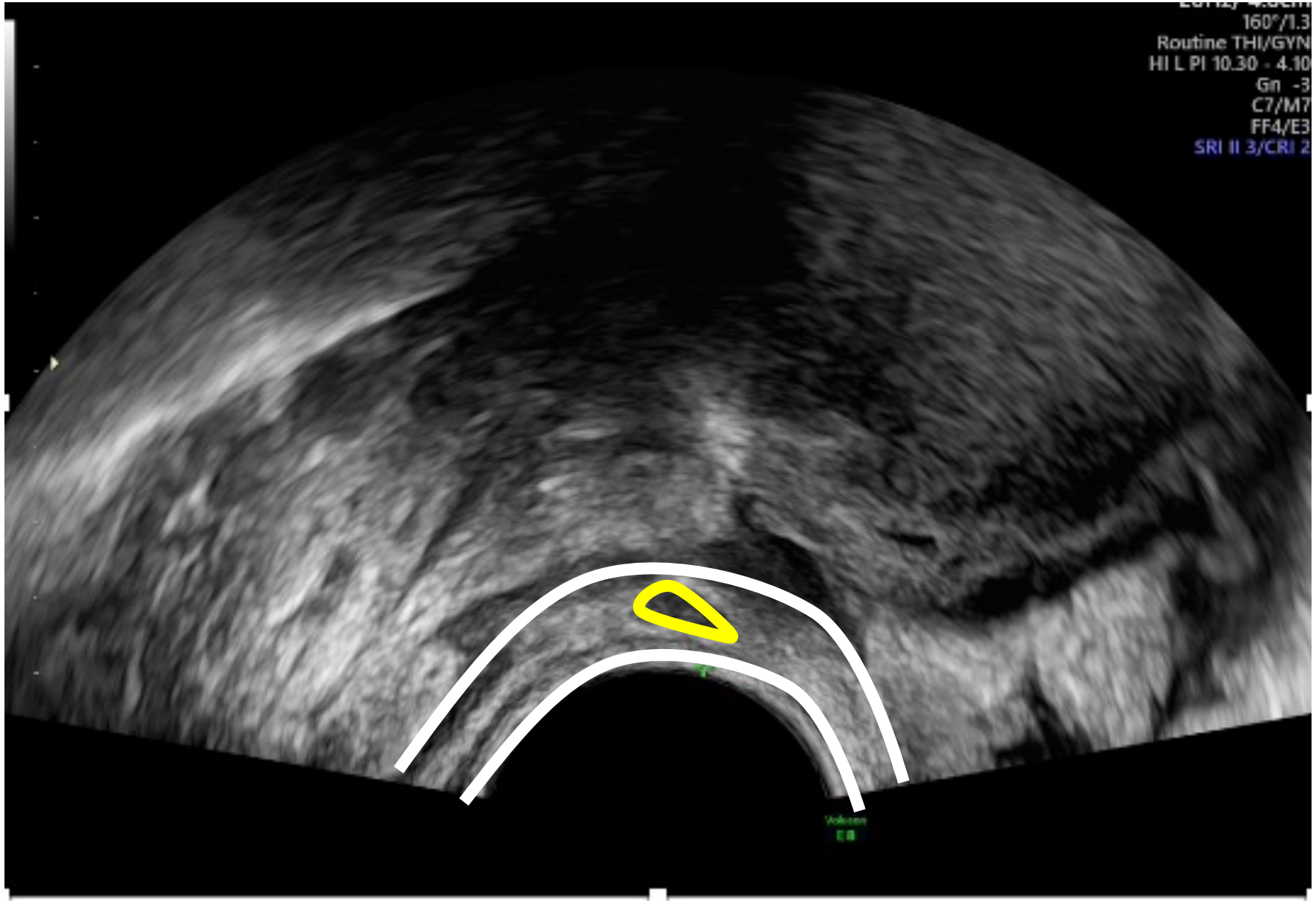
USL nodül> 17 mm ipsilateral üretere dışardan baskı yaparak striktüre, proksimal hidroüretere hatta hidronefroz

Veri Sınıflandırma Tipi: Genel / General

- Midsagital pozisyonda rektuma doğru açılandırılmış olan prob ile en yakınındaki hipoekojen vajinal duvar ve hemen üstünde hiperokojen Douglasın peritonu bulunur.

- süpürme hareketi ile sağ bacağa doğru ilerletip saat yönünün tersine probu yavaşça çevirerek ince hiperekojen periton çizgisinin kalınlaştığı alana fokuslanır ve hiperkoik çizginin en kalın olduğu yer sakrouterin ligamentin sagital kesitidir

Veri Sınıflandırma Tipi: Genel / General



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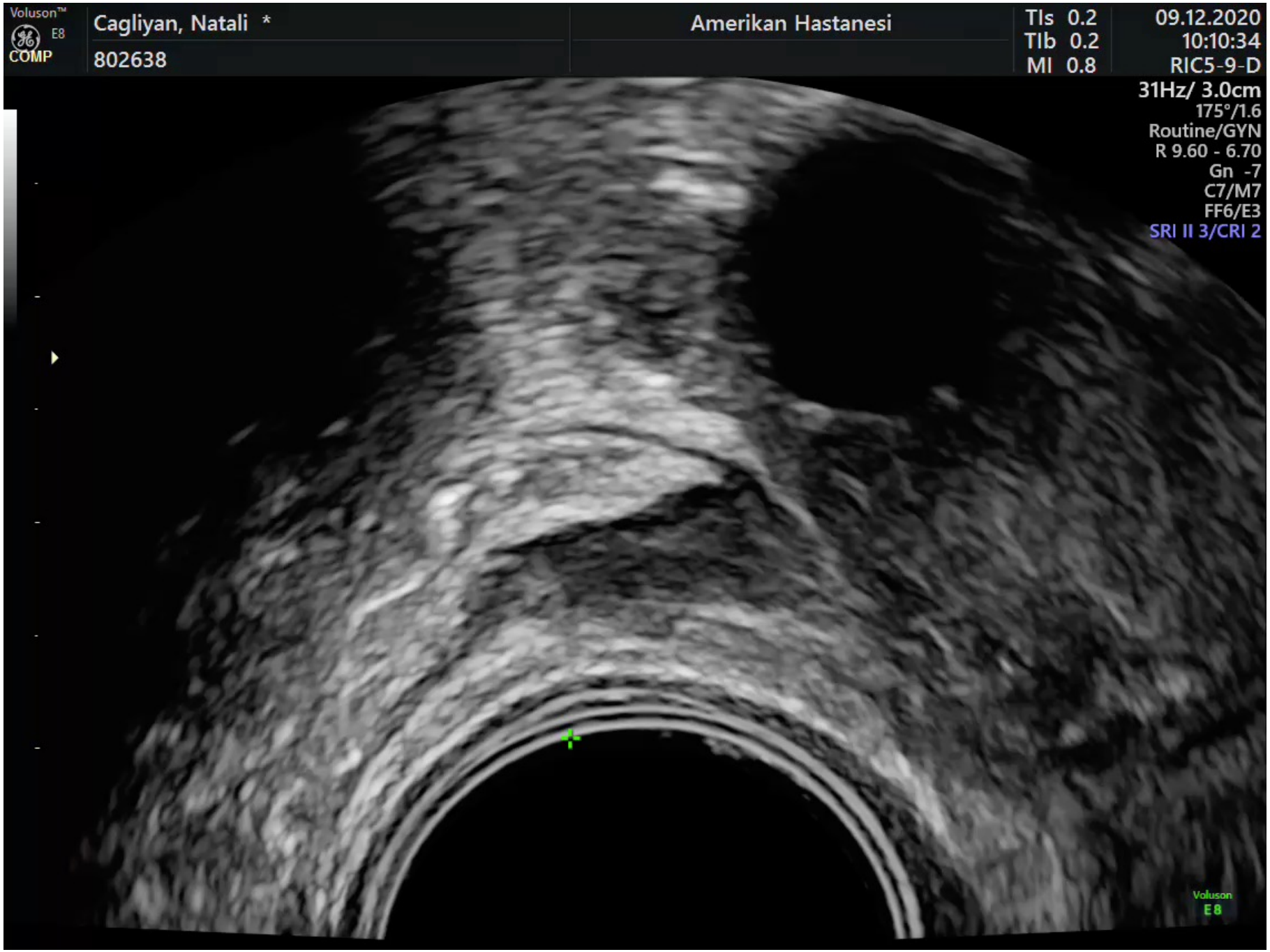

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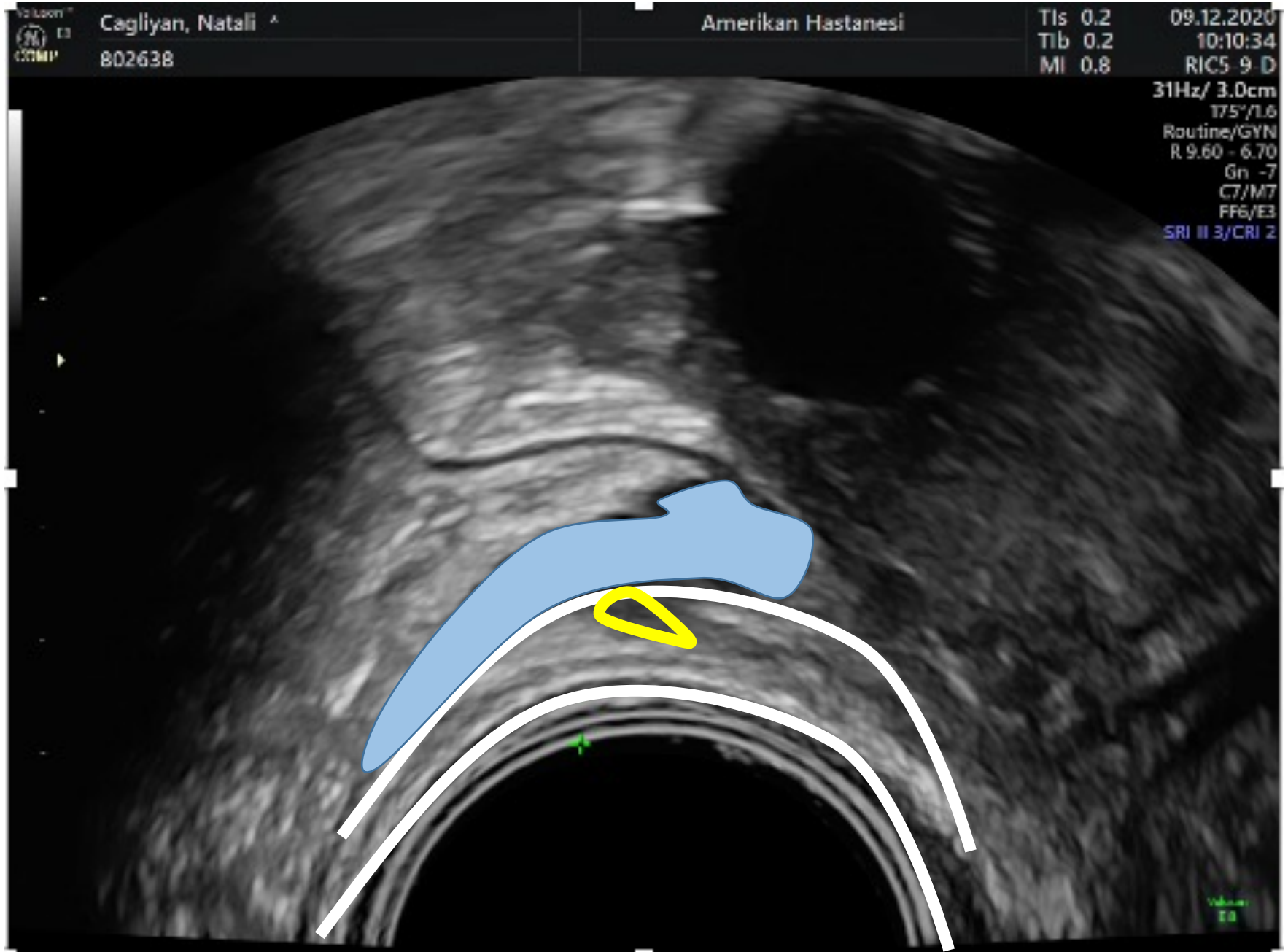
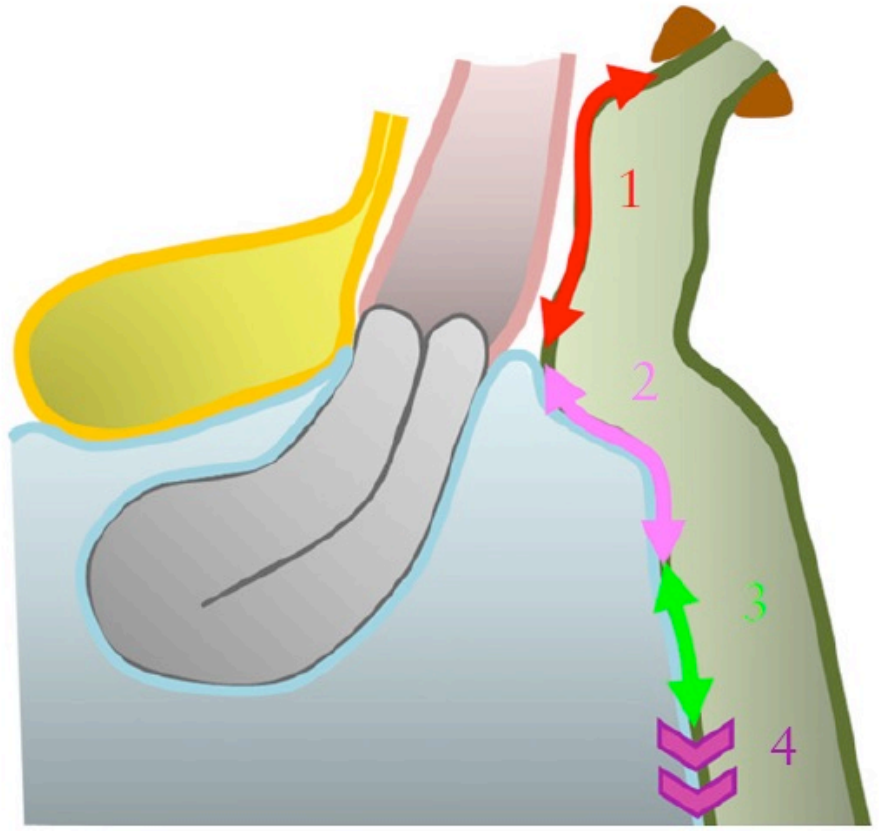


Veri Sınıflandırma Tipi: Genel / General

Rectum, rectosigmoid, Sigmoid



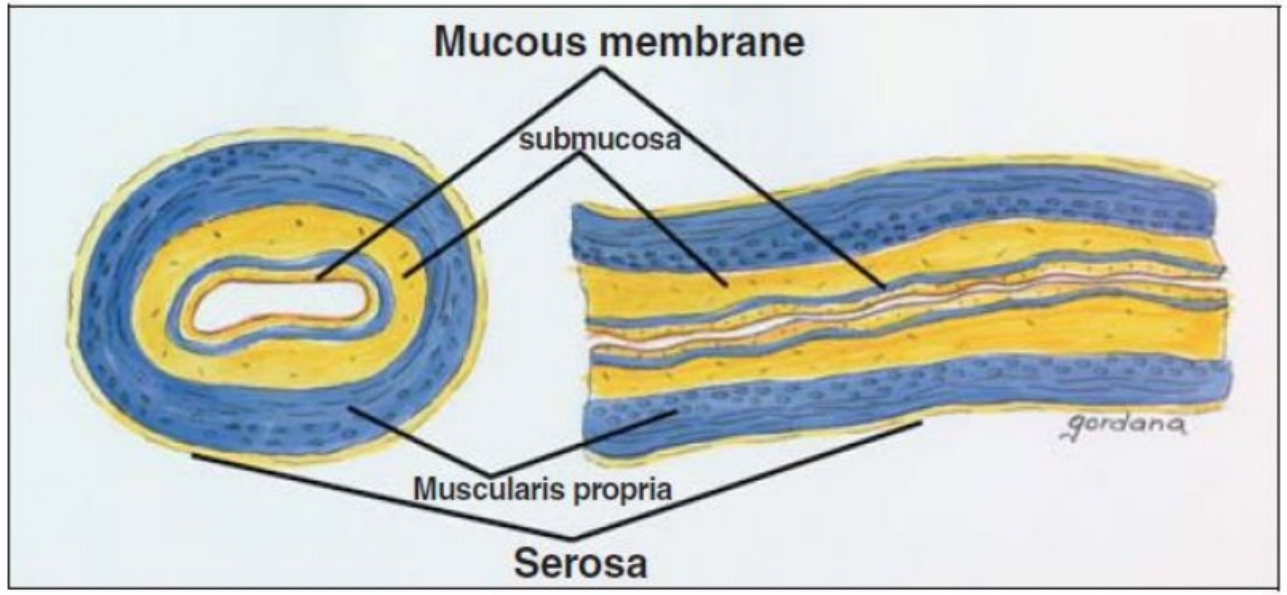
Lower anterior rectum

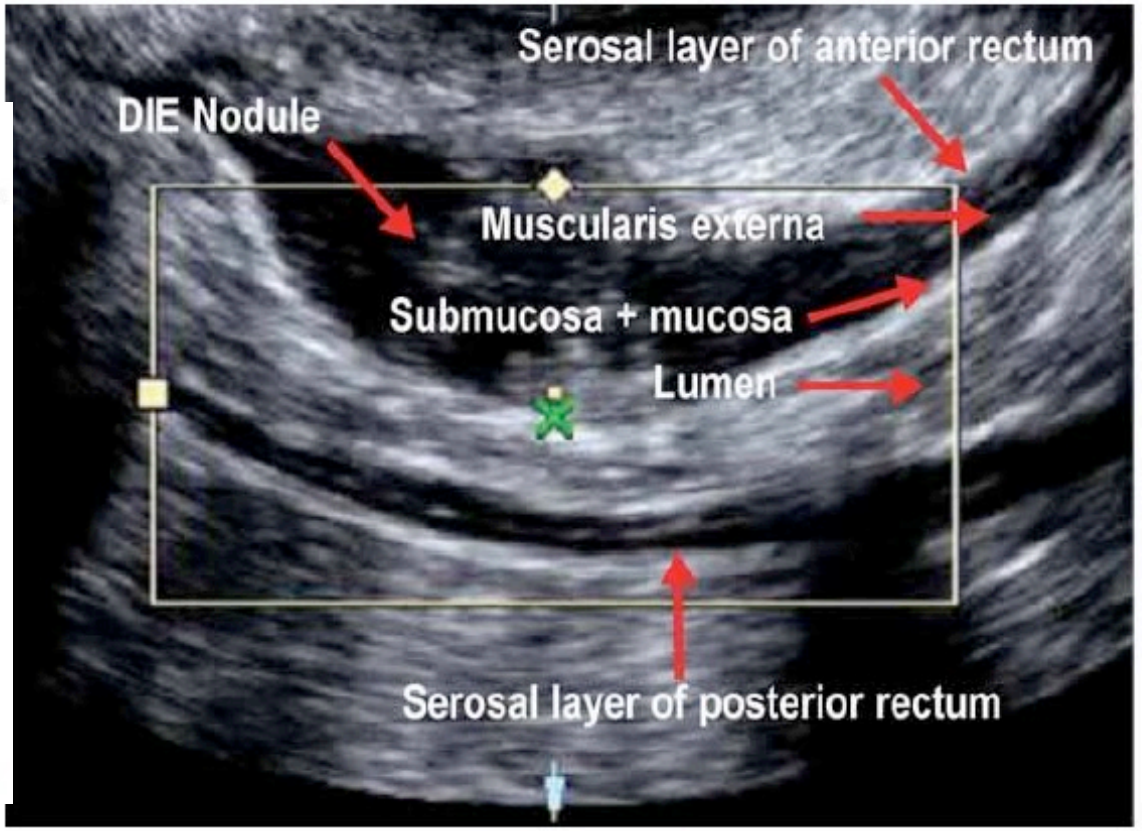
upper anterior rectum

rectosigmoid

sigmoid

Veri Sınıflandırma Tipi: Genel / General





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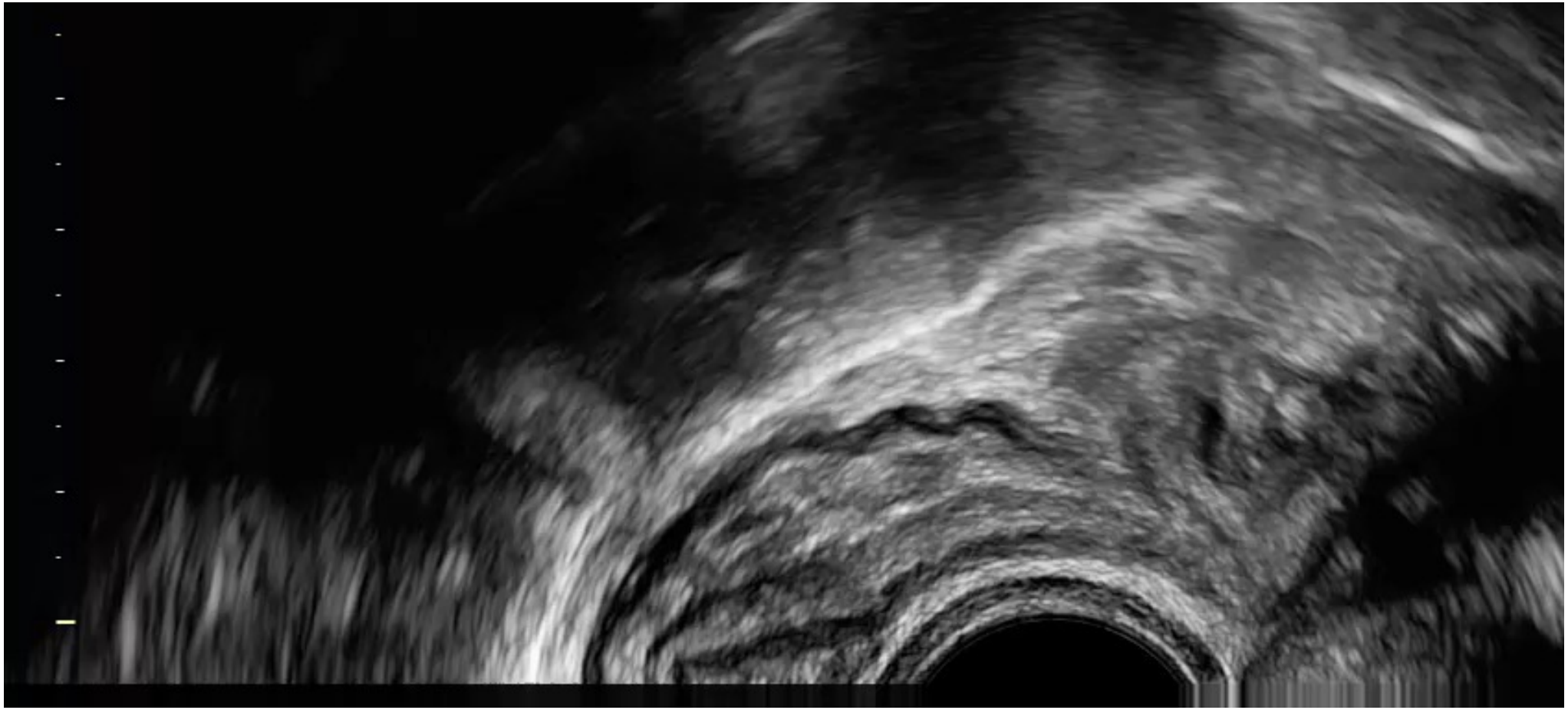
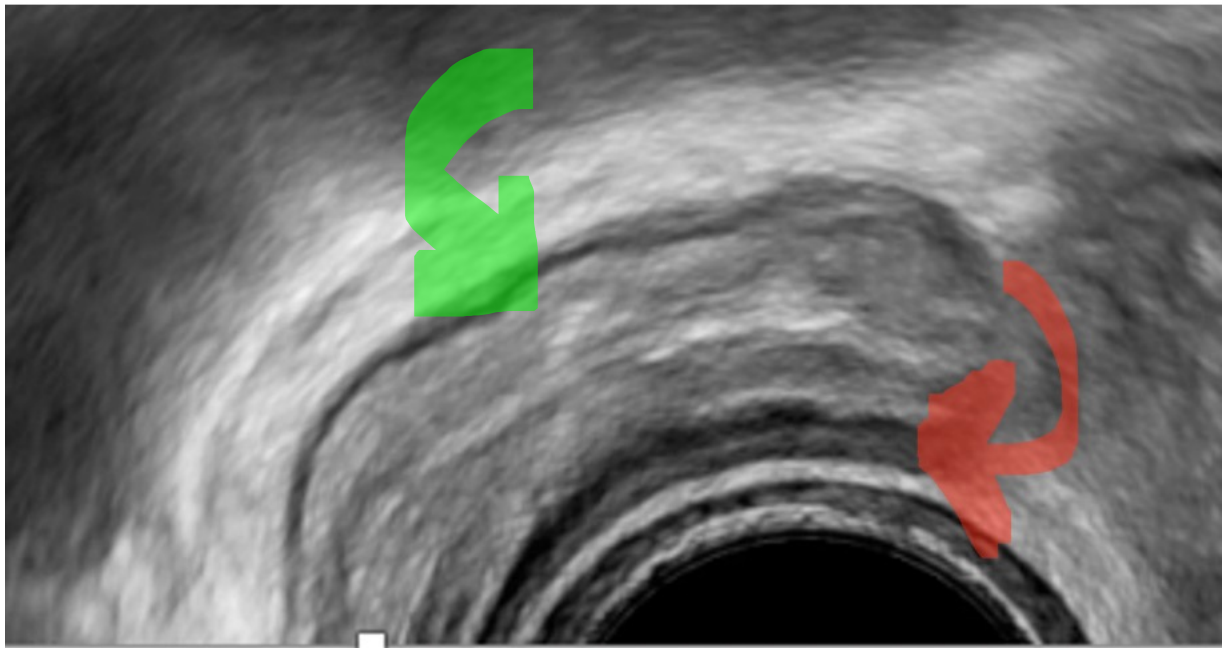


Almost always involves the anterior or the lateral rectosigmoid wall

Veri Sınıflandırma Tipi: Genel / General



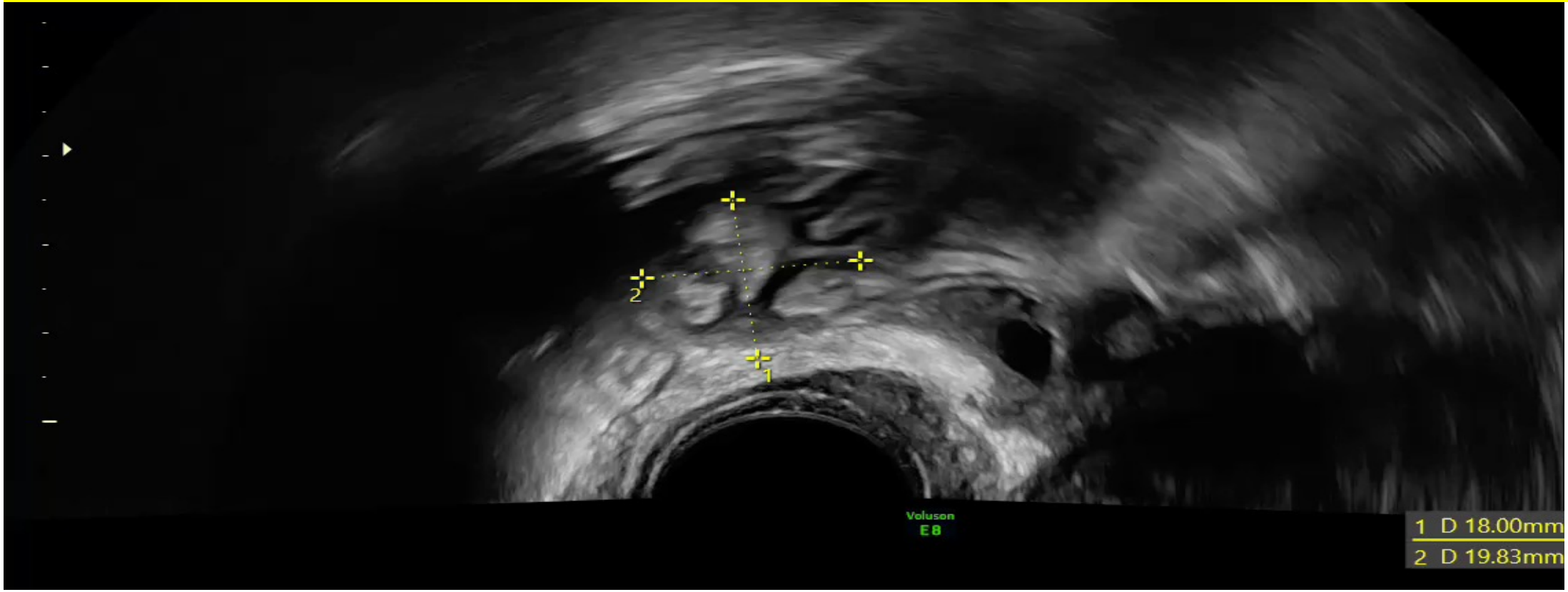
- hiperekojen anterior rektal seroza, hipoekojen muskularis propria, hiperekojen submukoza, hipoekojen mukoza ve lümen olarak

Veri Sınıflandırma Tipi: Genel / General

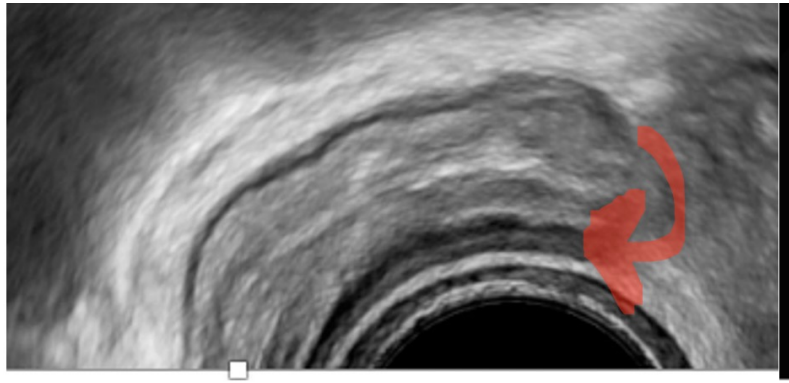
colon cancer growths typically extend outward and reach the serosa, whereas endometriosis lesions grow inward.

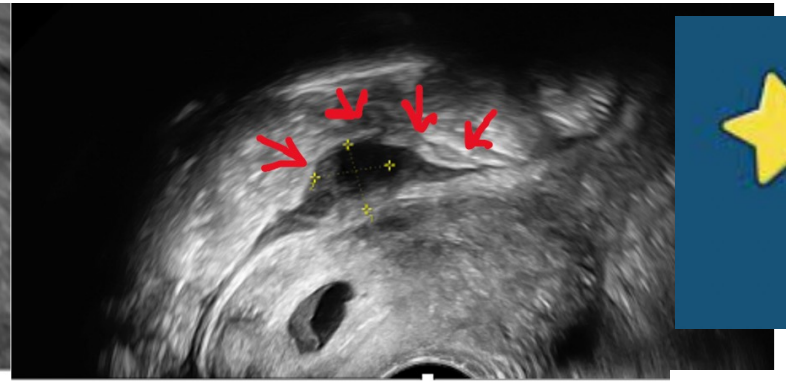
Veri Sınıflandırma Tipi: Genel / General

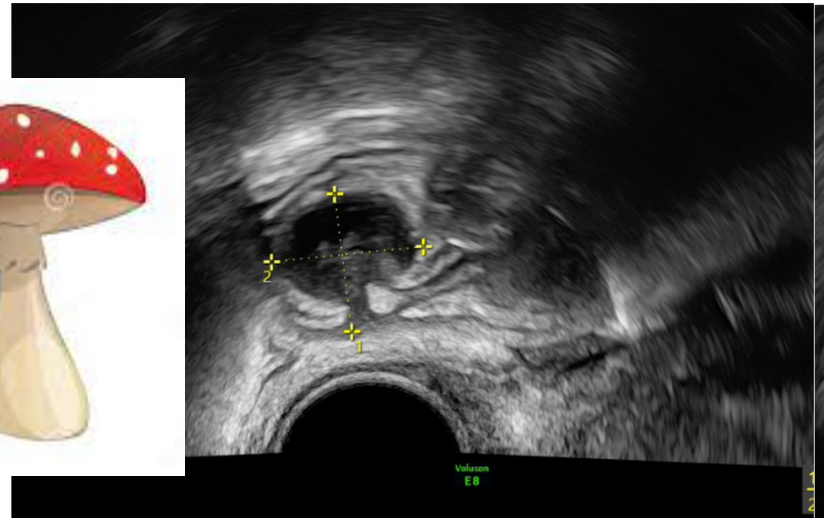
- Any focal thickening of the bowel wall that suggests an endometriotic nodule should be followed by gentle pressure with the probe to elongate the intestinal loop
- observe the peristalsis of the surrounding bowel because the nodule will remain immobile

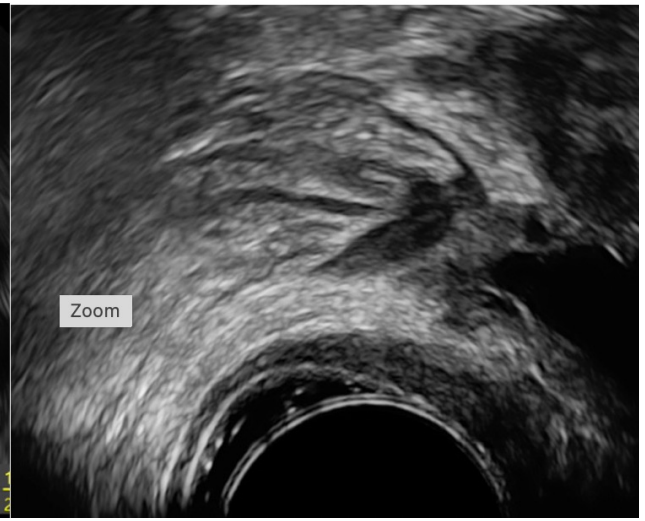


Veri Sınıflandırma Tipi: Genel / General









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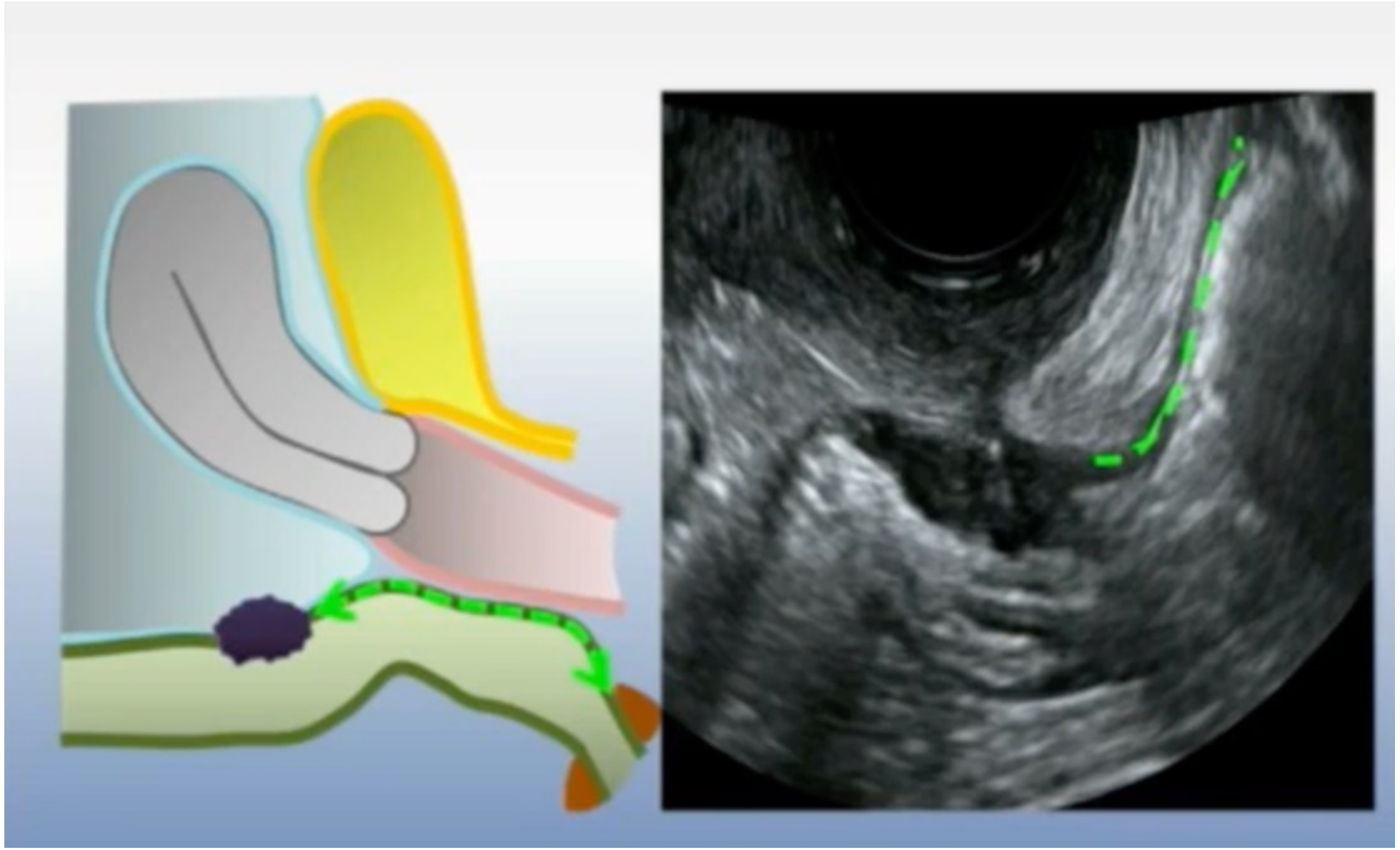
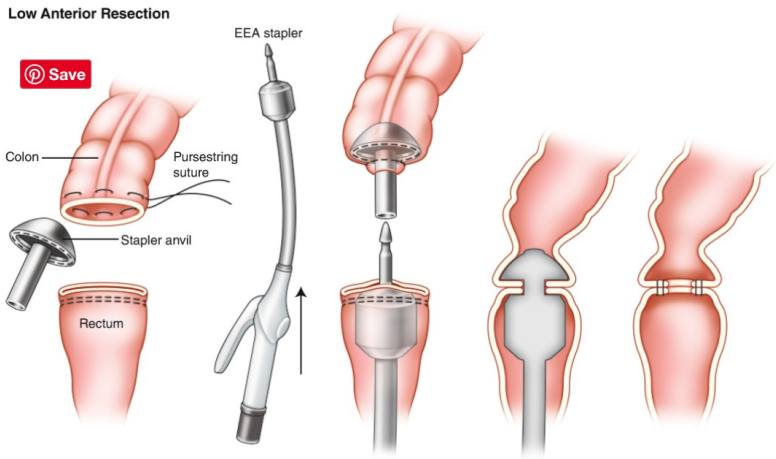
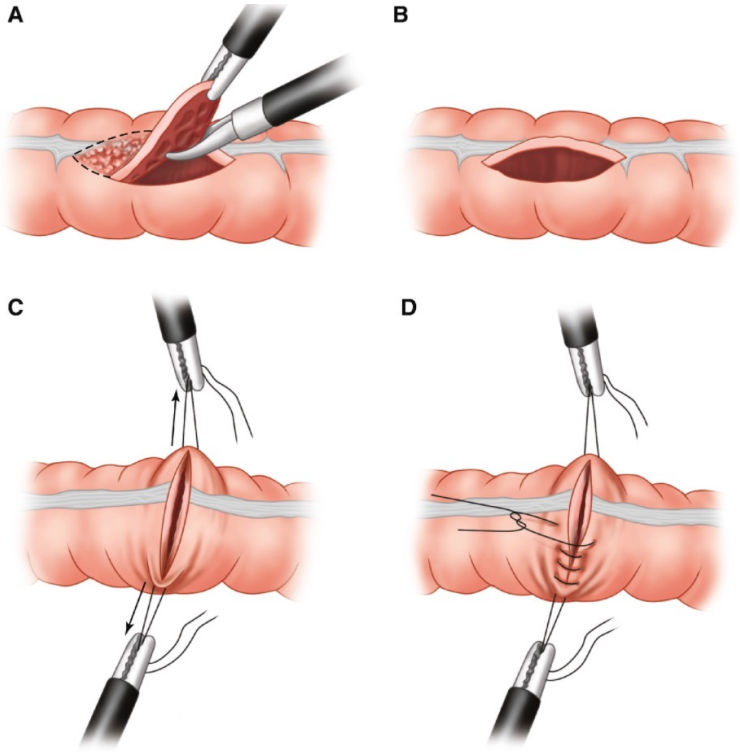
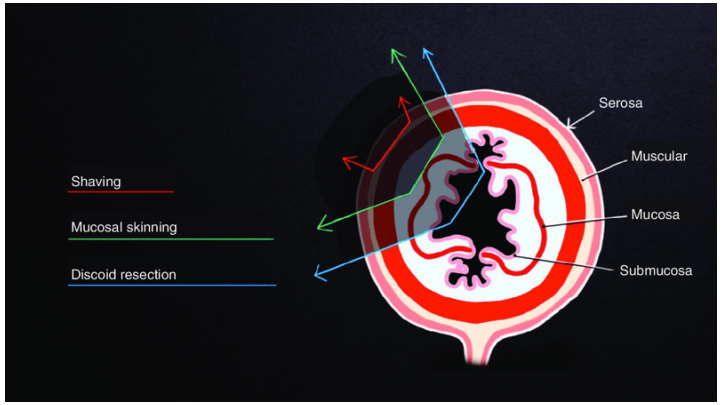


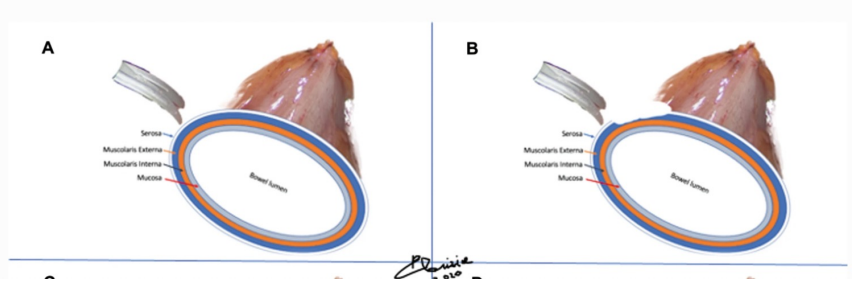
Veri Sınıflandırma Tipi: Genel / General

Which Surgical Method ?









Veri Sınıflandırma Tipi: Genel / General

Hangi Cerrahi Yöntem ?

- Nodülün uzunluğu >3cm, derinliği ≥ 7mm ise segmental rezeksiyon yapılması

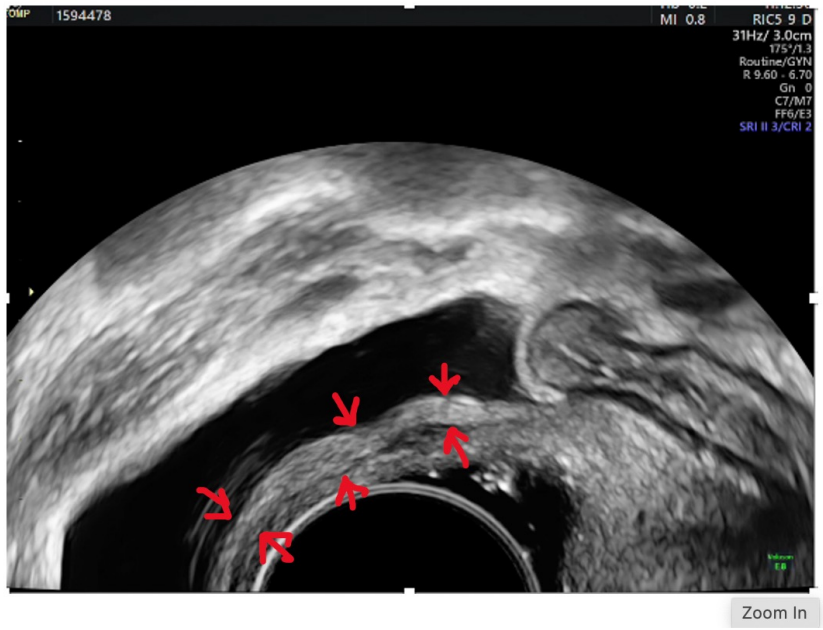
- Nodülün uzunluğu 2-3cm, derinliği ≥ 7mm ise diskoid rezeksiyon yapılması <7mm ise tıraşlama (shaving) tekniğinin düşünülmesi

- Nodülün uzunluğu <2cm, derinliği ≥ 7mm ise diskoid rezeksiyon yapılması <7mm ise tıraşlama (shaving) tekniğinin düşünülmesi

Veri Sınıflandırma Tipi: Genel / General

SonoPOD

- 35 yaş
- Dismenore+++



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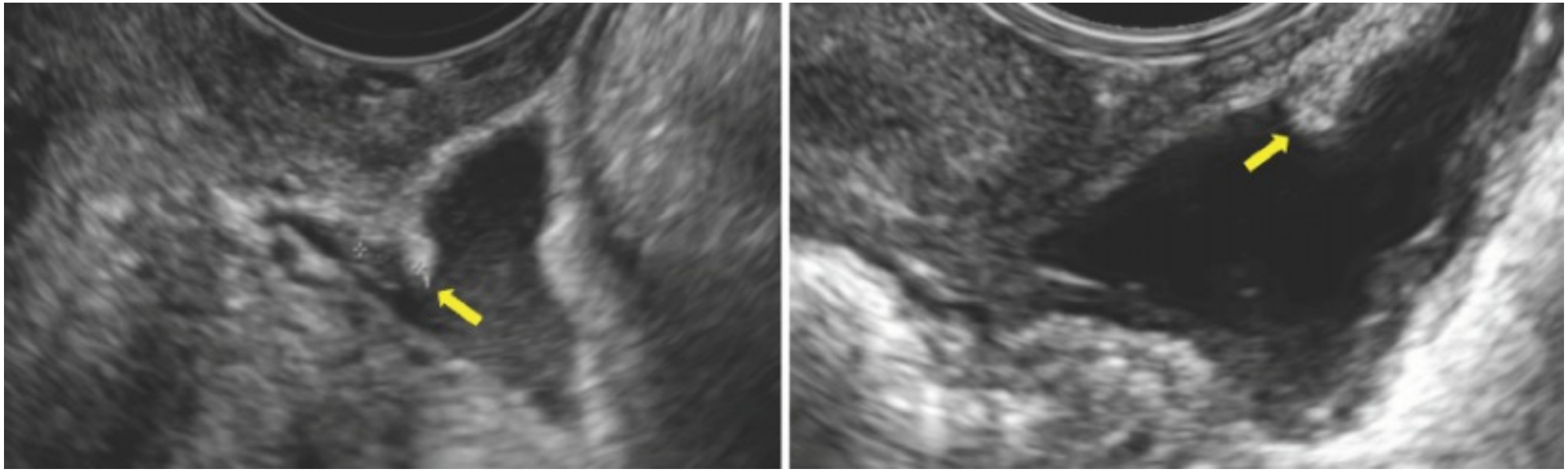

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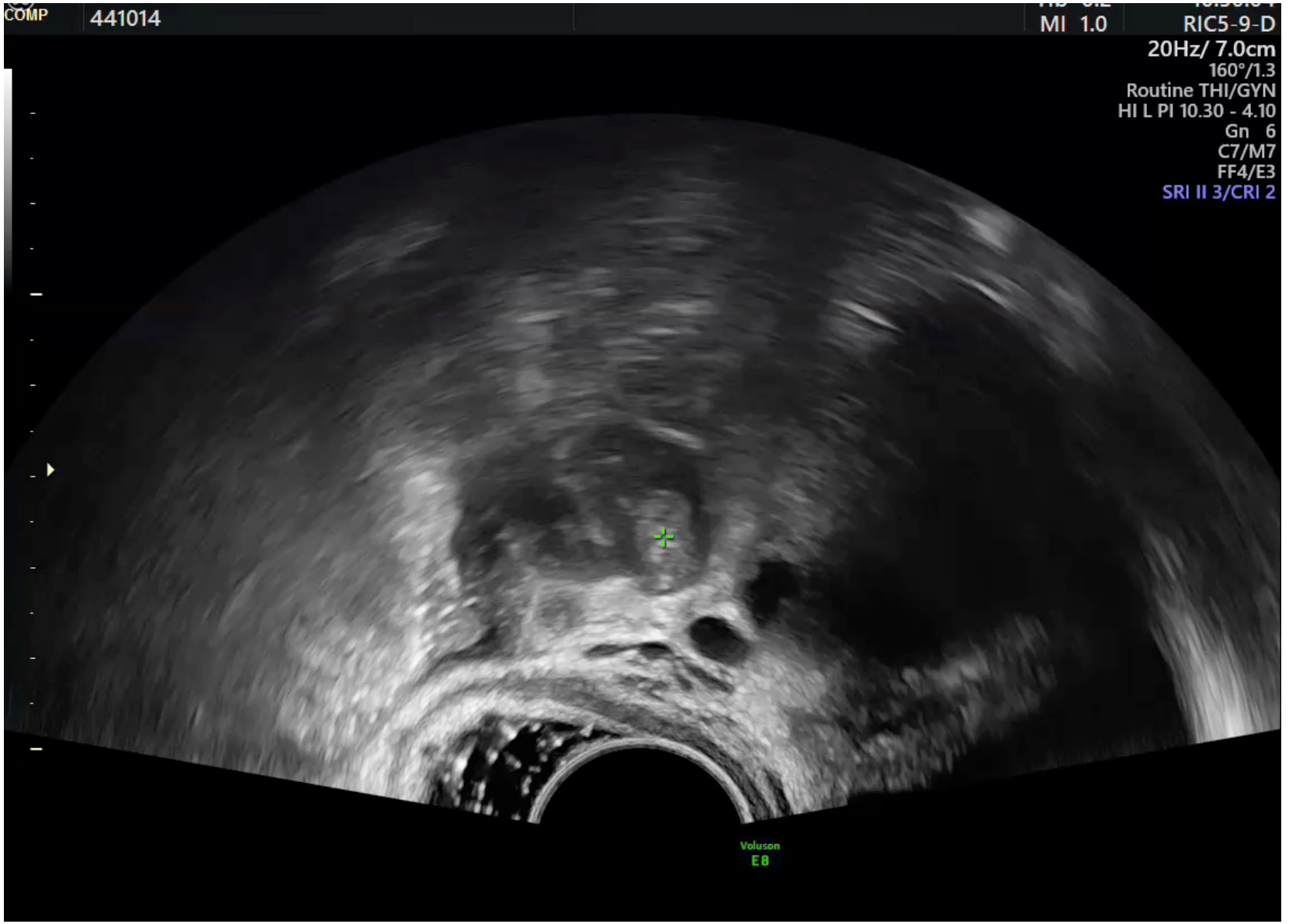

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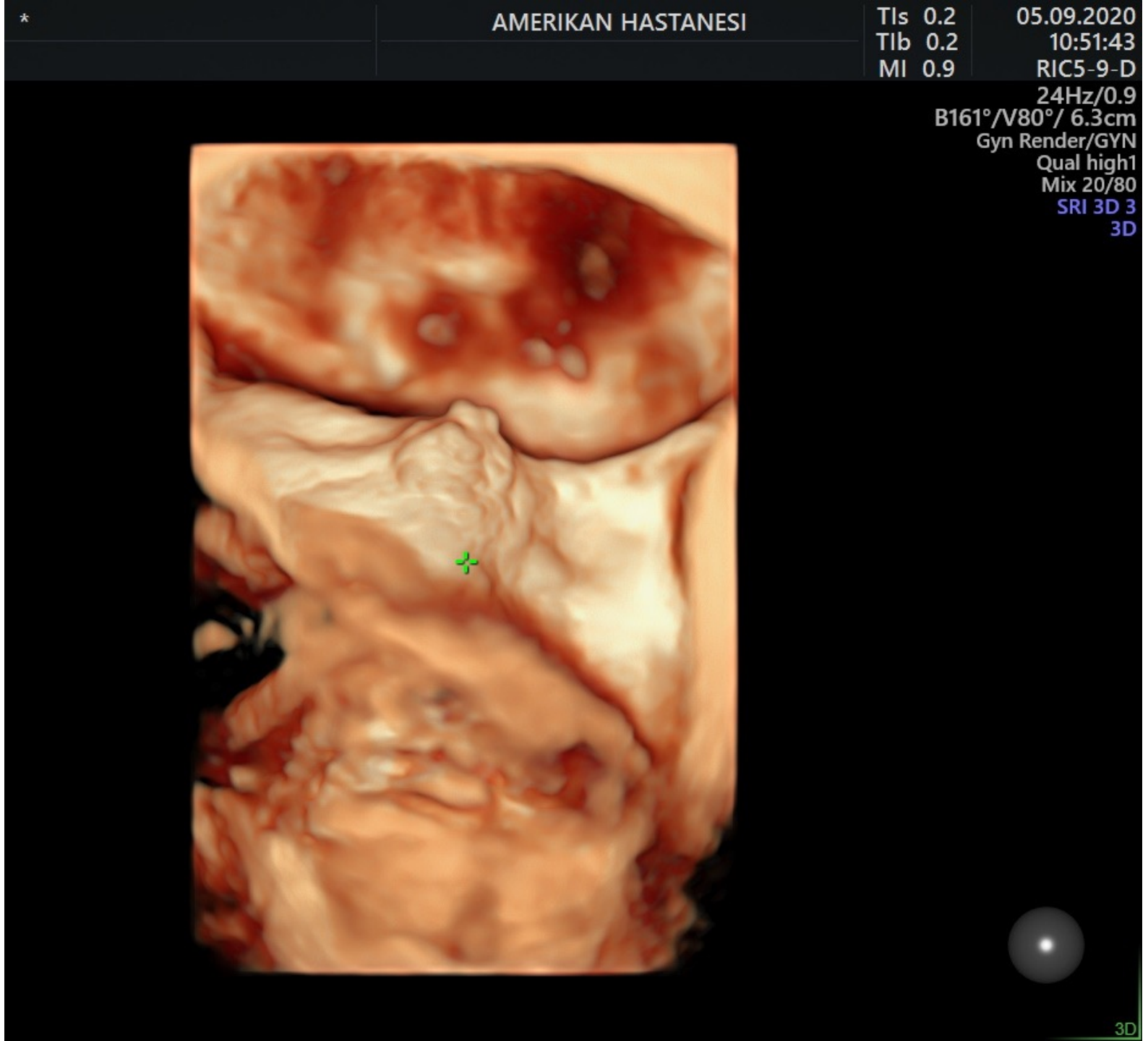

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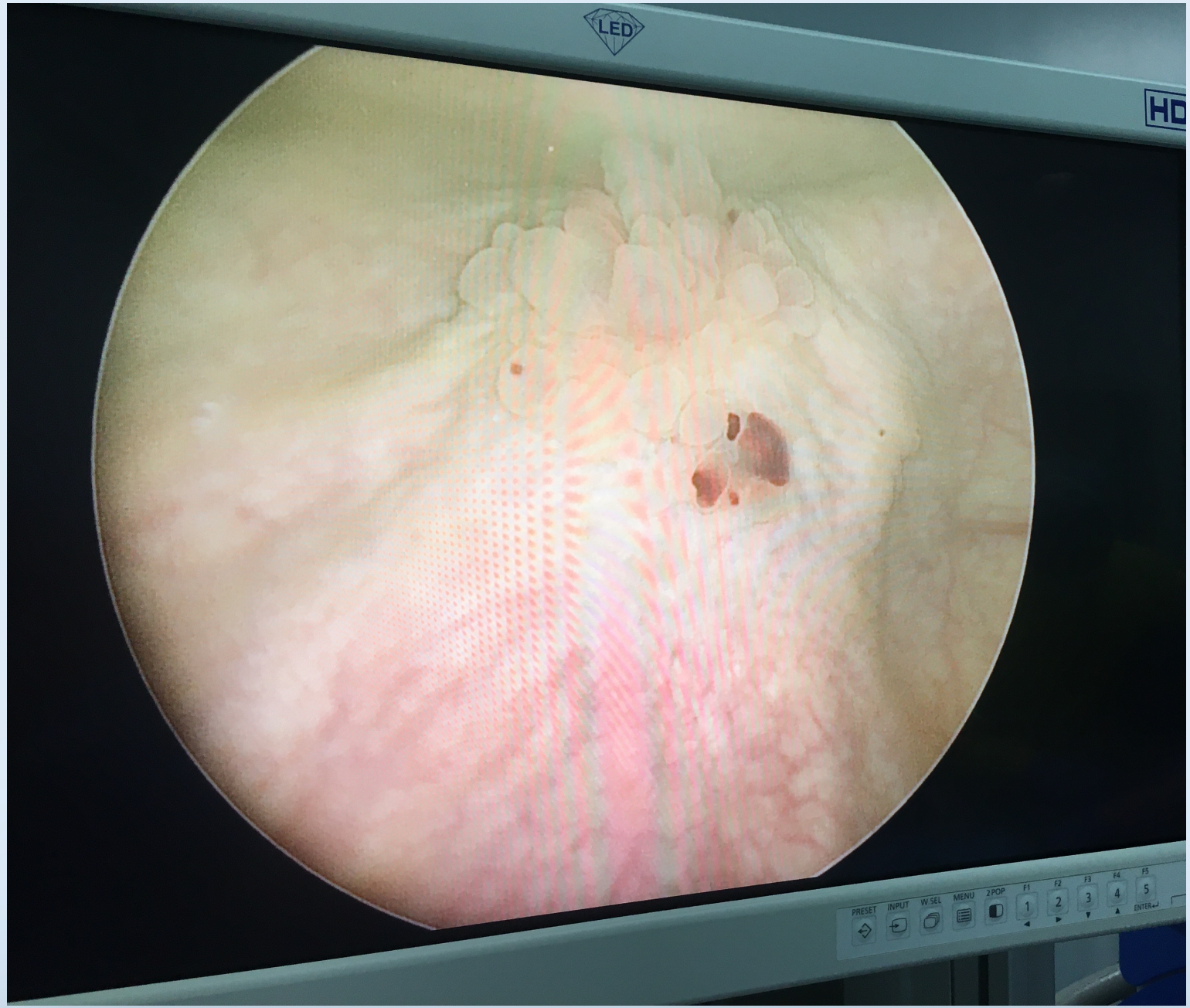

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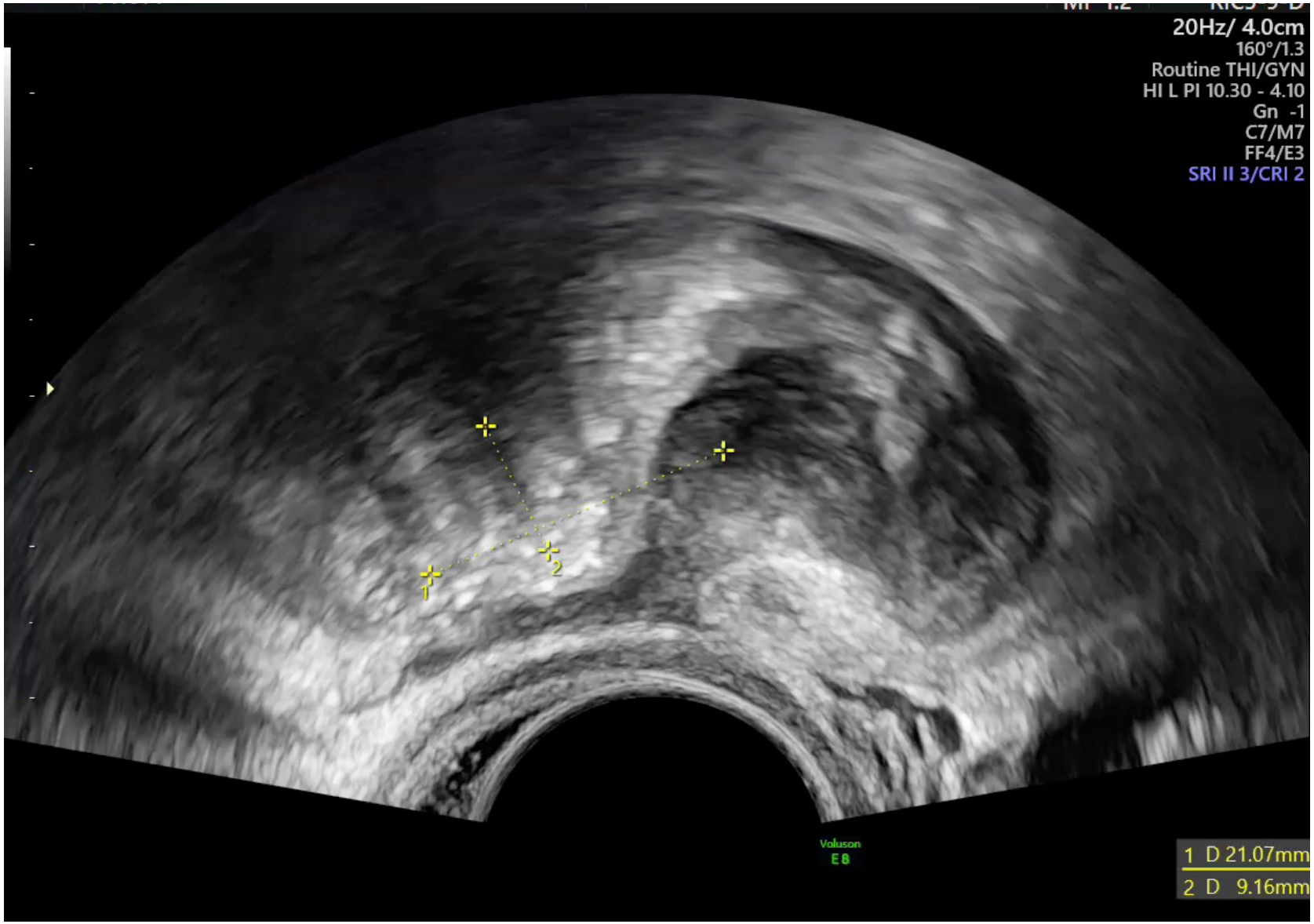

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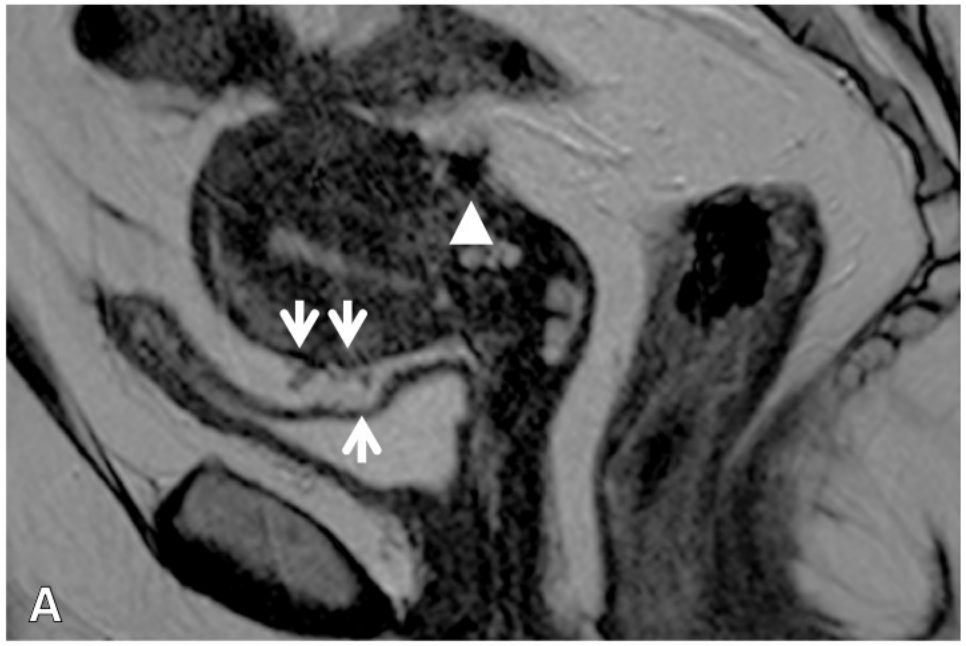
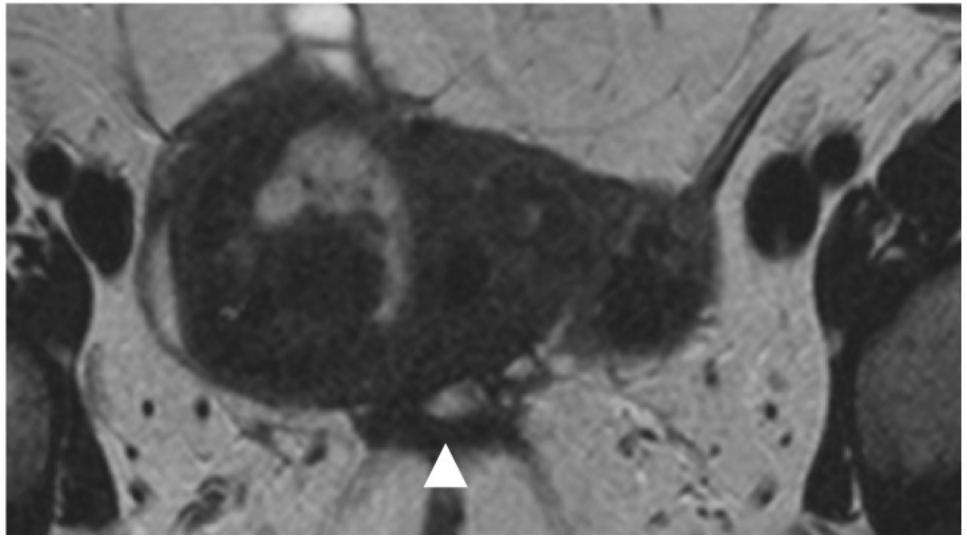




enc T2-weighted dark plaques, with or without high-signal-intensity foci on T1-weighted or fat suppression T1-weighted MRIs, corresponding to hemorrhagic foci or small hyperintense spaces on T2-weighted imaging

Veri Sınıflandırma Tipi: Genel / General

Wise

Wiser

Wisest

Veri Sınıflandırma Tipi: Genel / General

	RR	SR	SER	RR vs. SR	RR vs. SER	SR vs. SER
Overall (%)						
Sensitivity	42.18% (62/147)	86.39% (127/147)	74.15% (109/147)	$p<0.001$*	$p<0.001$*	$p=0.002$*
Specificity	95.27% (141/148)	45.95% (68/148)	81.76% (121/148)	$p<0.001$*	$p<0.001$*	$p<0.001$*

Structured expert read (SER) : expert radiologist with availability of the structured reporting template for use and 20 years of post-fellowship experience in abdominal imaging ,with particular interest and expertise in endometrio- sis.

Veri Sınıflandırma Tipi: Genel / General

Competence reached after how many evaluations?

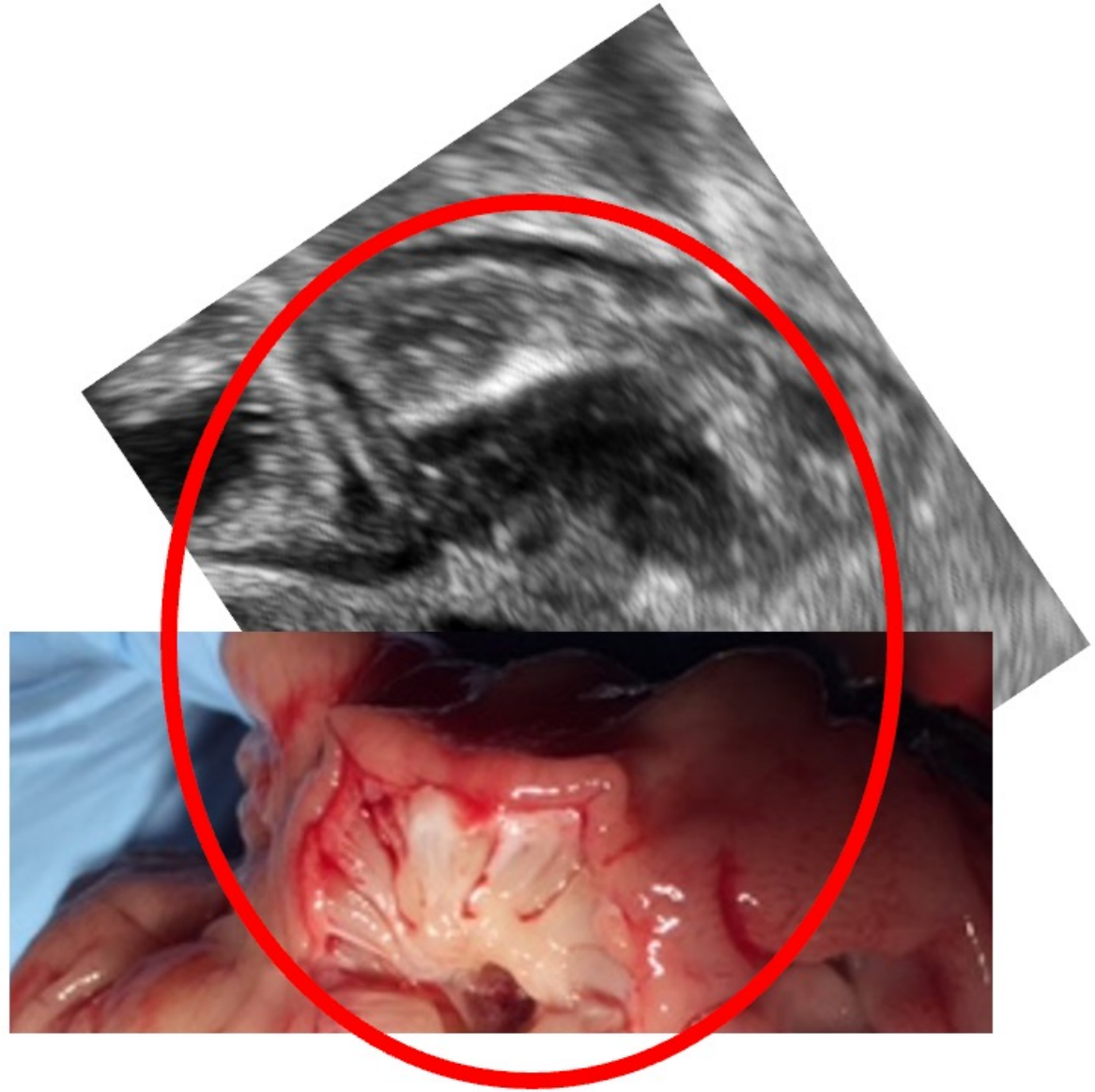
- Rectosigmoid DIE, an average of 39 evaluations
- USL : average, 44 evaluations
- RVS : 21 evaluations
- Post vaginal fornix: 25 evaluations

Stefano Guerriero

Veri Sınıflandırma Tipi: Genel / General

Map DIE, Get appropriate consents, Counsel your patient, prepare your team

Veri Sınıflandırma Tipi: Genel / General



Veri Sınıflandırma Tipi: Genel / General

Sabrınıza teşekkürler

Veri Sınıflandırma Tipi: Genel / General