

DISPNEİK HASTADA USG



DR. ÖĞR. ÜYESİ KIVANÇ
KARAMAN

SDÜ TIP FAKÜLTESİ ACIL TIP
AD

NEFES DARLIĞI

- Sadece ABD'de *her yıl 3-4 milyon* acil servis başvurusu (American Thoracic Society 2012 raporu)
- Ayırıcı tanı yelpazesi *Çok Geniş*
- Hızlı tanı ve tedavi *Hayat Kurtarıcı*
- Aksi takdirde *Yüksek Mortalite ve Morbidite*

Gece 24 teki tebliğde " umumî ahval vahamete doğru seyir ediyor,, deniliyor

Dün saat 10 da

İstanbul, 9 a.a. — Riyaseticümhur Umumî Kâtipliğinden :

1. — Reîsicümhur Atatürk'ün sıhî vaziyetleri hakkında müdavi ve müşavir tabipleri tarafından bu sabah saat 10 da verilen rapor ikinci maddededir:

2. — Geceyi rahatsız geçirdiler. Umumî hallerindeki vaziyet ciddiyetini muhafaza etmektedir.

Hararet derecesi: 36.8

Nabız muntazam: 128

Teneffüs: 28 dir.

Akşam saat 20 de

İstanbul, 9 a.a. — Riyaseticümhur Umumî Kâtipliğinden :

1. — Reîsicümhur Atatürk'ün sıhî vaziyetleri hak-

akşam saat "20" de verilen rapor ikinci maddededir:

2. — Bugünü yorgun ve dalgın geçirdiler. Umumî ahvaldeki ciddiyet biraz daha ilerlemiştir.

Nabız: muntazam, dakikada "124"

Teneffüs: "40"

Hararet derecesi: "37.6" dir.

Gece saat 24 te

İstanbul, 9 a.a. — Riyaseticümhur Umumî Kâtipliğinden :

1. — Reîsicümhur Atatürk'ün sıhî vaziyetleri hakkında müdavi ve müşavir tabipleri tarafından bu gece saat "24" te verilen rapor ikinci maddededir:

2. — Saat "20" den itibaren dalgınlık artmıştır. Umumî ahval vahamete doğru seyir etmektedir.

Hararet derecesi: "37.6"

Nabız: "132"

AYIRICI TANI

PULMONER	Astım, KOAH, Pnömoni, Pulmoner Ödem, ARDS, Pnömotoraks, Plevral Efüzyon
KARDİYAK	DKY, AMI, Perikaridyal Efüzyon , Perikardit, Myokardit, Kapak Hastalıkları
HAVAYOLU	Kitleler, Yabancı cisim, Anjioödem
VASKÜLER	PE , hava-yağ-amniyotik emboli, Pulmoner HT
NÖROMUSKÜLER	SVO, frenik sinir paralizisi, Guillain-Barré Sendromu
DİĞER	Anemi, Metabolik Asidoz, Şok, Düşük Kardiyak Output Durumu, CO İntoksikasyonu, Methemoglobinemi, Psikojenik Hiperventilasyon

Peki elimizde ne var???

- Anamnez???
- Fizik muayene???
- Görüntüleme???
 - (PA Akciğer grafisi, Tomografi...)
- Laboratuvar testleri???
 - (Kangazı, BNP, D-dimer, Kardiyak enzim...)

En önemli zorluk

- *Pulmoner vs Kardiyak patolojilerin birbirinden ayırımı*

[Get Access](#)[Share](#)[Export](#)**CHEST®**

Volume 85, Issue 1, January 1984, Pages 59-64



Dyspnea: The Heart or the Lungs?: Differentiation at Bedside by Use of the Simple Valsalva Maneuver

Michael J. Zema M.D., F.C.C.P. ^a, Anthony P. Masters R.R.T. ^b, Donald Margouleff M.D. ^c

[Show more](#)

<https://doi.org/10.1378/chest.85.1.59>

[Get rights and content](#)

Thirty-seven patients with dyspnea, clinical chronic obstructive pulmonary disease and abnormal pulmonary function tests demonstrating an obstructive airways pattern underwent six-foot posteroanterior chest radiography, radionuclide ventriculography and sphygmomanometer-monitored arterial pressure response during a bedside Valsalva maneuver. Patients could be

Echocardiography in the emergency room: is it feasible, beneficial, and cost-effective?

Oh JK¹, Meloy TD, Seward JB.

⊖ Author information

1 Divisions of Cardiovascular Diseases and Internal Medicine, Mayo Clinic, Rochester, MN 55905, USA.

Abstract

Echocardiography in the emergency room presents exciting practice possibilities that can facilitate prompt and reliable diagnostic evaluations in patients with suspected cardiovascular emergencies. Echocardiography has the diagnostic potentials to evaluate the entire spectrum of cardiovascular abnormalities short of delineating coronary anatomy and evaluation of the conduction system. By reliably assessing the global and regional function, visualizing the cardiovascular structures from multiple tomographic planes, and quantitating hemodynamic abnormalities, echocardiography should be able to assist emergency room physician's evaluation and triage of the patients with chest pain syndrome, unexplained dyspnea, hypotension, shock, chest trauma, and cardiac arrest, whereby hopefully minimizing the unnecessary admission to the hospital and facilitating inhospital evaluation of the admitted patients with echocardiographic information. However, the optimal echocardiography practice in the emergency room requires well trained sonographers and echocardiographers who can respond to the clinical needs at anytime. Whether an emergency room physician can perform and interpret echocardiographic examinations satisfactorily will depend on his/her level of training and continuing education in this area. Currently, there is no established guideline for performing echocardiography in the emergency room. Further clinical investigations are necessary to define the most optimal and economical utilization of this versatile imaging and hemodynamic diagnostic modality in the emergency room.

PMID: 10150427 DOI: [10.1111/j.1540-8175.1995.tb00536.x](https://doi.org/10.1111/j.1540-8175.1995.tb00536.x)

[Indexed for MEDLINE]

ACEP- USG Guideline 2001

- Primary Applications for Emergency Ultrasound
 - Trauma
 - Pregnancy
 - Echocardiography
 - Abdominal Aortic Aneurysm
 - Biliary
 - Renal
 - Procedural

ACEP- USG Guideline 2001

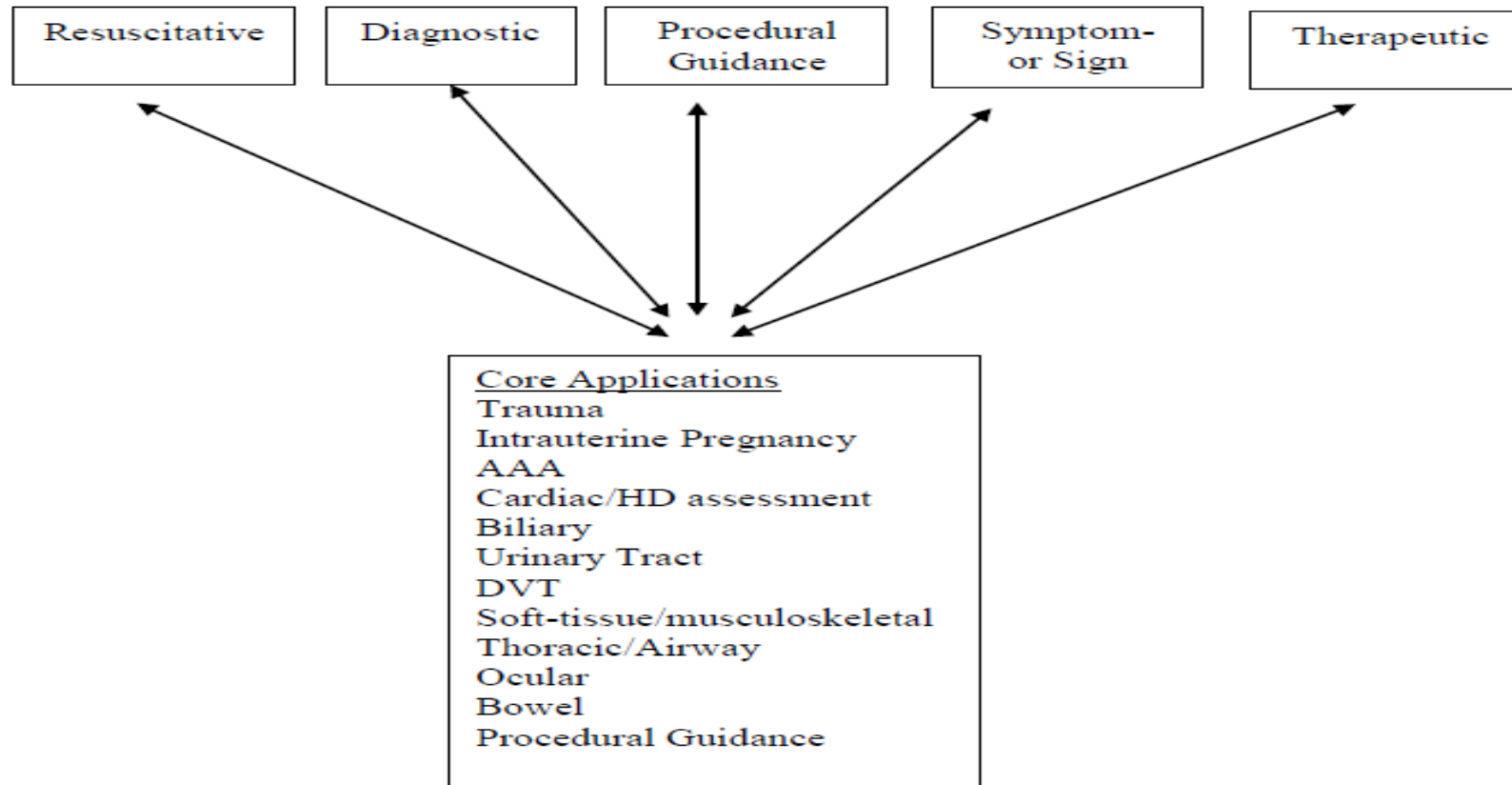
Table 5.

Future potential applications of emergency ultrasound.

Application	Rationale
Musculoskeletal	Musculoskeletal injuries Arthrocentesis Fracture detection Fracture reduction guidance
Deep venous thrombosis	Detection of deep venous thrombosis
Airway	Intubation detection in the apneic patient
Head and neck	Peritonsillar abscess detection and drainage
Testicular ultrasound	Rule out torsion
Cardiac (transthoracic)	Use for left ventricular function and hypotension
Orbital ultrasound	Orbital hematoma and retinal detachment
Transesophageal	Cardiac function and aortic disease
Obstetric second- and third-trimester bleeding	Placenta previa

ACEP- USG Guideline 2016

Figure 1. ACEP 2016 Emergency US Guidelines Scope of Practice



Çünkü artık USG $\geq$ Steteskop

European Journal of Emergency Medicine. 22(6):440–443, DEC 2015

DOI: 10.1097/MEJ.0000000000000258, PMID: 25715019

Issn Print: 0969-9546

Publication Date: 2015/12/01



 Print

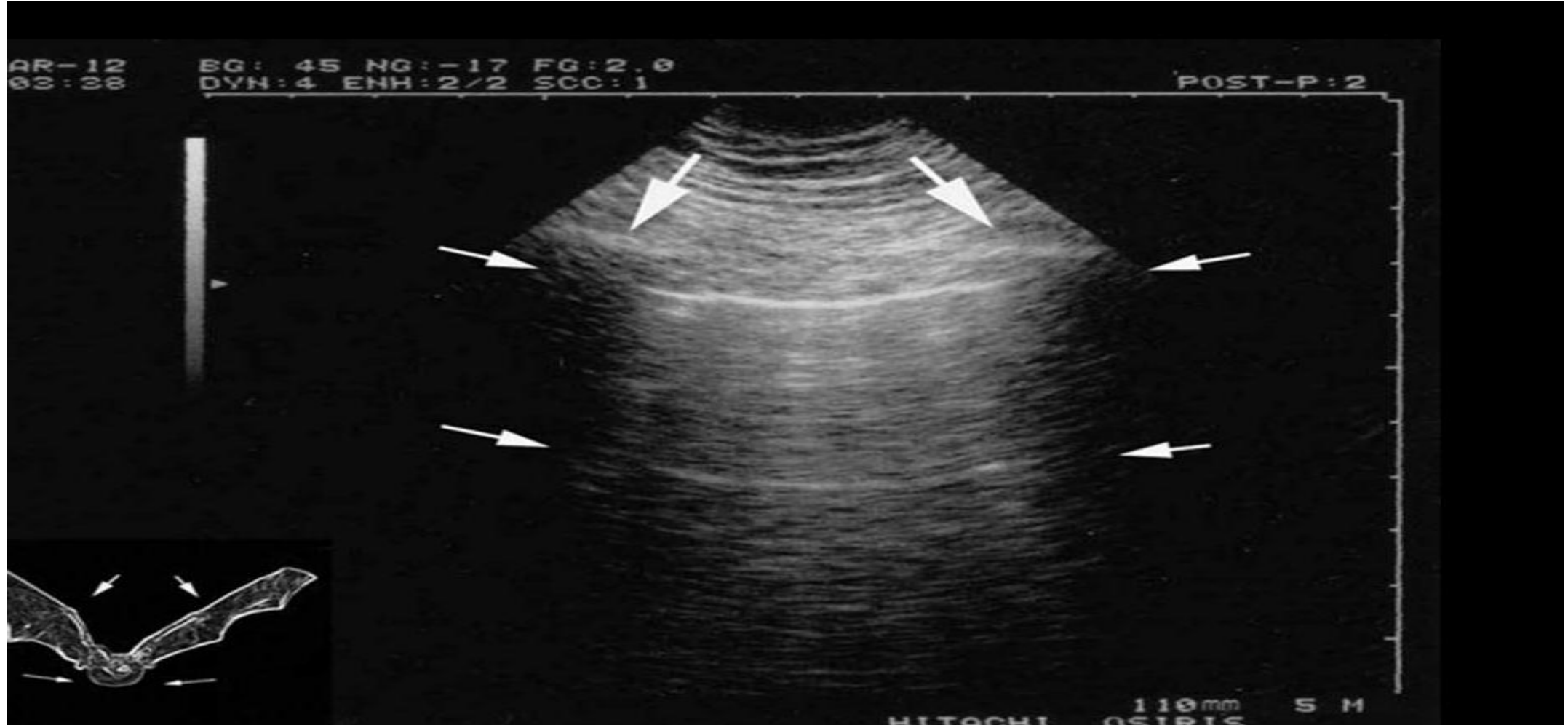
Stethoscope versus point-of-care ultrasound in the differential diagnosis of dyspnea: a randomized trial

Behzat Özkan;Erden Ünlüer;Pinar Akyol;Arif Karagöz;Mehmet Bayata;Haldun Akoğlu;Orhan Oyar;Ayşe Dalli

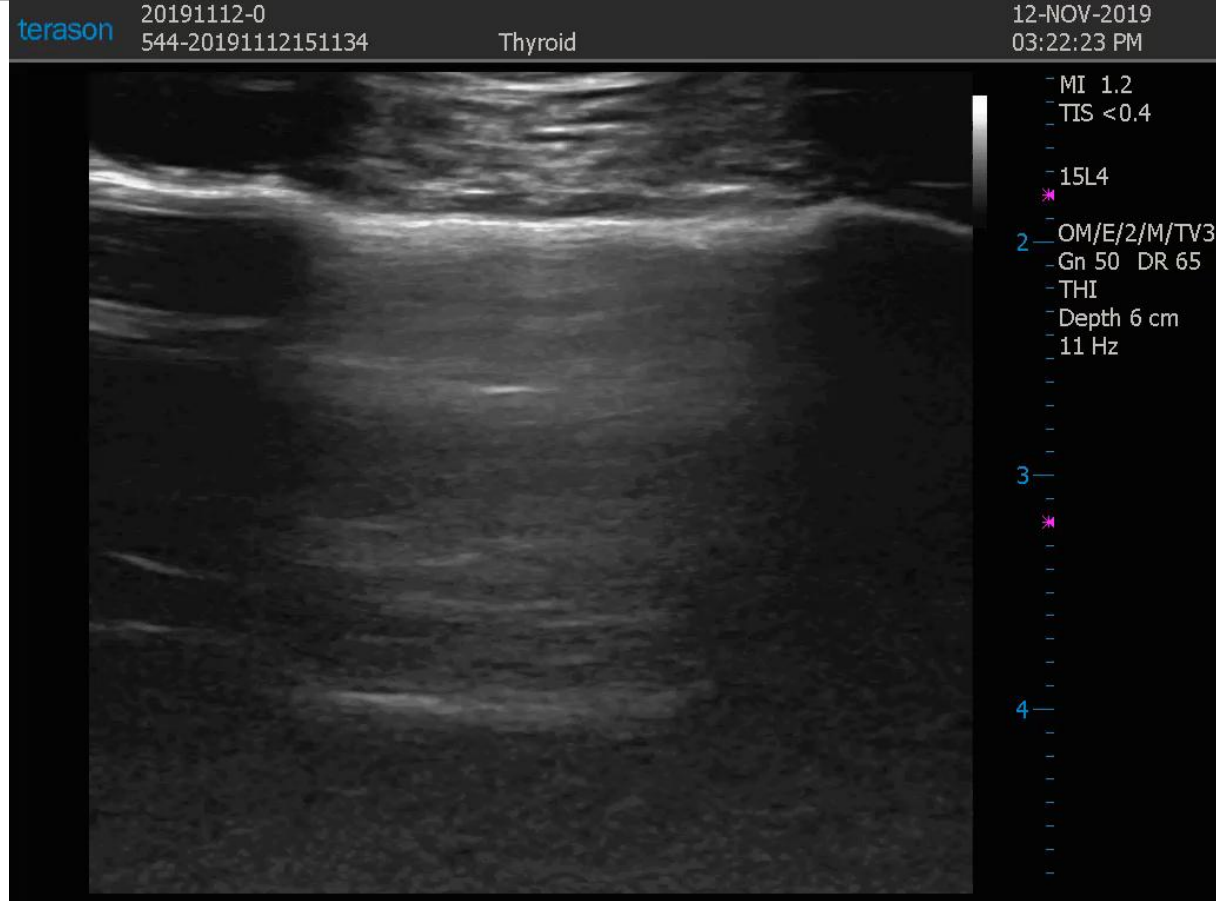
AC USG – Normal Bulgular

- Yarasa İşareti (Bat sign)
- Plevral Kayma İşareti (Sliding sign)
- A Çizgisi (A line)
- Sahil-Deniz Görüntüsü (Seashore sign)

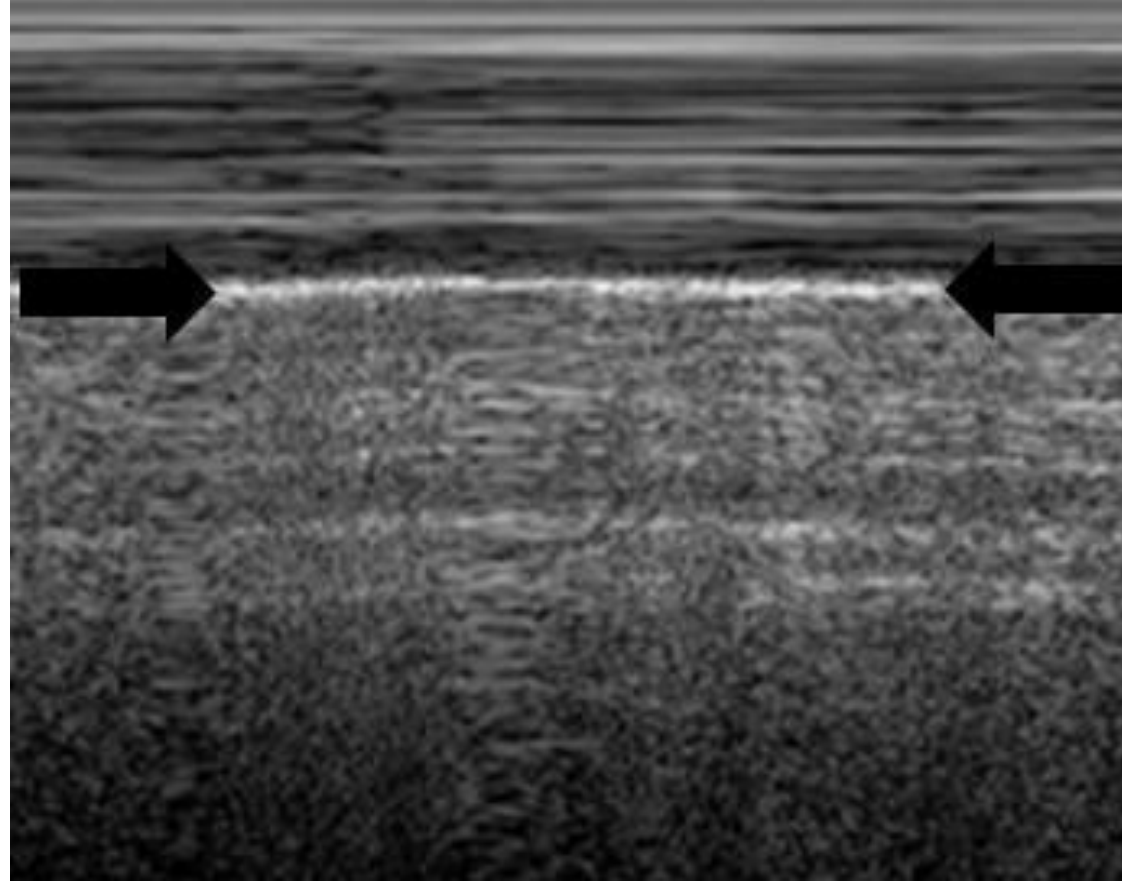
Yarasa İşareti (Bat Sign) - A Çizgisi (A Line)



Plevral Kayma İşareti



Sahil-Deniz Görüntüsü (Seashore sign)



AC USG – Patolojik Bulgular

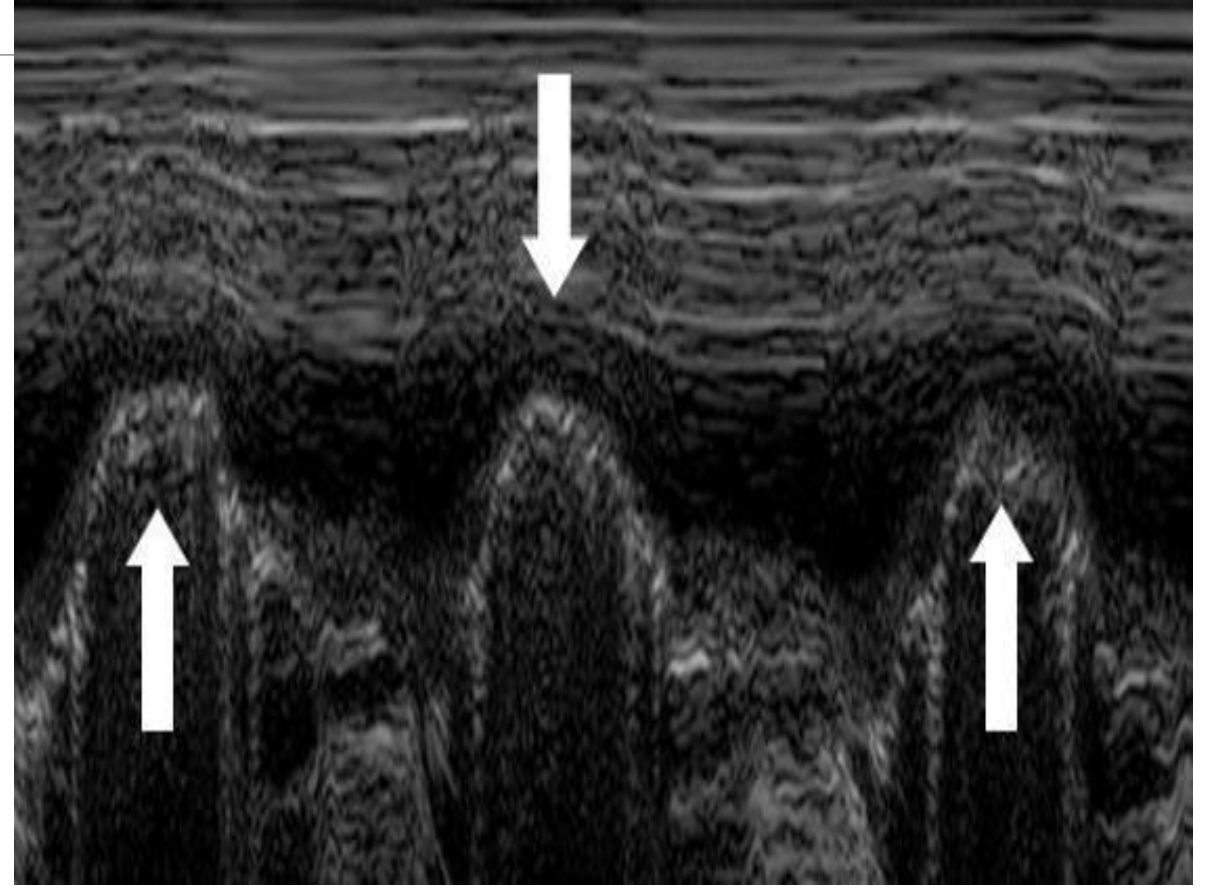
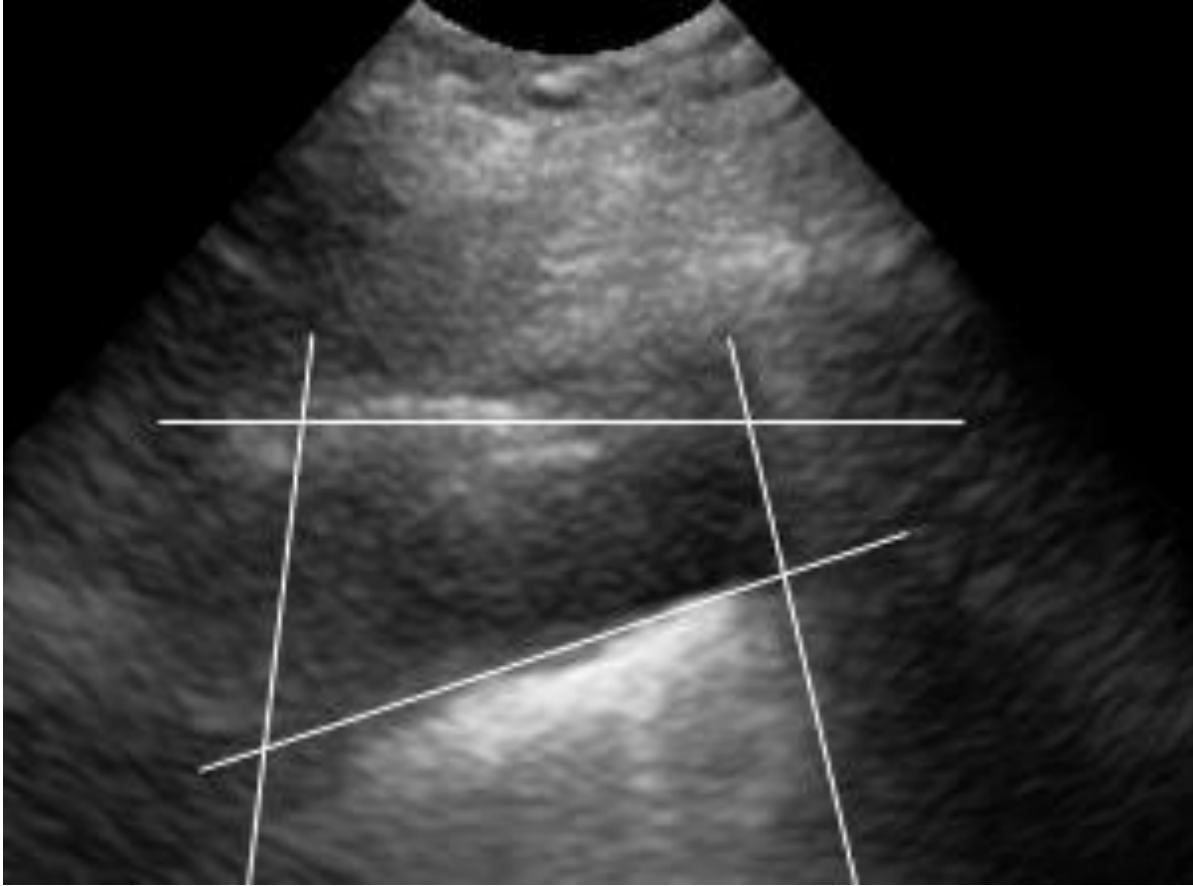
- Quad İşareti

- Longitudinal incelemede Plevral Efüzyonu gösterir

- Sinozoidal Bulgu

- Quad işareti saptanan alanın M Mode görüntüsündeki düzenli değişimdir (solunum hareketine bağlı)

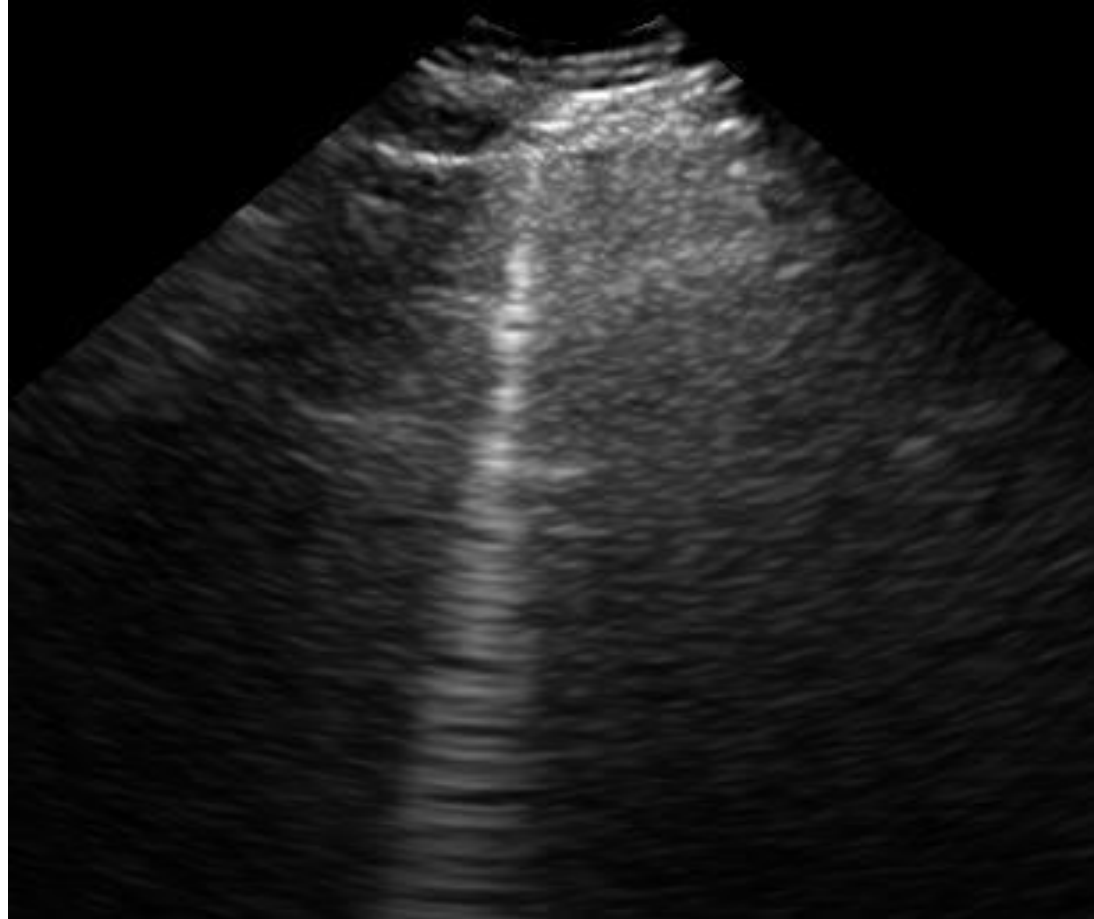
Quad İşareti ----- Sinozoidal Bulgu



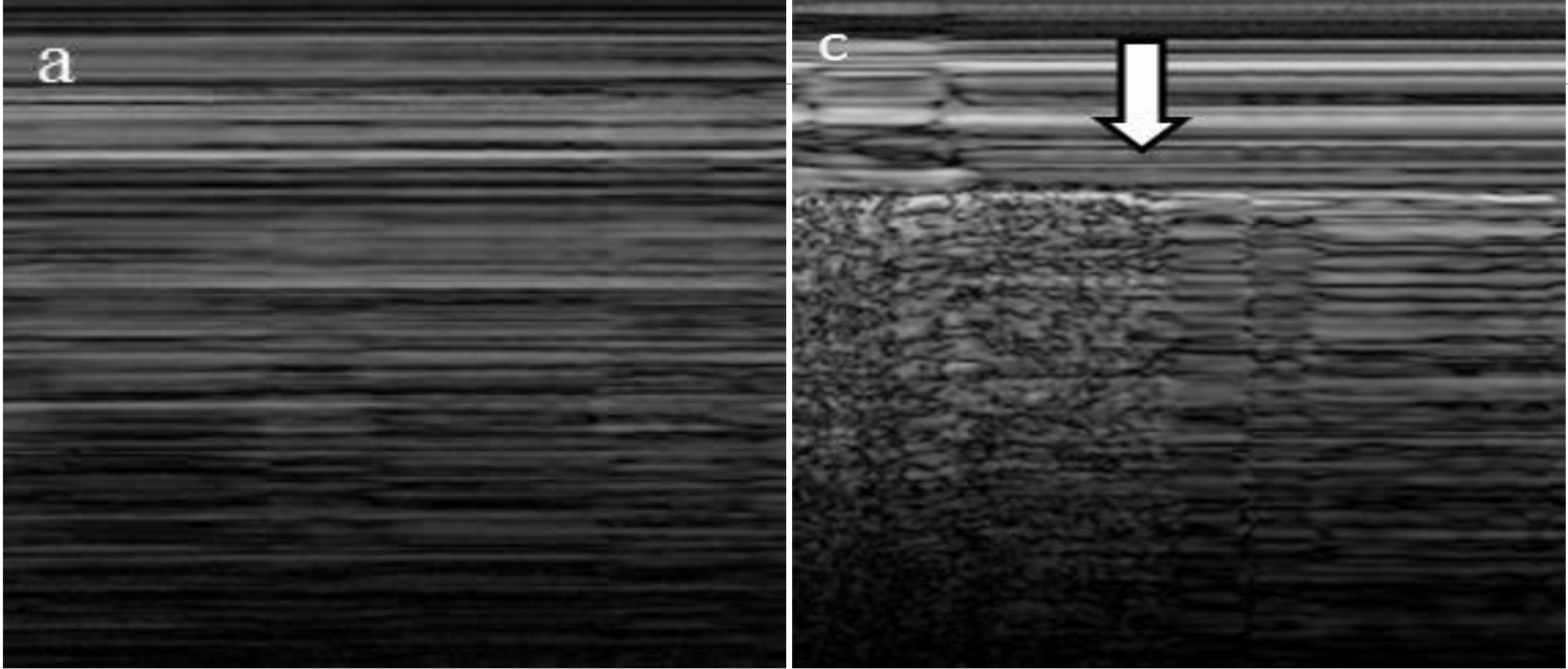
B Çizgileri (Kuyruklu Yıldız Artefaktı)

- Her kesitte 1-2 adet normal, >3 daima patolojik (B+)
- Plevradan köken alırlar
- Hiperekoik
- Ekran sonuna kadar devam eder
- A çizgilerini silerler
- Çizgiler arası mesafe <3 mm = Buzlu cam
- Çizgiler arası mesafe >7 mm = Pulmoner ödem (= Kerley B)

B izgisi (Kuyruklu Yıldız Artefaktı)

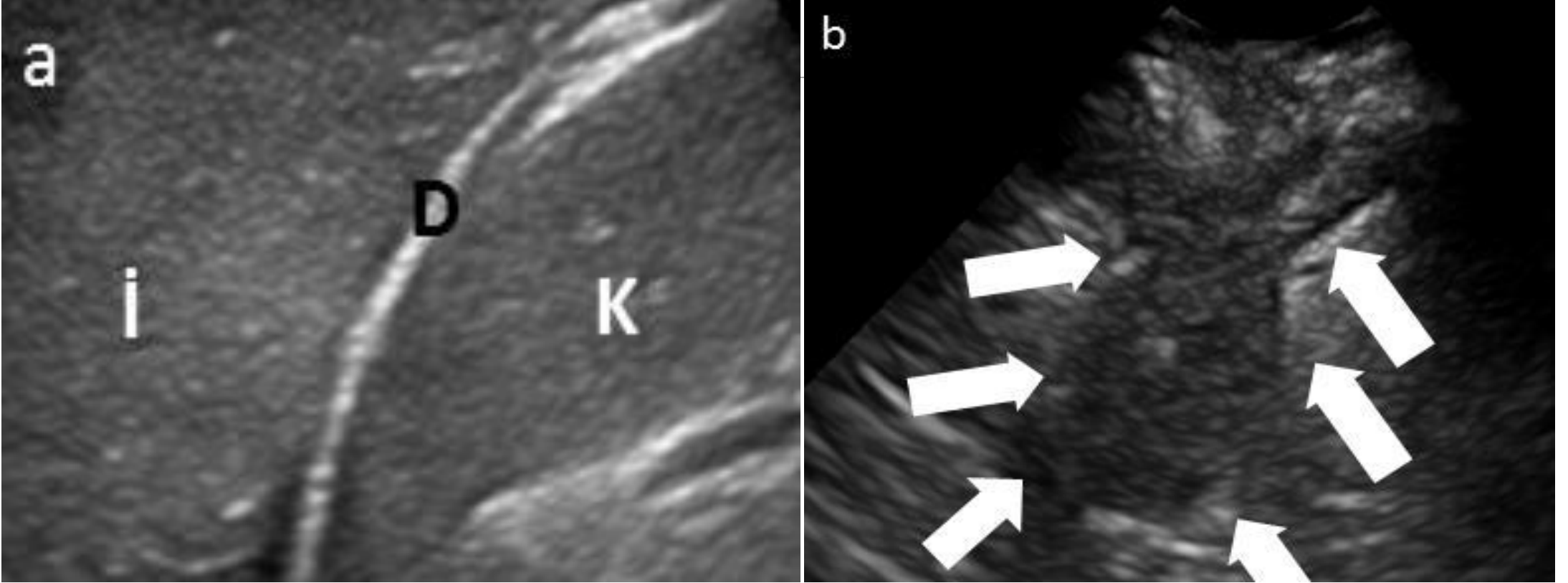


Stratosfer (Barkod) İşareti – AC Noktası (Lung Point)



Pnömotoraks için spesifiktir

Hepatizasyon Bulgusu



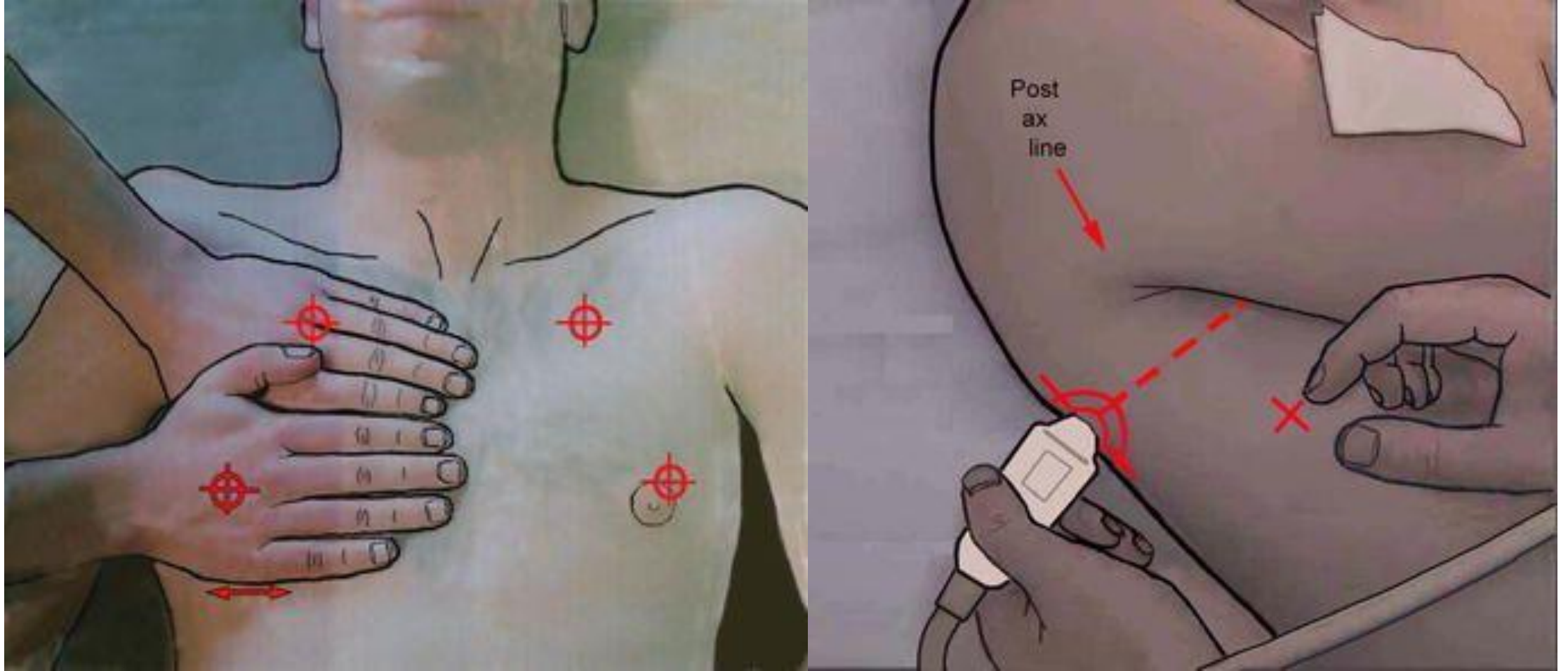
AC dokusundaki konsolidasyonu gösterir

Konsolide alan KC ekojenitesinde ve düzensiz sınırlıdır

Bedside Lung Ultrasound in Emergency (BLUE)

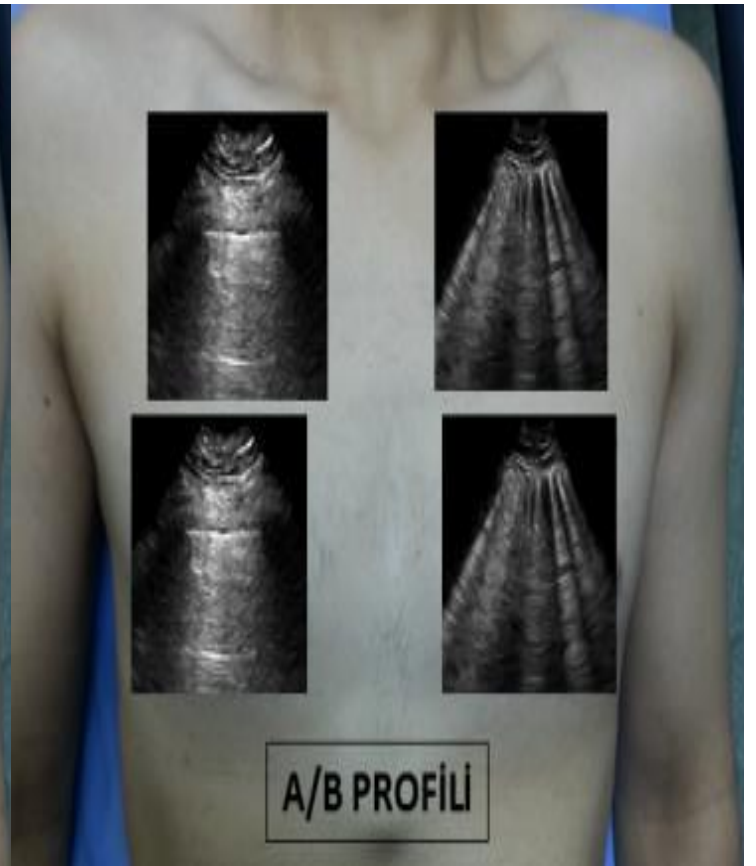
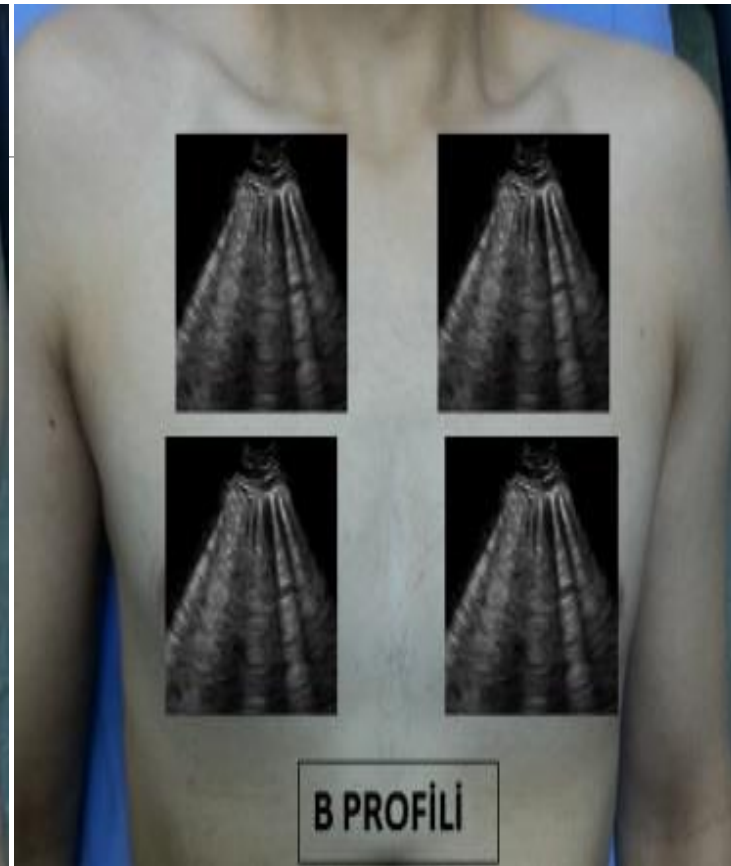
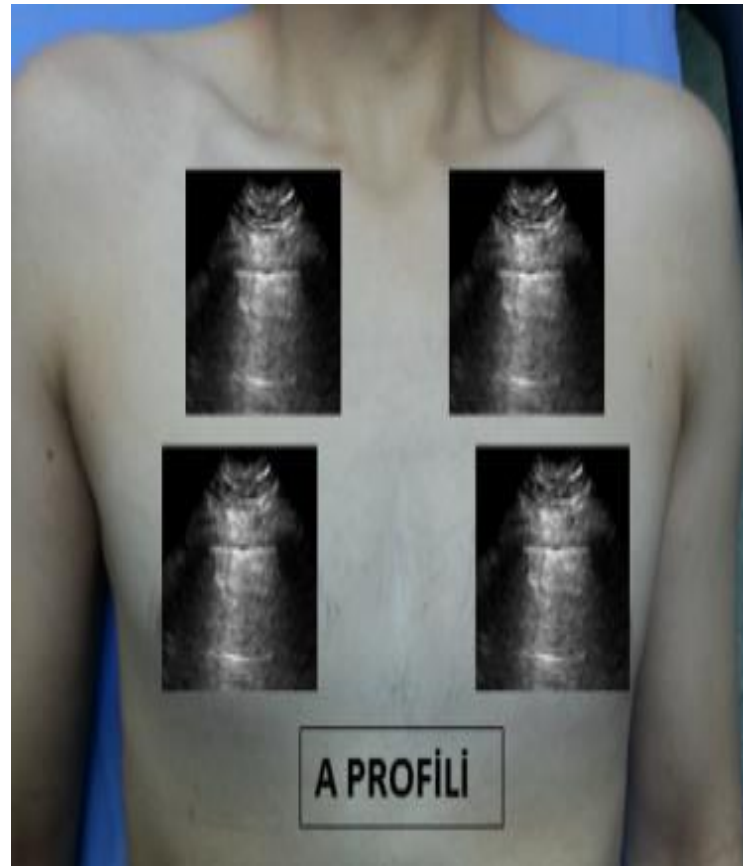
- 2012 yılında *Lichtenstein ve Ark.* tarafından
- Akut Solunum Yetmezliği hastalarında AC değerlendirmesi için
- İlk olarak BLUE-noktaları

BLUE-Points

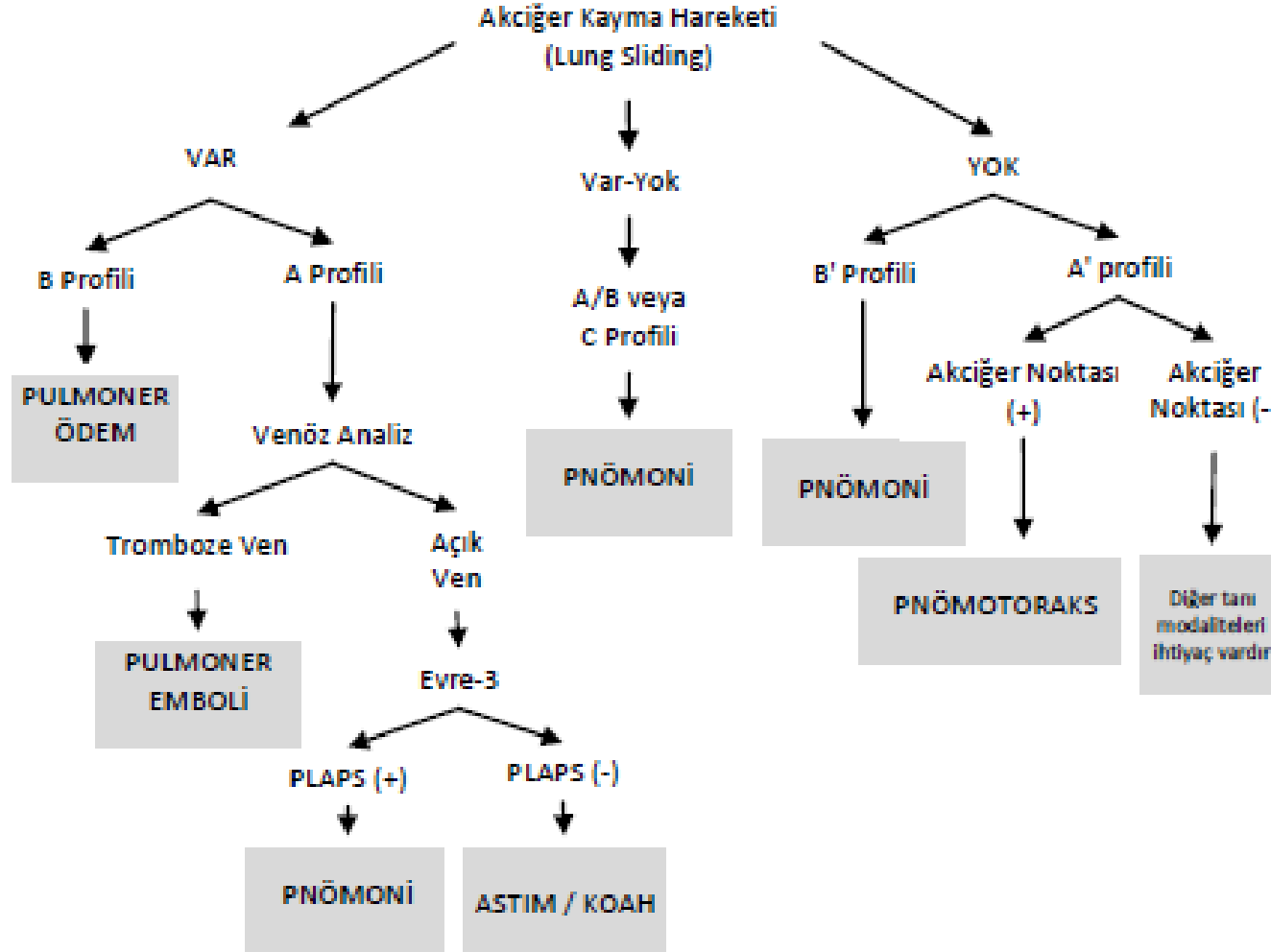


PROFİLLER

- A profil: Ön duvarda bilateral kayma bulgusu + A çizgileri
- A' profil: Kayma bulgusu $\emptyset$, bilateral A çizgileri
- B profil: Ön duvarda bilateral kayma bulgusu + B çizgileri
- B' profil: Kayma bulgusu $\emptyset$, bilateral B çizgileri
- A/B profil: Ön duvarda bir taraf A profil, diğer taraf B profil
- C profil: Ön duvarda konsolidasyon saptanmasıdır



BLUE Protokolü



BLUE Ne Kadar Etkin ???

Sensitivities and specificities of BLUE protocol ultrasonographic findings according to the BLUE protocol diagnosis.

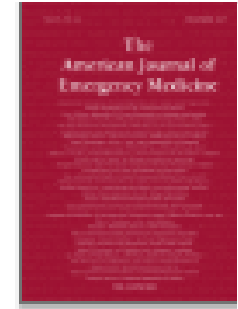
Diagnosis	BLUE protocol ultrasound findings	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	Positive predictive value (%) (95% CI)	Negative predictive value (%) (95% CI)
Cardiogenic pulmonary edema	Bilateral diffuse B lines together with lung sliding	87 (79–93)	97 (94–98)	91 (84–95)	95 (93–97)
Pneumonia	PLAPS, AB profile, C profile, B' profile, or Local B lines	82 (78–89)	98 (97–99)	96 (88–98)	94 (92–96)
COPD/asthma	Bilateral diffuse A lines together with lung sliding	96 (90–87)	75 (70–80)	61 (56–66)	98 (95–99)
Pneumothorax	Presence of A lines without lung sliding finding, absence of B lines, and presence of lung point finding	85 (42–99)	100 (99–100)	100 (99–100)	99 (98–99)
Pulmonary embolism	Presence of venous thrombosis in lower extremity venous examination together with bilateral diffuse A lines	46.2 (19–74)	100 (99–100)	100 (100–100)	98 (96–99)

Sadece Tanıda Değil !!!



The American Journal of Emergency Medicine

Volume 35, Issue 12, December 2017, Pages 1815-1818



Original Contribution

The impact of the BLUE protocol
ultrasonography on the time taken to treat
acute respiratory distress in the ED

Yatak Başı EKO !!!

- EF  Normal / Düşük ???
- Sağ Ventrikül  Normal / Geniş ???
- Perikardiyal Efüzyon ???



niyiz??

PMCID: PMC3966449

PMID: [24672616](#)

Erden E. Ünlüer, MD,* Arif Karagöz, MD,* Haldun Akoğlu, MD,[†] and Serdar Bayata, MD*

	EP 1			EP 2		
	Value	%95 CI lower limit	%95 CI upper limit	Value	%95 CI lower limit	%95 CI upper limit
Sensitivity (%)	98.7	91.8	99.9	98.7	91.8	99.9
Specificity (%)	86.2	74.1	93.4	87.9	76.1	94.6
Positive predictive value	0.902	0.812	0.954	0.914	0.825	0.962
Negative predictive value	0.980	0.882	0.999	0.981	0.884	0.999
Positive likelihood ratio	7.153	3.757	13.619	8.175	4.079	16.383
Negative likelihood ratio	0.015	0.002	0.109	0.015	0.002	0.107

Peki Sağ Ventrikülü Doğru Değerlendirebilir miyiz?



Brief Report

Accuracy of
ventricular s

Richard Andrew

Department of Emergency M

Consultative echo
RVS Category

Limited echo RV dilation Category

	No	Yes	Total
No	328	6	378
Yes	54	19	29
Total	382	25	407

Sensitivity	Specificity	LR+	LR-
26% (16-37%)	98% (96-99%)	14 (6-35)	0.75 (0.65-0.86)

Plevral Efüzyon !!!!

[J Ultrasound Med](#). 2019 Nov;38(11):2845-2851. doi: 10.1002/jum.14985. Epub 2019 Mar 18.

Diagnostic Yield and Accuracy of Bedside Echocardiography in the Emergency Department in Hemodynamically Stable Patients.

[Balderston JR](#)¹, [Gertz ZM](#)², [Brooks S](#)¹, [Joyce JM](#)¹, [Evans DP](#)¹.

Author information

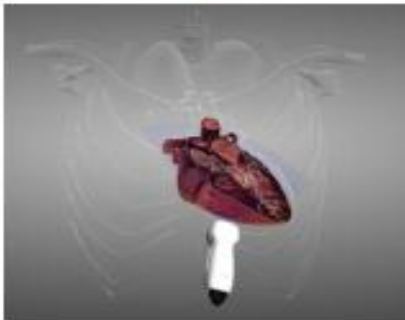
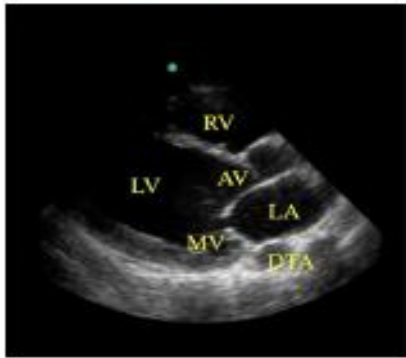
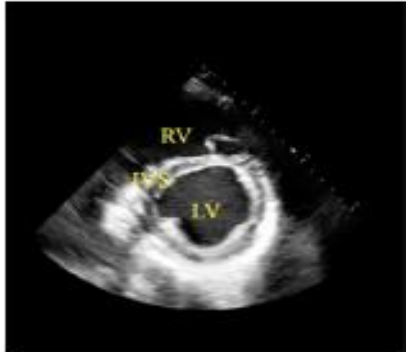
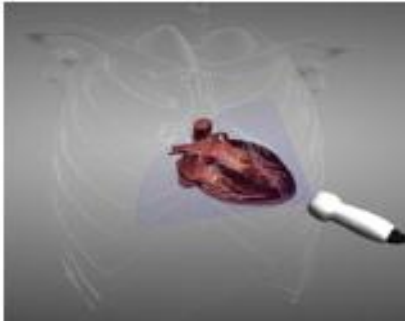
¹ Department of Emergency Medicine, Virginia Commonwealth University, Richmond, Virginia, USA.

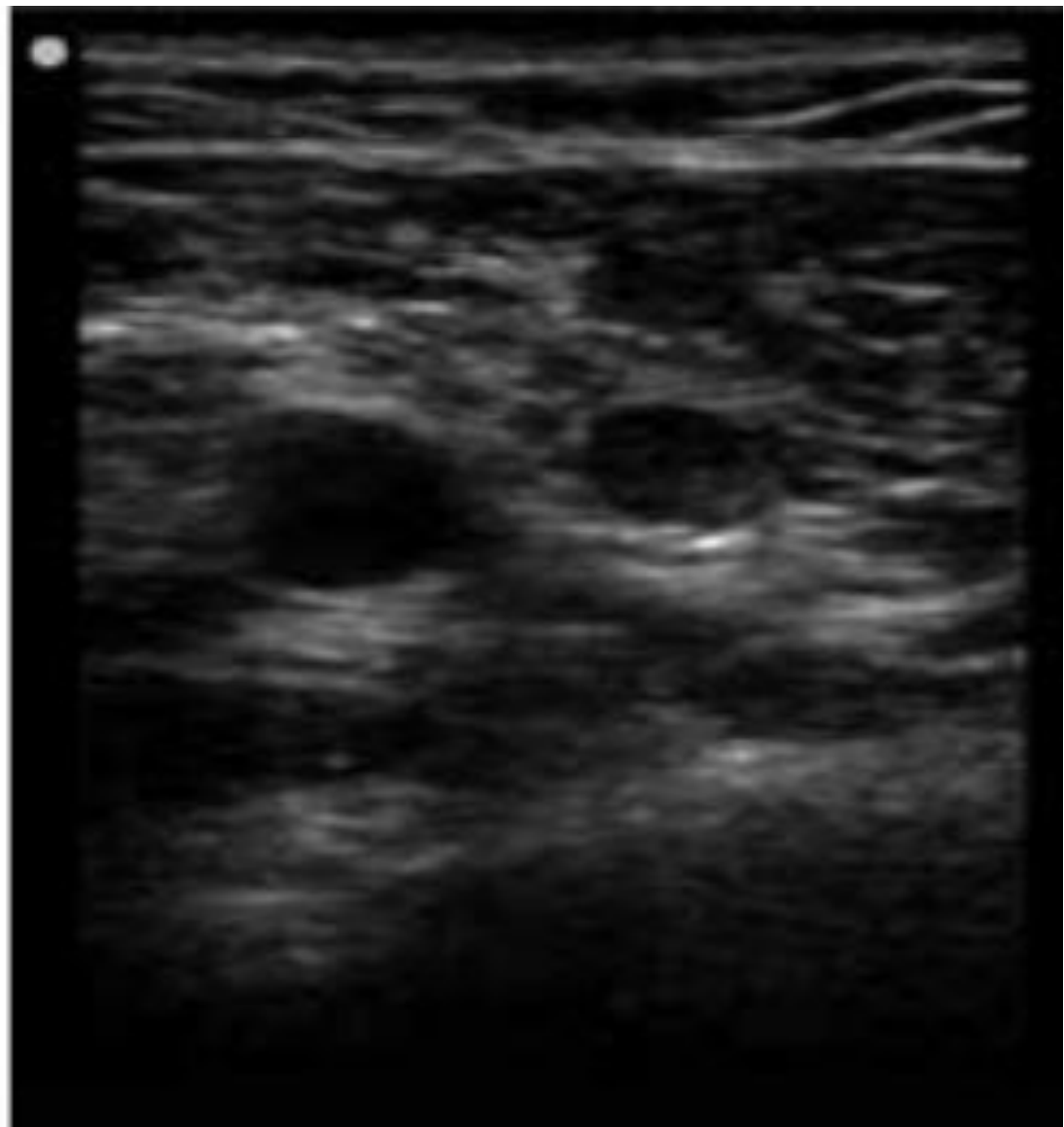
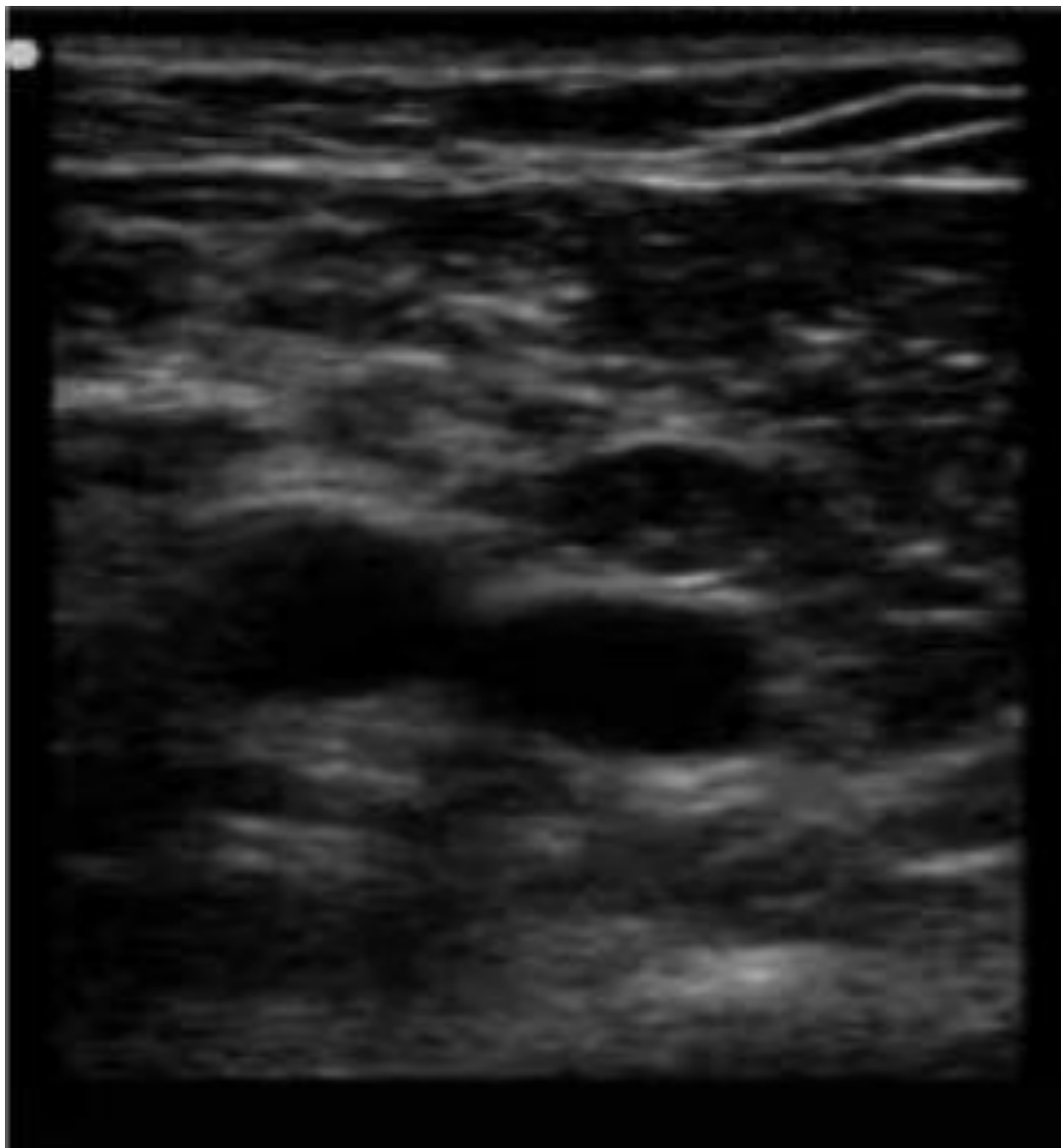
² Division of Cardiology, Virginia Commonwealth University, Richmond, Virginia, USA.

Table 3. Diagnostic Accuracy of FOCUS in Assessing Pericardial Effusion (n = 265)

Finding on FOCUS	Finding on Formal TTE		Sens, %	Spec, %	PPV, %	NPV, %	+LR	-LR
	Effusion Absent	Effusion Present						
Effusion absent	206	14	64.1	91.2	55.6	93.6	7.24	0.39
Effusion present	20	25	(47.2–78.3)	(86.5–94.4)	(40.1–70.0)	(89.3–96.3)	(4.48–11.70)	(0.26–0.60)

Values in parentheses are 95% confidence intervals. NPV indicates negative predictive value; PPV, positive predictive value; Sens, sensitivity; and Spec, specificity.

View	Probe Position	Ultrasound Anatomy	Clinical Applications
Parasternal long axis (PLAX)			LV systolic function E-point septal separation RV dilation Chamber dimensions Pericardial effusion
Parasternal short axis (PSAX)			LV systolic function RV dilation Septal kinetics Wall motion abnormalities Pericardial effusion
Apical 4 chamber (A4C)			LV systolic function Chamber dimensions RV function (TAPSE) Pericardial effusion Wall motion abnormalities MV/TV pathology Left atrial pressures



Sonuç

- USG resmin tamamı değil ama önemli bir parçası
- Amaç steteskop yerine ya da yanında USG probu
- Ben göremiyorum diye bir şey yok
olsa olsa ben yapmıyorum var!!!
- Unutma kim daha çok kullanırsa o daha iyi görüyor....

TEŞEKKÜRLER...

