Travma Hastalarında Yatakbaşı Ultrason

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EÜTF Acil Tıp Anabilim Dalı
ATOK Travma
Eylül 2013

Travma

- Çoklu travmalar
- Kritik hastalar
- Kafa Travmaları
- Göz yaralanmaları
- Kırıklar
- Tendon hasarları

FAST

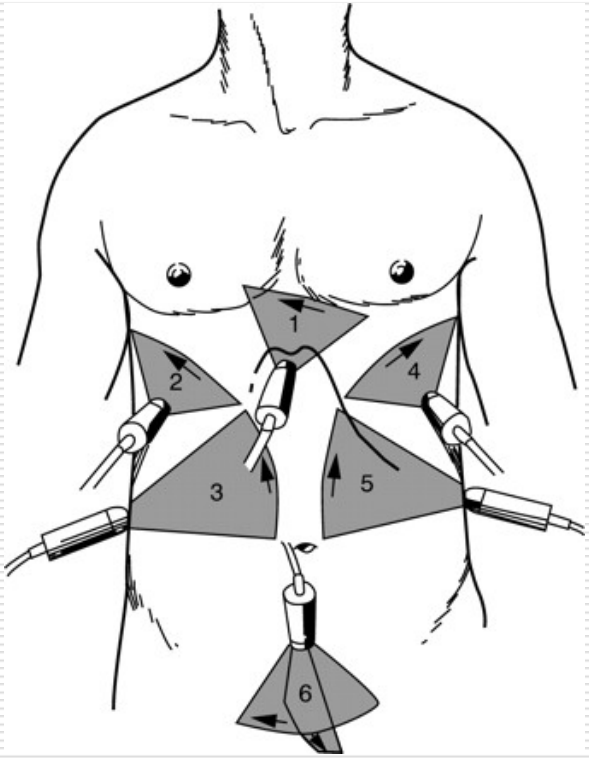
Focused **A**ssessment with **S**onography for **T**rauma

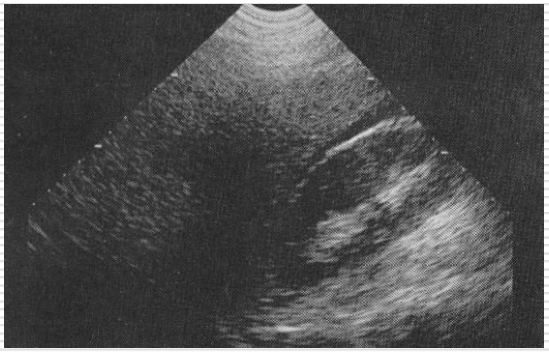
ODAKLANMIŞ TRAVMA ULTRASONU

- Kardiyak
- Morrison boşluğu (perihepatik)
- Sol üst kadran (perisplenik)
- Pelvik

AMAÇ

- Perikardiyal / plevral / peritoneal serbest





Odaklanmış Travma Ultrasonu

- Neden tercih edilir?
  - Hızlı uygulanır
  - İnvaziv değildir
  - Taşınabilir, hastanın alan değiştirmesi gerekmez
  - Gecikmeyi önler
  - Tekrarlanabilir
  - Radyasyon veya kontrast madde kullanımı yok

Table 7-2. COMPARISON OF ULTRASOUND, DIAGNOSTIC PERITONEAL LAVAGE, AND COMPUTED TOMOGRAPHY

COMPARISON CATEGORY	ULTRASOUND (US)	DIAGNOSTIC PERITONEAL LAVAGE (DPL)	COMPUTED TOMOGRAPI (CT)
Speed	2.5 min	20 min*	20†-60 min
Cost	Low‡	Low ($60)	High ($600)
Bedside test	+++	+++	–
Blunt trauma	+++	+++	+++
Penetrating trauma	++	++	+++
Unstable patient	+++	+	–
Identifies bleeding site	+/–	–	++
Nonoperative management	++	–	+++
Retroperitoneum/renal	++	–	+++
Pancreas	+/–	+	+++
Pelvic fracture	+/–	–	+++
Accuracy	94-97%	97.6%	92-98%

*Time for fluid in with beginning return of blood. Gross positive will be faster; lab counts will be much slower.
†Time includes transport time plus IV and oral contrast dosing. Shorter time is for spiral CT; longer for conventional scanners.
‡Unable to estimate cost because reflects fixed cost of machine and maintenance, plus fee for nonradiologist sonographer, which is inst determined.
+, good; ++ very good; +++, excellent.

Odaklanmış Travma Ultrasonu

- Neden tercih edilmez?
  - Kaynağı işaret etmez
  - Uygulayıcıya bağlı
  - Hastaya bağlı (obesite, yoğun intestinal gaz,...)
  - Retroperitoneal alan net değerlendirilemez
  - Çocuk hastalar
  - Başka nedenlerle serbest sıvı varlığı
    - Assit
    - Over kist rüptürü
    - Daha önce periton lavajı yapılmış olması

ENDİKASYONLAR

- Primer
  - Serbest sıvının tespiti
  - Perikardiyal, peritoneal, plevral

- Genişletilmiş(extended)
  - Pnömotoraks
  - Solid organ yaralanmaları
  - Afette triyaj

ENDİKASYONLAR

- Künt karın yaralanması
  - Abdominal ağrı (+/- peritoneal bulgu)
  - Eksternal karın duvarı bulguları
- Künt toraks yaralanması
  - Göğüs ağrısı
  - Göğüs duvarı bulguları
- Penetran yaralanmalarda ve yaşamsal girişimlerde
  - Perikardiyosentez, torakostomi…

ENDİKASYONLAR

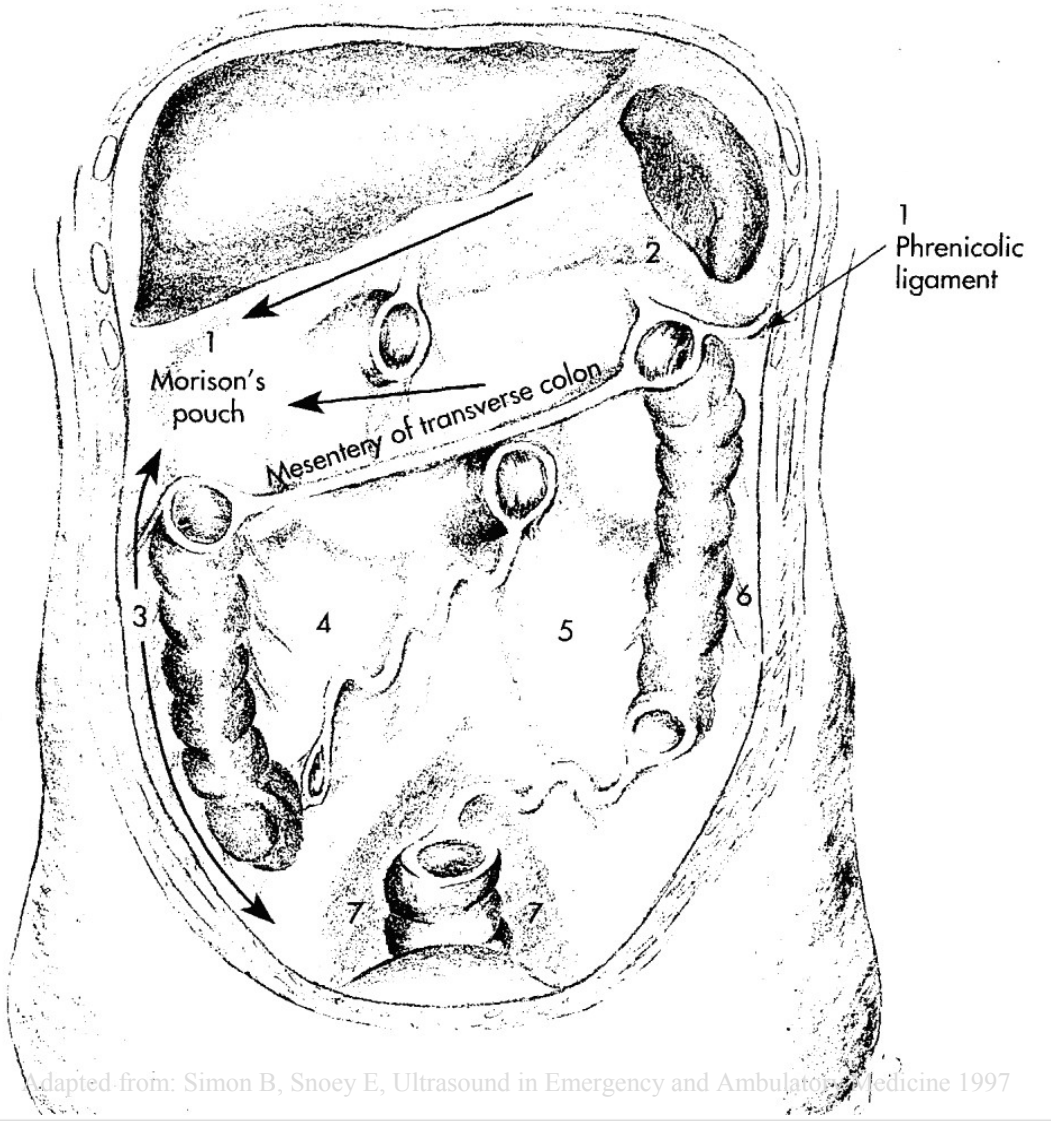
- Travmaya eşlik eden
  - Bilinç durumunda değişiklik
  - İlaç veya alkol alımı
  - Paralizi
  - Hemorajik şok
- Gebede travma ve fetüs değerlendirmesi
- Fraktürler:
  - Pelvik - Lumbal / torasik vertebra
  - Alt kotlar

KONTRENDİKASYON

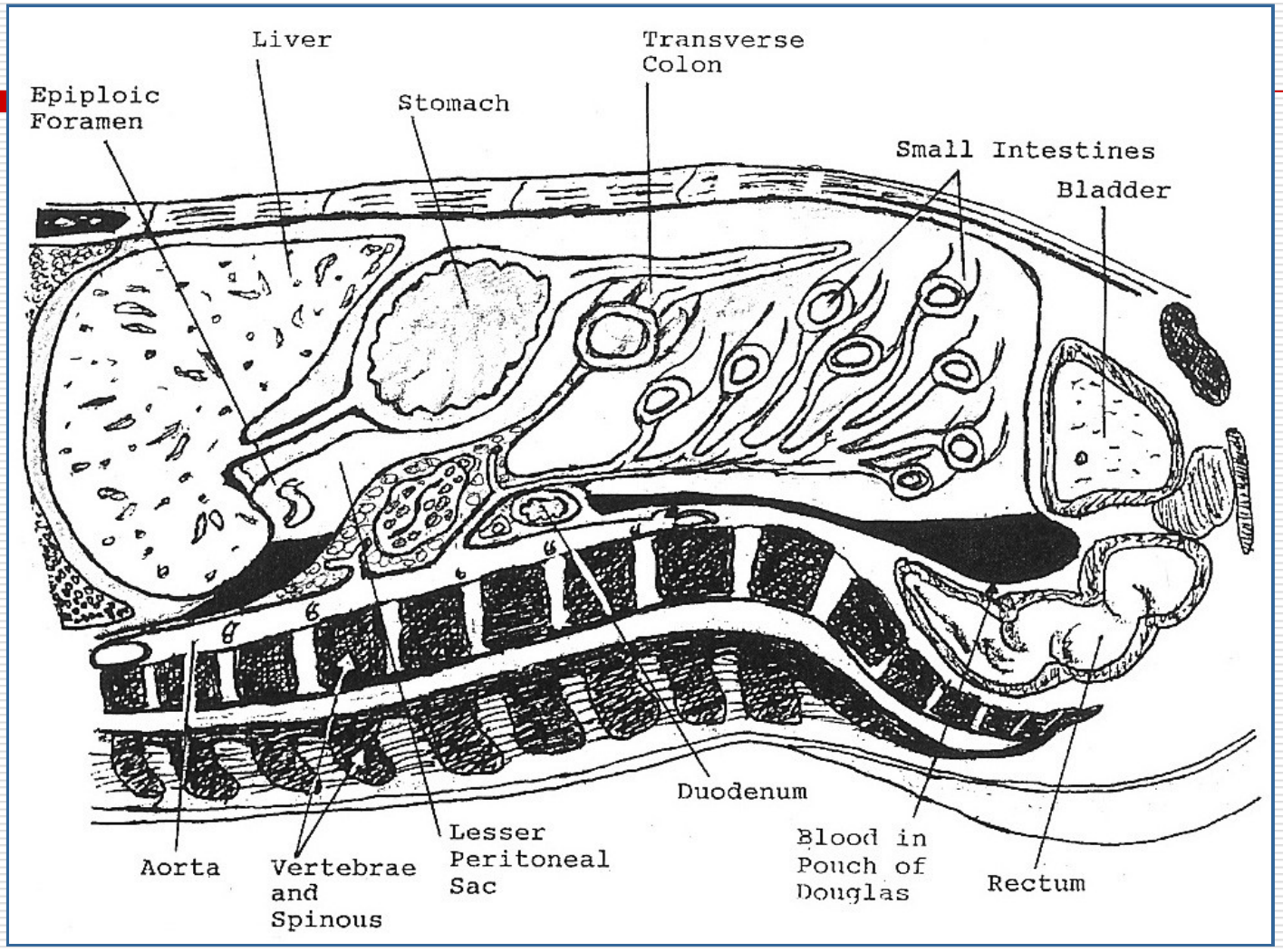
Acil cerrahi girişim

SERBEST SIVININ LOKALİZASYONU

1. Morison's pouch
2. Lienorenal
3. Rt. Paracolic
4. Rt. Inframesocolic
5. Lt. Inframesocolic
6. Lt. Paracolic
7. Pelvic cul-de-sac (pouch of Douglas)



Adapted from: Simon B, Snoey E, Ultrasound in Emergency and Ambulatory Medicine 1997

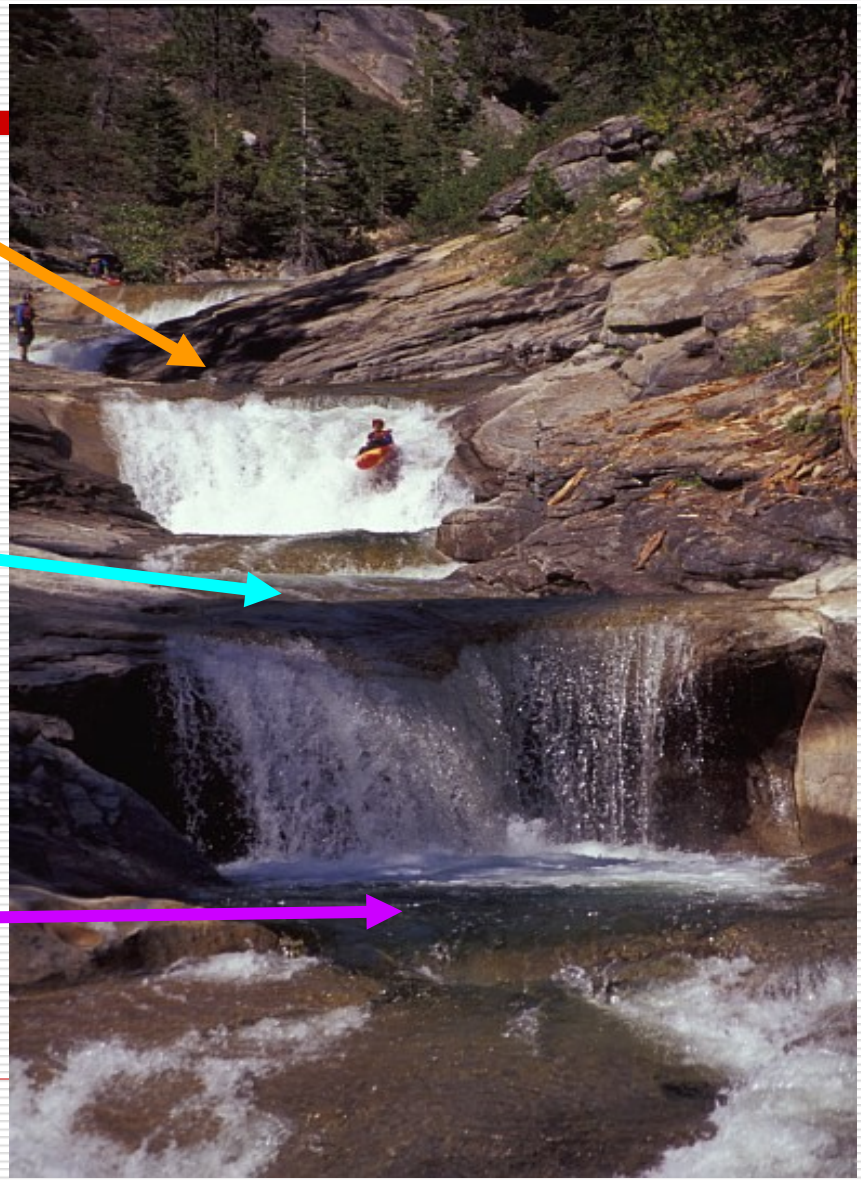

Liver
Transverse Colon
Epiploic Foramen
Stomach
Small Intestines
Bladder
Duodenum
Aorta
Vertebrae and Spinous
Lesser Peritoneal Sac
Blood in Pouch of Douglas
Rectum

SONUÇ

Perisplenik alan

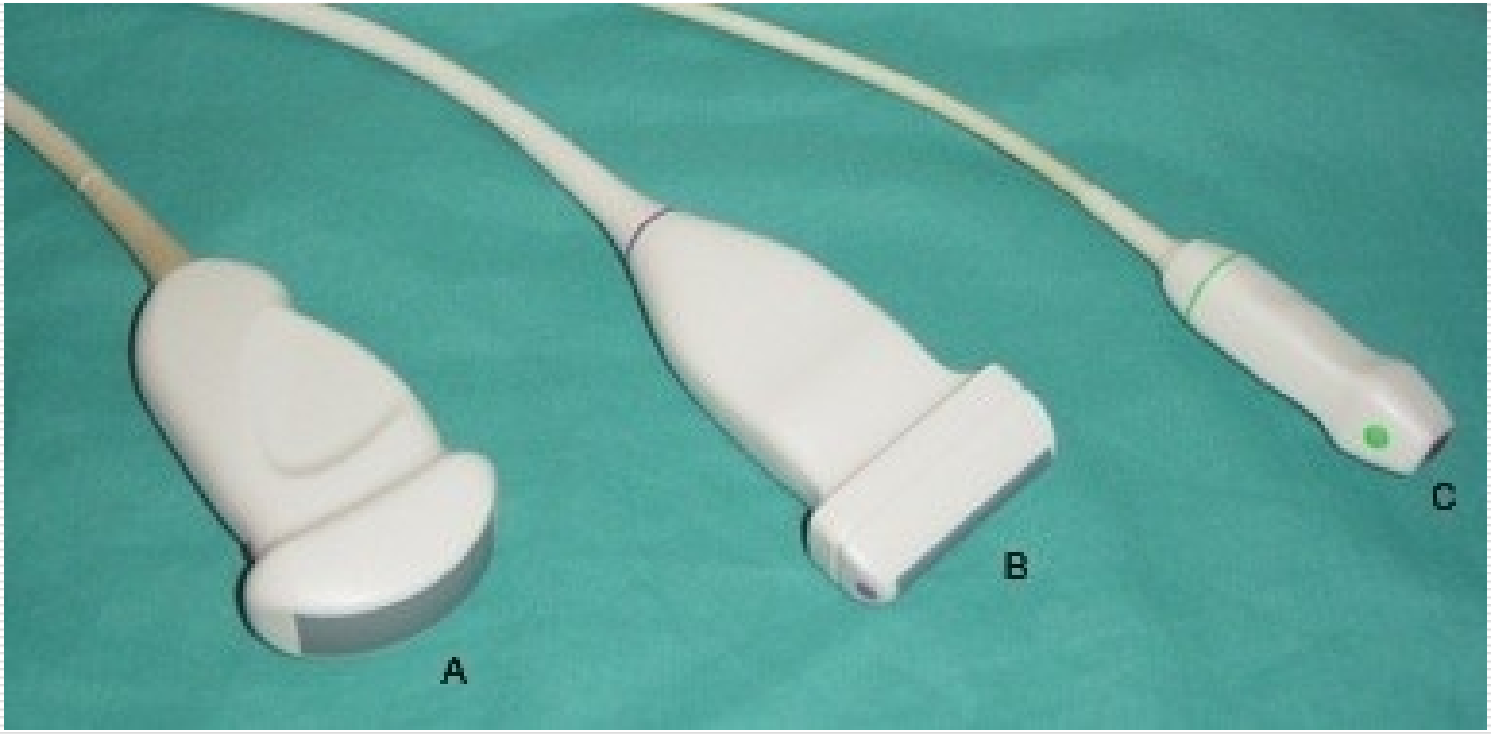
Morrison Poşu

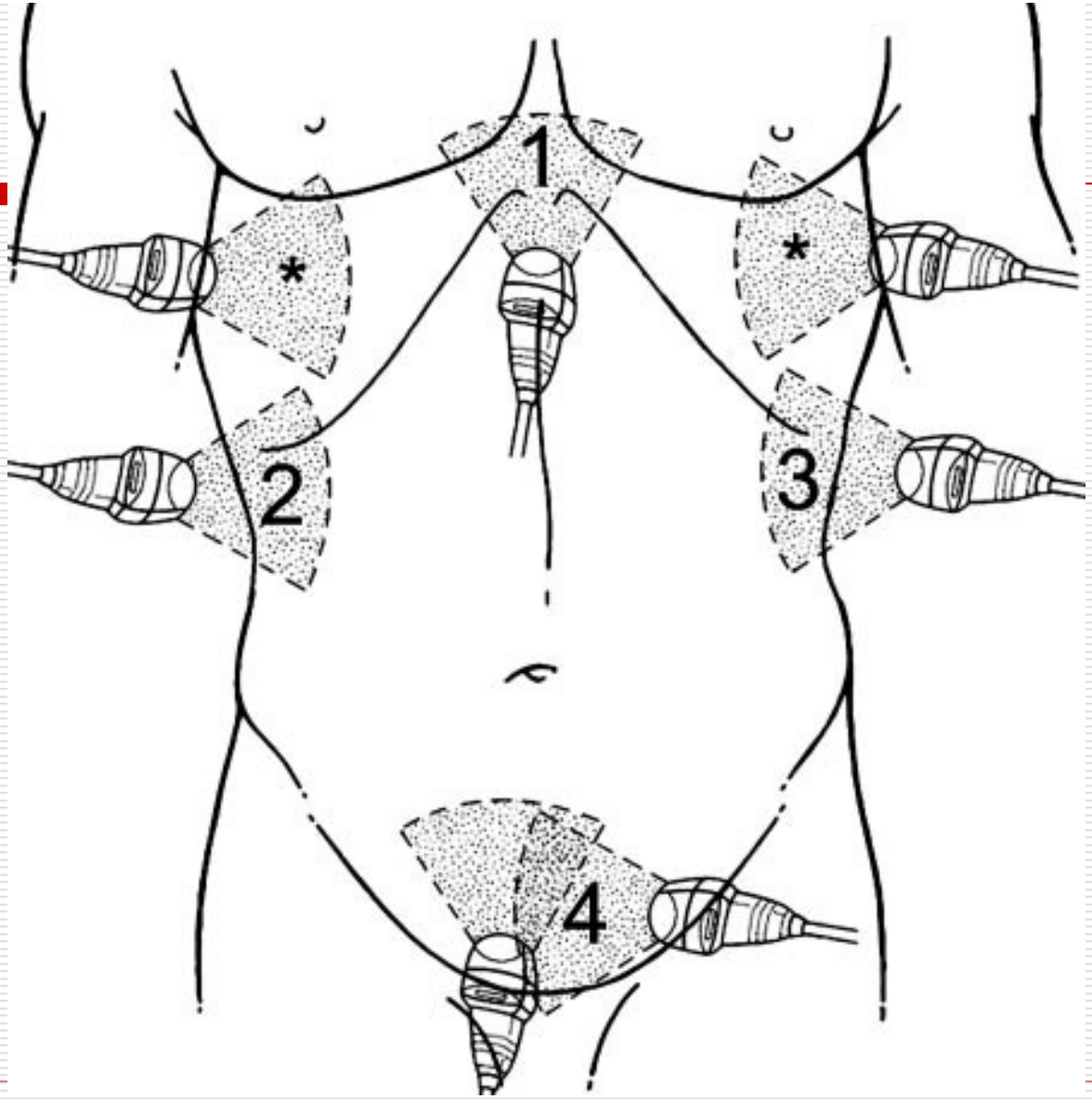
Douglas Poşu



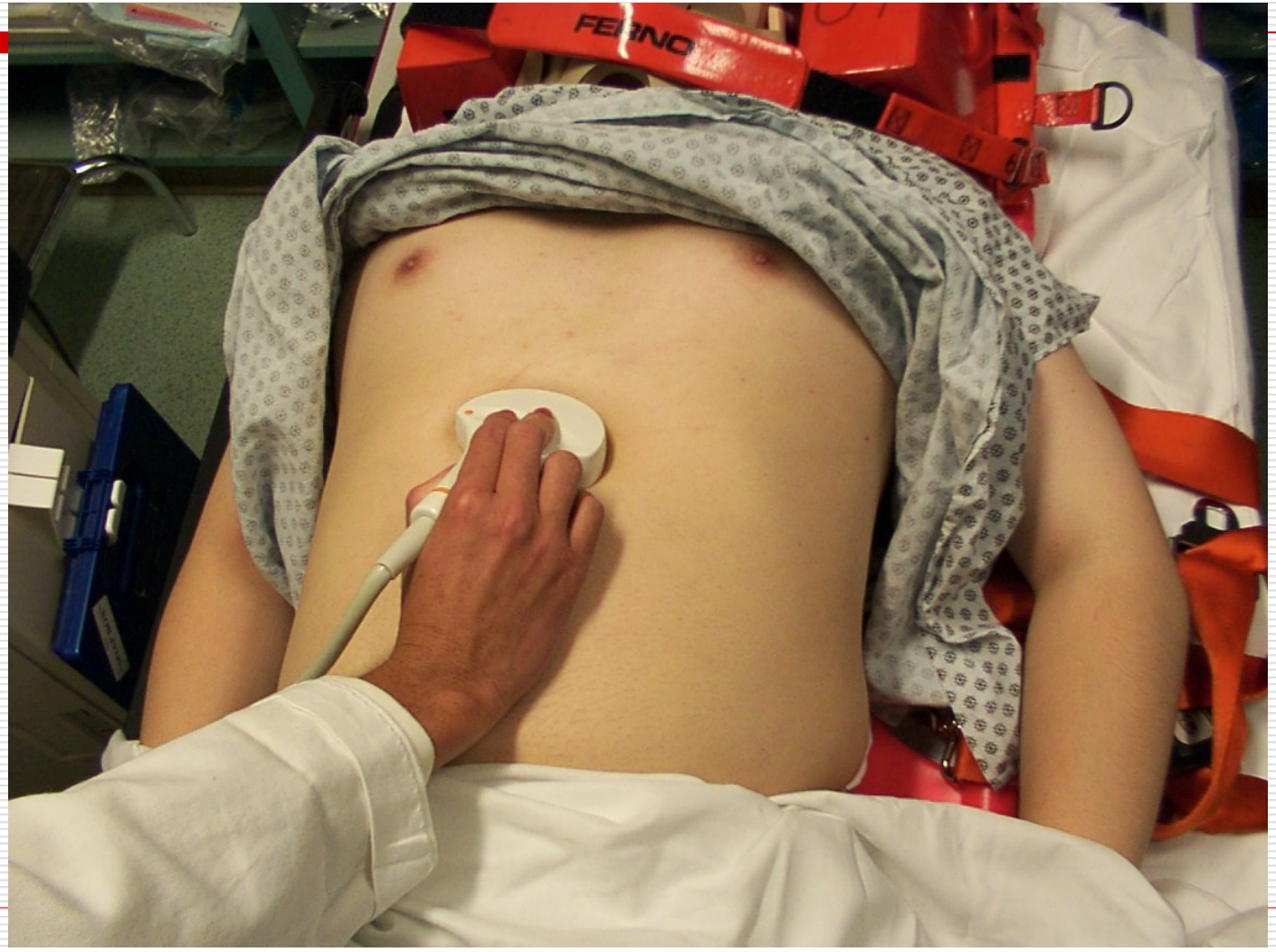
TEKNİK

TEKNİK

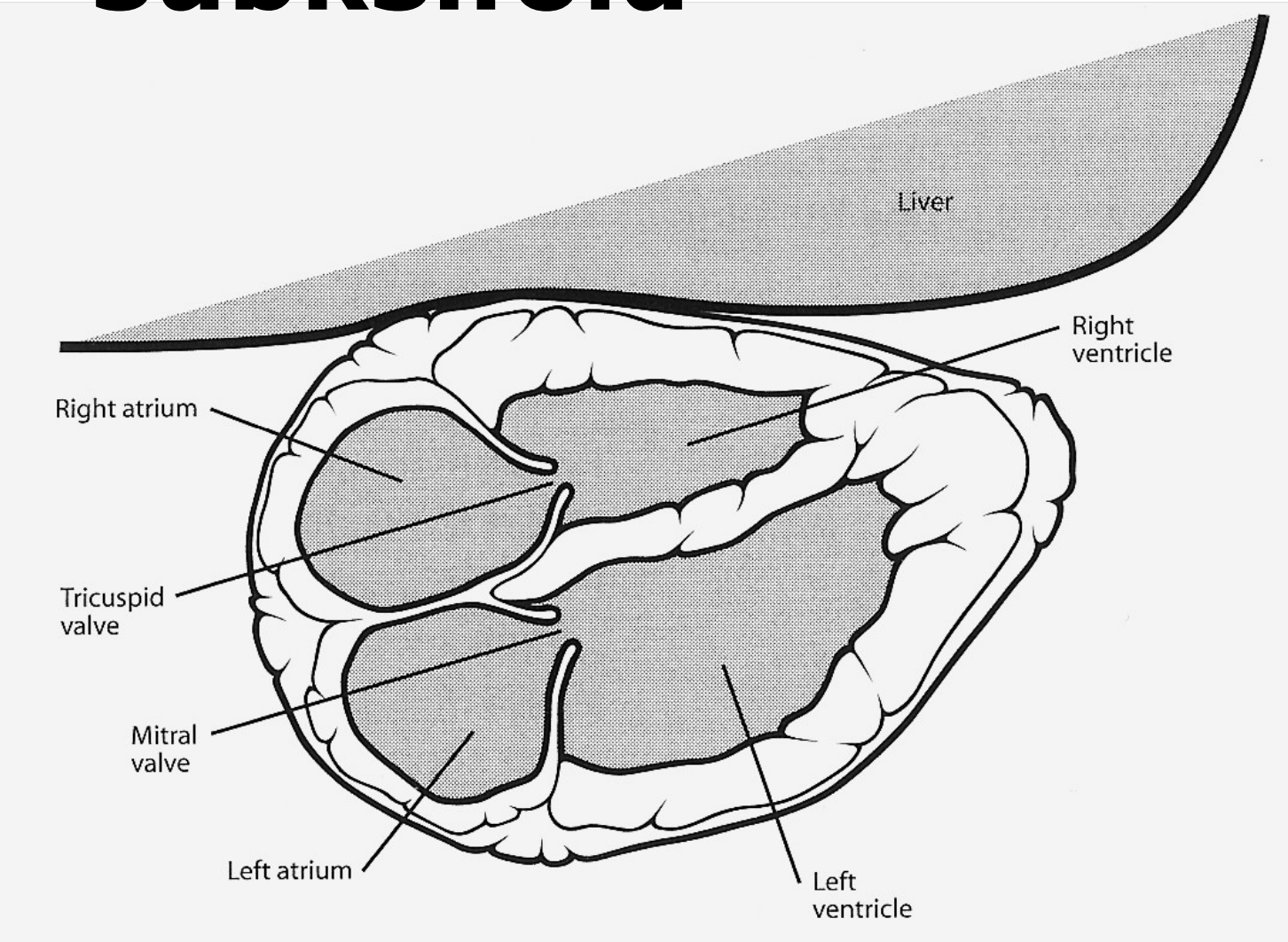



1
*
*
2
3
4

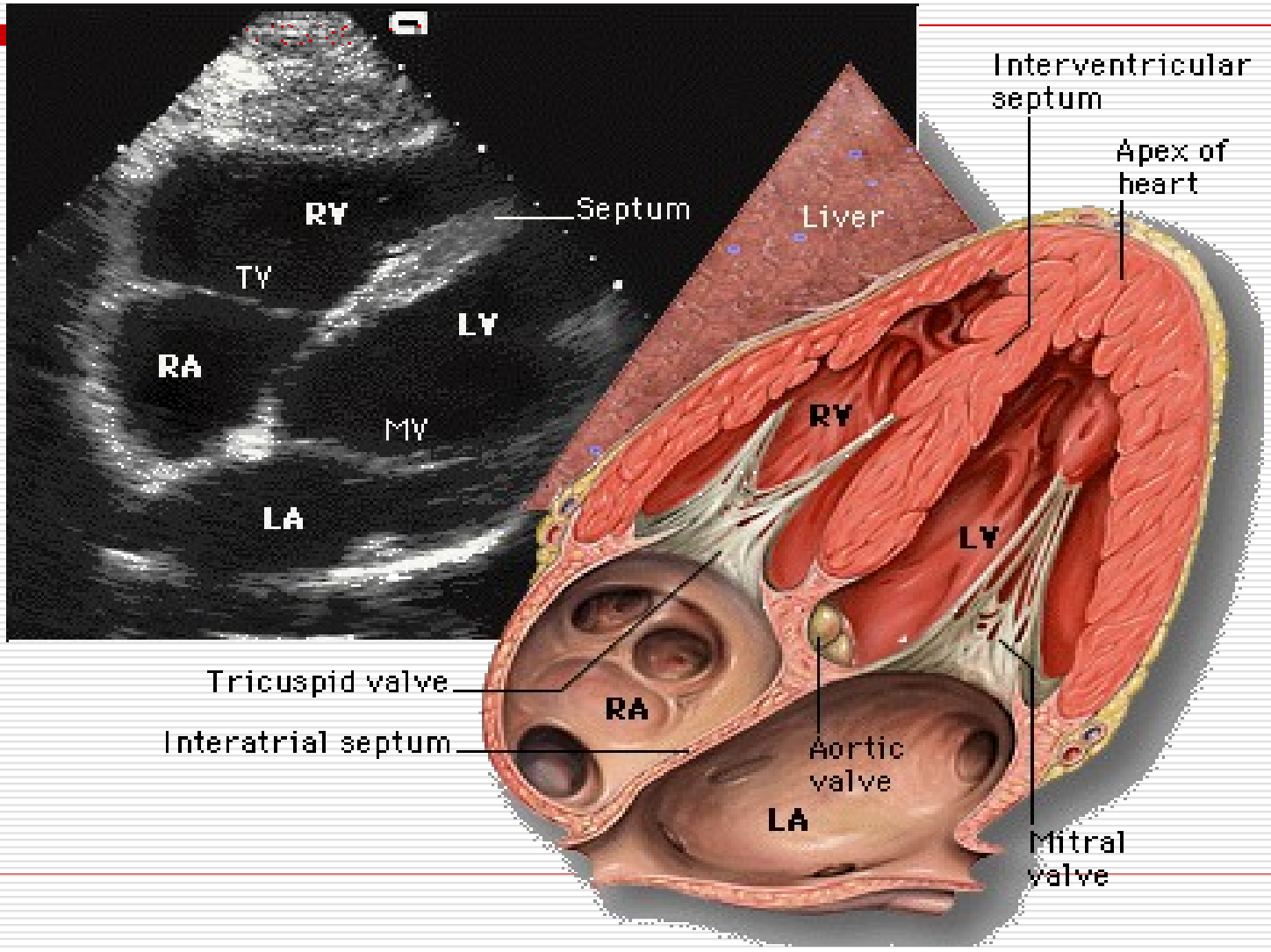
KARDİYAK - subksifoid



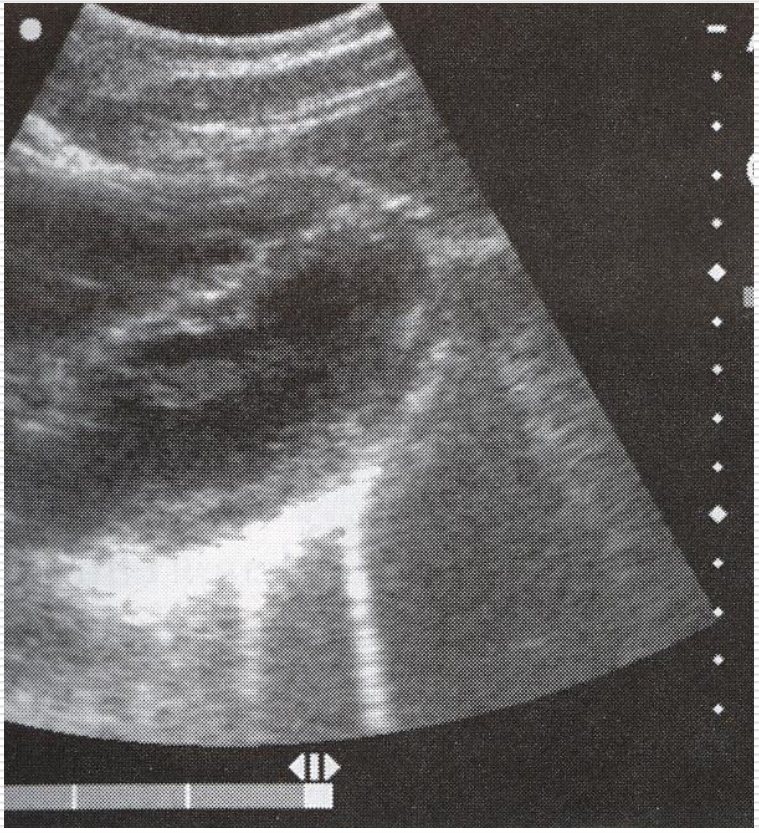
KARDİYAK - subksifoid

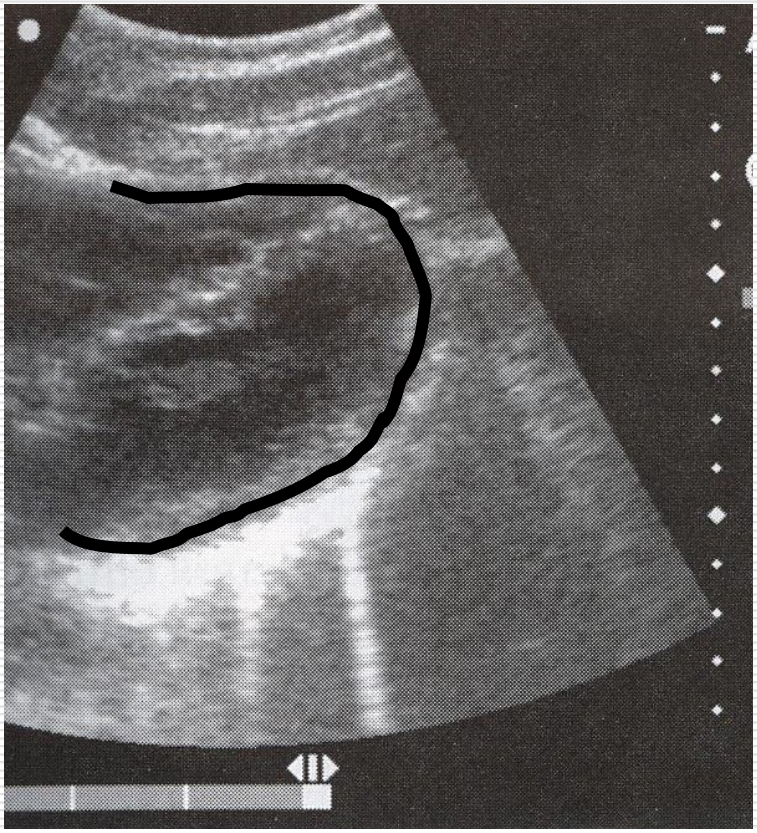


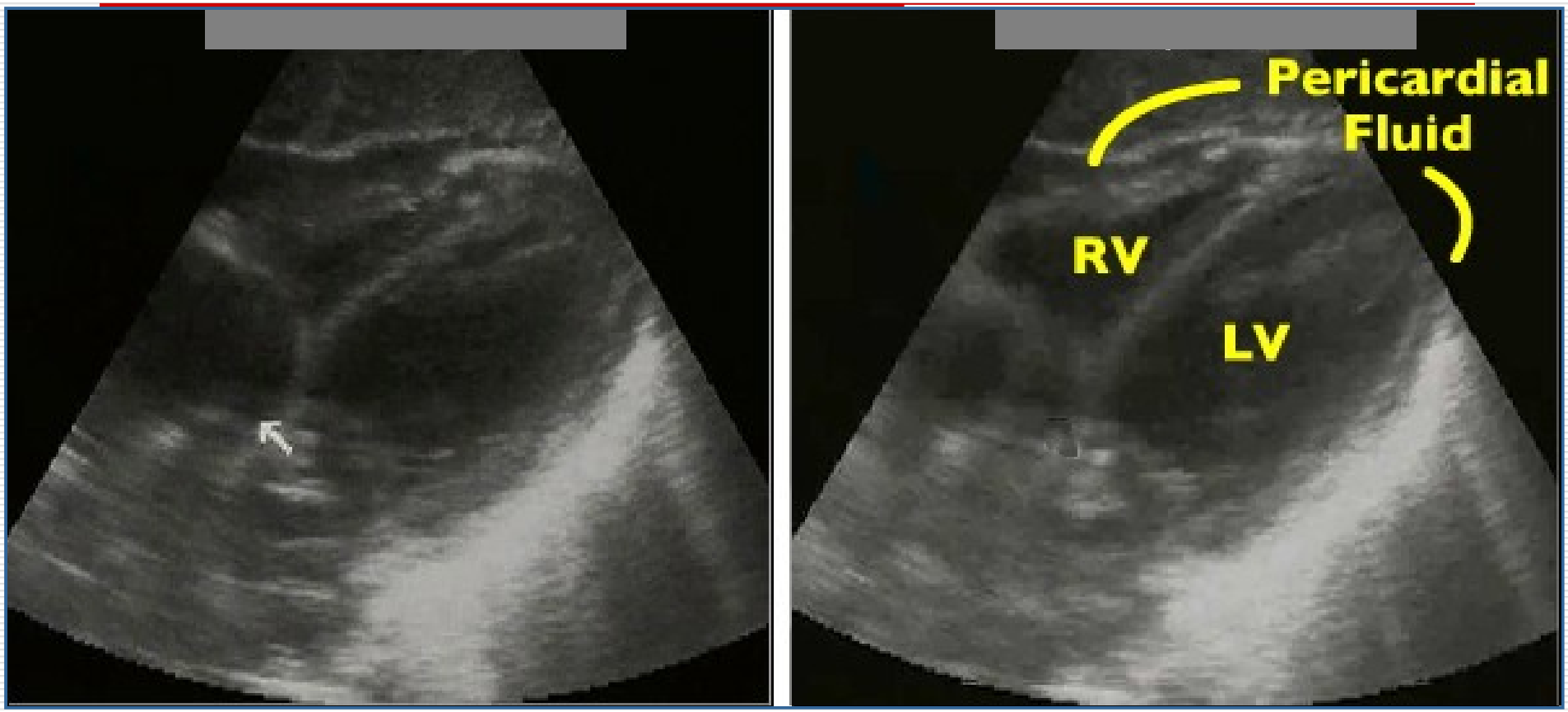
Subksifoid Görüntü



Subksifoid Görüntü

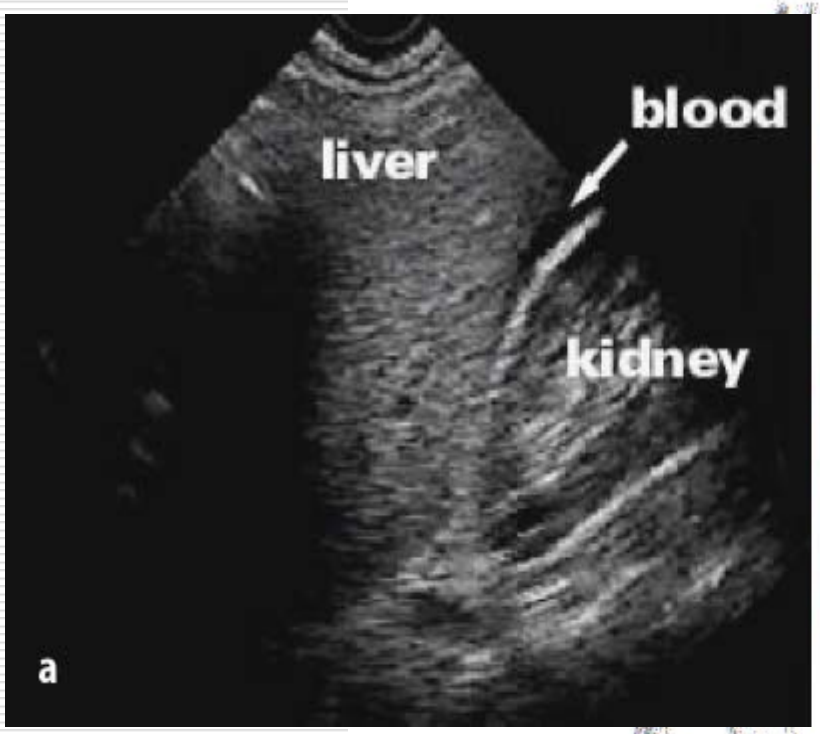


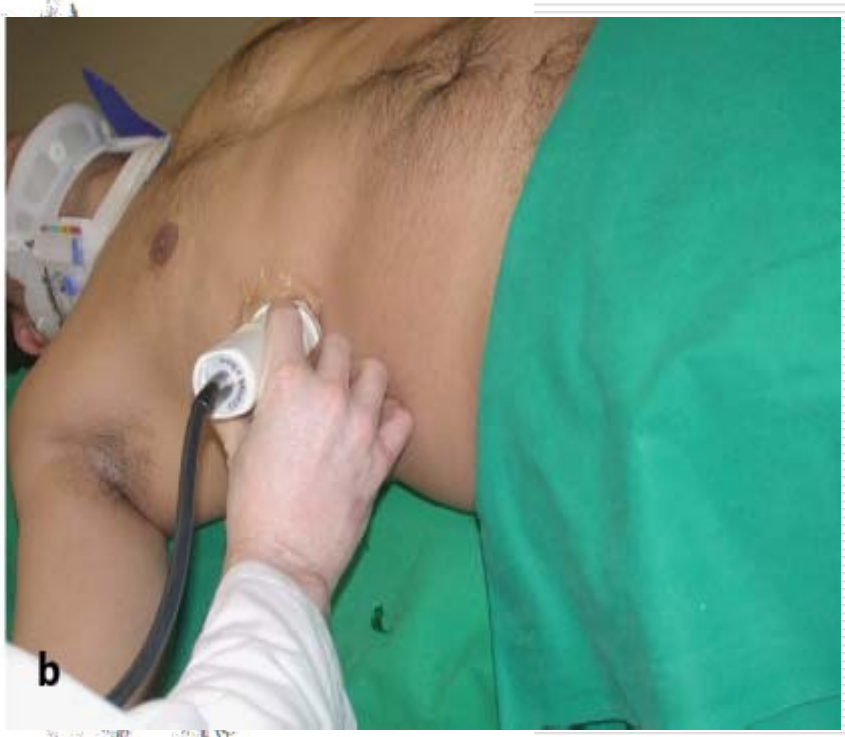



Pericardial
Fluid
RV
LV

PERİKARDİYAL EFÜZYON

SAĞ ÜST KADRAN – perihepatik MORRİSON





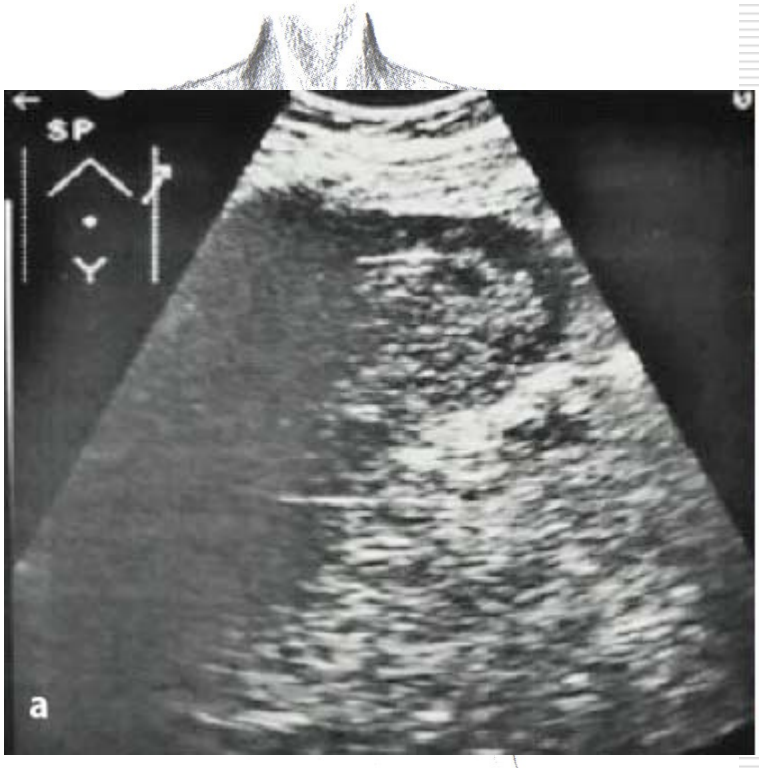

HCMC ED
ID[: Y]
[:]
01.08,'00
02:30:12
2CV 3.5M
V#17 DVA: 100%
R19
G73
C03
1:ABDOMEN


HCMC ED
ID[: Y]
[:]
12.07,'99
11:33:10
2CV 3.5M
50/51 DVA: 100%
23Hz
R19
G55
C03
1:ABDOMEN

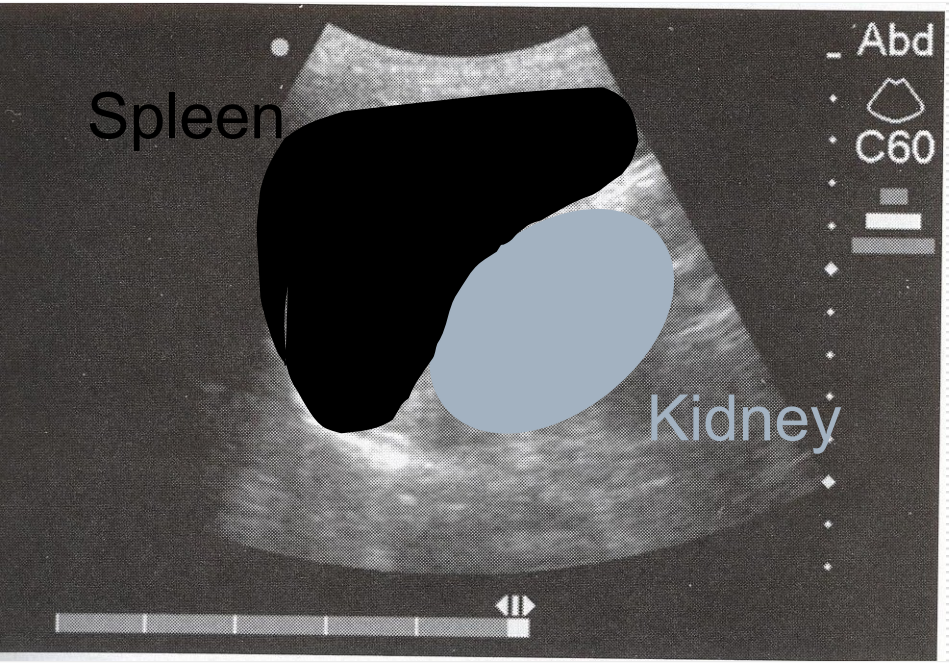

HCMC ED
ID[: Y]
[:]
01.17,'00
00:02:45
2CV 3.5M
V#21 DVA: 100%
R19
G76
C03
1:ABDOMEN

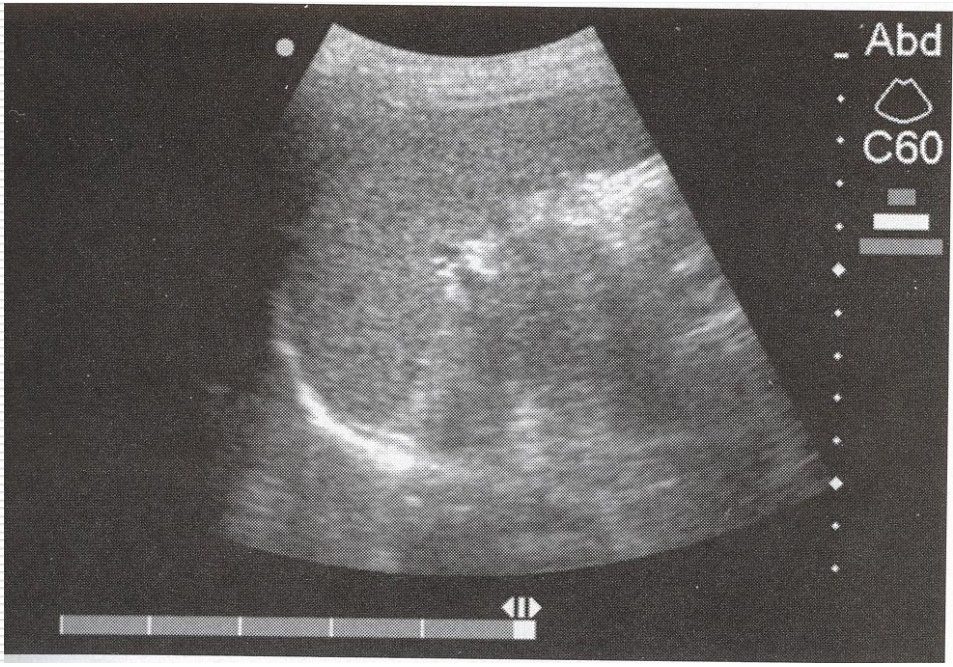

HCMC ED
ID[: Y]
[:]
12.23,'99
14:19:44
2CV 3.5M
50/51 DVA: 100%
23Hz
R19
G76
C03
1:ABDOMEN

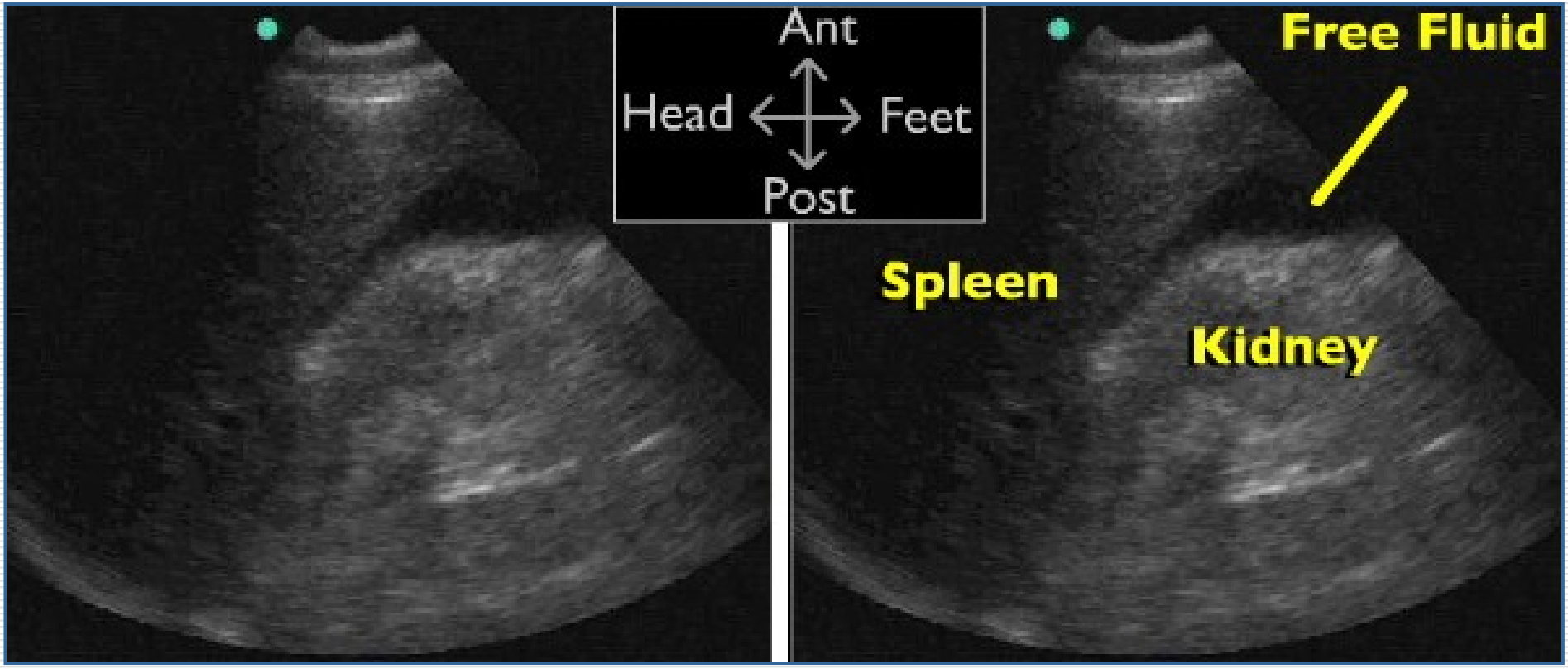
SOL ÜST KADRAN - Perisplenik



PERİSPLENİK

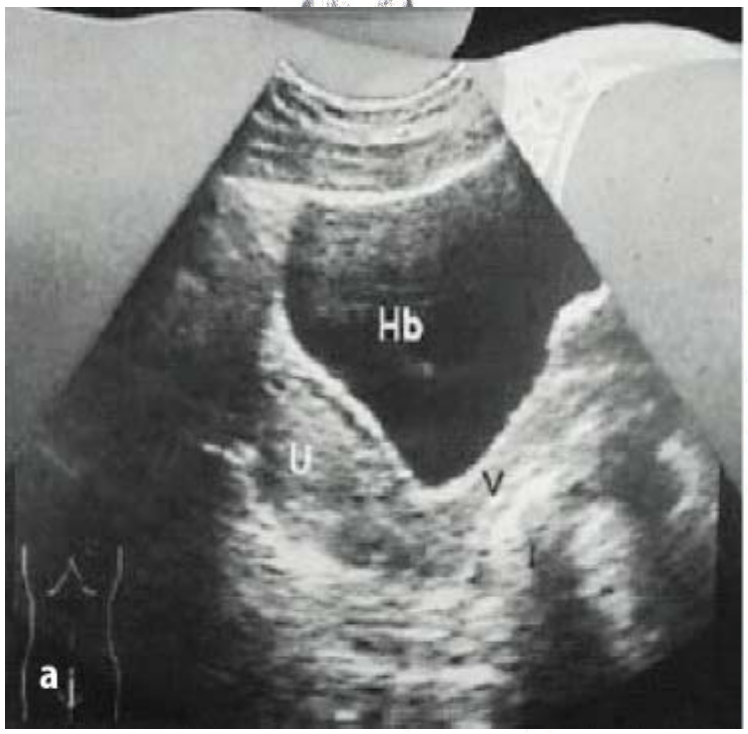


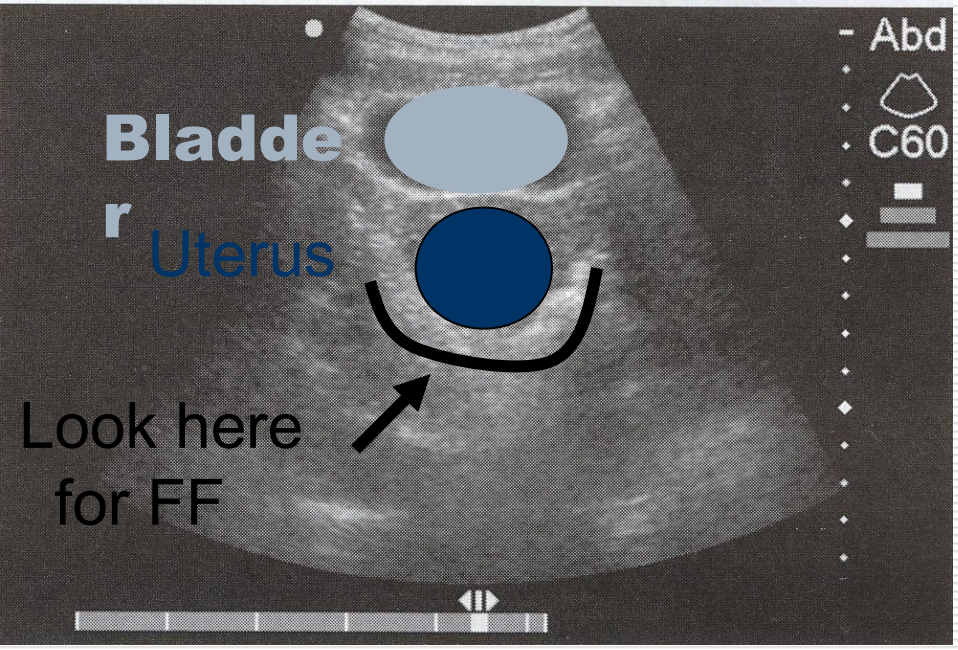


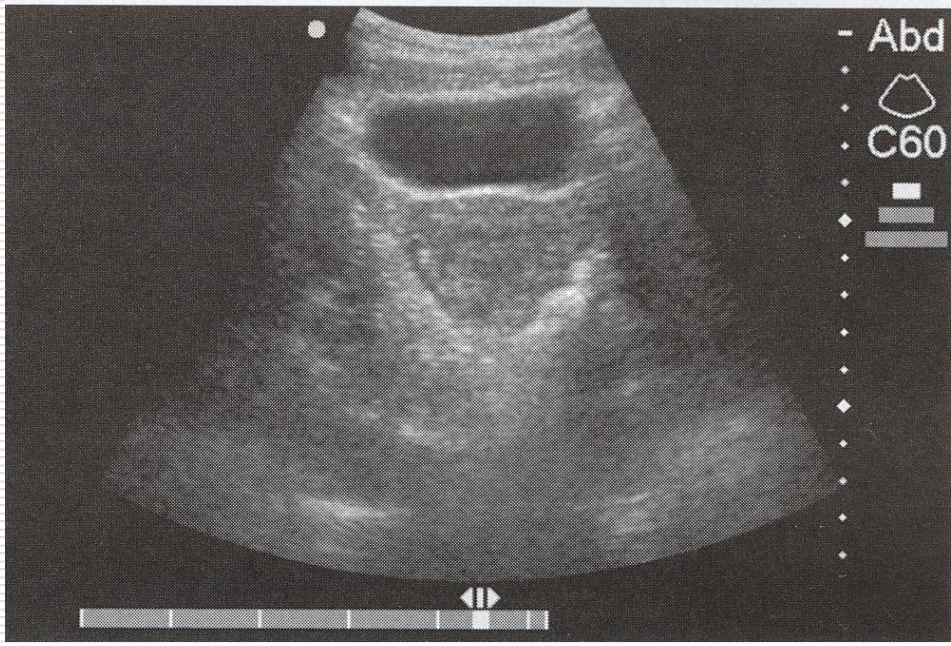

Ant
Head
Feet
Post
Free Fluid
Spleen
Kidney


HCMC ED
ID[: Y]
[:]
01.16,'00
23:47:21
2CV 3.5M
V#16 DVA: 100%
R19
G76
C03
1:ABDOMEN

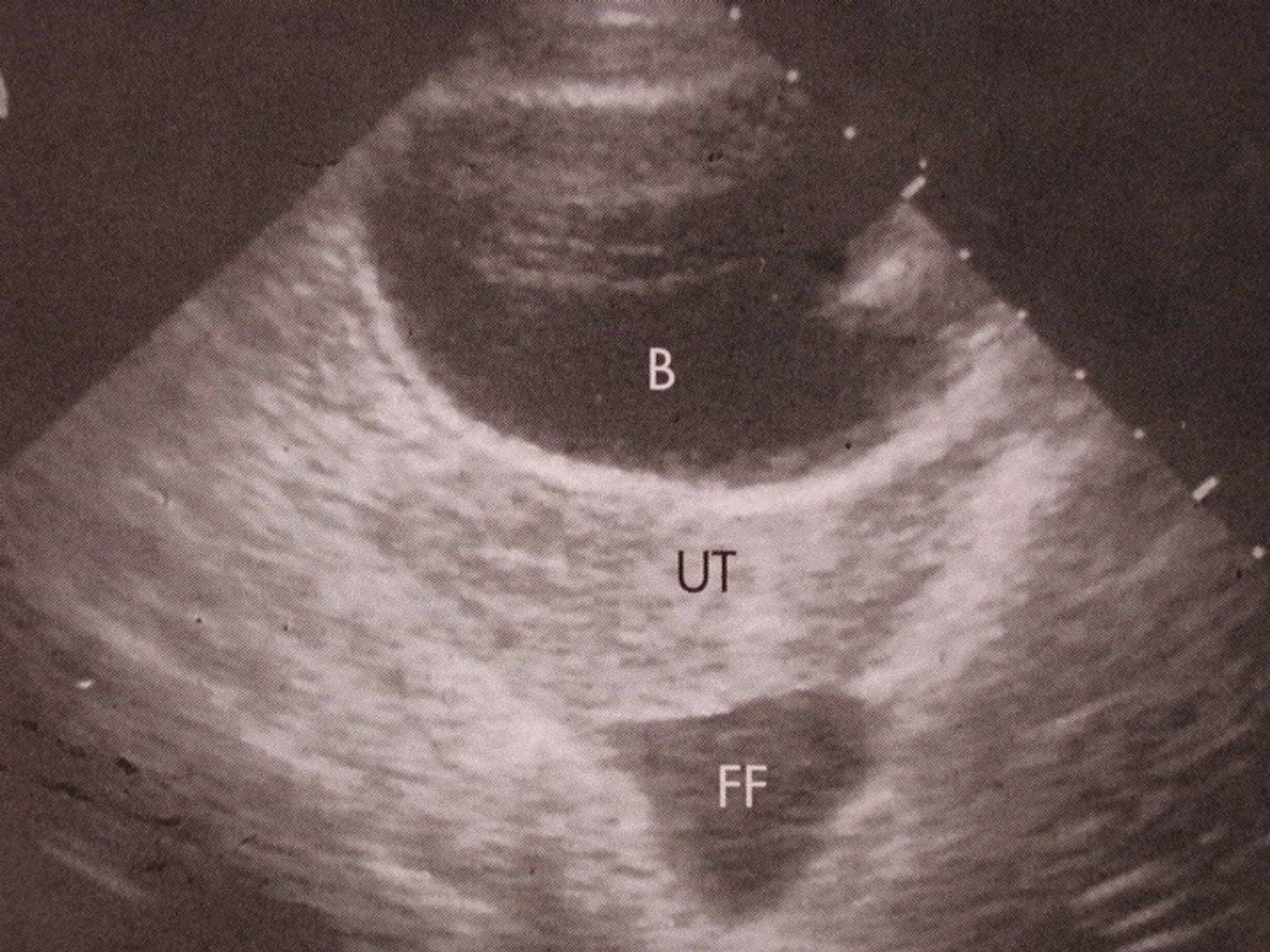
PELVİK - suprapubik

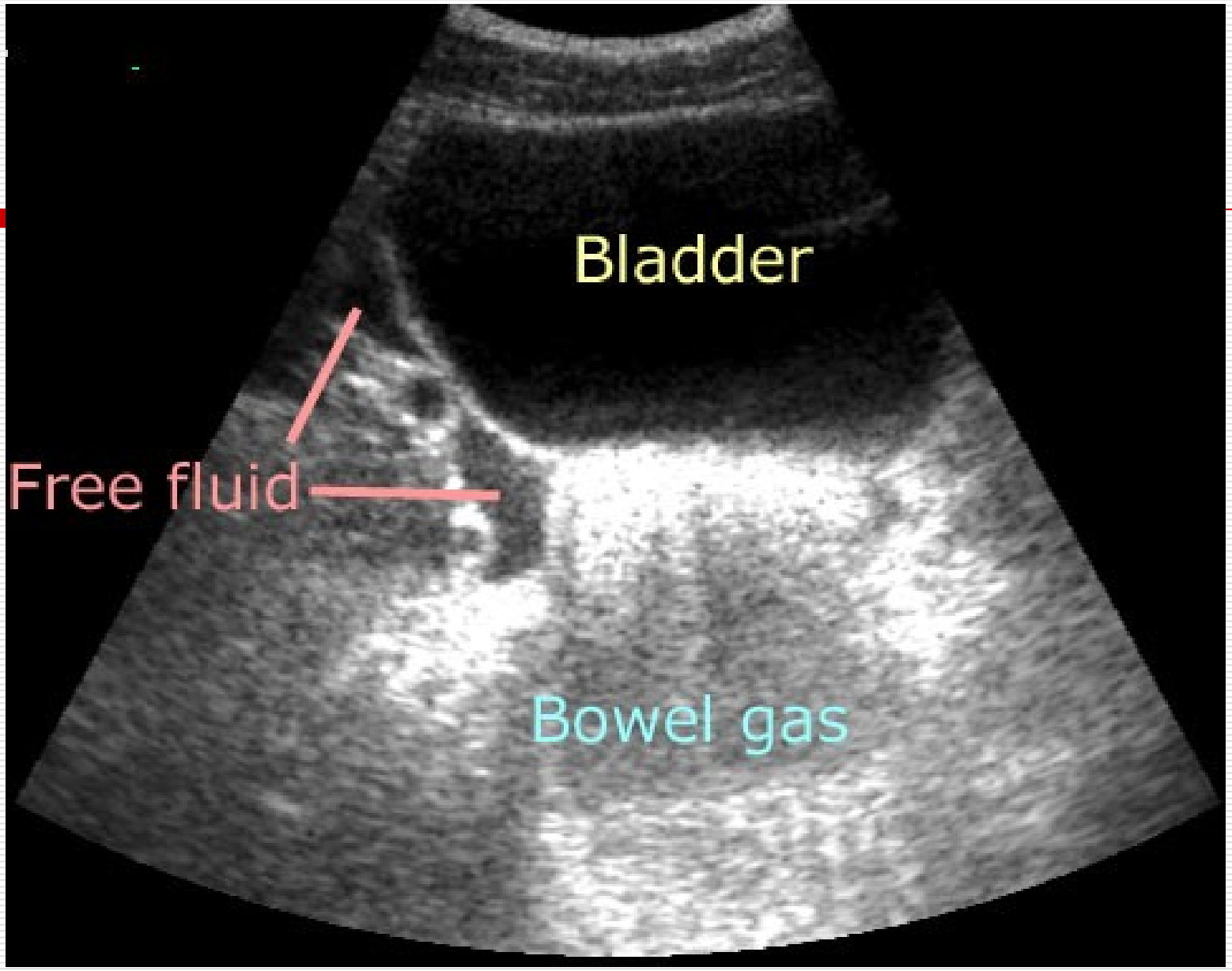






Transvers Görüntü


B
UT
FF


Bladder
Free fluid
Bowel gas


HCMC ED
ID[: Y]
[:]
02.23,'01
05:47:16
2CV 3.5M
V#05 DVA: 100%
R15
G55
C04
3:CARDIAC

TRAVMA HASTASINDA PNÖMOTORAKS VAR MI?

Emergency Bedside Ultras to Detect Pneumothorax

To the Editor:—The recent review article on the application of bedside ultrasonongraphy to the diagnosis of pneumothorax presented by Chan was both interesting and informative. It was an accurate description of most of the techniques and sonographic features useful for the detection of a pneumothorax,[1] but neglected to mention a newer tool with tremendous potential. The "power slide" sign, as it has been termed, utilizes the same principle for pneumothorax identification
color Doppler
Power color
motion detecti
standard color
able to more

Surgeon-Performed Ultras
Pneumothorax in the Trau

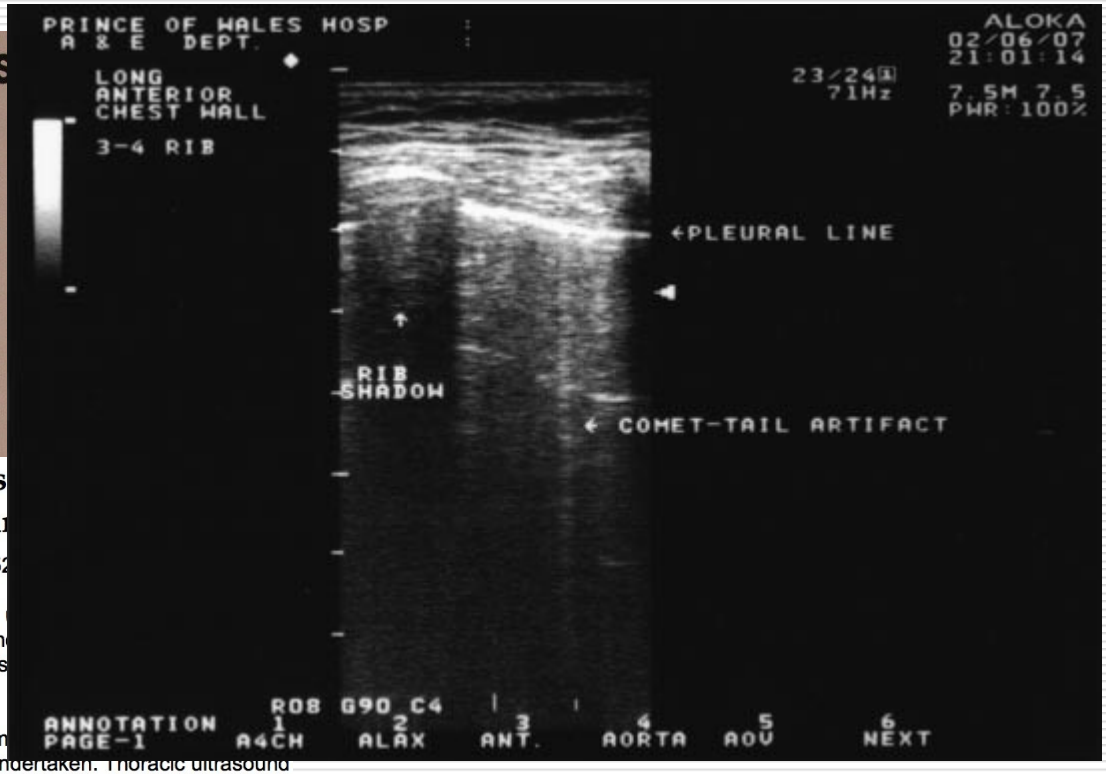
Journal of Trauma-Injury Infection & Critical Care. 56(3):52

Background: Surgeon-performed ultrasound has become
Initial reports suggest that sonography may be used for th
The purpose of this study was to evaluate the efficacy of s
presence of a pneumothorax in the trauma population.

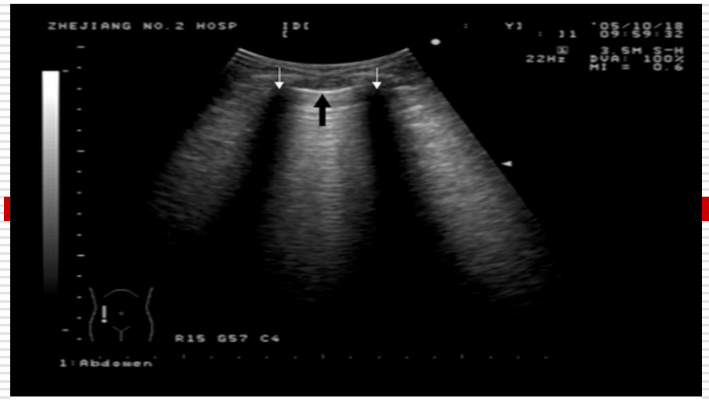
Methods: A prospective analysis of 328 consecutive traum
College of Surgeons-verified Level I trauma center was undertaken. Thoracic ultrasound was performed before chest radiography. The presence or absence of a "sliding-lung" sign or "comet-tail" artifact was recorded.

Results: Of 328 evaluations, there were 312 true-negatives, 12 true-positives, 1 false-negative, 1 false-positive, and 2 exclusions. Specificity, negative predictive value, and accuracy were 99.7%, 99.7%, and 99.4%, respectively.

Conclusion: Ultrasound is a reliable modality for the diagnosis of pneumothorax in the injured patient. This modality may serve as an adjunct or precursor to routine chest radiography in the evaluation of injured patients.

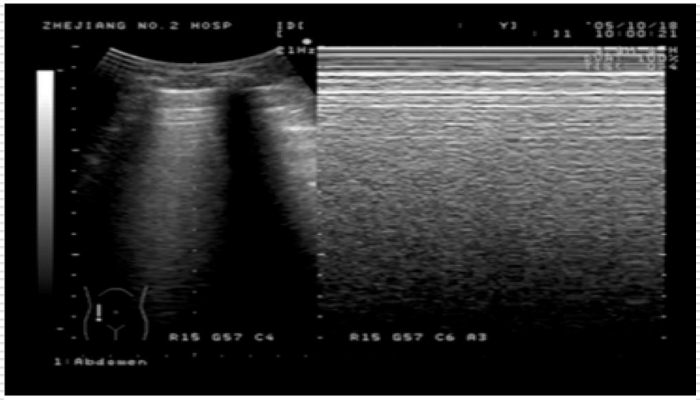


(a)



Siyah ok; plevral çizgi,
beyaz oklar; kot gölgeleri

(b)

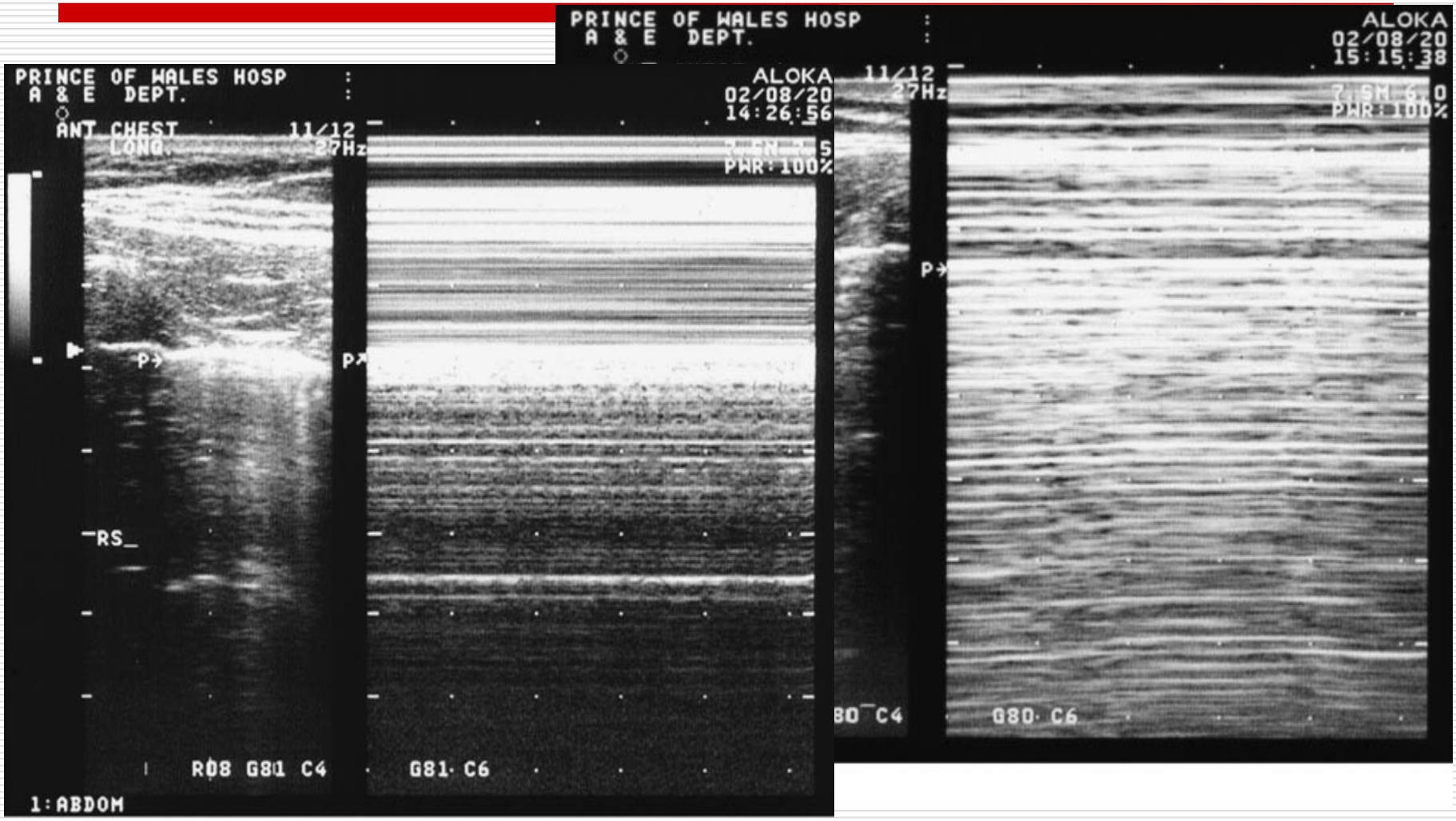


Sağdaki görüntü M-mode'da deniz kıyısı bulgusu

(c)

Siyah ok;plevral çizgi,
beyaz oklar;kuyrukluyıldız bulgusu

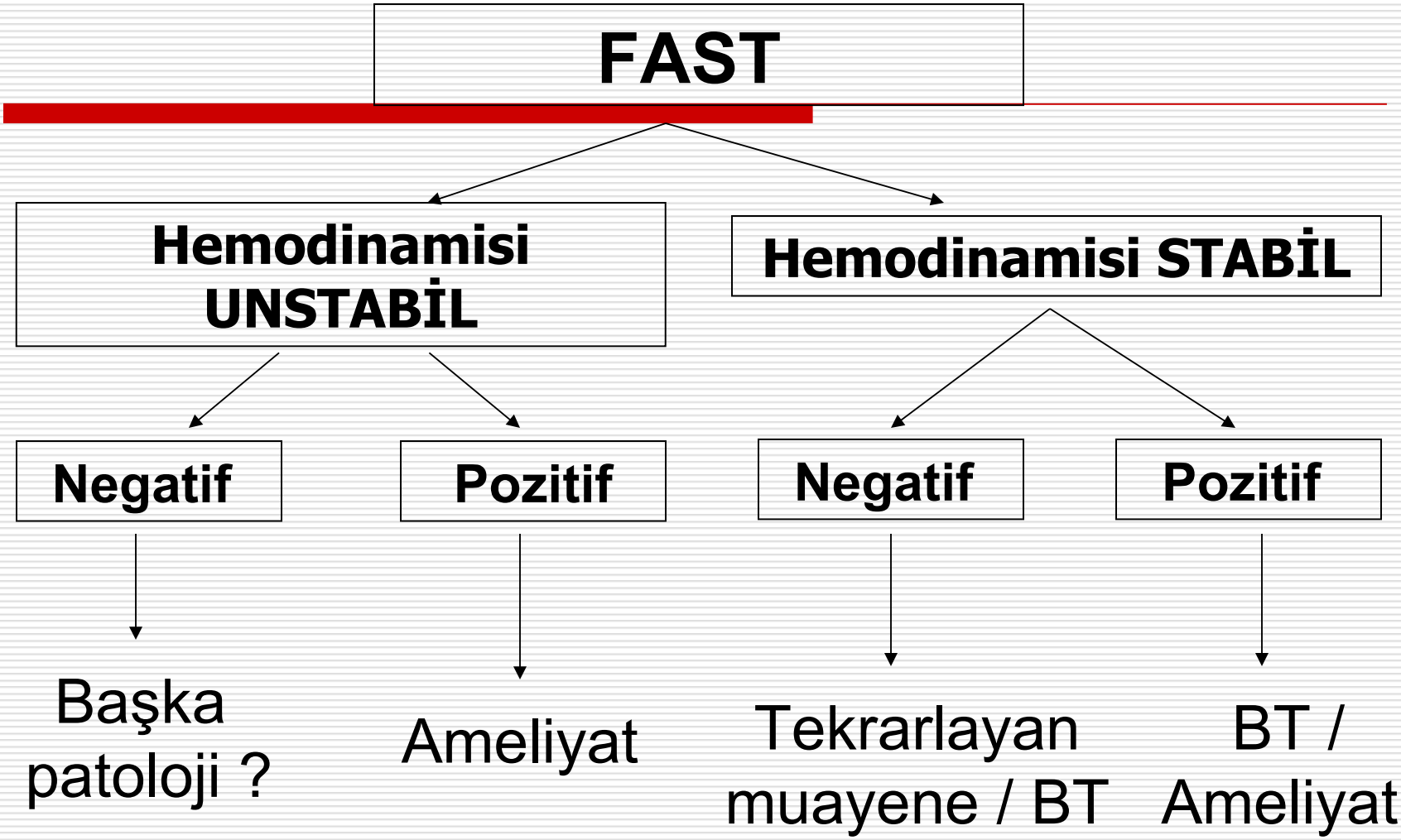
PNÖMOTORAKS



A

PEDİATRİK FAST

- Yeterince sensitive değil
  - Çeşitli çalışmalarda 30-80%
- Solid organ yaralanmalı çocukların 31-37% hemoperitoneum saptanmamış
- Spesifite 95-100%
  - If it's positive, it's positive
- CT ön planda


FAST
Hemodinamisi UNSTABİL
Hemodinamisi STABİL
Negatif
Pozitif
Negatif
Pozitif
Başka patoloji ?
Ameliyat
Tekrarlayan muayene / BT
BT / Ameliyat

LİTERATÜR

- *Abrams, et al*
  - **Trendelenburg ... 400 cc**
  - **Supin ... 700 cc**

- *Jehle VKD, et al: Sensitivity in detecting free intraperitoneal fluid with the pelvic views of the FAST exam. Am J Emerg Med. :*
  - **Pelvik görüntü (dolu mesane)…100 cc**

142‡ A PROSPECTIVE TRIAL OF SERIAL ULTRASOUND EXAMINATIONS IN THE EVALUATION OF BLUNT ABDOMINAL TRAUMA

John S. Rose, **Aaron Bair, John P. McGahan, David H. Wisner,** University of California, Davis, Medical Center, Sacramento.

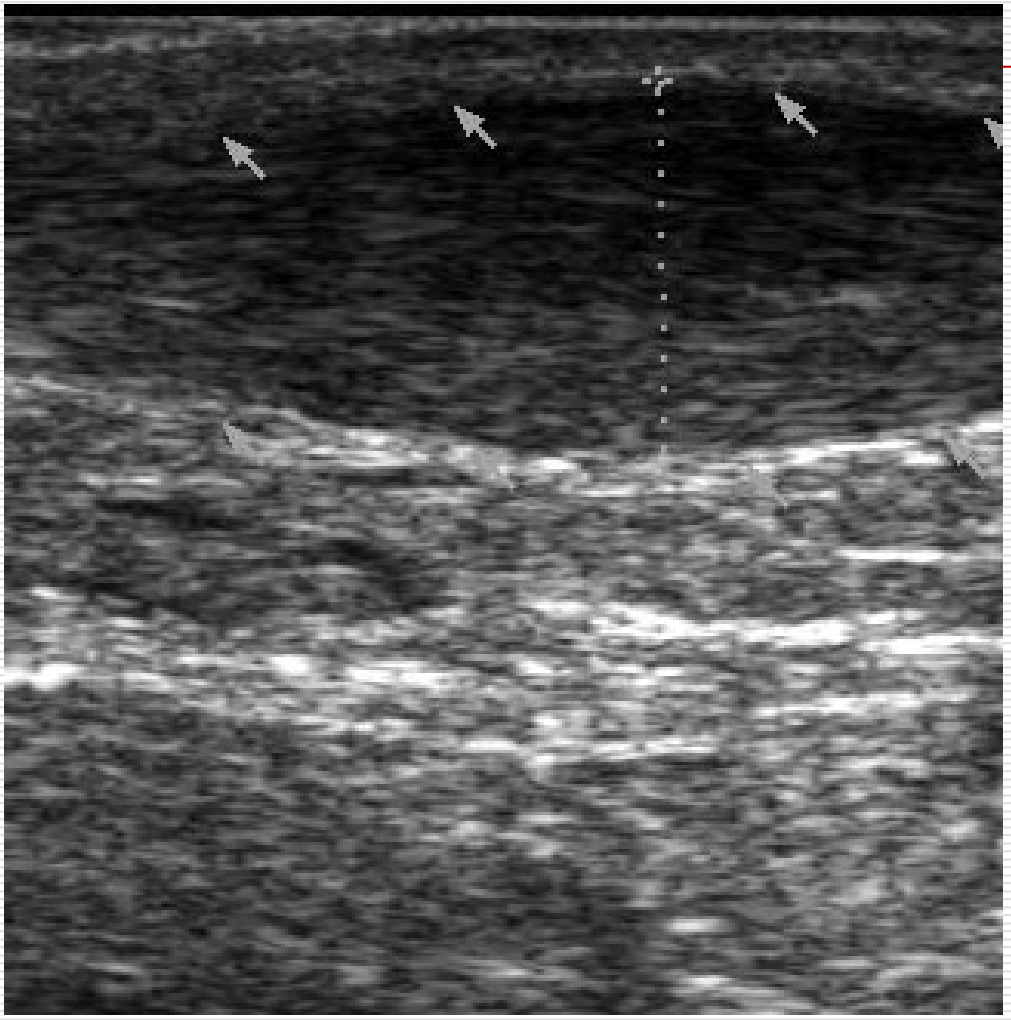
Objective: Serial ultrasound (US) examinations to detect traumatic hemoperitoneum have been advocated, but their value is unknown. This study was conducted to determine if a scheduled serial US at 2 hours from arrival improved the detection of clinically significant hemoperitoneum (CSH) in blunt trauma patients (pts). **Methods: Design:** Prospective, observational study conducted between 4/96 and 10/96. **Setting:** University ED with Level-I trauma center. **Participants:** Critical blunt trauma pts arriving between 0800 and 2330. **Observations:** All pts received an abdominal US upon arrival by an experienced sonologist or emergency physician. Pts with a negative initial US were eligible for a 2-hour follow-up US performed by the same sonographer. CSH was defined as a positive US resulting in laparotomy. **Results:** 175 pts were entered. Mean time of initial US was 23.3 min (SD ± 16.4 min) from pt arrival. Twenty-one pts (13%) had positive initial US and went for laparotomy. Of the remaining 154 pts, 91 received a scheduled 2-hour follow-up US. One pt (0.1%; 95% CI 0–4%) had CSH detected at the 2-hour US. 63 pts did not receive a 2-hour US for various reasons, including other operative intervention or diagnostic studies. Of these, 0 had CSH necessitating laparotomy during the admission. **Conclusion:** The large majority of CSH is detected by the initial US. In a study of this size, routine serial US examinations at 2 hours increase the detection of CSP in a very small number of critical trauma patients.

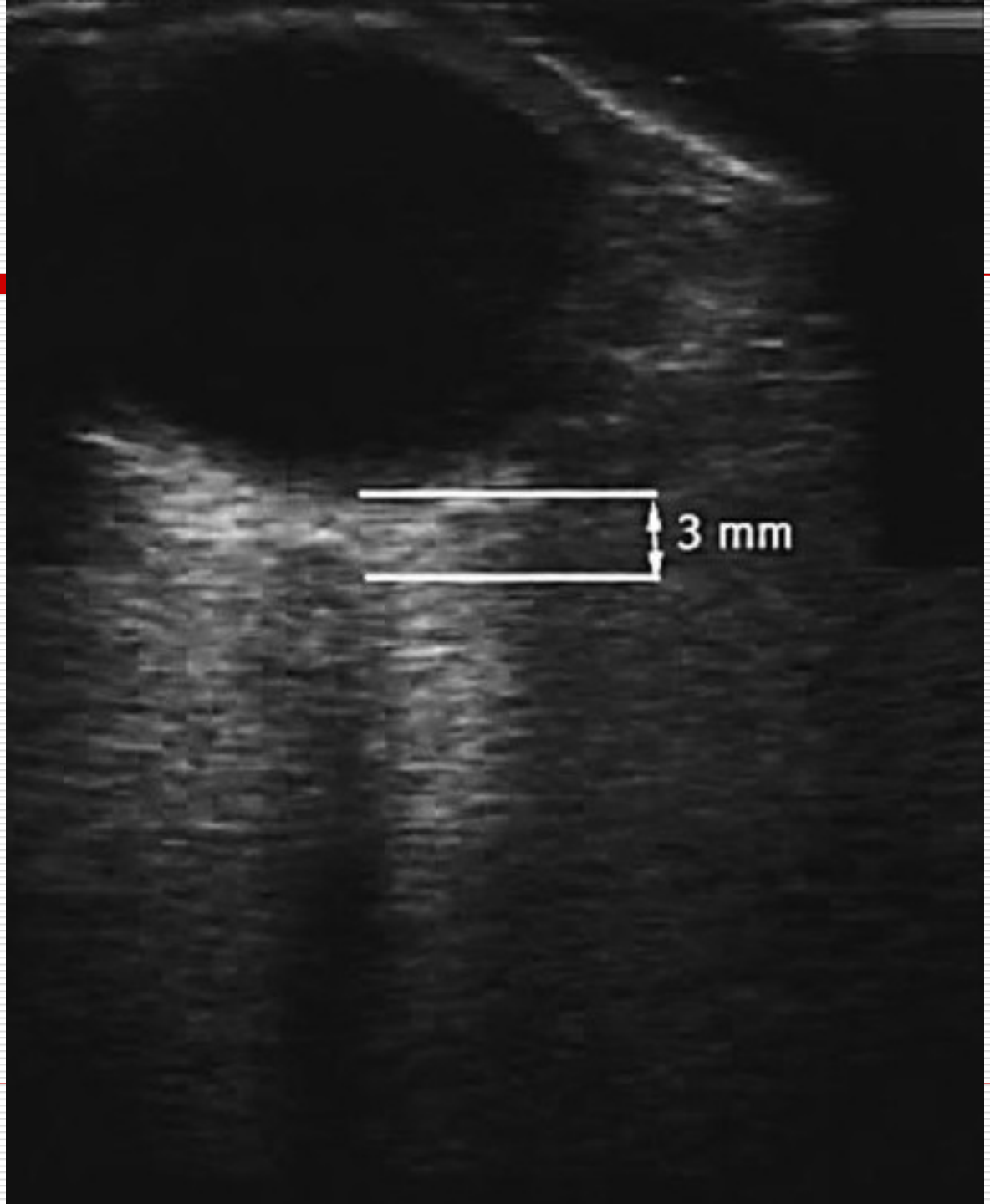
Kırıklar

- Pediatrik
- Sternum
- Kotlar
- Tüm ekstremite
  - Colles redüksiyon

Colles Kırığı

Aşil Tendonu




3 mm


3.0 mm, 6.7 mm

Sternum Kırığı

Femur Kırığı

Kosta Kırıkları

ÖZET

- Bütün yaralanmalar serbest sıvı üretmez
- Gebe hasta; uterin rüptür veya plasental abrupsiyoyu göstermez
- Sıvı kaynağı: Asit, idrar, barsak içeriği
- Retroperitonu göstermez
- Tüm kırıklarda etkin
- Göz dibi KİBASta +