

急診超音波的大小事

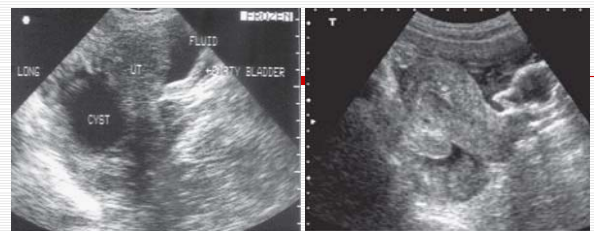
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急診超音波的重要觀念

- History
- Physical examination
- Impression
- EUS for answer

Case 1

- Young female, acute lower abdominal pain
- 很痛，非常痛，痛到冒冷汗
- HR: 120 bpm, BP: 60/40 mmHg
- 處理程序？
- O2, IVF challenge, monitor, 驗血驗尿
- Echo



- Ruptured corpus luteum cyst
- Empty uterus. Ectopic pregnancy

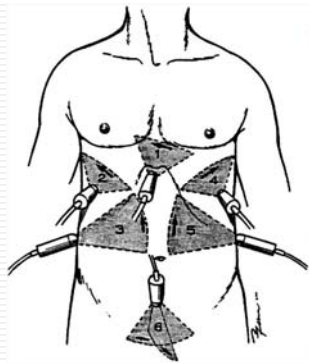


- 還是出血

Case 2

- Trauma, MBA
- Multiple contusion
- Vital signs stable
- Abdominal pain

FAST or E-FAST



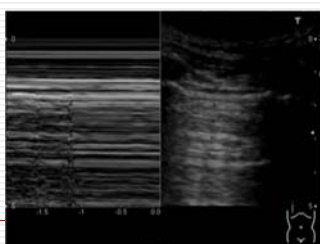
- ☐ FAST negative
- ☐ NEXT?

- ☐ 沒看到不代表不存在
- ☐ V6的故事

Case 3



CVC
的是CVC on不上



你可以有更好的選擇

- ☐ Echo in vascular access
- ☐ Improve success rates
- ☐ Decrease the complications



Case 4

- ☐ 手腫，腳腫，臉腫，屁股腫
- ☐ 硬的軟的，熟了？
- ☐ 戳一針前，可以看一下

Normal vs. Cellulitis



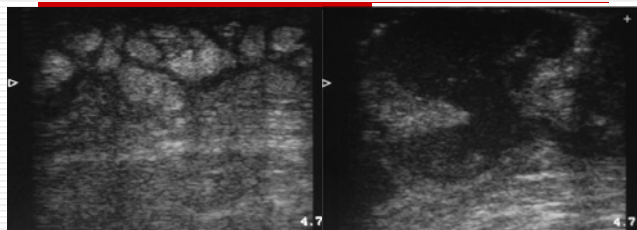
Source: Ma GJ, Maheer JR. Emergency Ultrasound.
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Cellulitis vs. Abscess

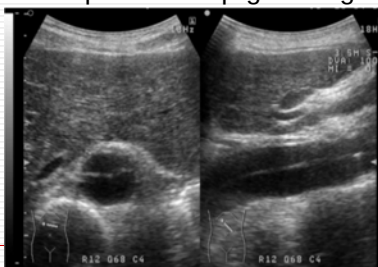


Case 5

- ❑ 60 year old male
- ❑ Left flank pain. Urolithiasis history.
- ❑ U/A: RBC: 5-10
- ❑ 沒床躺。NEXT?



- ❑ 65 year old female
- ❑ Postprandial epigastralgia



不是每次都這麼幸運

- ❑ Age ≥ 50 y/o
- ❑ syncope / hypotension / dizziness and/or
- ❑ Abdominal / back / flank / groin pain
- ❑ AAA不等於rupture
- ❑ Aortic dissection不是每次都看的到

Case 6

- ❑ 65 year old male
- ❑ 血壓低
- ❑ 心臟不好，EF? 不知道
- ❑ 心中百轉千迴，揪竟這個水要怎麼掐
- ❑ 可以少一點瞎摸的機會

Hypotensive Protocol

- ❑ Free intraperitoneal fluid = FAST
- ❑ Focused cardiac exam
- ❑ Focused abdominal aorta evaluation
- ❑ Inferior vena cava (IVC) view

Table 2 Inferior vena cava (IVC) measurement and right atrial pressure^{7 16}

Expiratory (max) diameter IVC	Collapse index (%) $100 \times (\text{max} - \text{min diameter}) / \text{max diameter}$	Estimated right atrial pressure
<2 cm	>40–50%	<10 mm Hg
>2 cm	<40–50%	>10 mm Hg

Correlations Between IVC Size and CVP

Inferior vena cava size (cm)	Respiratory change	Central venous pressure (cm H ₂ O)
<1.5	Total collapse	0-5
1.5-2.5	>50% collapse	6-10
1.5-2.5	<50% collapse	11-15
>2.5	<50% collapse	16-20
>2.5	No change	>20

ELSEVIER GLOBAL MEDICAL NEWS

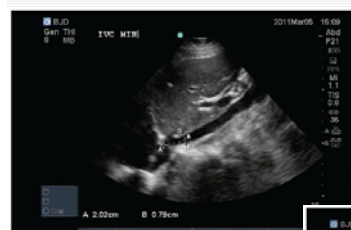


Figure 2. Image shows inspiratory (minimal) diameter of the IVC.

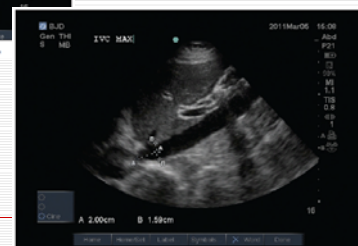


Figure 3. Image shows expiratory (maximal) diameter of the IVC.

Table 1 Rapid Ultrasound in SHock (RUSH) protocol: ultrasonographic findings seen with classic shock states

RUSH Evaluation	Hypovolemic Shock	Cardiogenic Shock	Obstructive Shock	Distributive Shock
Pump	Hypercontractile heart Small chamber size	Hypocontractile heart Dilated heart	Hypercontractile heart Pericardial effusion Cardiac tamponade RV strain Cardiac thrombus	Hypercontractile heart (early sepsis) Hypocontractile heart (late sepsis)
Tank	Flat IVC Flat jugular veins Peritoneal fluid (fluid loss) Pleural fluid (fluid loss)	Distended IVC Distended jugular veins Lung rockets (pulmonary edema) Pleural fluid Peritoneal fluid (ascites)	Distended IVC Distended jugular veins Absent lung sliding (pneumothorax)	Normal or small IVC (early sepsis) Peritoneal fluid (sepsis source) Pleural fluid (sepsis source)
Pipes	Abdominal aneurysm Aortic dissection	Normal	DVT	Normal

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Case 7

- ❑ 60 year old female
- ❑ 單腳紅紅腫腫，有點痛又不太痛
- ❑ 沒發燒
- ❑ WBC: 7K
- ❑ Cellulitis? DVT?
- ❑ Wells criteria?

EUS for DVT

- ❑ Non-compression of the vessel
 - Inability to completely compress the vessels
 - With proper pressure
 - After good position
- ❑ Only complete compression rule out DVT
- ❑ Only the lack of total compression means DVT





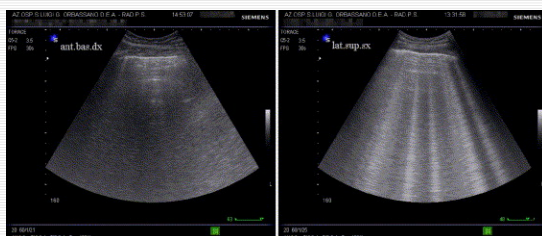
Case 8

- ❑ 80 year old male
- ❑ SOB, wheezing
- ❑ 心臟沒力，抽菸六十年
- ❑ 到底在喘哪一種

Normal Landmark

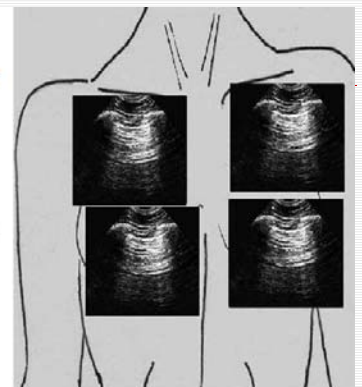


Normal vs. Lung Edema



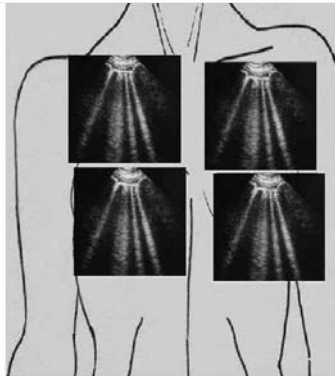
- Predominant bilateral A lines plus lung sliding
 - COPD
 - Asthma

- Nearly rules out Pulmonary edema (predominant bilateral B line)



Lichtenstein et al. Relevance of lung ultrasound in the diagnosis of acute respiratory failure: the BLUE protocol. CHEST July 2008 vol. 134 no. 1 117-125

- Predominant bilateral B lines plus lung sliding
 - Pulmonary edema,
- Nearly rules out
 - COPD (predominant bilateral A lines)
 - PE
 - PTX (absent B lines)

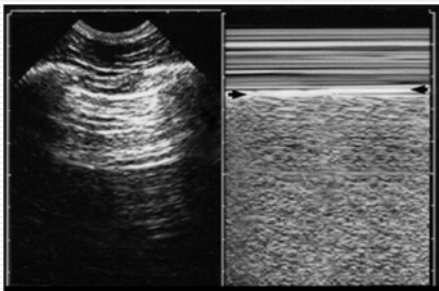


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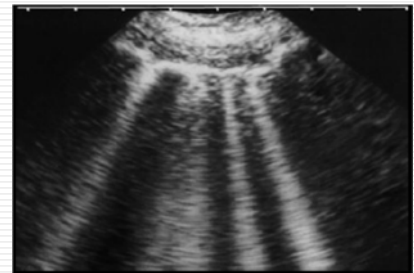
Case 9

- ❑ 26 year old male
- ❑ MBA, head injury, 意識不清
- ❑ 身體有點擦挫傷，FAST: negative
- ❑ 插完管後，portable CXR: 無明顯異常
- ❑ 等CT
- ❑ Bradycardia, hypotension, CPR

Seashore sign

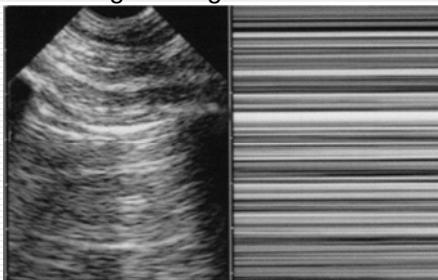


Comet-tail artifact

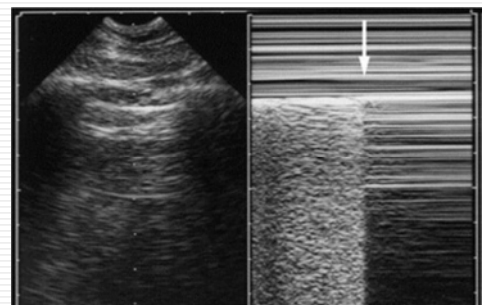


Stratosphere sign

- ❑ No lung sliding



Lung point



Something You should Know

- ☐ Pelvis
- ☐ FAST
- ☐ Central line
- ☐ Soft tissue infection
- ☐ AAA
- ☐ IVC, shock
- ☐ DVT
- ☐ COPD vs. lung edema
- ☐ Pneumothorax

Thanks for Your Attention !