

Palliative Care Point of Care Ultrasound (PoCUS)

Christine Pun, MD CCFP (EM) (PC) FCFP

Assistant Professor, NOSM; Palliative CEPD Committee

Independent Practitioner - Core and Expanded (Resuscitation Track), CPoCUS

2019 Palliative Care Conference – Sault Ste Marie; October 25, 2019.

LEARNING OBJECTIVES

At the end of this session, participants will be able to:

- Discuss basics of (bedside) PoCUS.
- Discuss applications of PoCUS in Palliative Care

DISCLOSURE SLIDE

- **I have no relationships with commercial interests to disclose.**
- **We have 2 machines made available to us through in-kind sponsorship for the purpose of education. I am not endorsing a specific brand.**

Which health discipline do you represent?

Physician

Nurse
practitioner

Nurse

Personal
support worker

Other

What is your main practice setting

Hospice

Community
(home visits)

Clinic

Hospital

Other

WHAT IS POCUS

- Performed by clinician at the bedside
- Specific indications and applications
- Diagnostic or procedural



Which best describes you?

I have access to a PoCUS device and use it regularly

I know how to do PoCUS,
but we need a/more
device(s).

I don't know how to do
pocus and have no device

“We” have a device, but I
don't know how to use it.

WHAT IS ULTRASOUND?



HOW DOES ULTRASOUND WAVES BEHAVE?

- Fluid – Black
- Tissue – Grey
- Bone/Calcium – White with shadow
- Air – Scatter
- Interfaces – “Outline”

ULTRASOUND PROBES

Higher Frequency = Lower Penetration = Better Resolution



<https://www.gehealthcare.com/products/ultrasound/ultrasound-transducers>



DEVICE SELECTION - OPTIONS



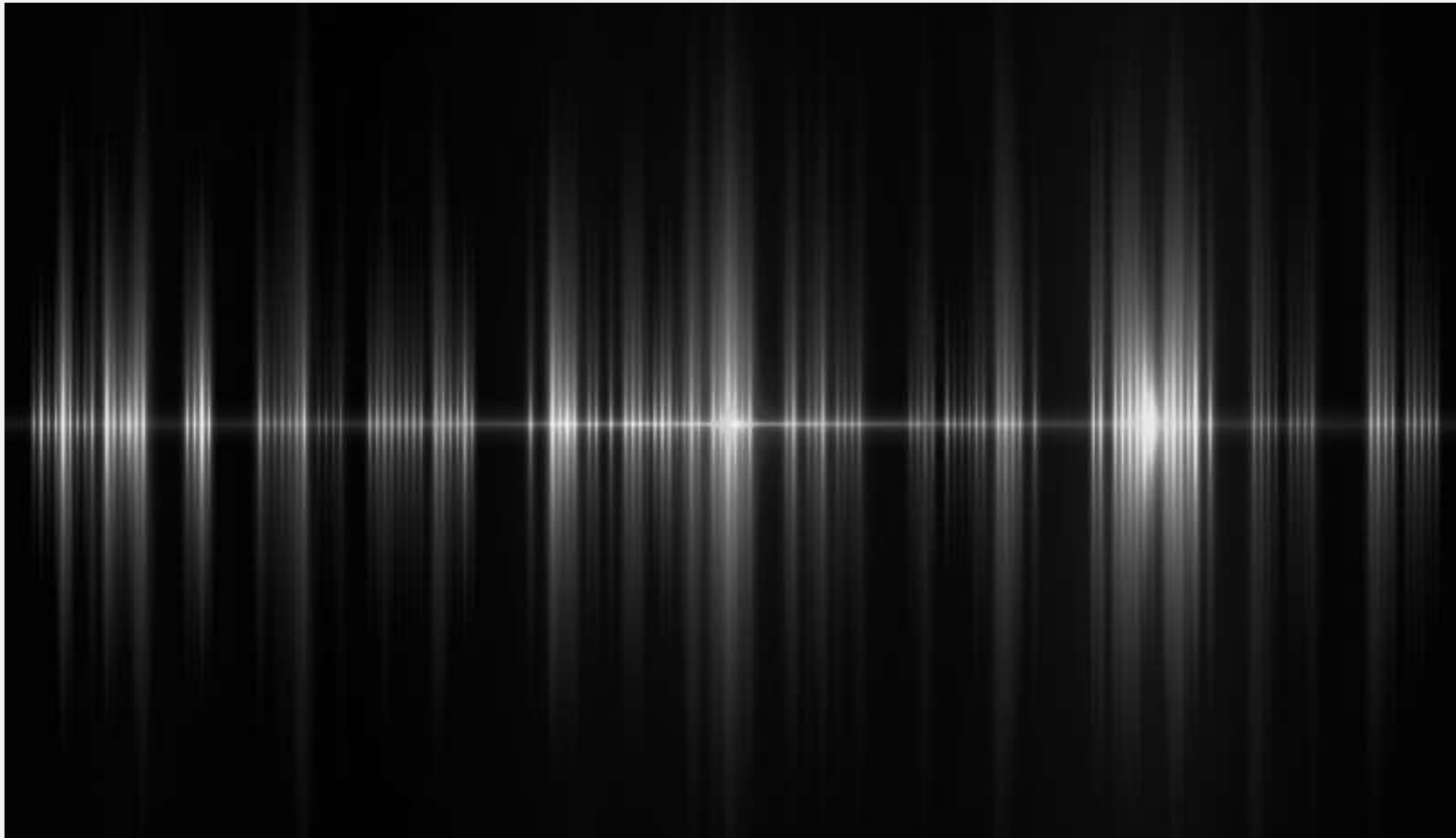
- Chison ECO2, ECO3, ECO5, ECO6, Q5, Q9, Sonobook, Sonotouch 30, Ebit 60
- Clarius C3 Convex, L7 Linear, C7 Microconvex
- Esaote: MyLab Seven, MyLab Six, MyLab Alpha, MyLab Gamma, MyLab One
- Fujifilm: Sonosite IVIZ, SII, Edge II, X-Porte, M-Turbo
- GE Healthcare:Vscan, Venue 50, NextGen LOGIQ, LOGIQ S7, LOGIQ P9
- Mindray DP-30, DP-50
- Phillips: Lumify, Sparq, CX 50
- SeeMore: SiMPli
- Sonoscape A6, S2, S8, X5, EI



DEVICE SELECTION

- Setting & Uses
- Familiarity with device/existing devices
- Cost: new vs. refurbished
- Size/weight (Portability/"Stealability"): laptop, fold-down, handheld/tablet/hand-operated
- Battery life
- Image quality
- Image storage
- Probes, pre-sets
- Warranty & support

APPLICATIONS



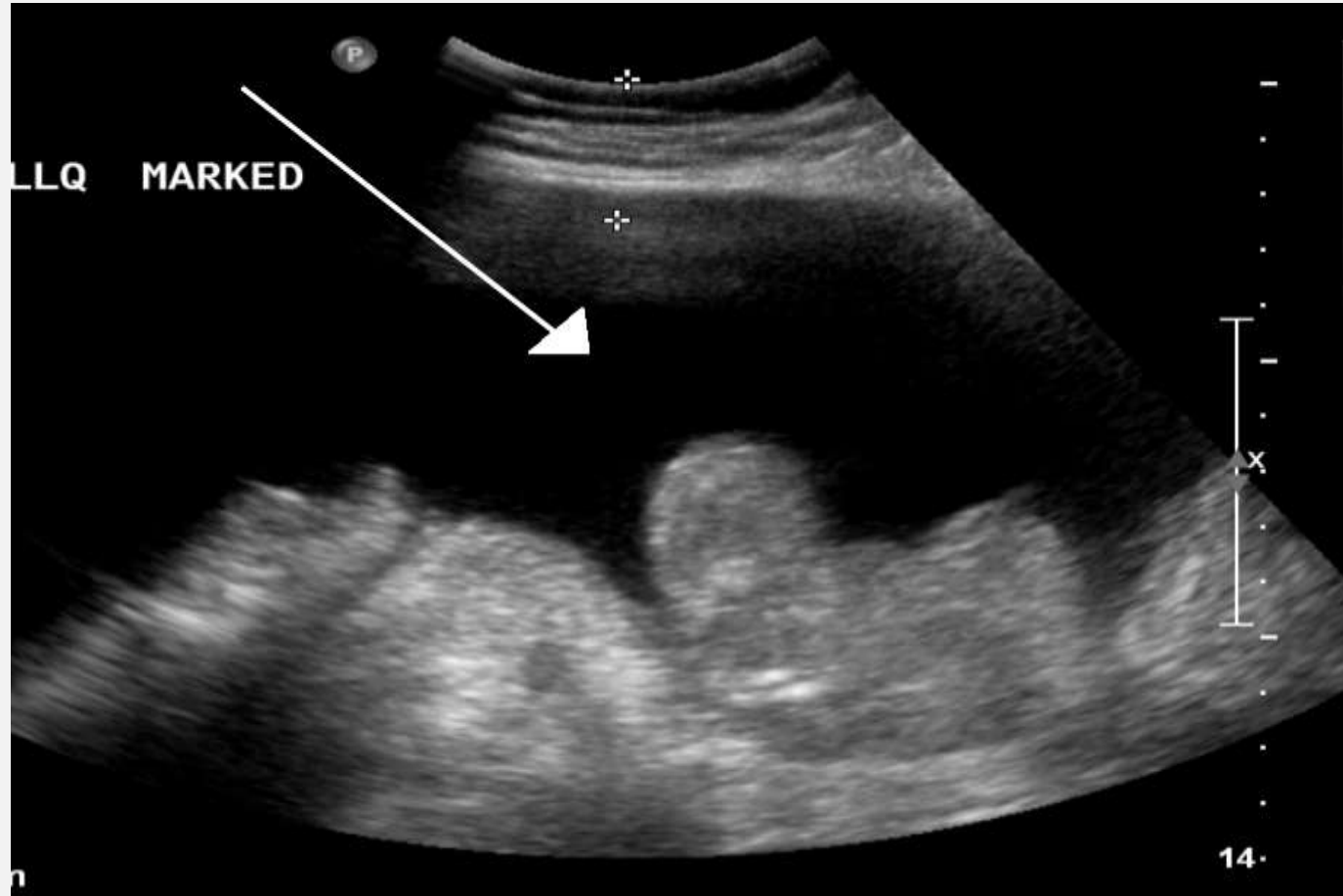
CASE #1

56 year-old female

- Metastatic ovarian cancer/abdominal carcinomatosis
- Increasing abdominal distension and discomfort

Paracentesis?

SCENARIO 1A



James Heilman, MD [CC BY-SA 3.0 (<https://creativecommons.org/licenses/by-sa/3.0>) or GFDL (<http://www.gnu.org/copyleft/fdl.html>)], from Wikimedia Commons

Scenario 1A - Paracentesis?

Yes.

No.

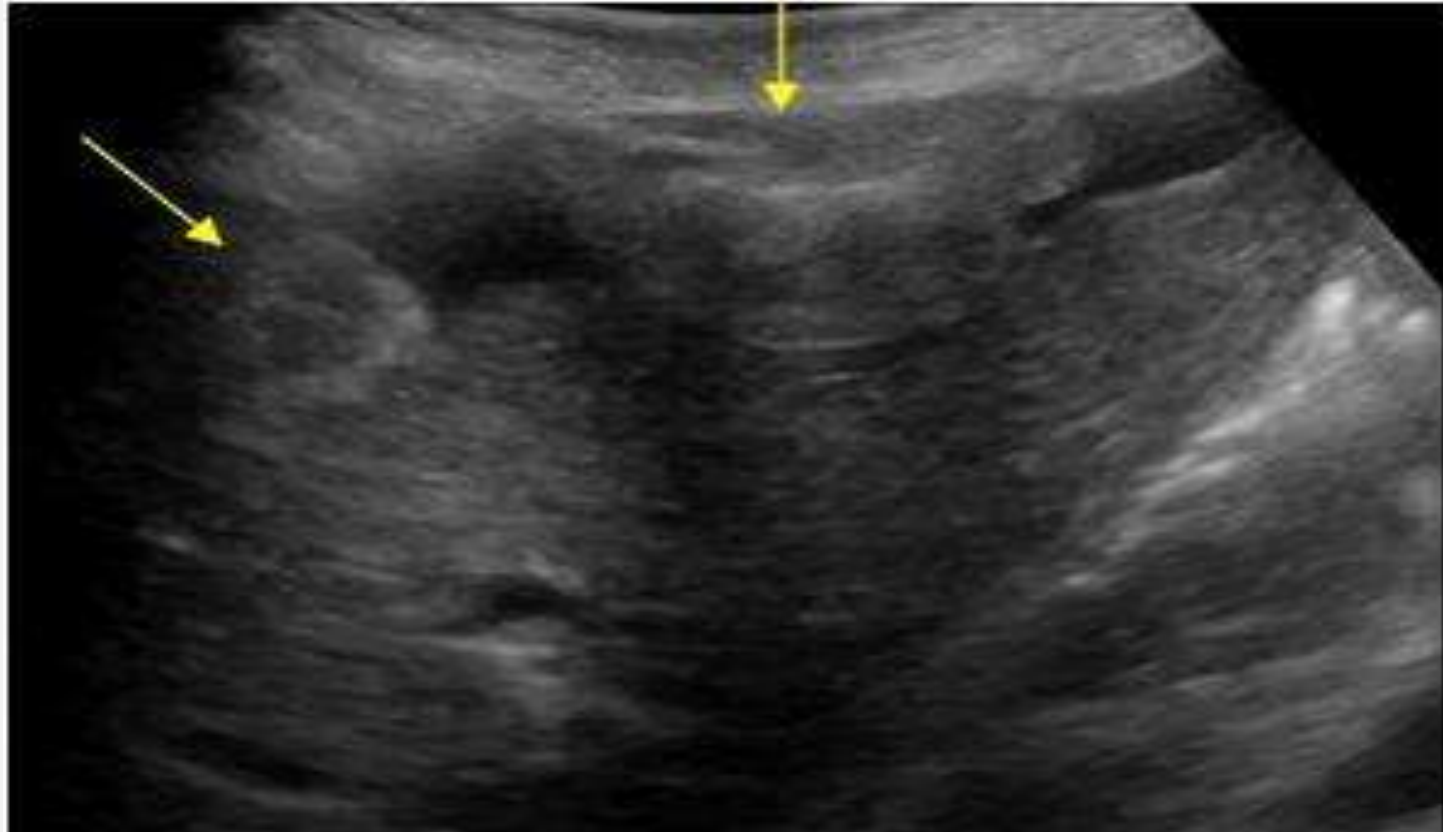
I
don't
know.

ASCITES



James Heilman, MD [CC BY-SA 3.0 (<https://creativecommons.org/licenses/by-sa/3.0>) or GFDL (<http://www.gnu.org/copyleft/fdl.html>)], from Wikimedia Commons

SCENARIO 1B



<http://www.ultrasoundcases.info/>

Copyright © Dr.T.S.A. Geertsma, Ziekenhuis Gelderse Vallei, Ede, The Netherlands.

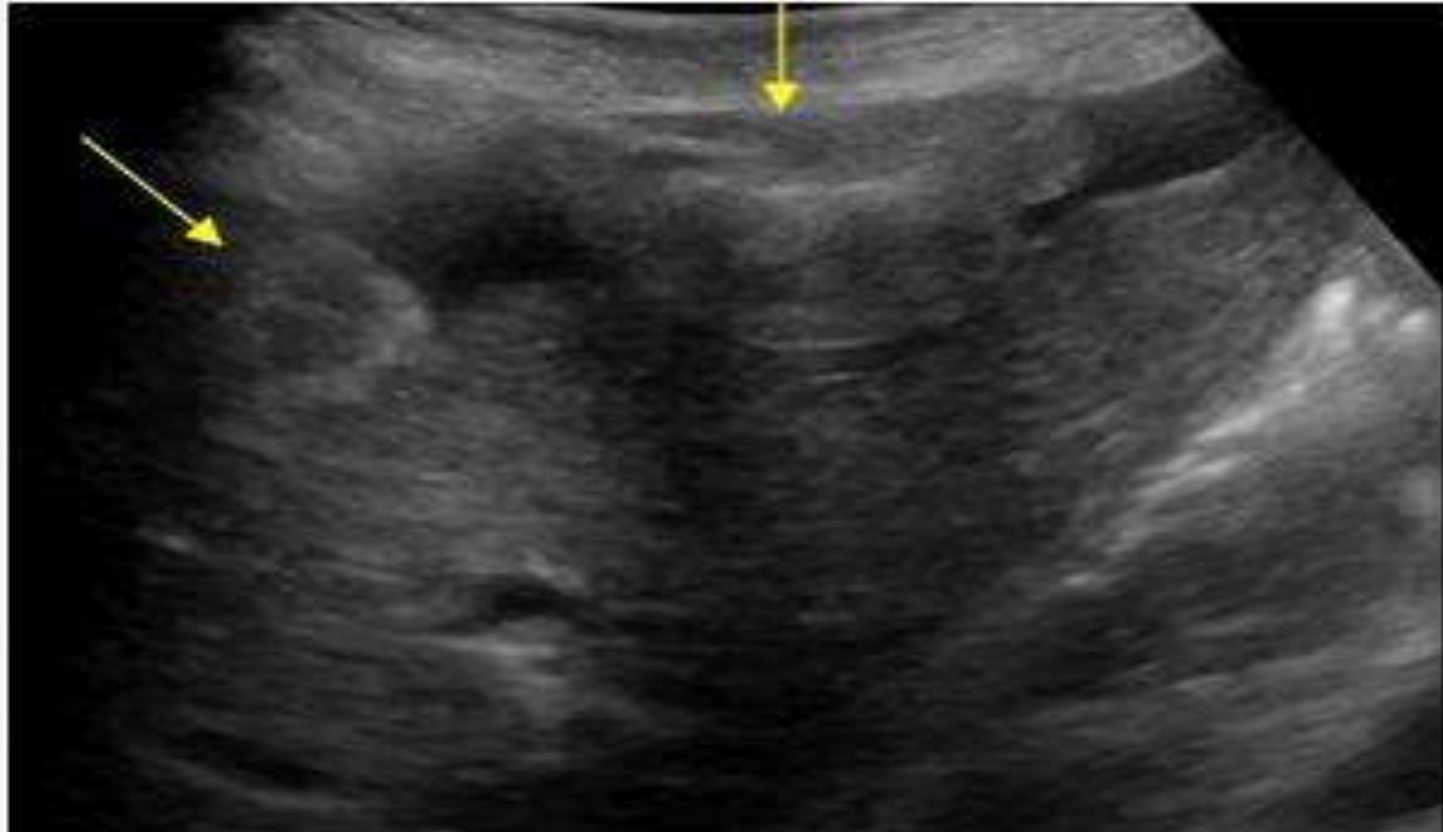
Scenario 1B - Paracentesis?

Yes.

No.

I
don't
know.

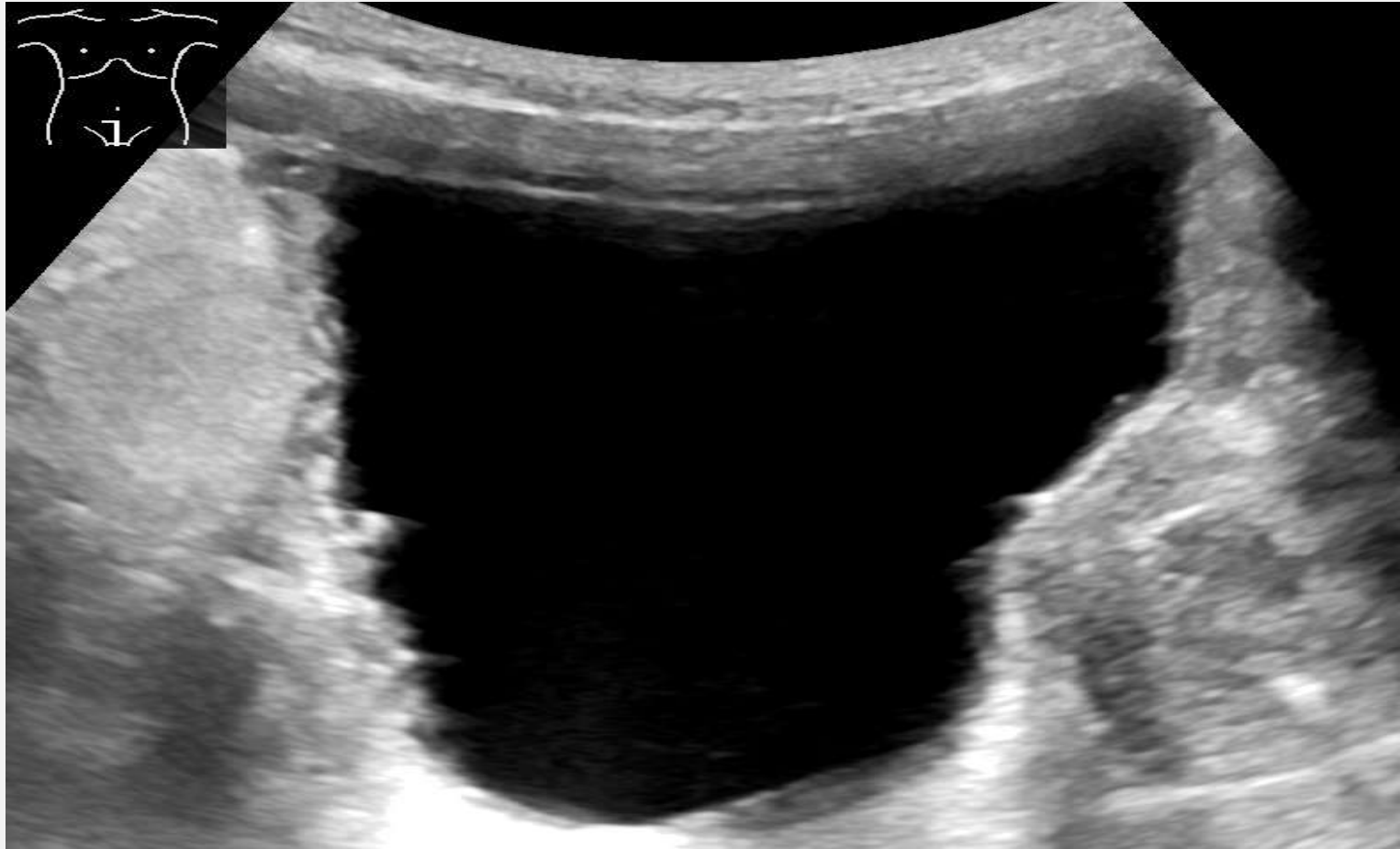
INTRA-ABDOMINAL METASTASES



<http://www.ultrasoundcases.info/>

Copyright © Dr.T.S.A. Geertsma, Ziekenhuis Gelderse Vallei, Ede, The Netherlands.

SCENARIO 1C



By Mikael Häggström - Own work, CC0, <https://commons.wikimedia.org/w/index.php?curid=65548789>

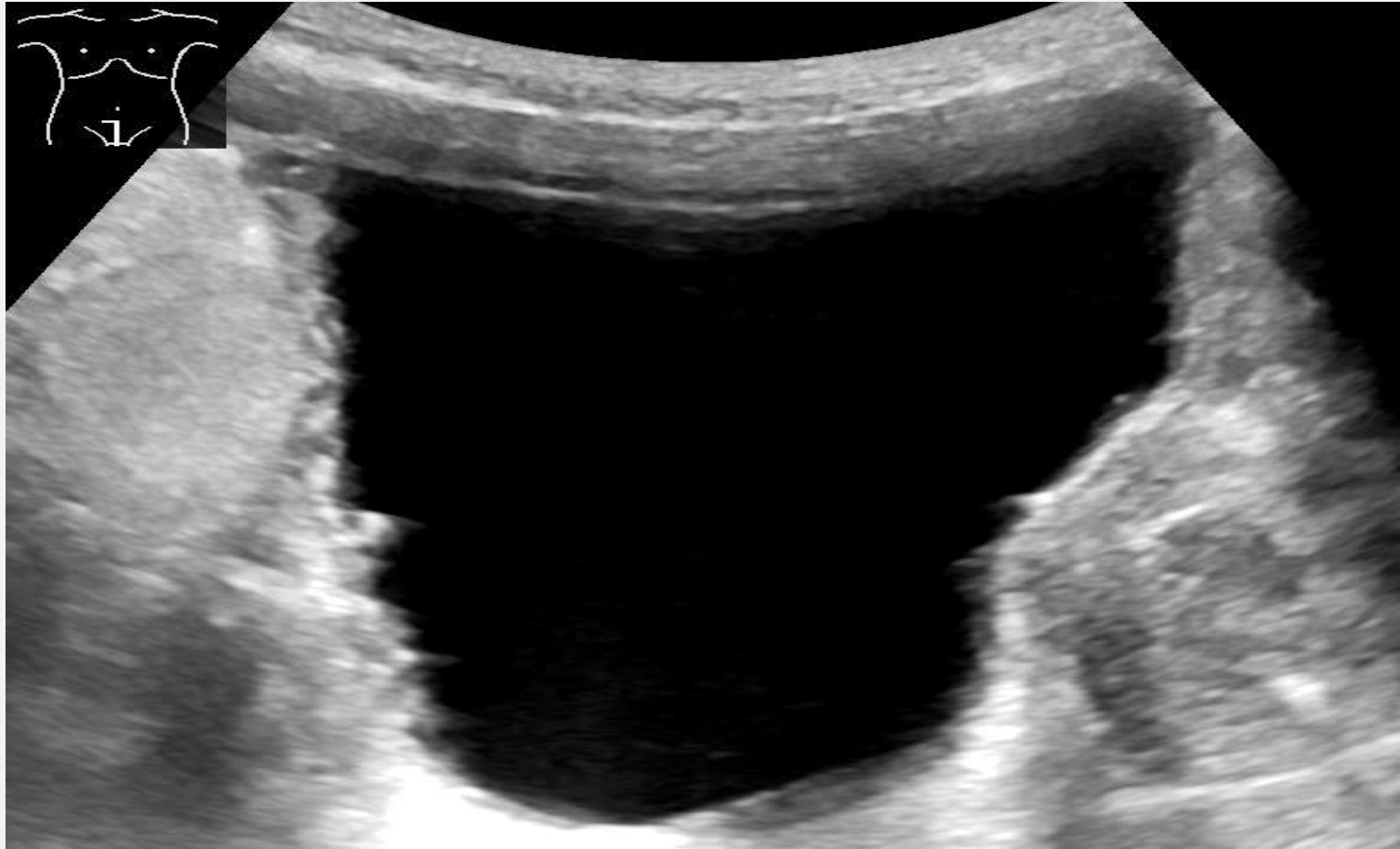
Scenario 1C - Paracentesis?

Yes.

No.

I
don't
know.

DISTENDED BLADDER



By Mikael Häggström - Own work, CC0, <https://commons.wikimedia.org/w/index.php?curid=65548789>

HYDRONEPHROSIS



Case courtesy of Dr Matthew Lukies,
Radiopaedia.org, rID: 50539



By morning2k - Own work, CC BY 2.5,
<https://commons.wikimedia.org/w/index.php?curid=637000>

CASE #2

79 year old frail elderly

- CHF, recent “cold”
- Increasing SOB and bilateral leg swelling R>L

Dx?

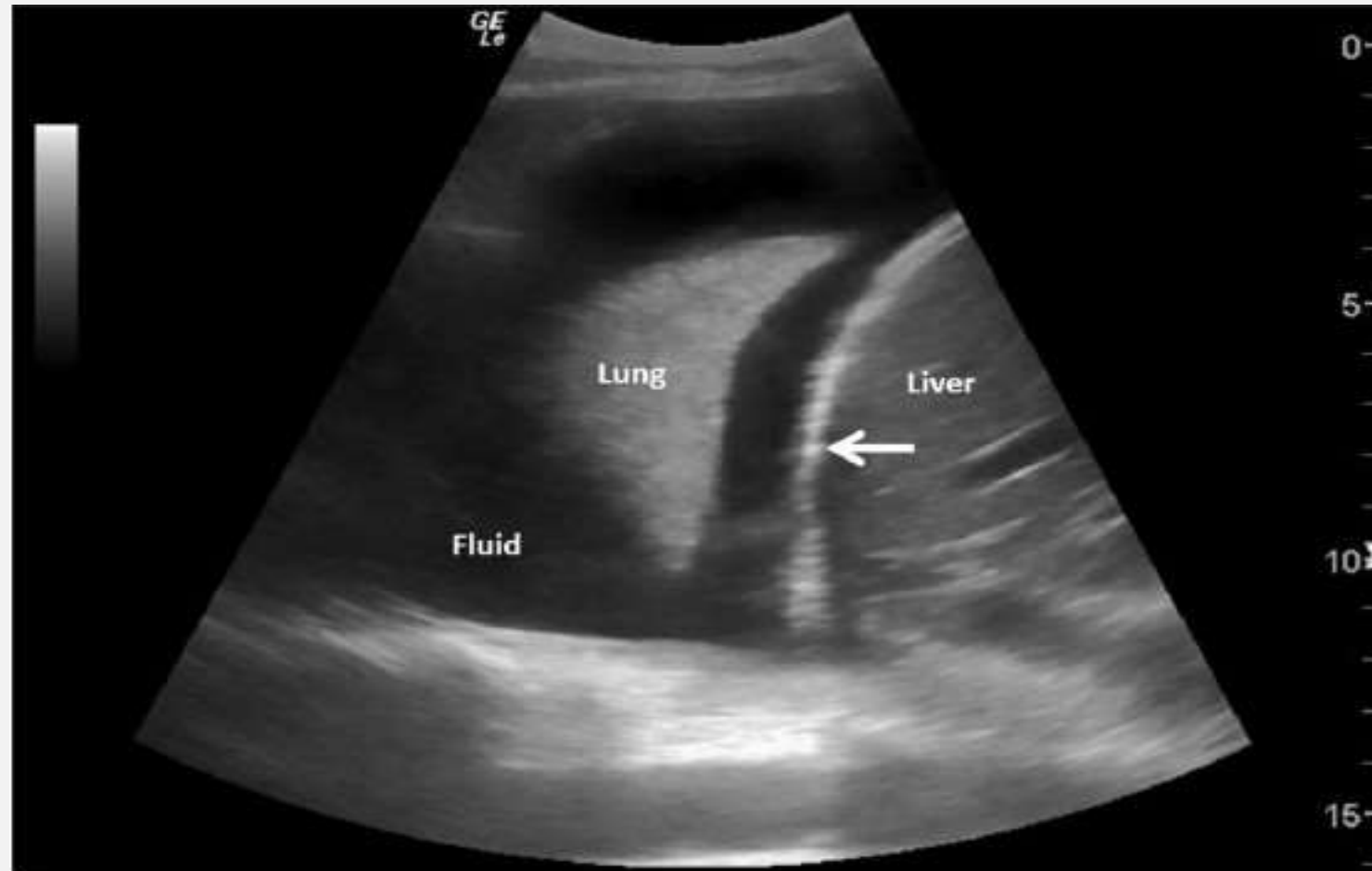
Case 2 - Differential Diagnosis

SCENARIO 2A

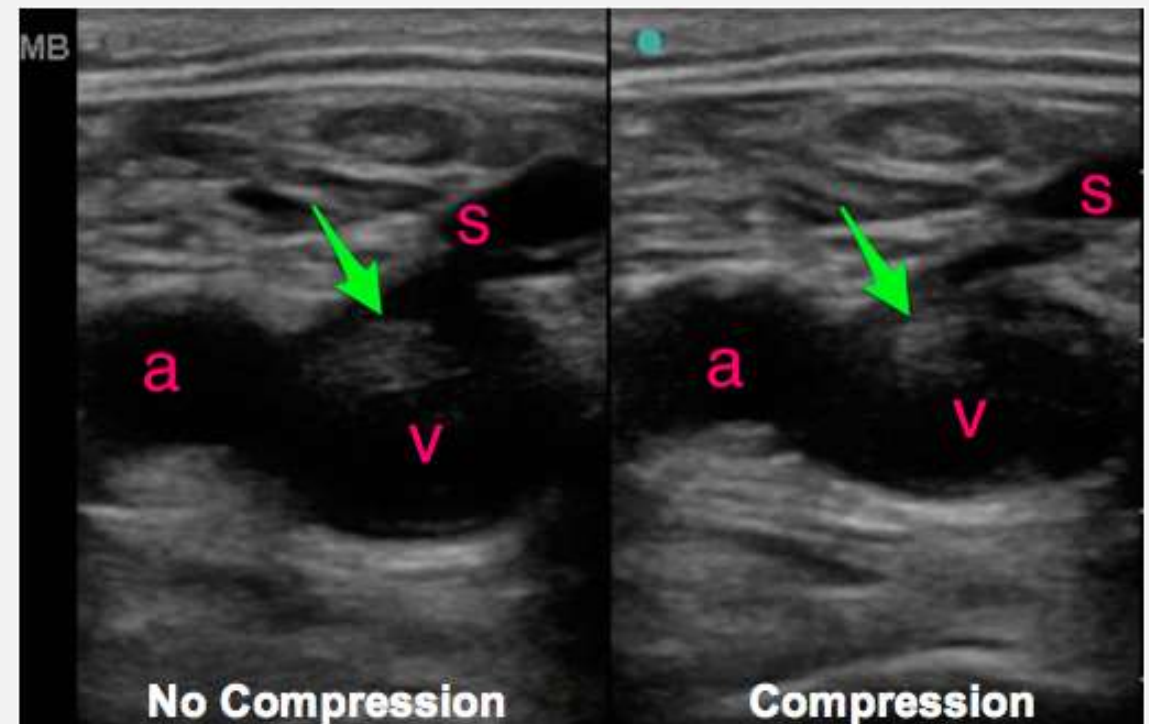
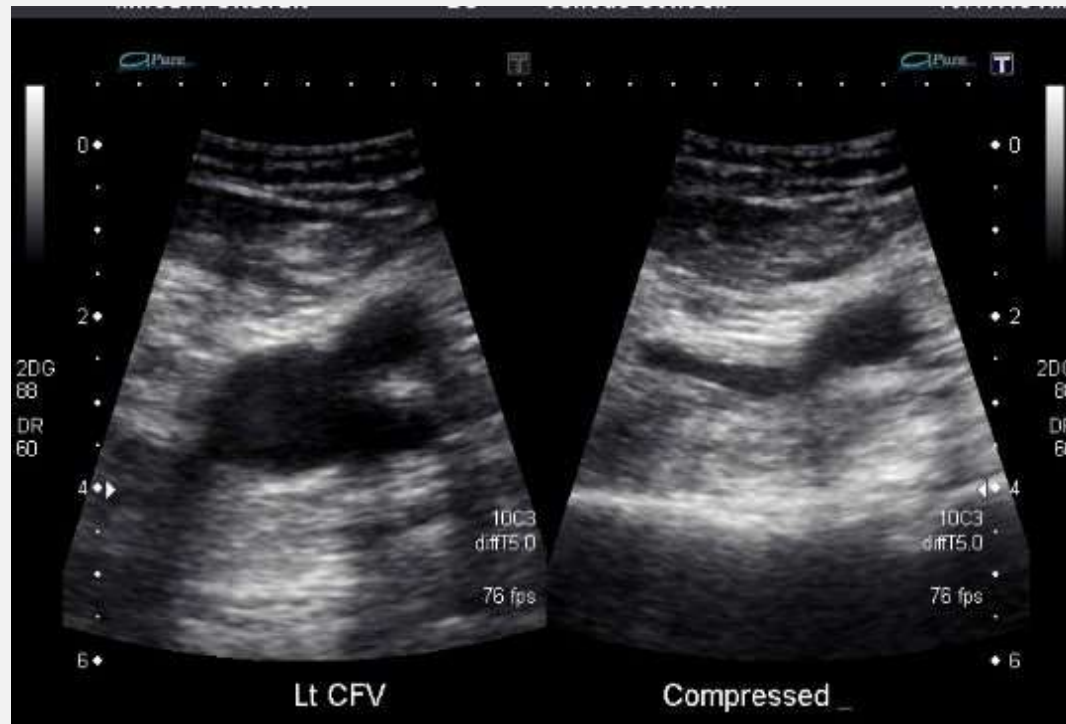


<https://www.mdedge.com/emergencymedicine/article/96697/imaging/emergency-ultrasound-lung-assessment>

SCENARIO 2B



SCENARIO 2C



<https://www.ultrasoundpaedia.com/uploads/53003/ufiles/dvt-leg/dvt%20normal/cfv-comp-norm.jpg>

<https://aliemcards.com/cards/dvt-ultrasound/>

SCENARIO 2D



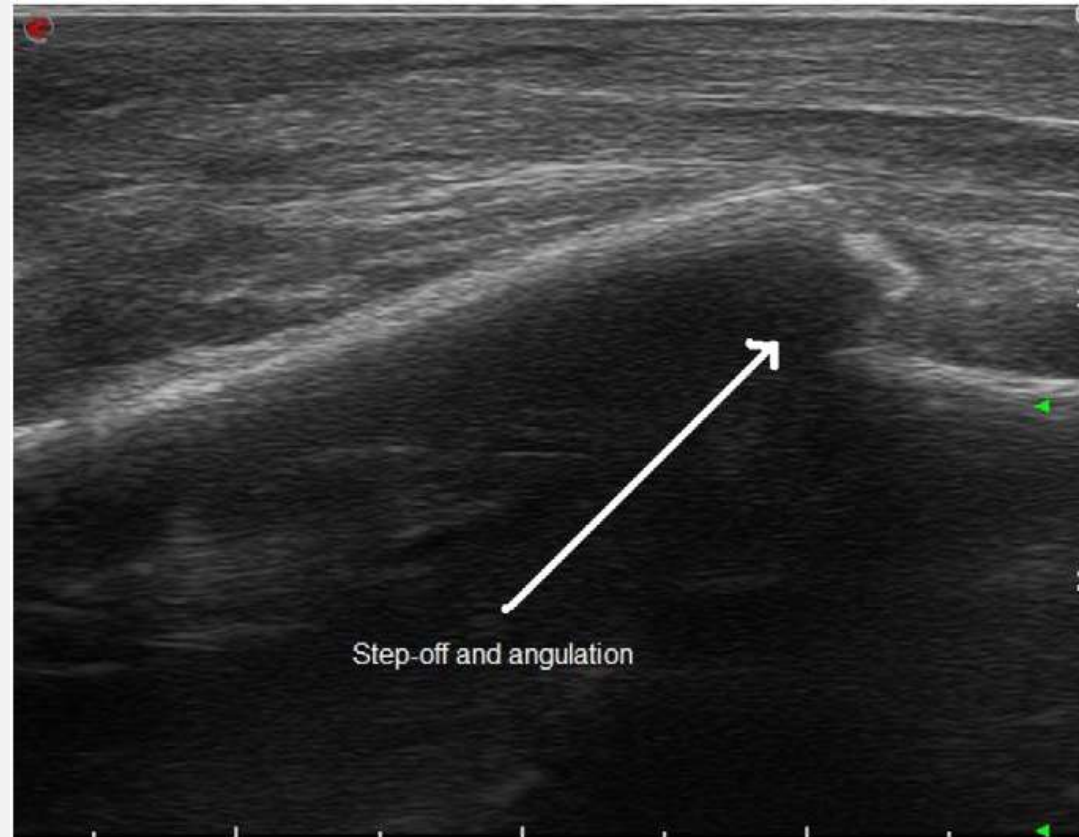
<https://healthcare-in-europe.com/en/home/index.html?src=scrollto>

CASE #3

90 year-old nursing home patient

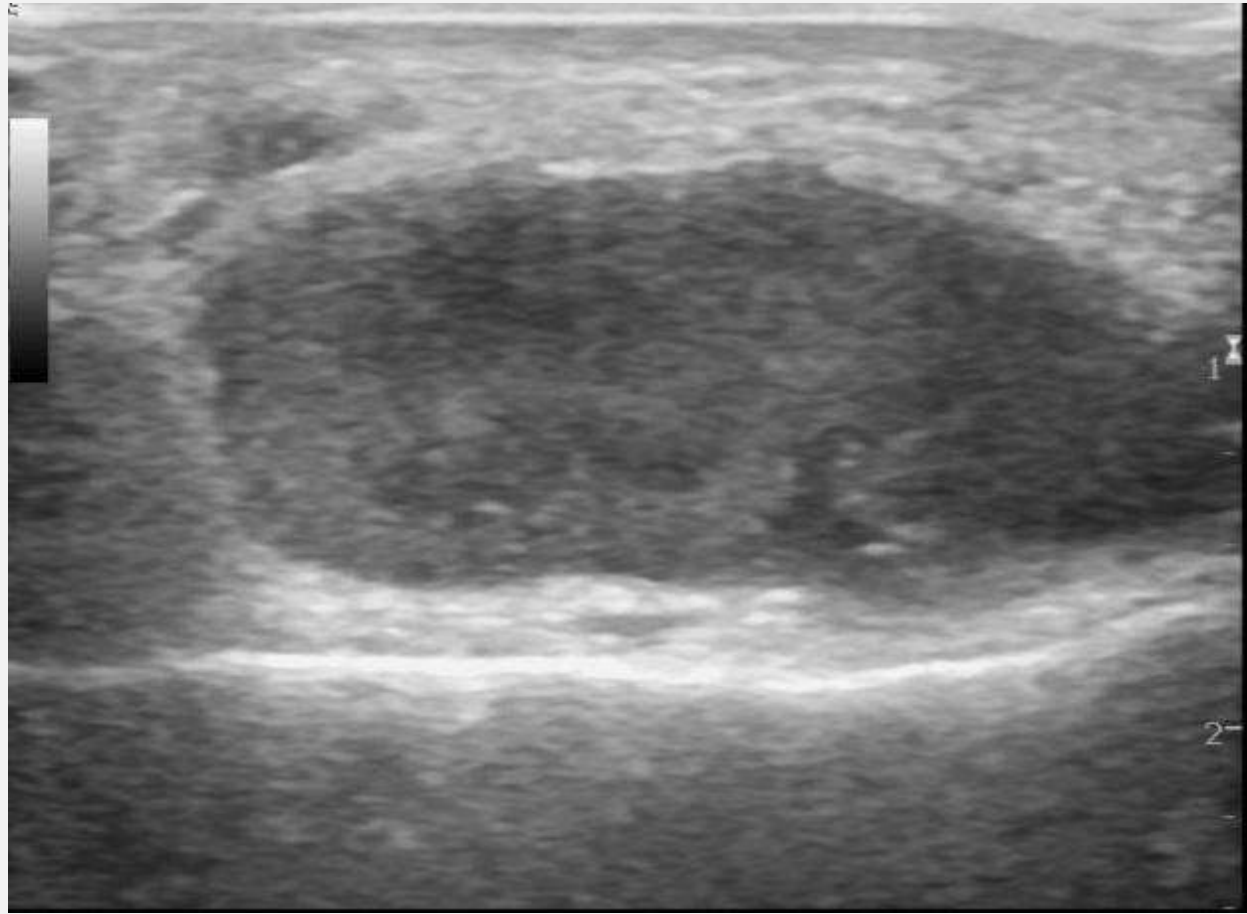
- Fell overnight, swollen forearm

SCENARIO 3A



Kozaci, Nalan, et al. "Evaluation of the effectiveness of bedside point-of-care ultrasound in the diagnosis and management of distal radius fractures." *The American journal of emergency medicine* 33.1 (2015): 67-71.

SCENARIO 3B



Case courtesy of Dr Maulik S Patel, Radiopaedia.org, rID: 24248

POCUS – “CORE APPLICATIONS”

Pericardial Effusion

Cardiac Activity

Aortic Aneurysm

Abdominal Free Fluid

Intrauterine Pregnancy

Pleural Effusion

Pneumothorax

POCUS – EXPANDED APPLICATION

Resuscitation track

For certification in:
Advanced cardiac
views (PSL, PSS,
A4C),
Advanced Lung,
IVC

Diagnostic track

For certification in:
Gallbladder, Renal,
Bladder, DVT,
Ocular

Musculoskeletal track

For certification in:
Fracture diagnosis
and reduction,
Joint assessment,
Dislocation
reduction, Soft
tissue injury,
Abscess, Tendon
rupture

POCUS – DIAGNOSTIC APPLICATIONS IN PALLIATIVE CARE

Ascites

Pleural effusion

Bladder volume

Hydronephrosis

DVT

Intra-abdominal metastases

POCUS-GUIDED PALLIATIVE INTERVENTIONS

Paracentesis; placement of peritoneal catheters

Thoracentesis

Ultrasound-guided venous catheterization

Nerve blocks +/- neurolysis: truncal blocks (celiac, superior hypogastric, ganglion), peripheral

Botulinum toxin injection: Intra-parotid and submandibular glands for sialorrhea

MSK

- Corticosteroid injection to shoulder for adhesive capsulitis related to terminal upper extremity weakness
- Knee aspiration and corticosteroid injection for OA
- Sacroiliac joint and lumbar epidural steroid injection for low back pain

Percutaneous nephrostomy, suprapubic cystostomy

Questions



Thoughts

cpun@hsnsudbury.ca

REFERENCES

- Steve Socransky & Ray Wiss (2014). Essentials of Point-of-Care Ultrasound , Version 1.2 The EDE 2 Course, 2014. Apple Books.
- Chernack, B., Knowlton, S. E., & Kohler, M. J. (2017). The Use of Ultrasound in Palliative Care and Hospice. *American Journal of Hospice and Palliative Medicine*®, 34(4), 385–391.
- Dhamija E, Thulkar S, Bhatnagar S. Utility and potential of bedside ultrasound in palliative care. *Indian J Palliat Care* 2015;21:132-6
- Gishen F, Trotman I. Bedside ultrasound--experience in a palliative care unit. *European journal of cancer care*. 2009;18:642-644.
- Caldwell J, Edriss H, Nugent K. Chronic peritoneal indwelling catheters for the management of malignant and non-malignant ascites. *Proc (Bayl Univ Med Cent)*. 2018;31(3):297-302. Published 2018 Jun 1. doi:10.1080/08998280.2018.1461525