WEBINAR

Practical Small Animal Ultrasound: Guiding Safe, Accurate Fine Needle Aspirations

September 2022

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Your Host

Dr. Oron Frenkel, MD, MS

Emergency Physician & POCUS Educator

Chairman, Clarius Medical Advisory Board

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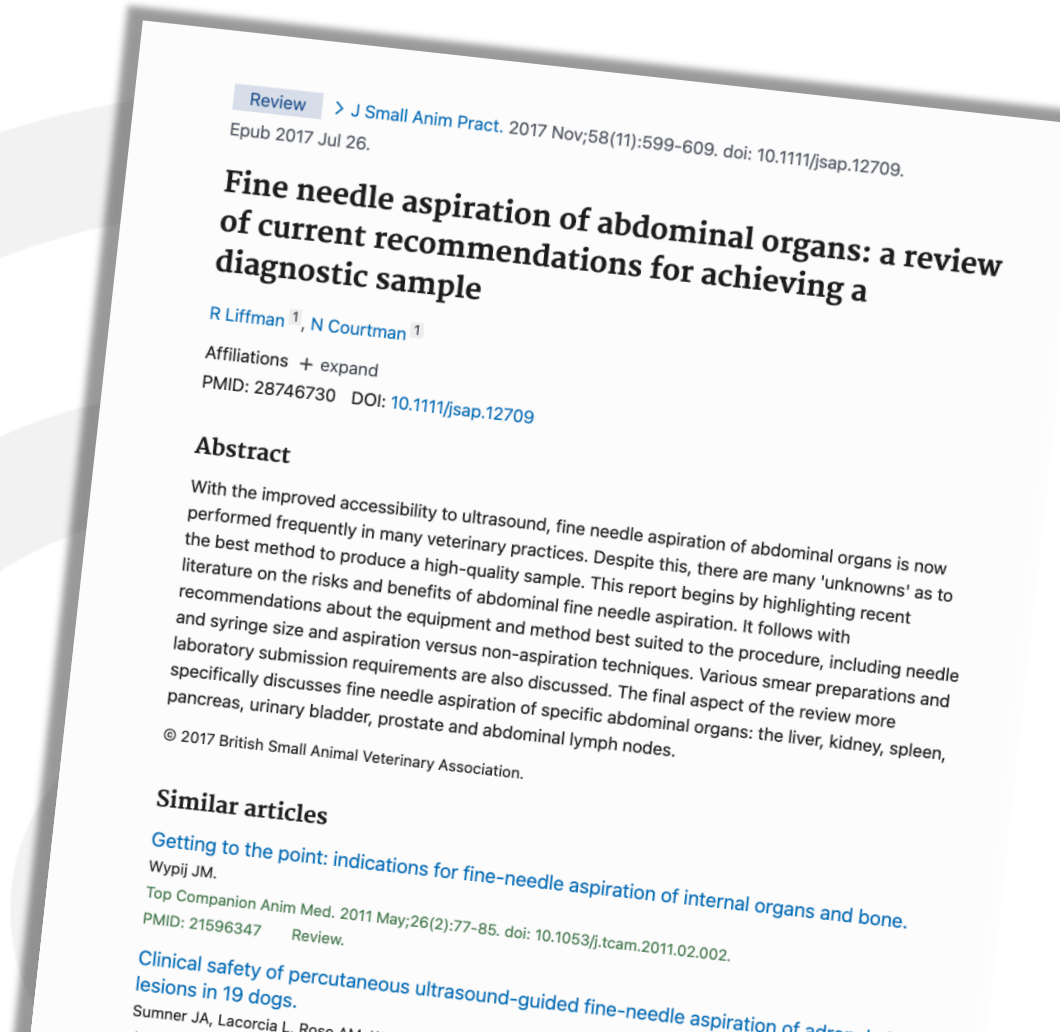
Fine needle aspiration of abdominal organs: a review of current recommendations for achieving a diagnostic sample

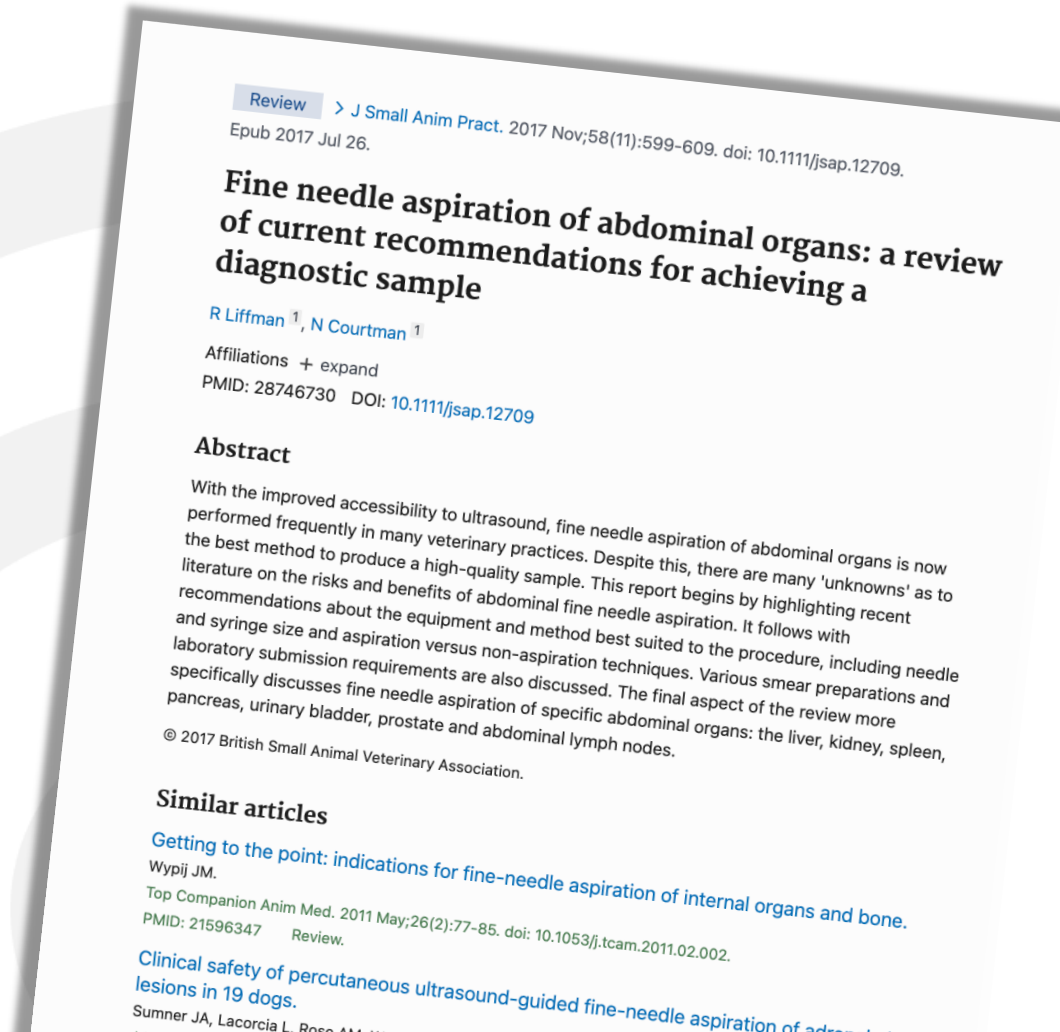
If successful, these results can then be used to obtain a definitive diagnosis, to guide additional testing or to rule in or out specific diseases.



Liffman R, Courtman N. Fine needle aspiration of abdominal organs: a review of current recommendations for achieving a diagnostic sample. J Small Anim Pract. 2017 Nov;58(11):599-609. doi: 10.1111/jsap.12709. Epub 2017 Jul 26. PMID: 28746730.

Fine needle aspiration of abdominal organs: a review of current recommendations for achieving a diagnostic sample

There is rarely a need for general anaesthesia during the procedure, and the small gauge of the needle seldom leads to clinical complications.



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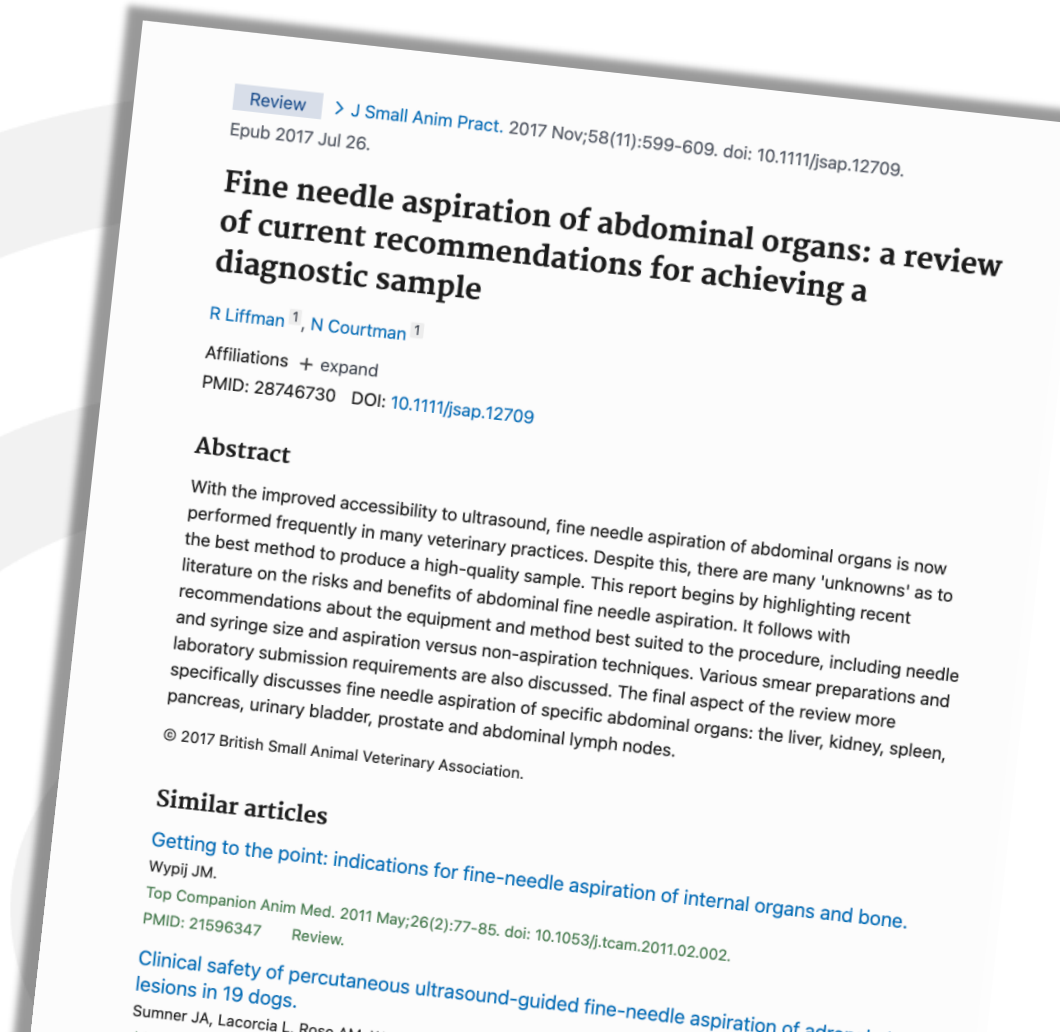
Fine needle aspiration of abdominal organs: a review of current recommendations for achieving a diagnostic sample

Currently, controversies exist in both human and veterinary literature about the influence of factors such as needle size, aspiration versus non-aspiration techniques and appropriate sample preparation.



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Assessment of the clinical usefulness of ultrasound-guided cytological specimens obtained from gastrointestinal lesions in dogs and cats

J Small Anim Pract. 2021 Feb;62(2):114-122. doi: 10.1111/jsap.13260. Epub 2021 Jan 5.

Assessment of the clinical usefulness of ultrasound-guided cytological specimens obtained from gastrointestinal lesions in dogs and cats

R B S Turner [1], R Liffman [1], A P Woodward [2], C Beck [1], N Courtman [1], J R S Dandrieux [1]

Affiliations + expand

PMID: 33403667 DOI: 10.1111/jsap.13260

Abstract

Objectives: Cytological biopsies are an integral additional test to an abdominal ultrasound when a lesion is identified, but there is little published on factors that that may impact achieving a clinically useful sample of gastrointestinal lesions obtained by ultrasound-guided fine-needle cytologic biopsy. This retrospective, descriptive study aimed to assess factors that may influence the clinical usefulness of submitted cytological samples collected from gastrointestinal lesions by ultrasound-guided percutaneous fine-needle cytologic biopsy.

Material and methods: Gastrointestinal cytological samples obtained from 25 dogs and 19 cats over 2.5 years were reviewed and determined as clinically useful or clinically useless as per the cytology report. Variables dependent on the ultrasound exam that were used in the analysis included lesion location, lesion thickness, loss of gastrointestinal layering, and the number of slides submitted.

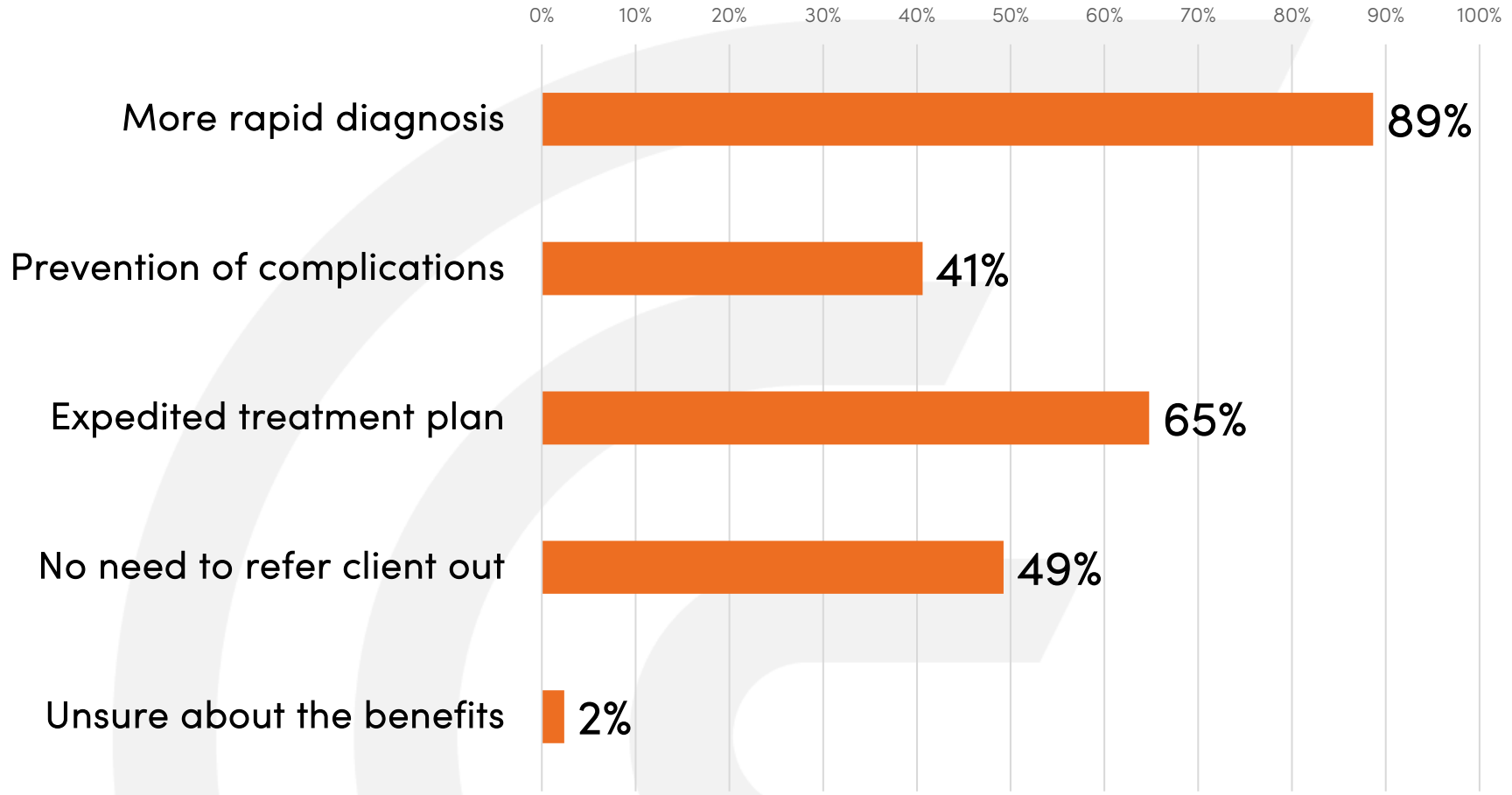
Results: Thirty (30/44) of the submitted cytological samples were considered clinically useful. Factors associated with achieving a clinically useful sample in univariable models included the number of slides submitted and the thickness of the lesion. However, these two variables appear inter-related, as a weak correlation existed between them. Where histologic biopsies were [illegible] useful sample had a partial or complete agreement with histology in three of

Ultrasound-guided fine-needle cytological biopsies of gastrointestinal masses provided a clinically useful sample in two-third of the cases, especially if more slides were provided to the cytologist and thicker lesions were sampled.

Turner RBS, Liffman R, Woodward AP, Beck C, Courtman N, Dandrieux JRS. Assessment of the clinical usefulness of ultrasound-guided cytological specimens obtained from gastrointestinal lesions in dogs and cats. J Small Anim Pract. 2021 Feb;62(2):114-122. doi: 10.1111/jsap.13260. Epub 2021 Jan 5. PMID: 33403667.

Poll

What do you see as the benefits of in-house ultrasound guided fine-needle aspiration?



Your Expert Guest Speaker

Dr. Camilla Edwards
DVM, CertAVP, MRCVS

Peripatetic Veterinary Ultrasonographer | Educator | First Opinion Veterinary Ultrasound

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Fine Needle Aspiration

Dr Camilla Edwards DVM CertAVP MRCVS

First Opinion Veterinary Ultrasound

Conflict of interest declaration: Honoraium

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What will we learn in this webinar?

- Indications – when to perform FNA
- Potential complications
- Patient Preparation
- How to take the FNA and how to practice
- Which organs to sample
- Cases

What knowledge are we already assuming?
We're assuming you have some basic knowledge about ultrasound machine set up and basic anatomy

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FNA indications

- Lesion for cytology
- Free fluid for cytology and chemistry
- Fluid from an organ lumen for cytology and chemistry
- Sampling as part of treatment – drain abscess relieve pleural effusion etc.

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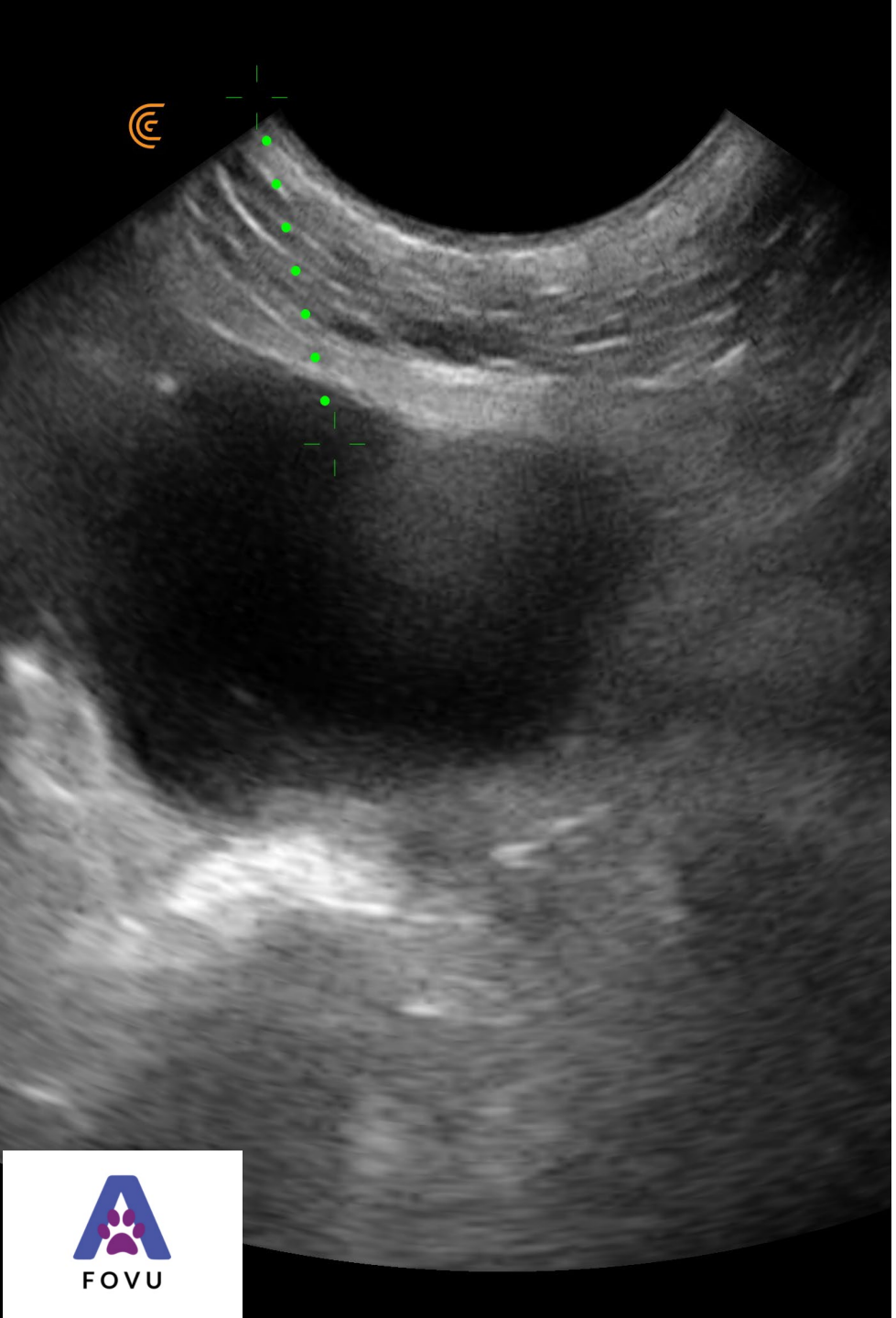

Possible complications

- Bruising
- Haemorrhage
- Fluid leakage (urine, bile)
- Organ rupture (urinary bladder, gallbladder)
- Tracking of neoplastic cells

- It is important to remember that risks are low

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How to manage the risk

Haemorrhage and bleeding

- Coagulation tests - APTT and PTT
- Choose your route wisely (use Doppler)
- Take the shortest route to the lesion

Fluid leakage and organ rupture

- Consider whether an organ is too structurally altered to cope with a needle
- To get a bile sample go through liver so this seals over gallbladder to prevent leakage.
- Otherwise only pass through the organ of interest.

Neoplastic seeding

- TCC in bladder and prostate.
- Carcinomas in general.
- Risk is low but cases have been reported
- Consider other sampling methods such as traumatic catheterisation
- Only pass through the organ of interest

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Organs to FNA*

Bladder

- Cystocentesis – ultrasound guided is safer than blind
- Tumor – FNA is reliable but has a small risk of seeding – traumatic catheterisation first.

Prostate

- Can drain prostatic abscesses successfully.
- FNA can cause seeding and may be worth doing a prostatic wash first to try and get diagnosis.

Liver

- Complications are rare, but only achieves mediocre results diagnostically

Spleen

- Diffuse disease good diagnostically – focal lesions often blood dilution

Gallbladder

Kidney

- Great risk of bleeding than liver, achieves good diagnostic results, complications are rare

Gastrointestinal tract

- If there is a thick wall tumour I will take a sample, but you have to be concerned about not hitting the lumen.

Abdominal lymph nodes

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*Liffman, R. and Courtman, N. (2017), Fine needle aspiration of abdominal organs: a review of current recommendations for achieving a diagnostic sample. J Small Anim Pract, 58: 599-609.

Patient Preparation

Consider sedation or general anaesthetic

Patient hair should be clipped

Ultrasound gel should be removed from the skin and the probe as it can mimic necrotic tissue microscopically and can make cytology difficult to interpret.

The area should be cleaned and prepared with alcohol (this facilitates ultrasound also without gel which is not sterile).

Samples should be placed in tubes and on slides as necessary for testing specific for the patient.

Needle size and length will depend on site, patient and vet

- Blue/Green needle 1 ½ inch
- Use the same syringe for the same sampling site, but new needle each time

Slides

Containers

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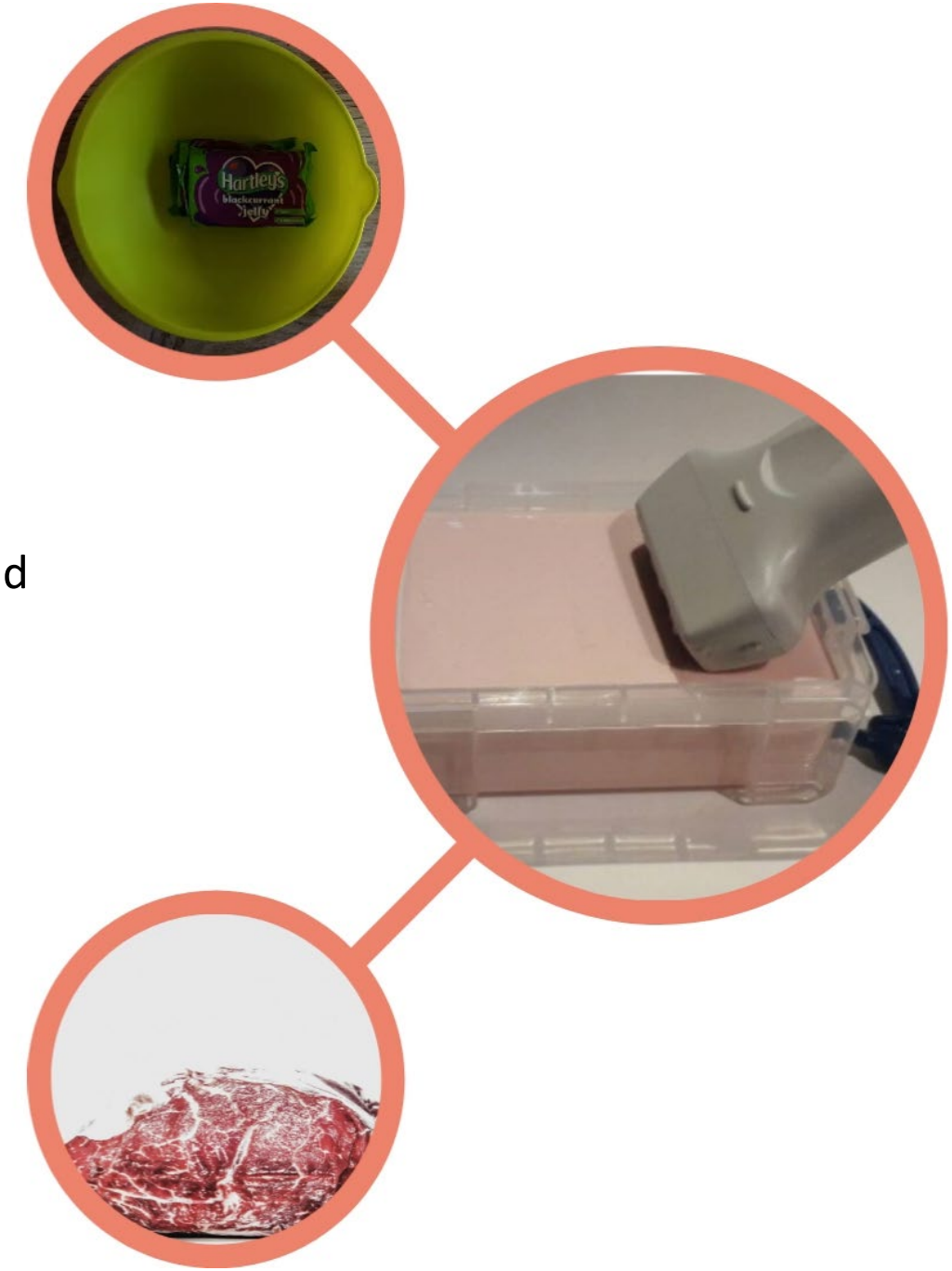
How to practice

- Simulator
- Jelly/Jello mould
- Tofu
- Meat



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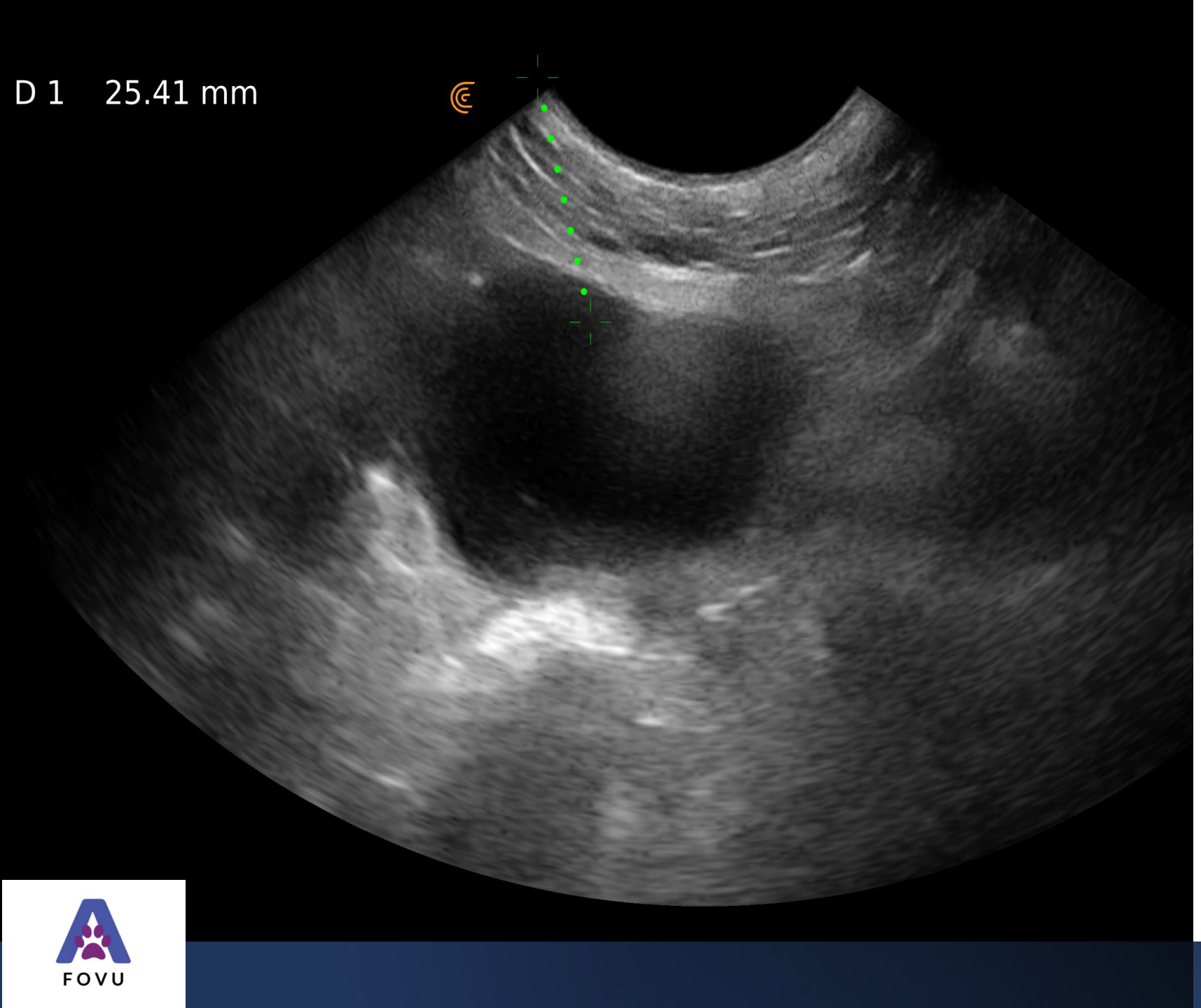

How to take the sample

- Find the shortest route to the lesion
  - Might involve moving the animal dorsal/lateral/oblique recumbency
- Measure the distance to use appropriate length needle
- Avoid loops of intestine – think in 3D – fan through the area
- Avoid large blood vessels – switch on colour flow mapping

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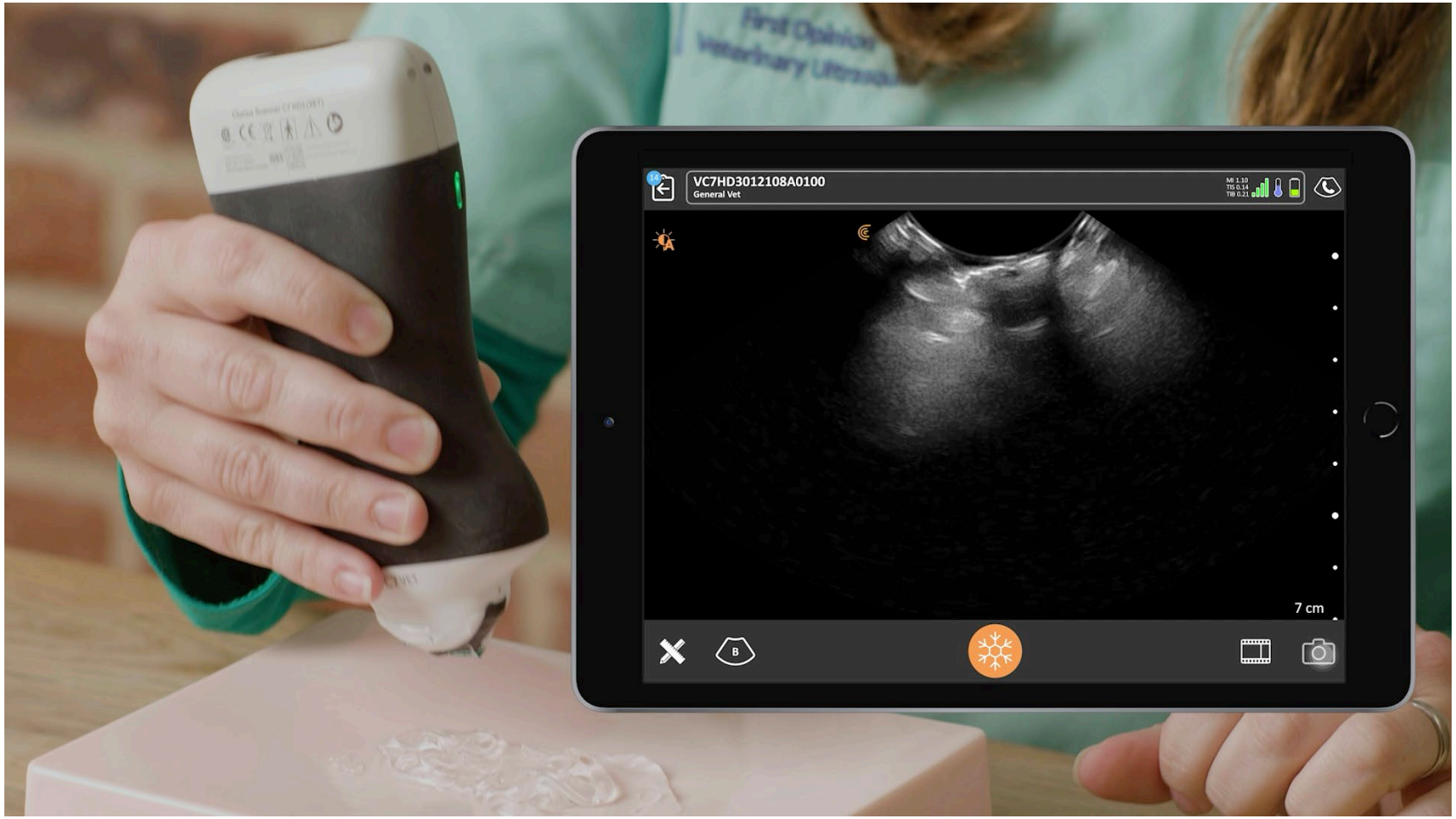
How to take an FNA video



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Preparing the slide

- Slide preparation
- Squash slide can be prepared
- The more samples that are taken the more likely a diagnosis is achieved

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After the procedure

- Immediately after procedure take an image of the sampled area or bladder.
- If possible scan again after a few minutes or hours.
- Check for free fluid – measure any seen and monitor

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Cases

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Case 1

- Signalment: 19yo, Fn, DSH
- History: Off food, weight loss

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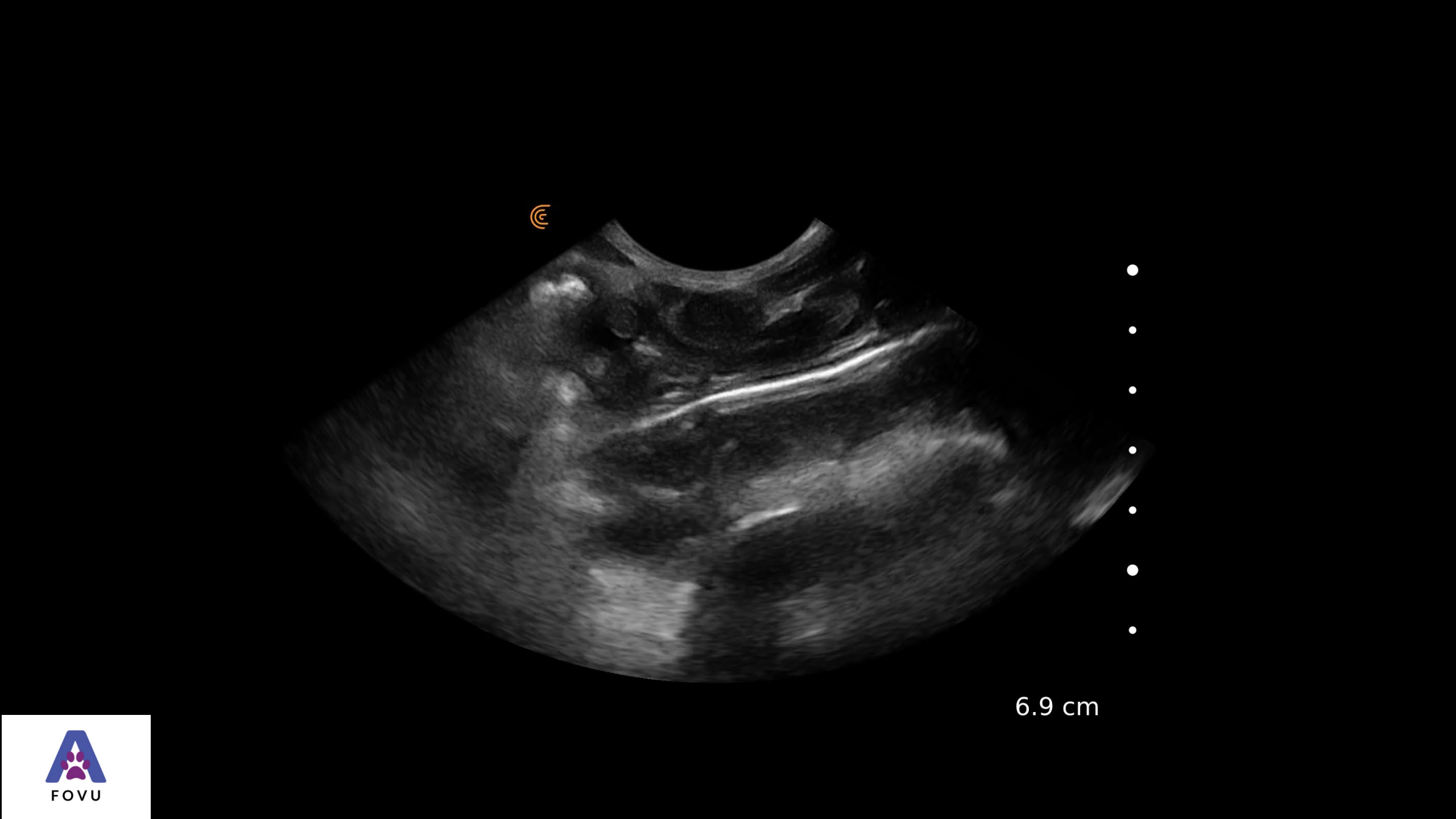
6.9 cm

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3.4 cm


3.4 cm

Findings and FNA preparation

- Thickened muscularis layer throughout the jejunum
- Enlarged hypoechoic jejunal lymph nodes

- Find the shortest route
- Assess surrounding organs
- Assess local vasculature
- Check area post FNA

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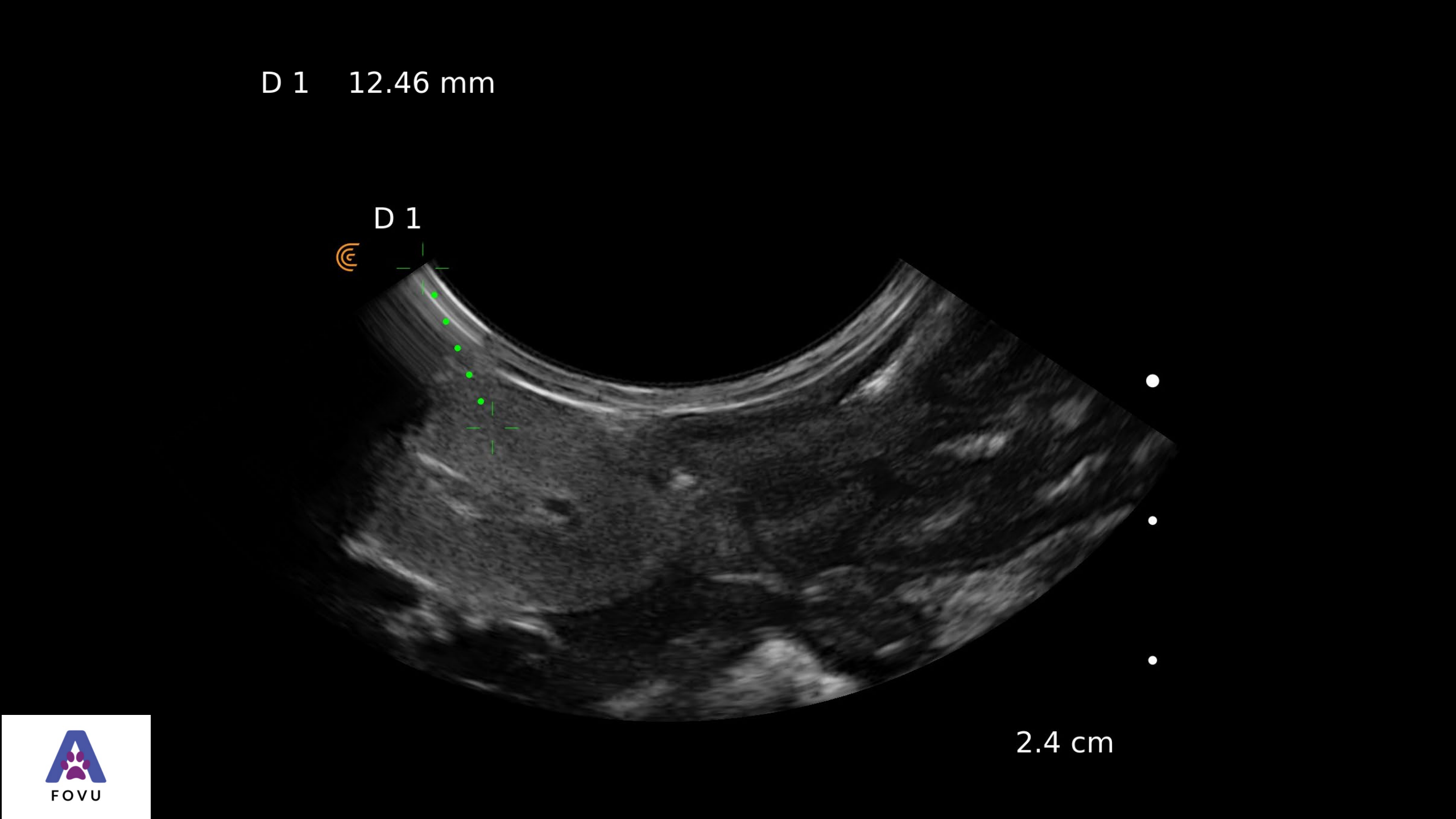
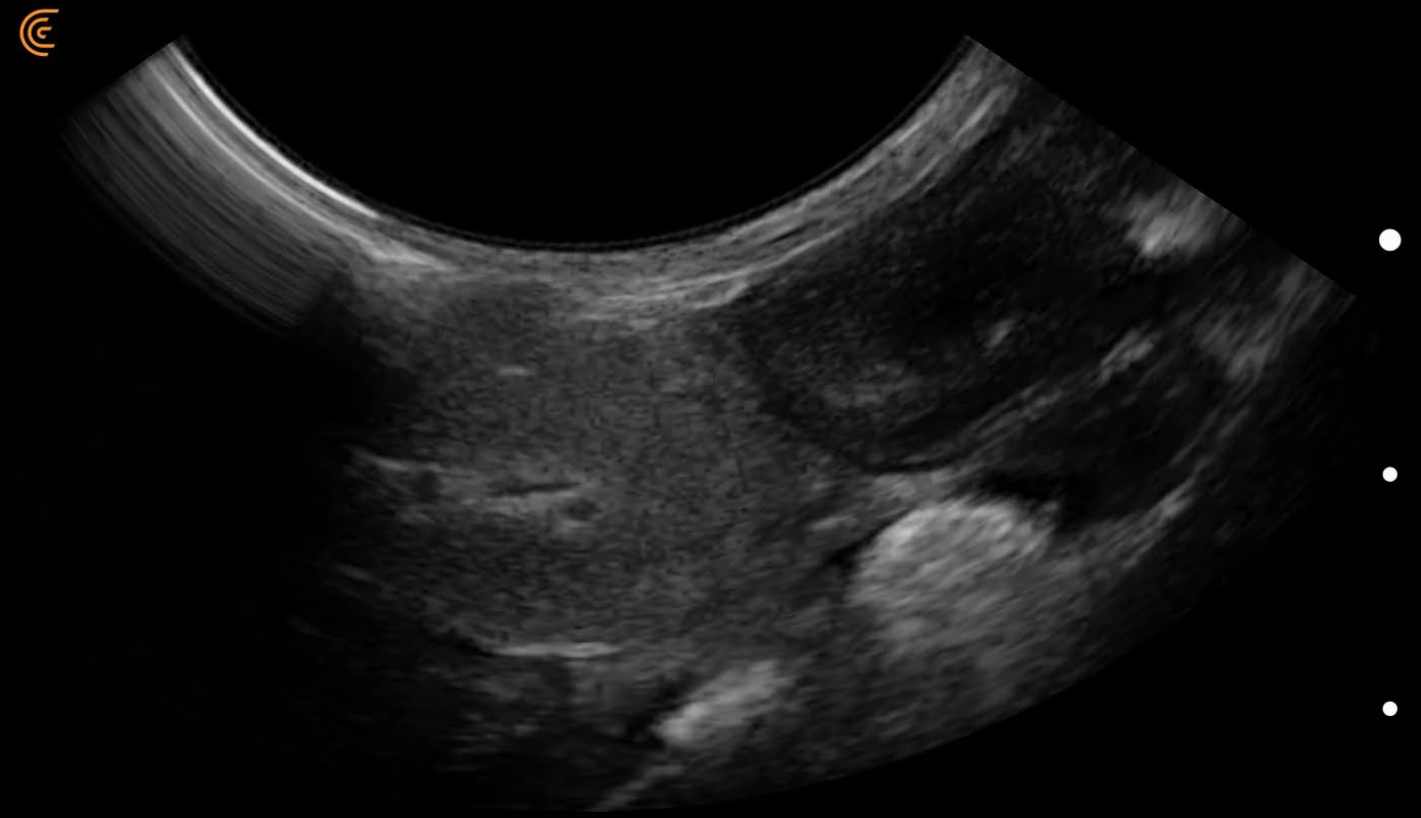

D 1 12.46 mm
D 1
2.4 cm


2.4 cm



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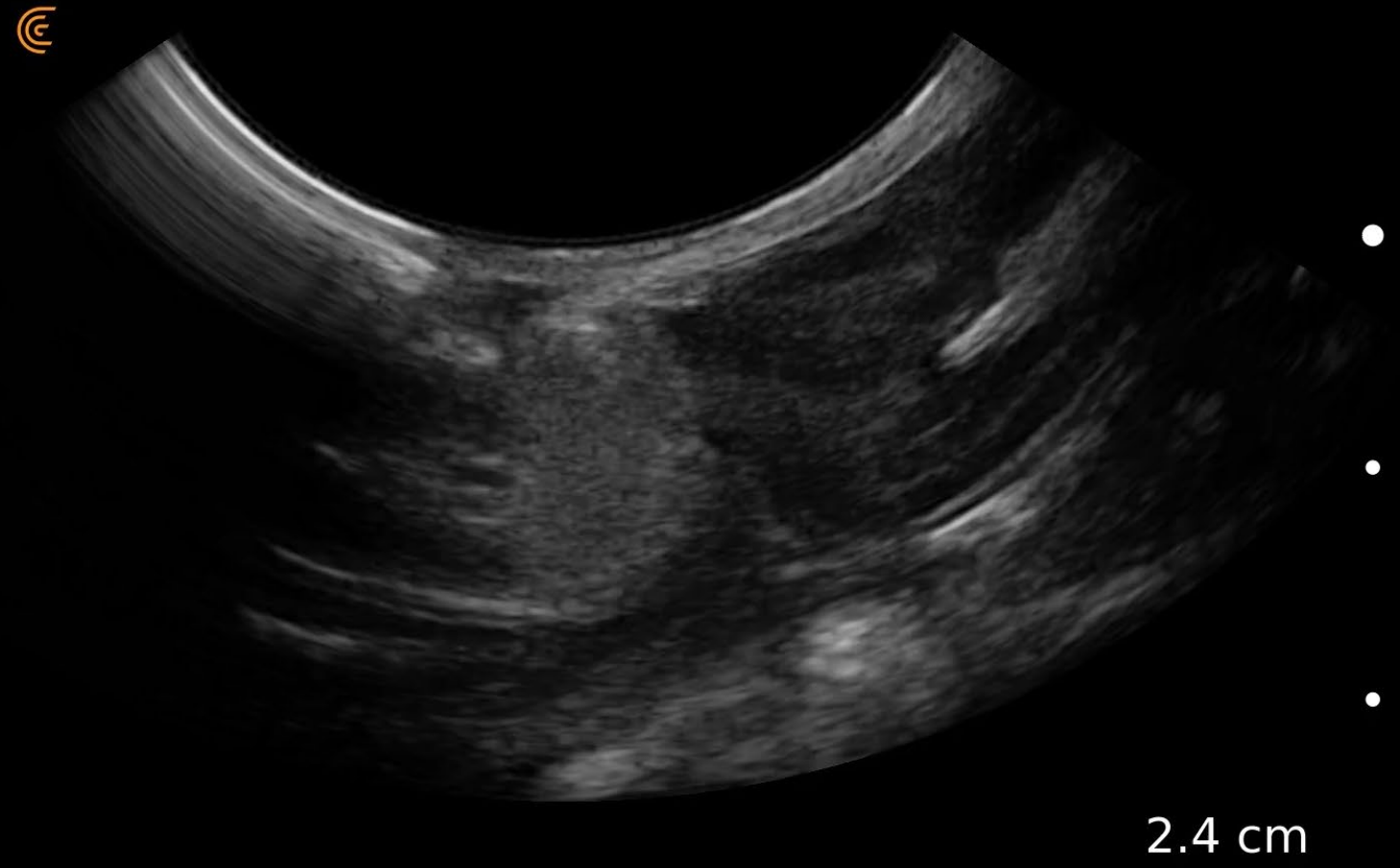

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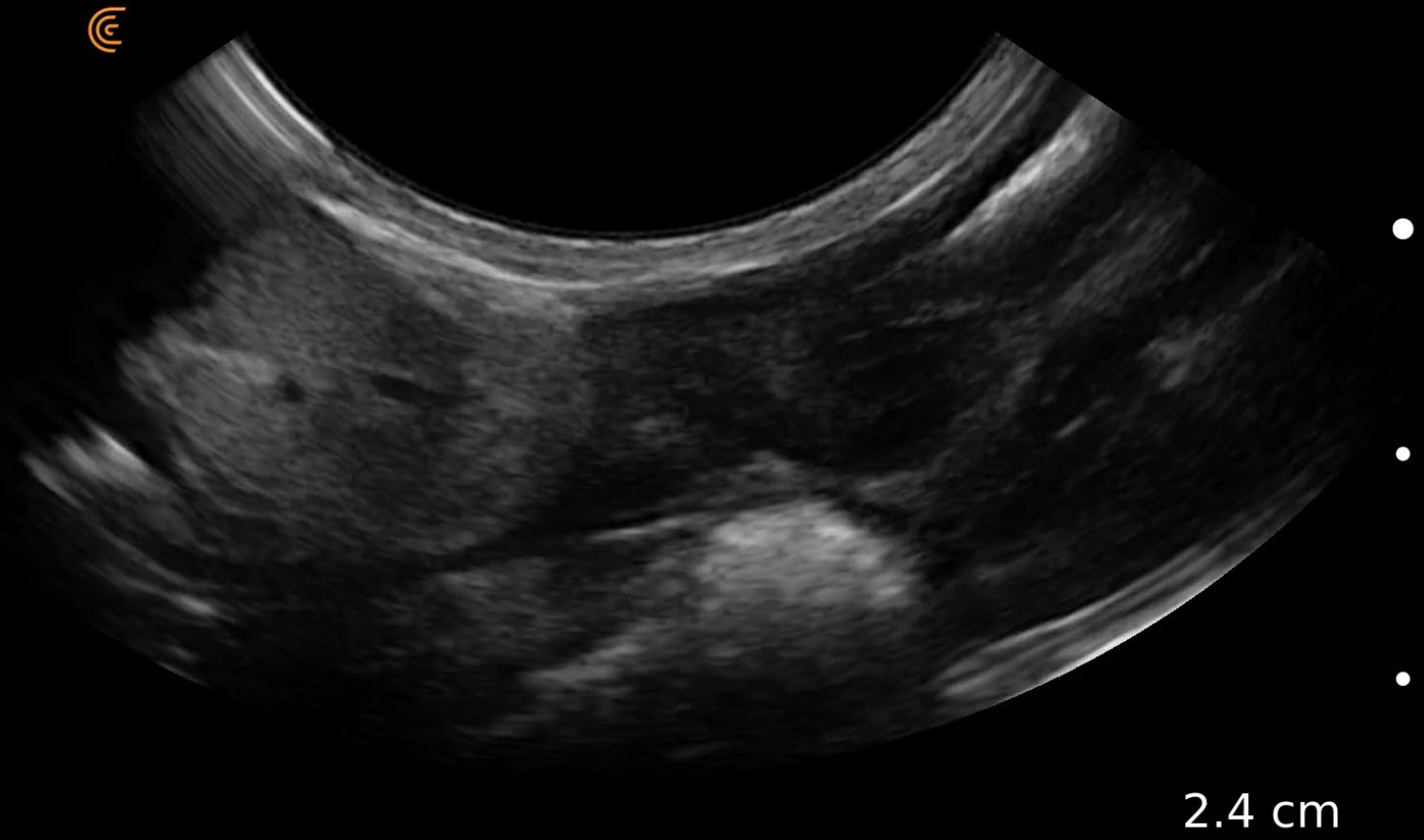

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2.4 cm

FNA result

- FNA of lymph node – mild hyperplasia

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Case 2

- Signalment: Mn, 11yo, 4.8kg, DSH cat
- History: Recent pancreatitis

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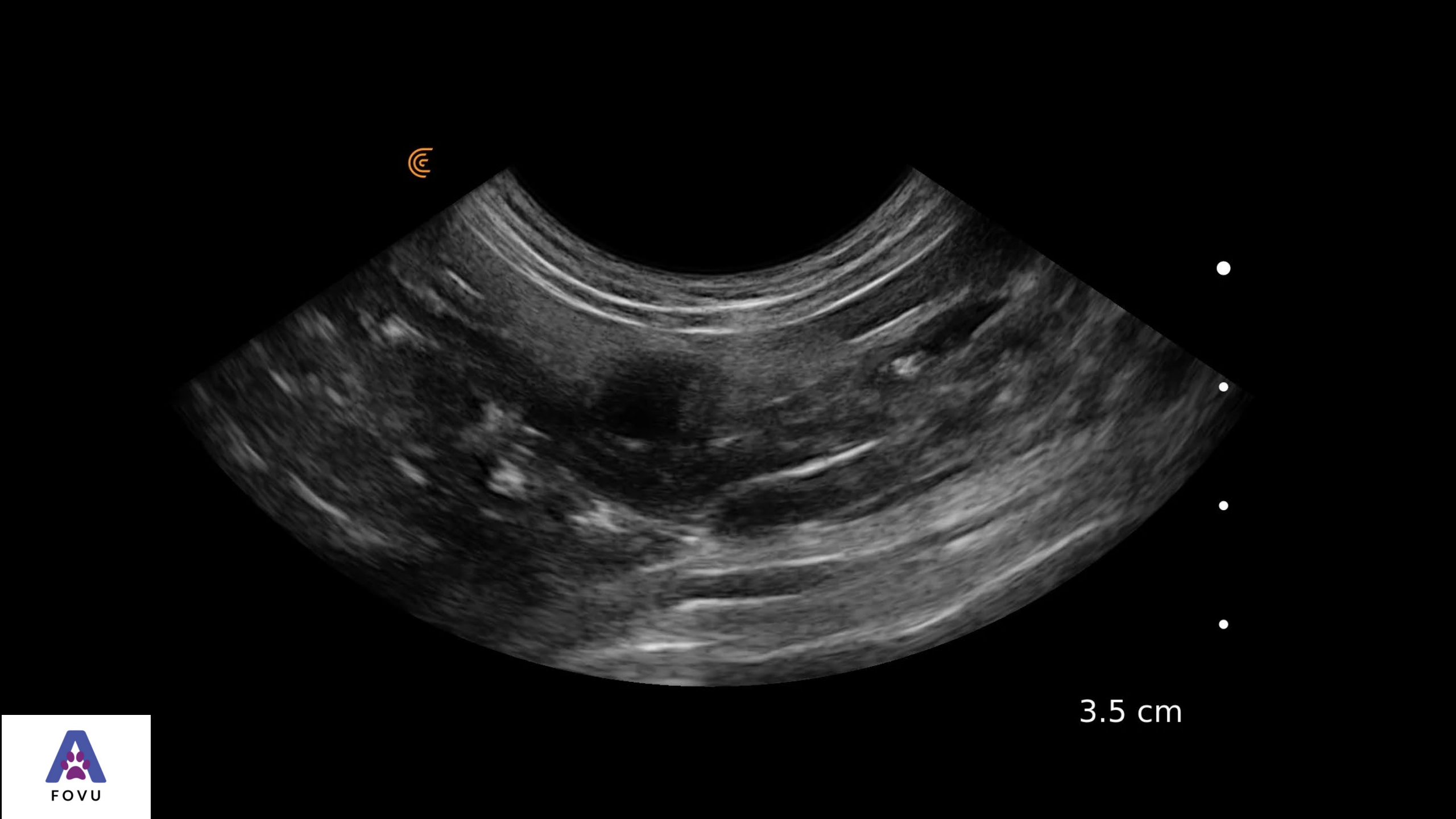
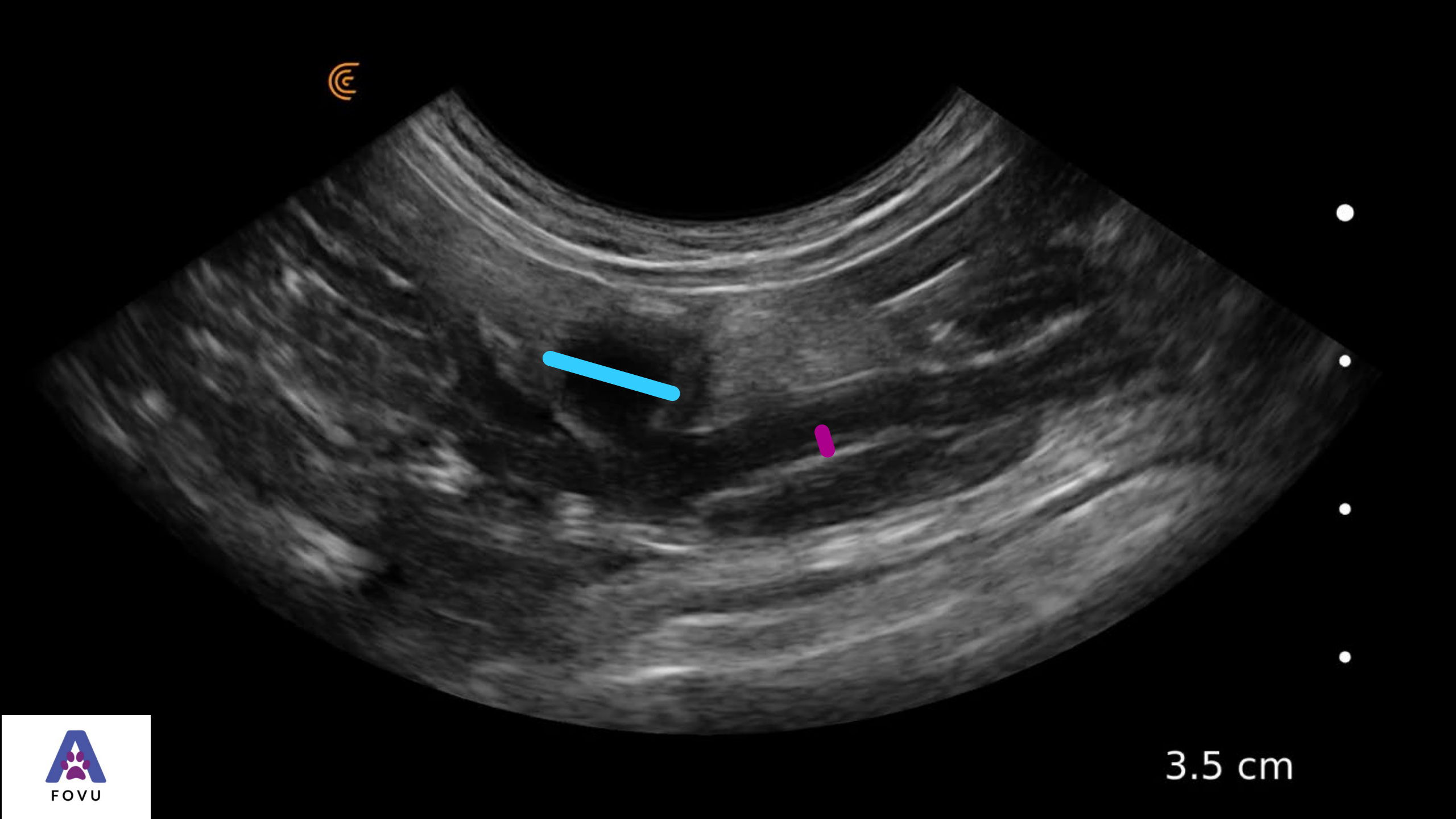
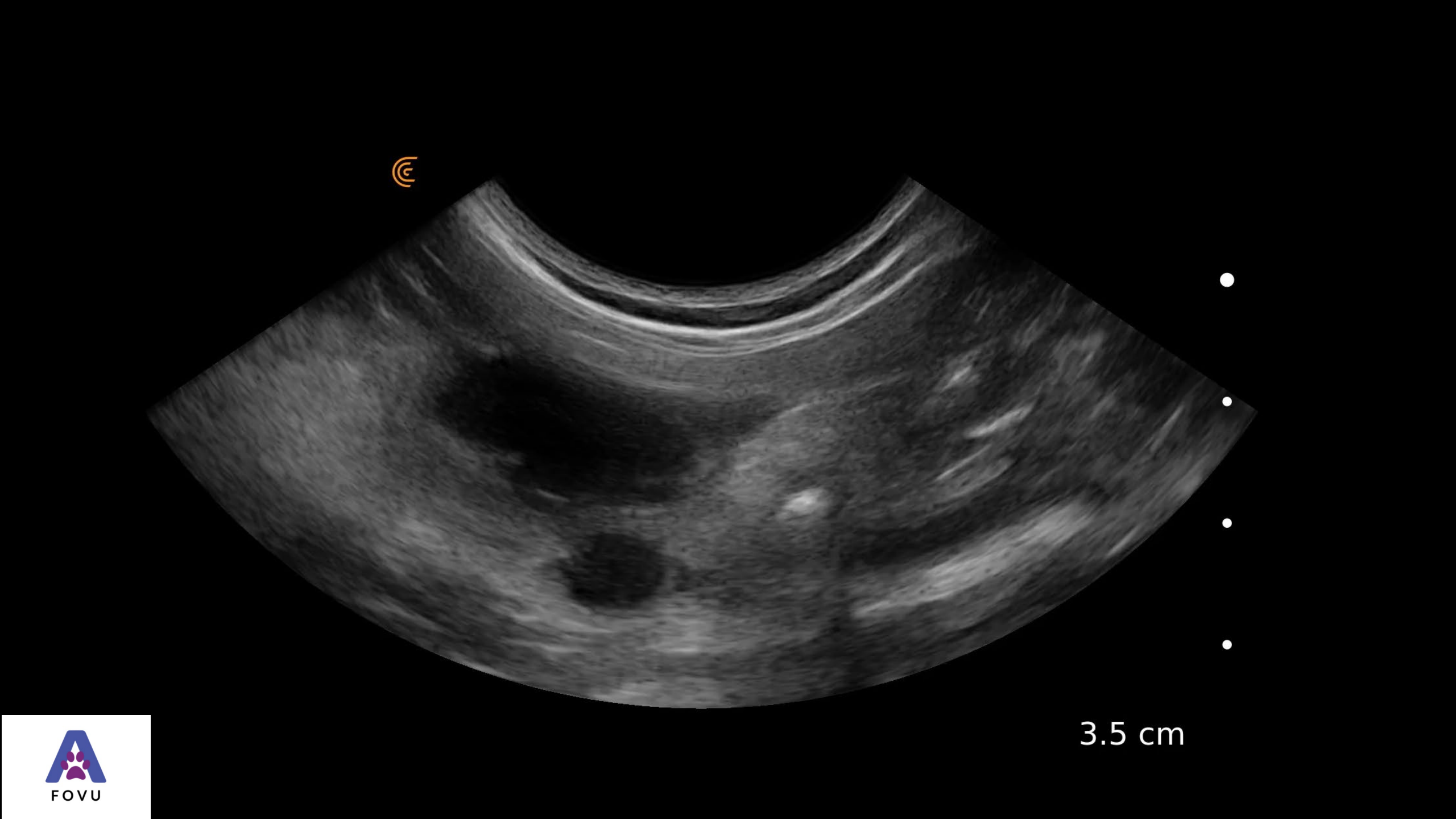

3.5 cm


3.5 cm


3.5 cm


3.5 cm


3.5 cm

Findings and FNA Preparation

- Focal mass associated with jejunum

- Shortest route
- Avoid small intestine
- Avoid blood vessels
- Check post FNA

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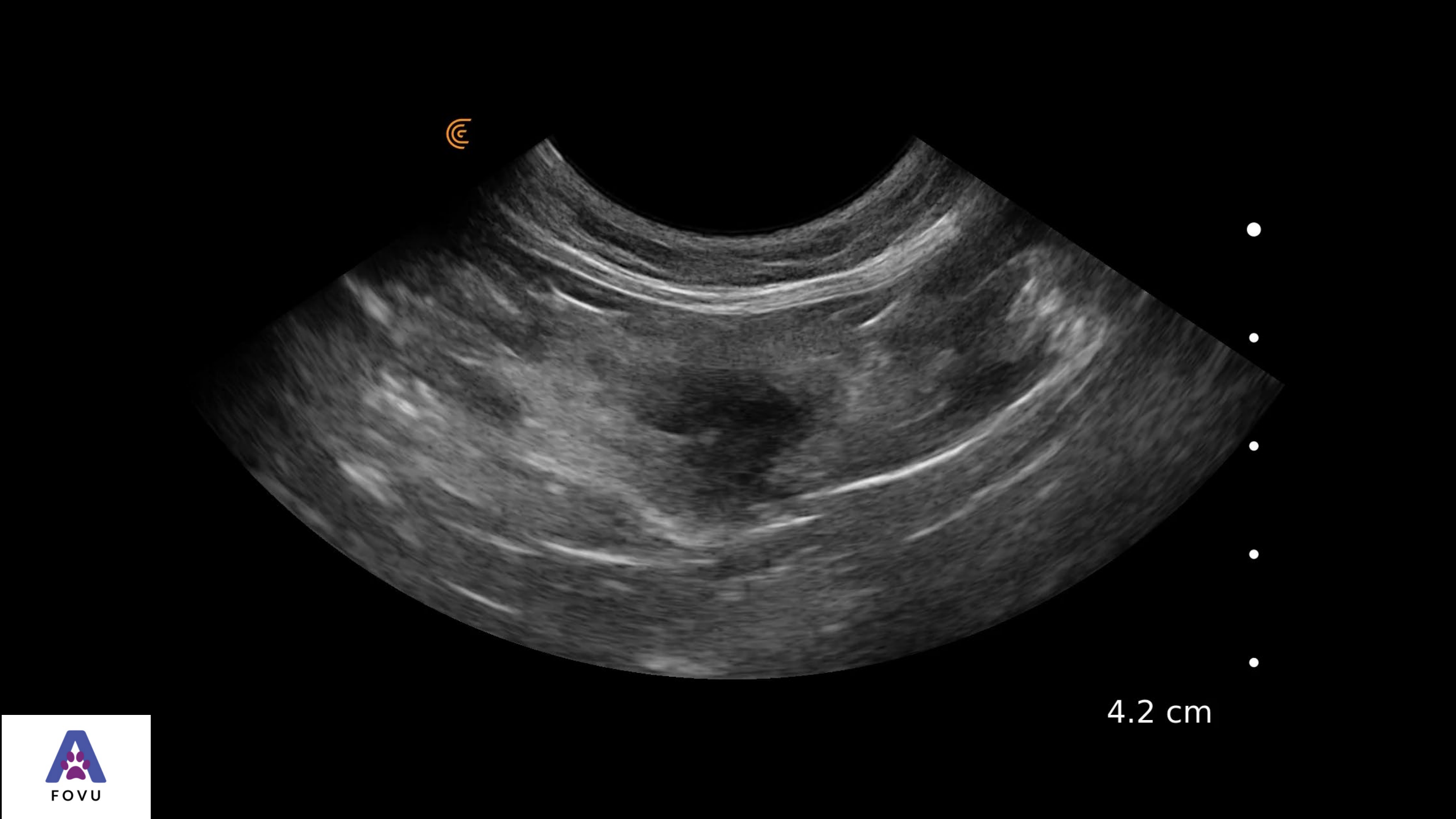
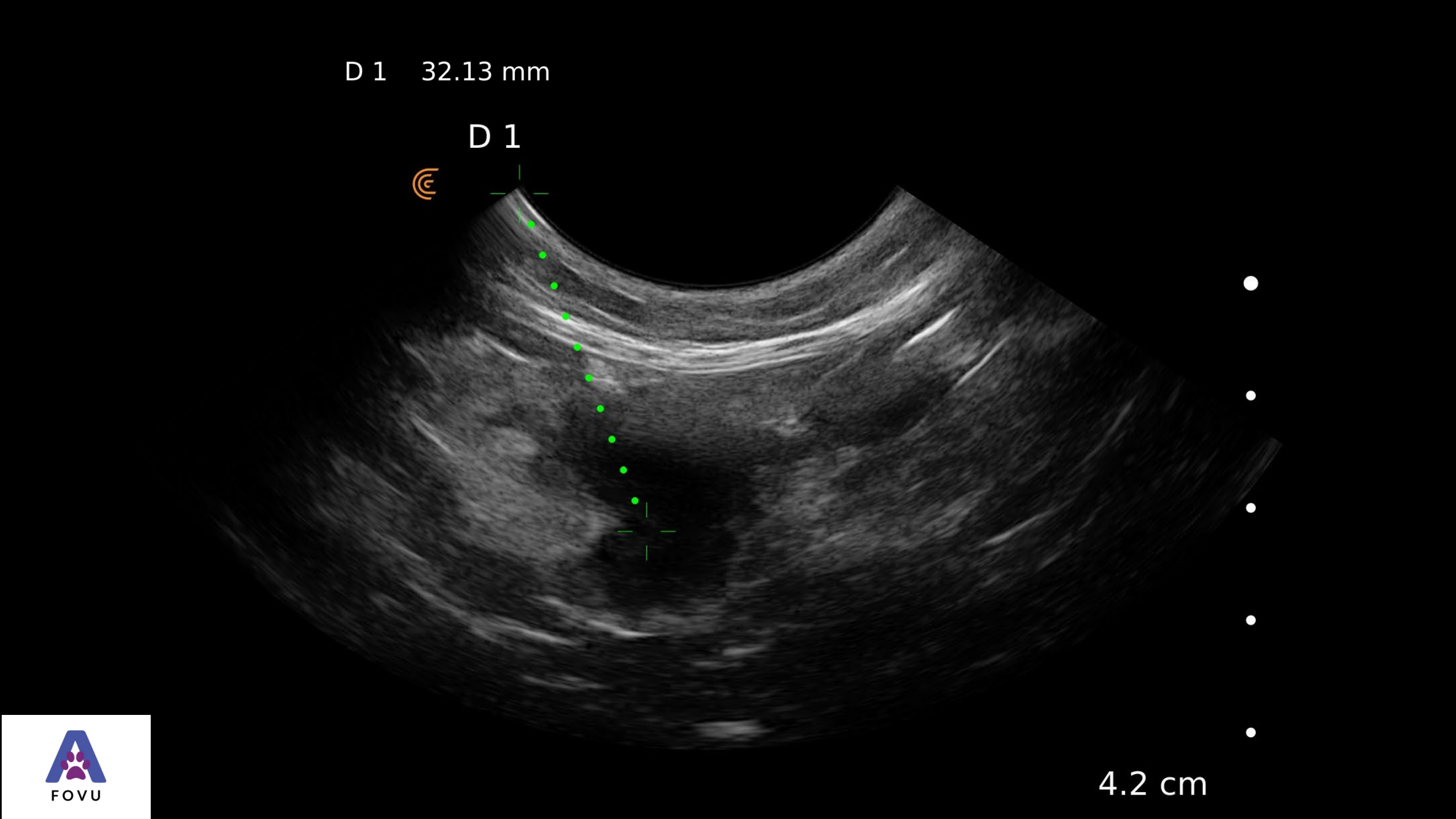
3.5 cm


4.2 cm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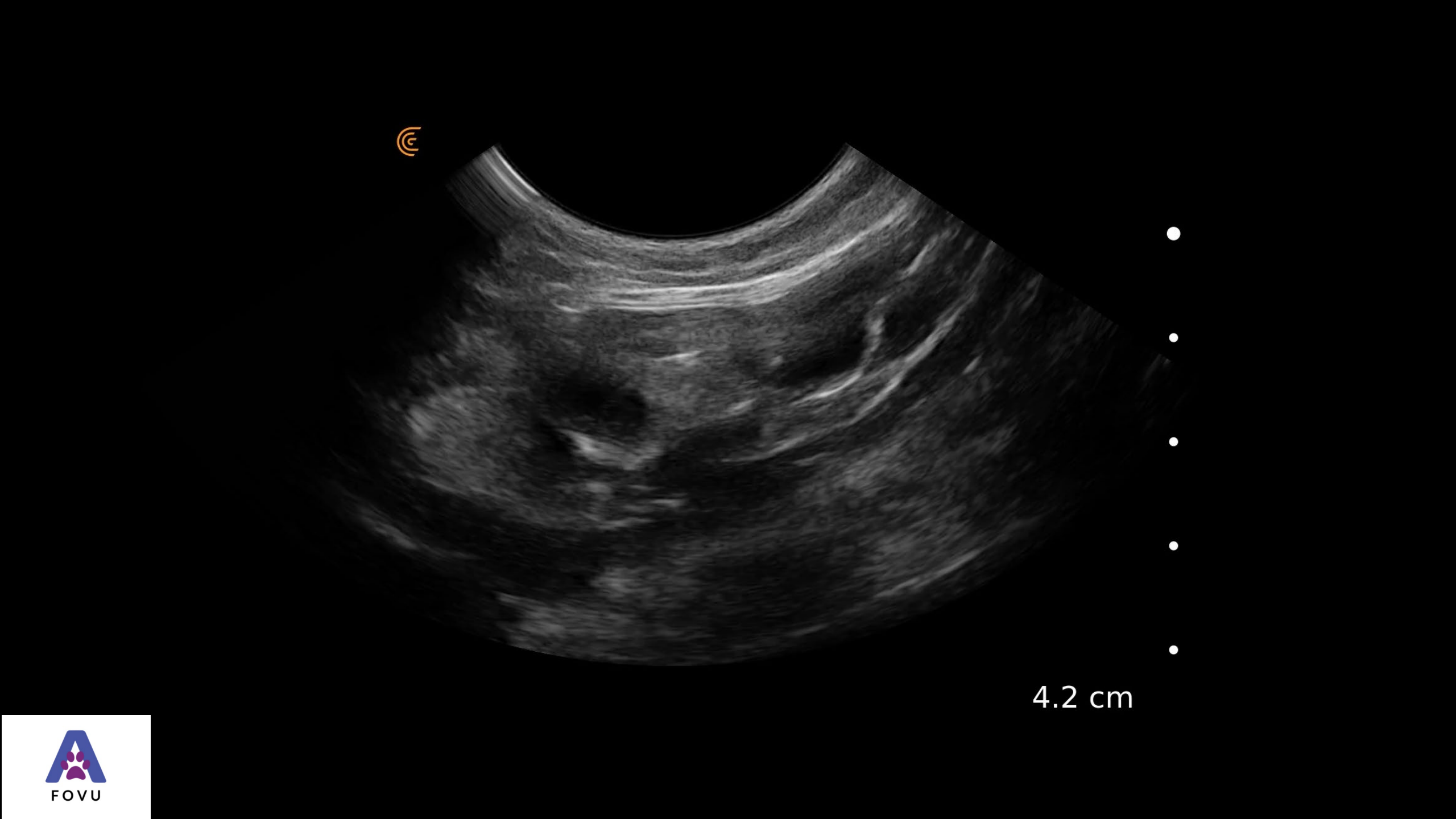
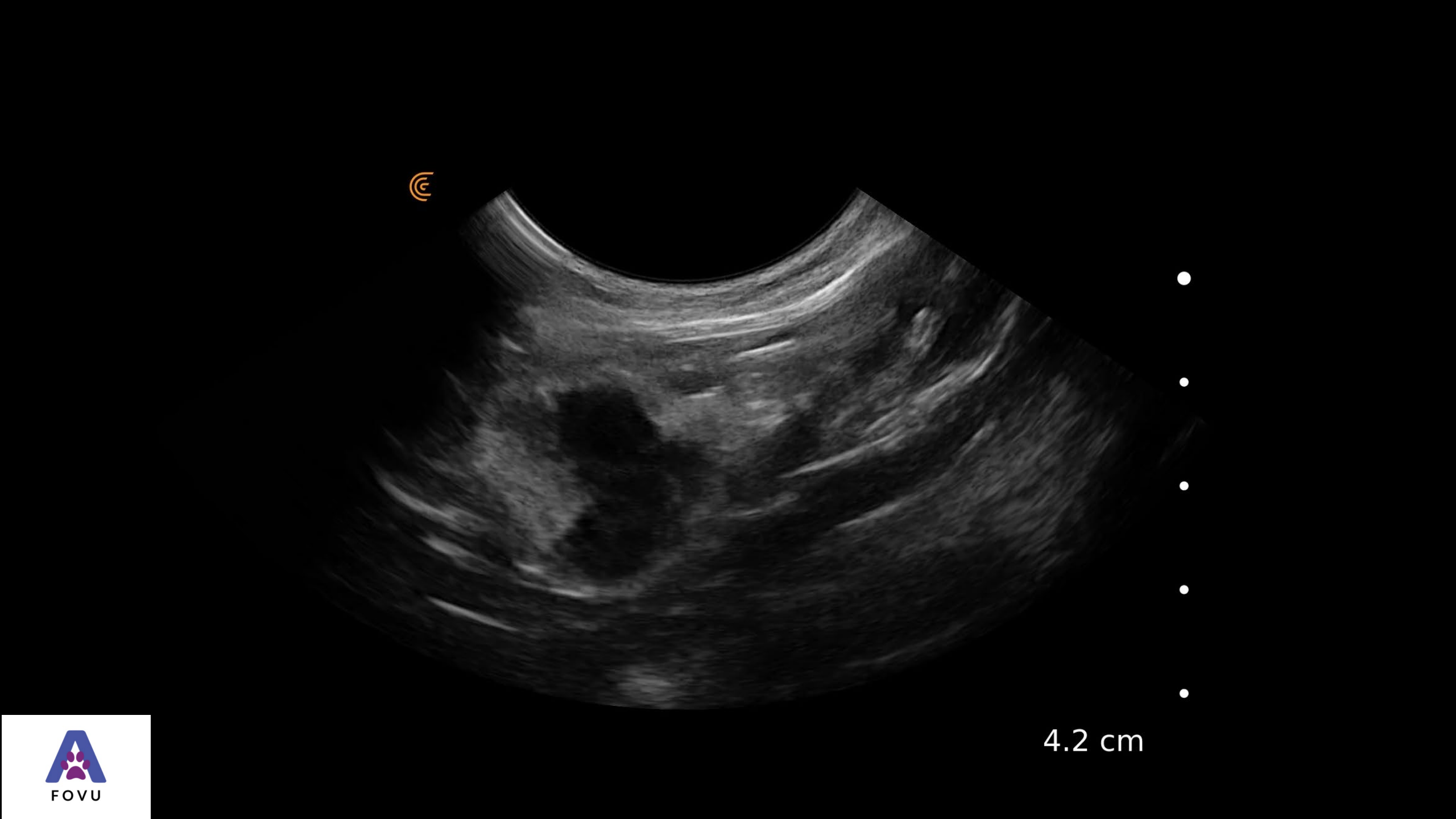
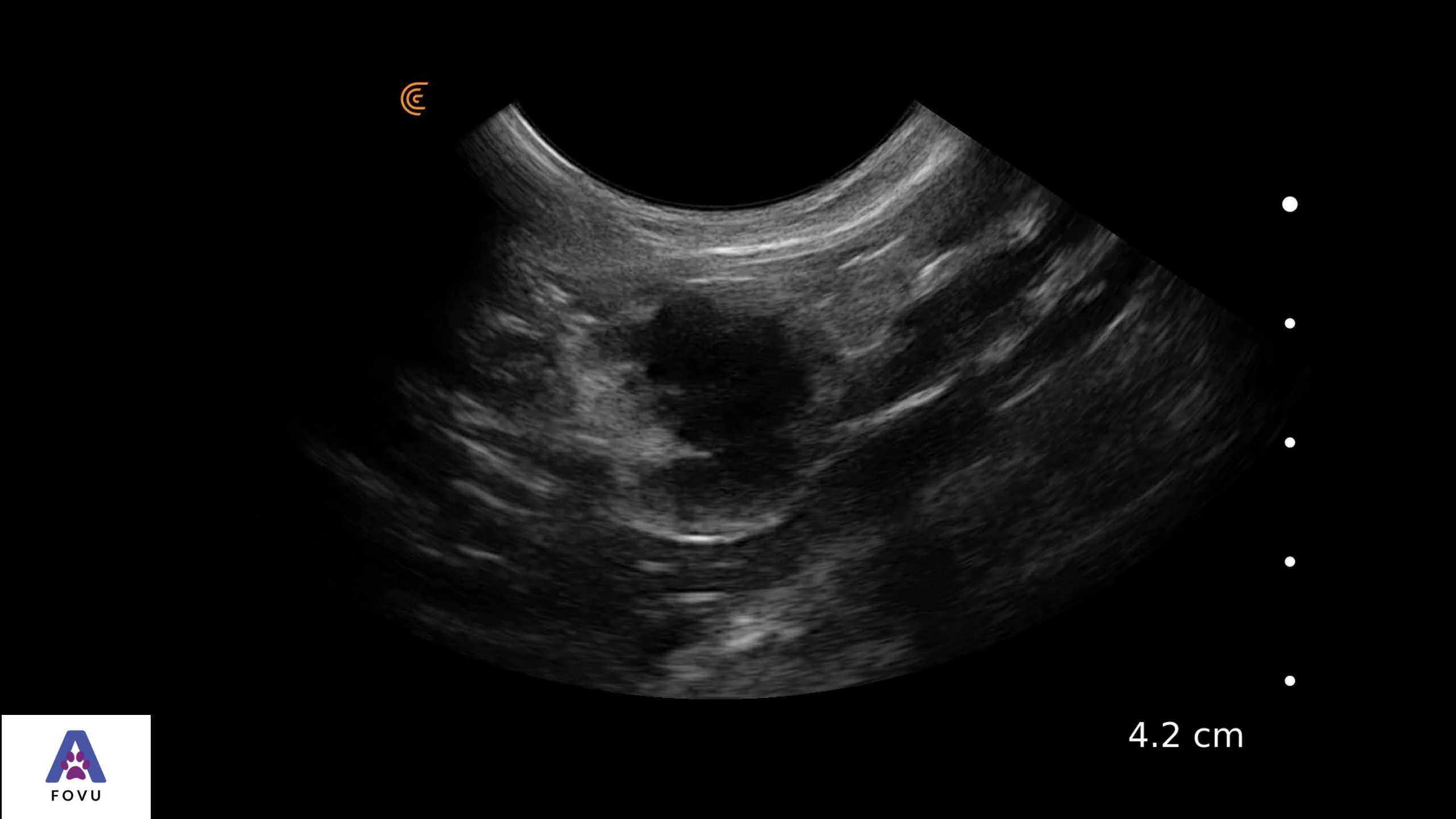
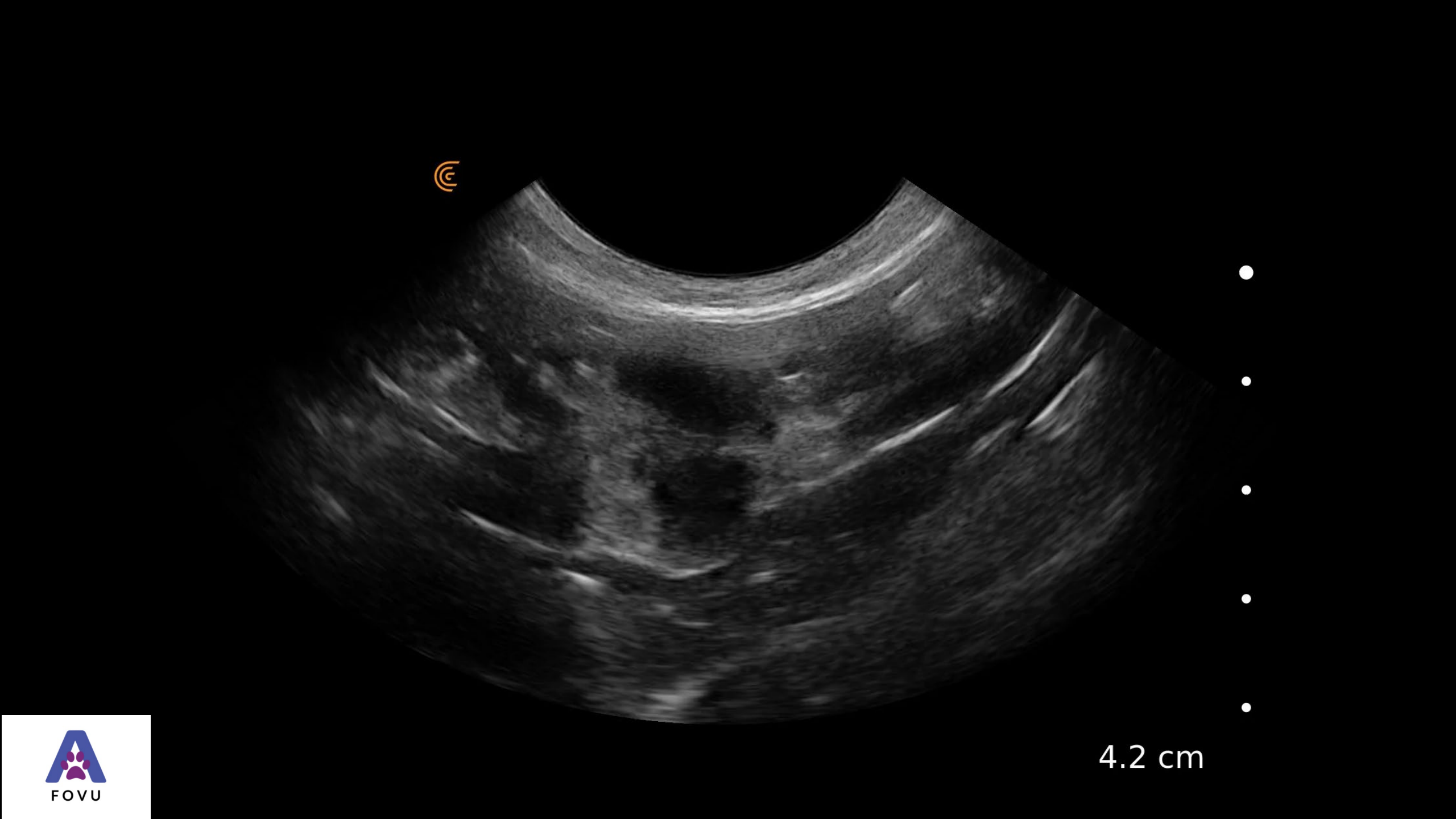
D 1
4.2 cm


4.2 cm


4.2 cm


4.2 cm


4.2 cm

FNA results

- Cytology revealed a mast cell tumour
- Third most common intestinal neoplasm in cats after lymphoma and carcinoma
- Metastases are common to local draining lymph nodes and liver

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What are the take home messages today?

- **Patient preparation**
  - Don’t forget to wipe away all the ultrasound gel
- **How to take the sample and how to practice**
  - FNA – woodpecker technique
  - Practice in simulators initially, then cystocentesis and then FNA
- **Slide preparation**
  - Squash technique
- **Looking after your patient post sampling**
  - Scan immediately post to look for any free fluid
  - Scan 30 minutes later to check no free fluid
- **PRACTICE PRACTICE PRACTICE!**

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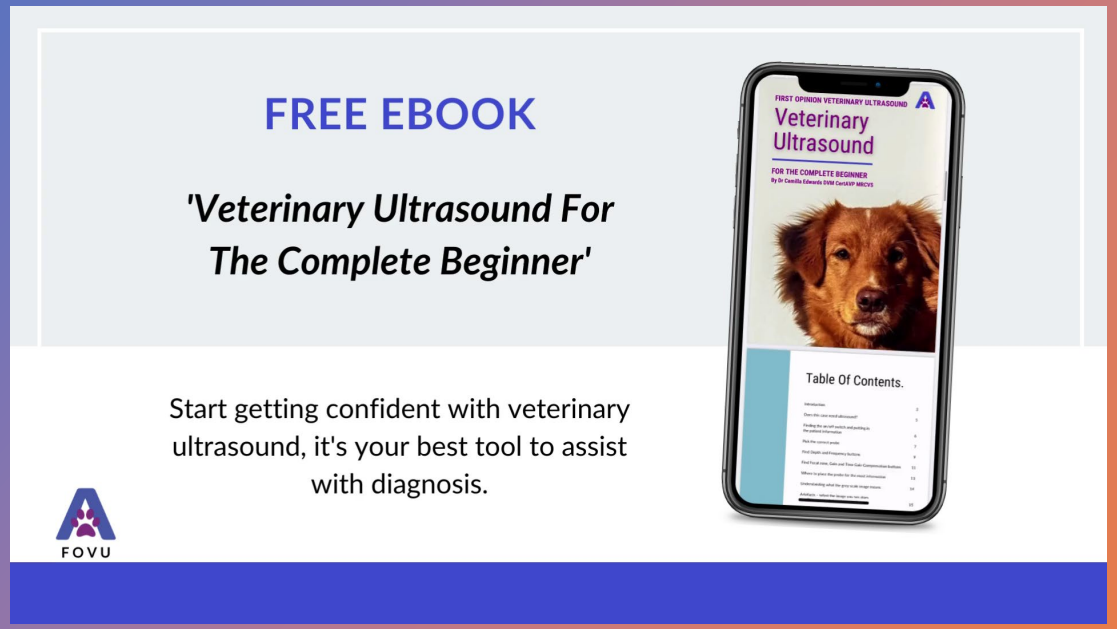
Thank you!



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Get in touch with any questions

Camilla@fovu.co.uk

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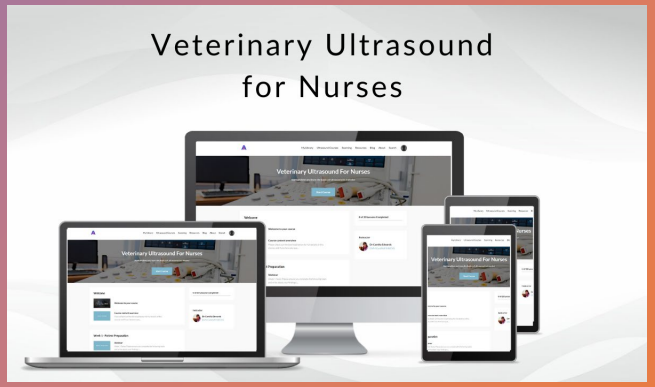

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Clinical Manager

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Poll

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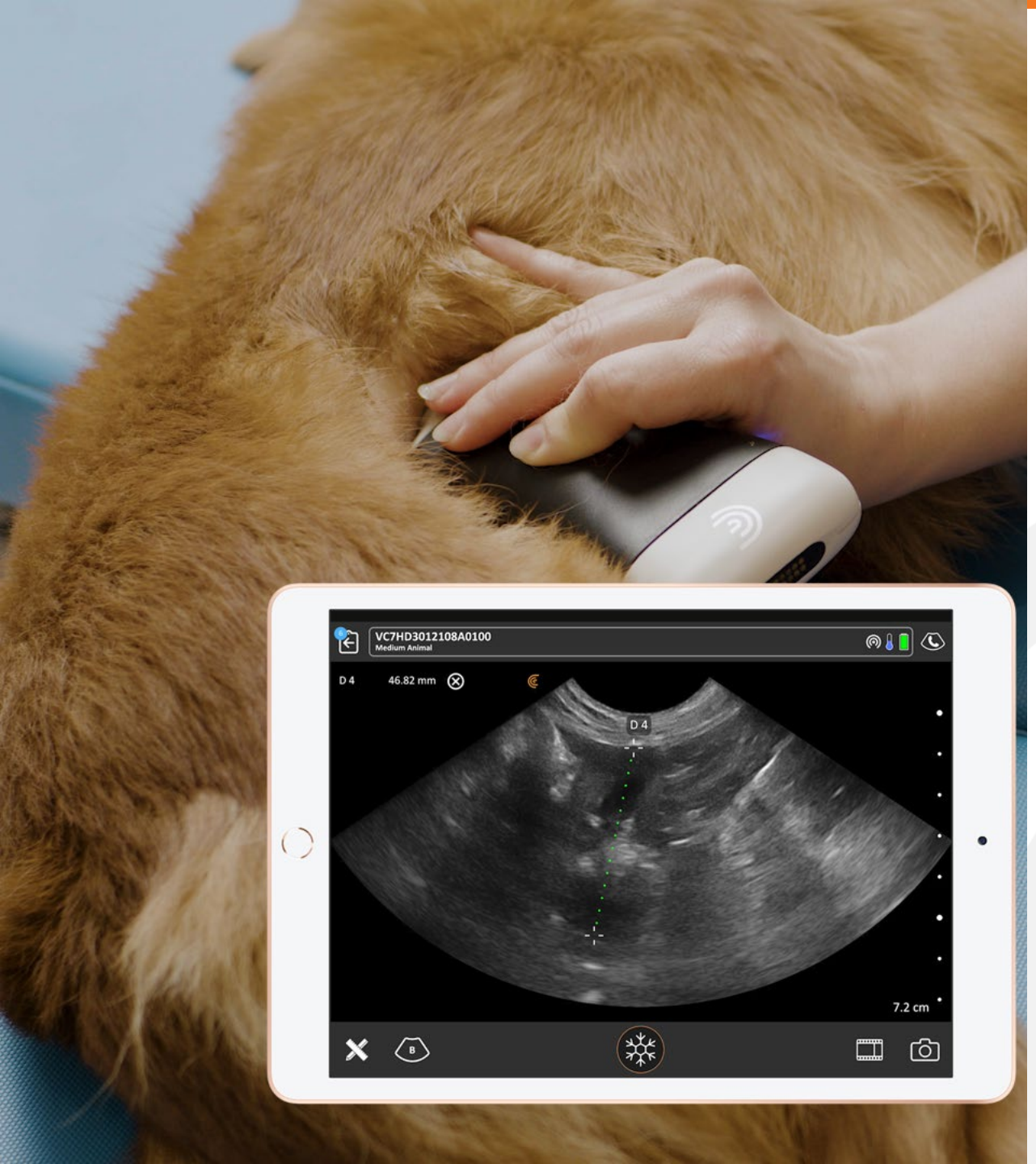

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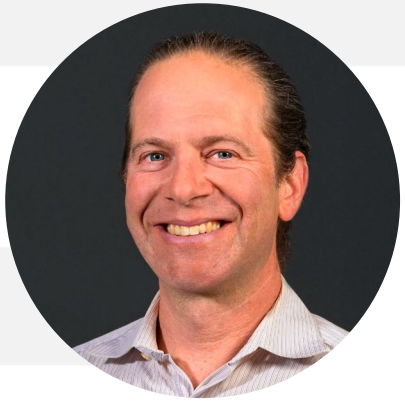
Questions?

Dr. Camilla Edwards



Dr. Oron Frenkel

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Thank you!