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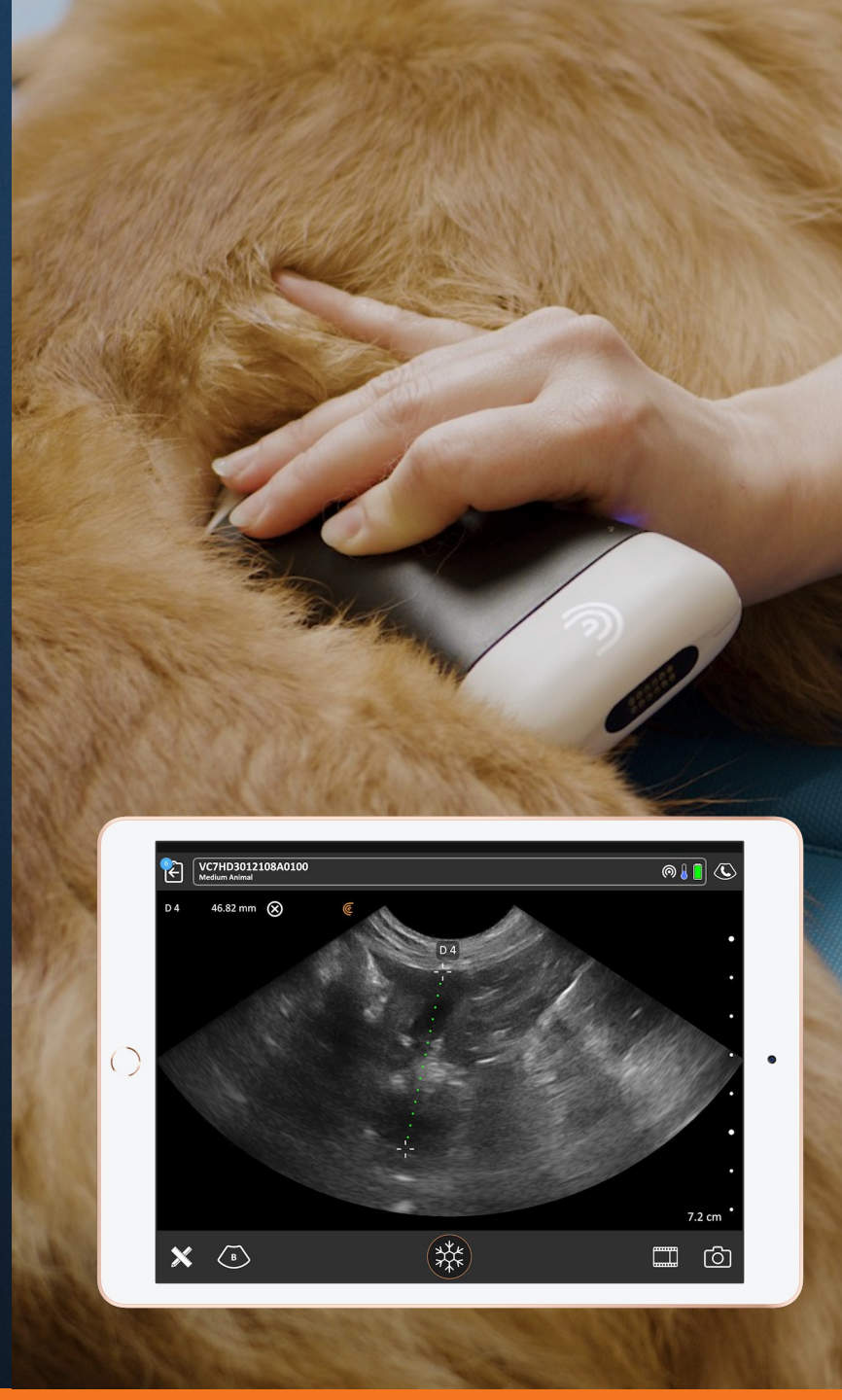
WEBINAR

Practical Small Animal Ultrasound: Guiding Diagnosis and Management of Palpable Abdominal Masses

July 2023



Your Host

Oron Frenkel, M.D., M.S.

Emergency Physician & POCUS Educator
Chairman, Clarius Medical Advisory Board

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Sonographic Evaluation of Lymph Nodes

> “Ultrasound provides non-invasive, real-time imaging information of both peripheral and more deeply seated lymph nodes… and can be evaluated by ordinary B-mode, different Doppler methods, and by contrast enhancement.”

Nyman HT, O'Brien RT. The sonographic evaluation of lymph nodes. Clin Tech Small Anim Pract. 2007 Aug;22(3):128-37. doi: 10.1053/j.ctsap.2007.05.007. PMID: 17844819.

ELSEVIER

Clinical Techniques in Small Animal Practice

Volume 22, Issue 3, August 2007, Pages 128-137

The Sonographic Evaluation of Lymph Nodes

Helena T. Nyman DVM, MSc, PhD *, Robert T. O'Brien DVM, MS, DACVR †

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Ultrasound can be used to detect and evaluate both normal and abnormal lymph nodes, as well as aid in biopsy sampling procedures, an important part of staging procedures in cancer patients. Several parameters can be evaluated using ultrasound; lymph node size, margins, echogenicity, echopattern (echotexture), acoustic transmission, presence and distribution of vascular flow, and vascular flow indices. The most diagnostically helpful include the short/long axis ratio of the lymph node, the pattern of distribution of the blood vessels within the lymph node, and to some extent the resistive and pulsatility indices. This review discusses the use of ultrasound for detecting, evaluating, and sampling peripheral, abdominal and thoracic lymph nodes in small animals.

Section snippets

General Considerations

When an abnormal lymph node is found, it is important to know the anatomic structures it drains so as to closely evaluate those regions. Conversely, one should also know which lymph nodes to interrogate when a particular organ or region is diseased. Vascular anatomic landmarks usually define the location of the lymph nodes, and knowledge of the vessel distribution allows the operator to effectively examine the regions. Ultrasound can be used to evaluate lymph node characteristics only if a…

Peripheral Lymph Nodes

The sonographic evaluation of peripheral lymph nodes is relatively new in veterinary medicine and so far there are only a few reports that describe their characteristics in dogs.2, 3, 4, 6 Improvements in ultrasound equipment with availability of high-frequency

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Feline abdominal ultrasoundgraphy: what's normal? The adrenal glands

> “Ultrasound examination of the adrenal glands can provide important information pertaining to several conditions including hyperaldosternonism and hyperadrenocorticism.”

Griffin S. Feline abdominal ultrasonography: what's normal? what's abnormal? The adrenal glands. J Feline Med Surg. 2021 Jan;23(1):33-49. doi: 10.1177/1098612X20979509. PMID: 33403910.

Review > J Feline Med Surg. 2021 Jan;23(1):33-49. doi: 10.1177/1098612X20979509.

Feline abdominal ultrasonography: what's normal? what's abnormal? The adrenal glands

Sally Griffin [1]

Affiliations + expand

PMID: 33403910 DOI: 10.1177/1098612X20979509

Abstract

Practical relevance: Abdominal ultrasound plays a vital role in the diagnostic work-up of many ca presenting to general and specialist practitioners. Ultrasound examination of the adrenal glands can provide important information pertaining to several conditions including hyperaldosteronism and hyperadrenocorticism.

Clinical challenges: Despite ultrasonography being a commonly used modality, many practitioner are not comfortable performing an ultrasound examination or interpreting the resulting images. Even for the experienced ultrasonographer, differentiating between incidental findings, such as adrenal mineralisation, and clinically significant pathological changes can be challenging.

Aim: This review, part of an occasional series on feline abdominal ultrasonography, discusses the ultrasonographic examination of the normal and diseased adrenal glands. Aimed at general practitioners who wish to improve their knowledge of and confidence in feline abdominal ultrasound, this review is accompanied by high-resolution images and videos available online as supplementary material.

Equipment: Ultrasound facilities are readily available to most practitioners, although the use of ultrasonography as a diagnostic tool is highly dependent on operator experience.

Evidence base: Information provided in this article is drawn from the published literature and the author's own clinical experience.

Keywords: Ultrasound; acromegaly; adrenal mineralisation; hyperadrenocorticism; hyperaldosteronism; hyperthyroidism; hypoadrenocorticism; phaeochromocytoma.

Similar articles

Feline abdominal ultrasonography: What's normal? What's abnormal? The pancreas.
Griffin S.
J Feline Med Surg. 2020 Mar;22(3):241-259. doi: 10.1177/1098612X20903599.

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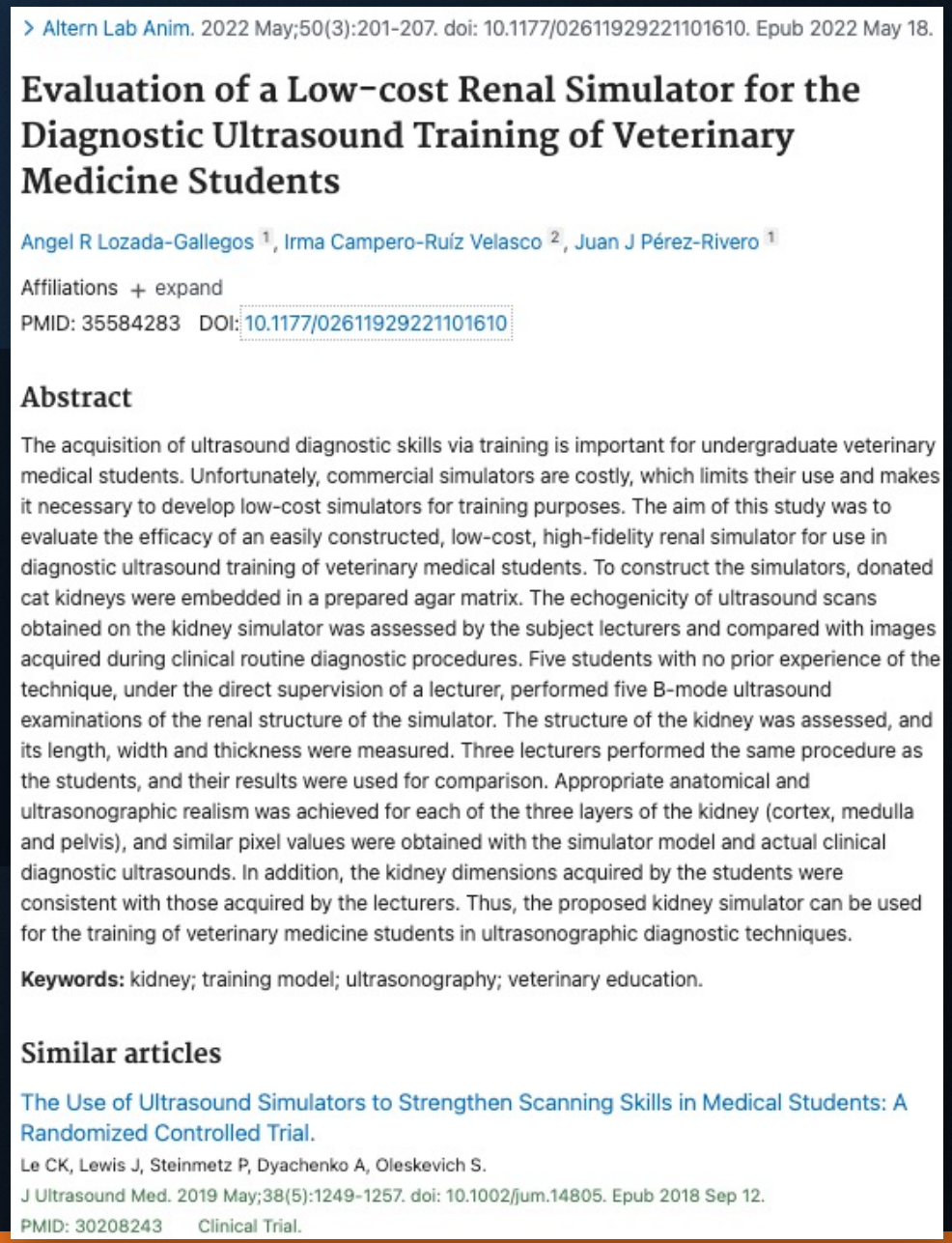
Evaluation of a Low-cost Renal Simulator for the Diagnostic Ultrasound Training of Veterinary Medicine Students

> “Unfortunately, commercial simulators are costly, which limits their use and makes it necessary to develop low-cost simulators for training purposes.”

Lozada-Gallegos AR, Campero-Ruíz Velasco I, Pérez-Rivero JJ. Evaluation of a Low-cost Renal Simulator for the Diagnostic Ultrasound Training of Veterinary Medicine Students. Altern Lab Anim. 2022 May;50(3):201-207. doi: 10.1177/02611929221101610. Epub 2022 May 18. PMID: 35584283.



> Altern Lab Anim. 2022 May;50(3):201-207. doi: 10.1177/02611929221101610. Epub 2022 May 18.

Evaluation of a Low-cost Renal Simulator for the Diagnostic Ultrasound Training of Veterinary Medicine Students

Angel R Lozada-Gallegos [1], Irma Campero-Ruíz Velasco [2], Juan J Pérez-Rivero [1]

Affiliations + expand

PMID: 35584283 DOI: 10.1177/02611929221101610

Abstract

The acquisition of ultrasound diagnostic skills via training is important for undergraduate veterinary medical students. Unfortunately, commercial simulators are costly, which limits their use and makes it necessary to develop low-cost simulators for training purposes. The aim of this study was to evaluate the efficacy of an easily constructed, low-cost, high-fidelity renal simulator for use in diagnostic ultrasound training of veterinary medical students. To construct the simulators, donated cat kidneys were embedded in a prepared agar matrix. The echogenicity of ultrasound scans obtained on the kidney simulator was assessed by the subject lecturers and compared with images acquired during clinical routine diagnostic procedures. Five students with no prior experience of the technique, under the direct supervision of a lecturer, performed five B-mode ultrasound examinations of the renal structure of the simulator. The structure of the kidney was assessed, and its length, width and thickness were measured. Three lecturers performed the same procedure as the students, and their results were used for comparison. Appropriate anatomical and ultrasonographic realism was achieved for each of the three layers of the kidney (cortex, medulla and pelvis), and similar pixel values were obtained with the simulator model and actual clinical diagnostic ultrasounds. In addition, the kidney dimensions acquired by the students were consistent with those acquired by the lecturers. Thus, the proposed kidney simulator can be used for the training of veterinary medicine students in ultrasonographic diagnostic techniques.

Keywords: kidney; training model; ultrasonography; veterinary education.

Similar articles

The Use of Ultrasound Simulators to Strengthen Scanning Skills in Medical Students: A Randomized Controlled Trial.

Le CK, Lewis J, Steinmetz P, Dyachenko A, Oleskevich S.

J Ultrasound Med. 2019 May;38(5):1249-1257. doi: 10.1002/jum.14805. Epub 2018 Sep 12.

PMID: 30208243 Clinical Trial.

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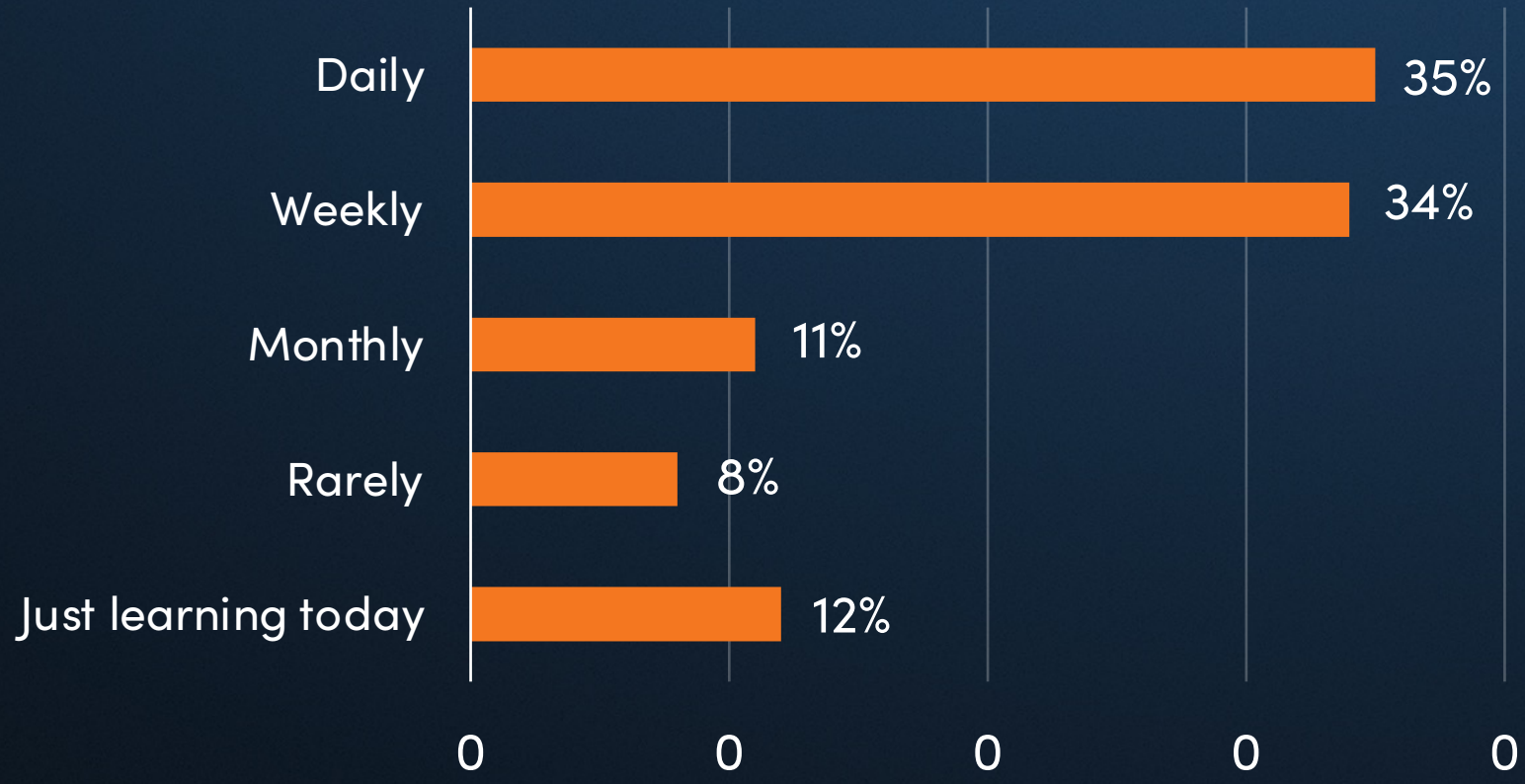
Interactive Poll

How frequently do you use ultrasound in your veterinary practice?



Your Host

Dr. Camilla Edwards, DVM, CertAVP, MRCVS

Peripatetic Veterinary Ultrasonographer | Educator | First Opinion Veterinary Ultrasound

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PRACTICAL SMALL ANIMAL ULTRASOUND

Guiding Diagnosis and Management of Palpable Abdominal Masses

Dr Camilla Edwards DVM CertAVP MRCVS

FOVU

First Opinion Veterinary Ultrasound

Palpable mass

- Palpating location
- Sometimes presume the specific organ
- Combine with history and signalment
- So how can ultrasound help?

How can ultrasound help?

- Determine the exact organ the mass is associated with
- Can characterise the mass
- Local invasion or evidence of metastatic spread
- Ultrasound guided sampling can give a definitive diagnosis and prognosis

How can we determine the organ of origin of the mass

Full systemic exam

- Rule out organs
- Rule in organs

Don’t miss significant pathology

Case 1

Signalment

12yo, Mn, DSH

History

Deteriorating body condition score, weight loss, previous UTIs, no hair regrowth, pot belly, mass palpated mid abdomen, diabetic.

Case 1

01

Case 1

02

Case 1

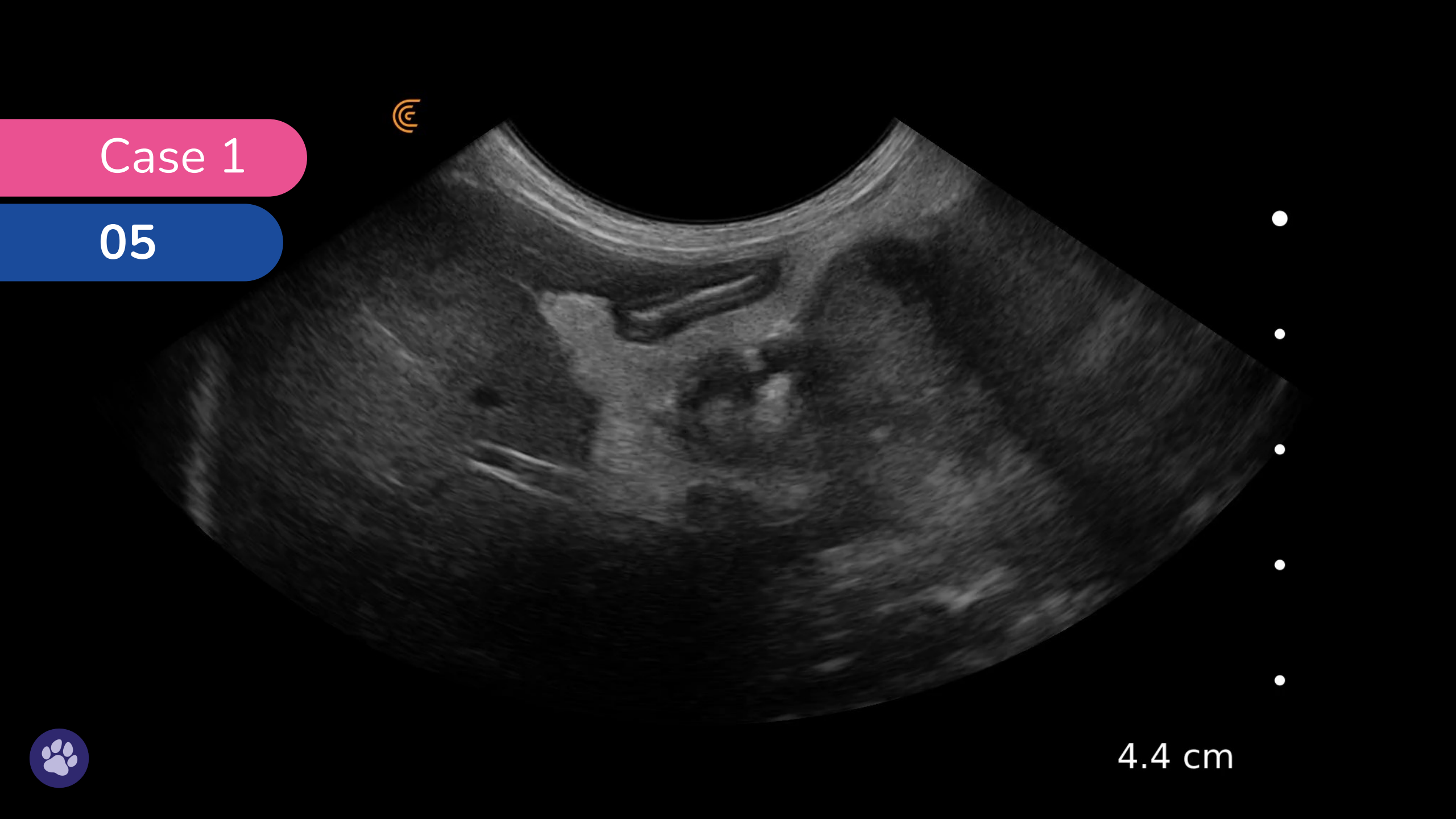
03

Case 1

04

Case 1

05



Case 1

Outcome

- Evidence of massive changes in the pancreas.
- The pancreas was very abnormal - heterogenous with cystic structures seen throughout, well defined but bumpy margins and grossly enlarged causing the mass palpated.
- No normal pancreas was seen.

How can ultrasound help

to characterize the mass?

- Size/Shape
- Position
- Echogenicity
- Echotexture
- Edge
- Distribution
- Circulation

Video


VC7HD3012108A0100
Medium Animal
MI 1.10
TIS 0.14
TIB 0.21
100%
6 cm
B

Case 2

Signalment

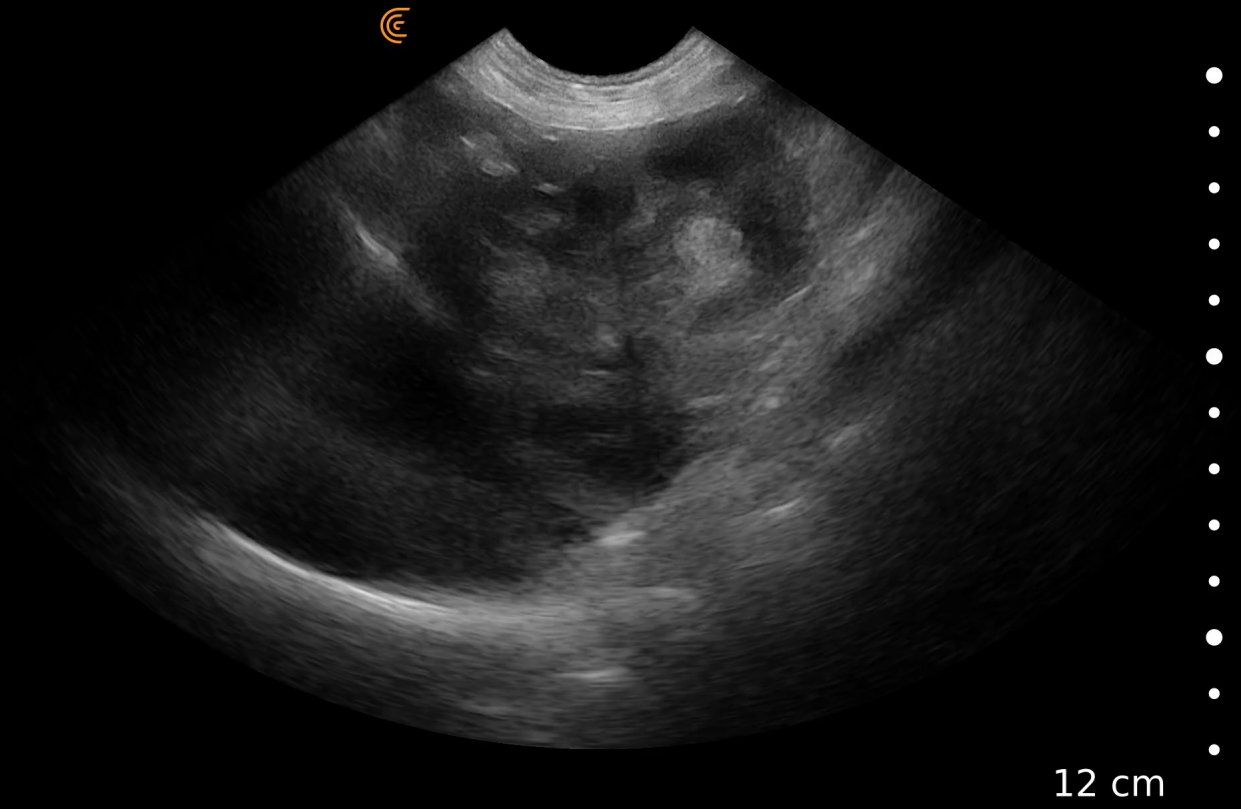
Boxer, 7yo, Fn

History

History of inappropriate urination, vomiting, PU/PD, haematuria, proteinuria, abnormal right kidney on scan

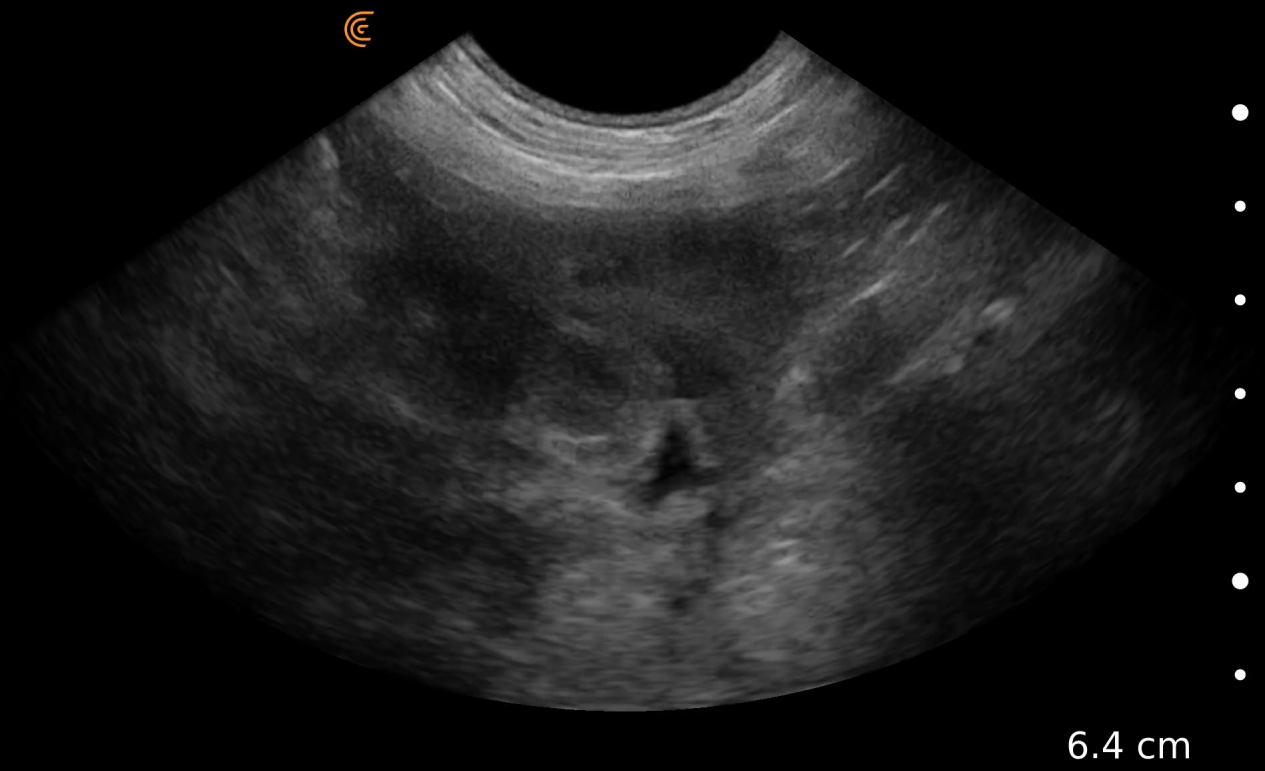
Case 2

01



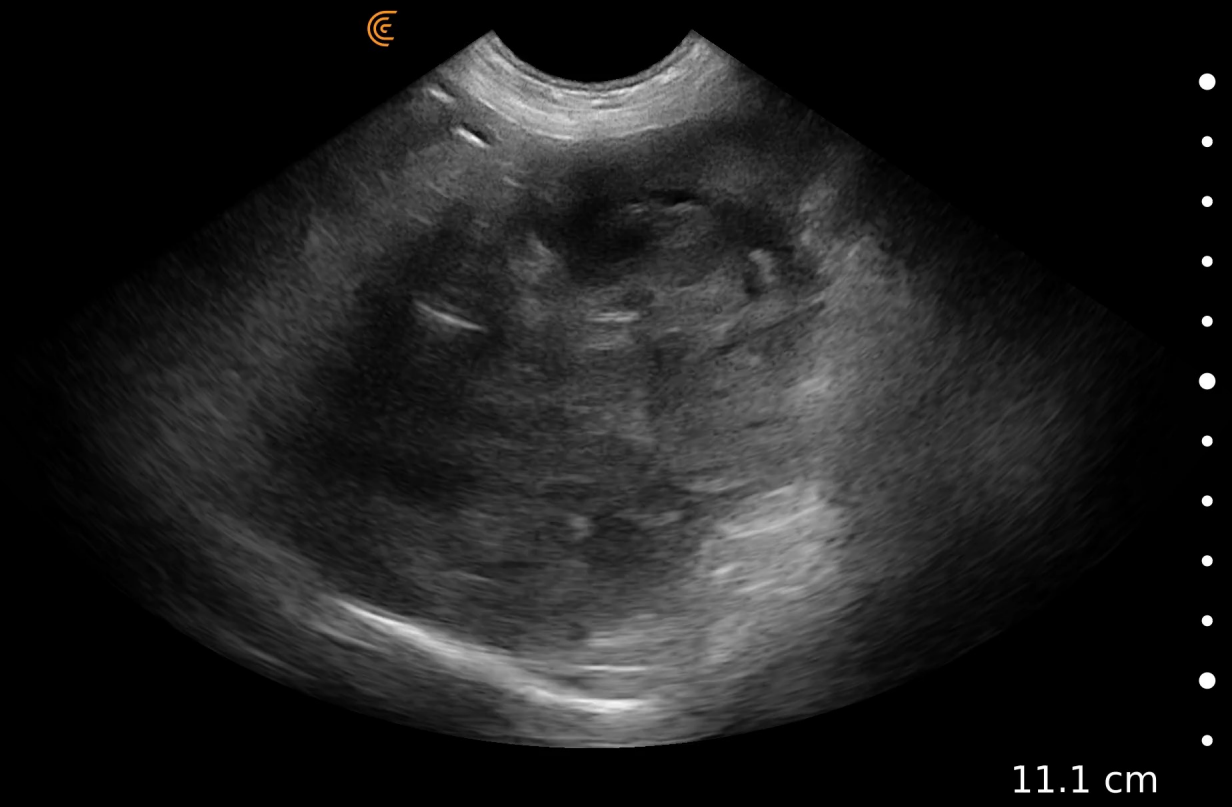
Case 2

02



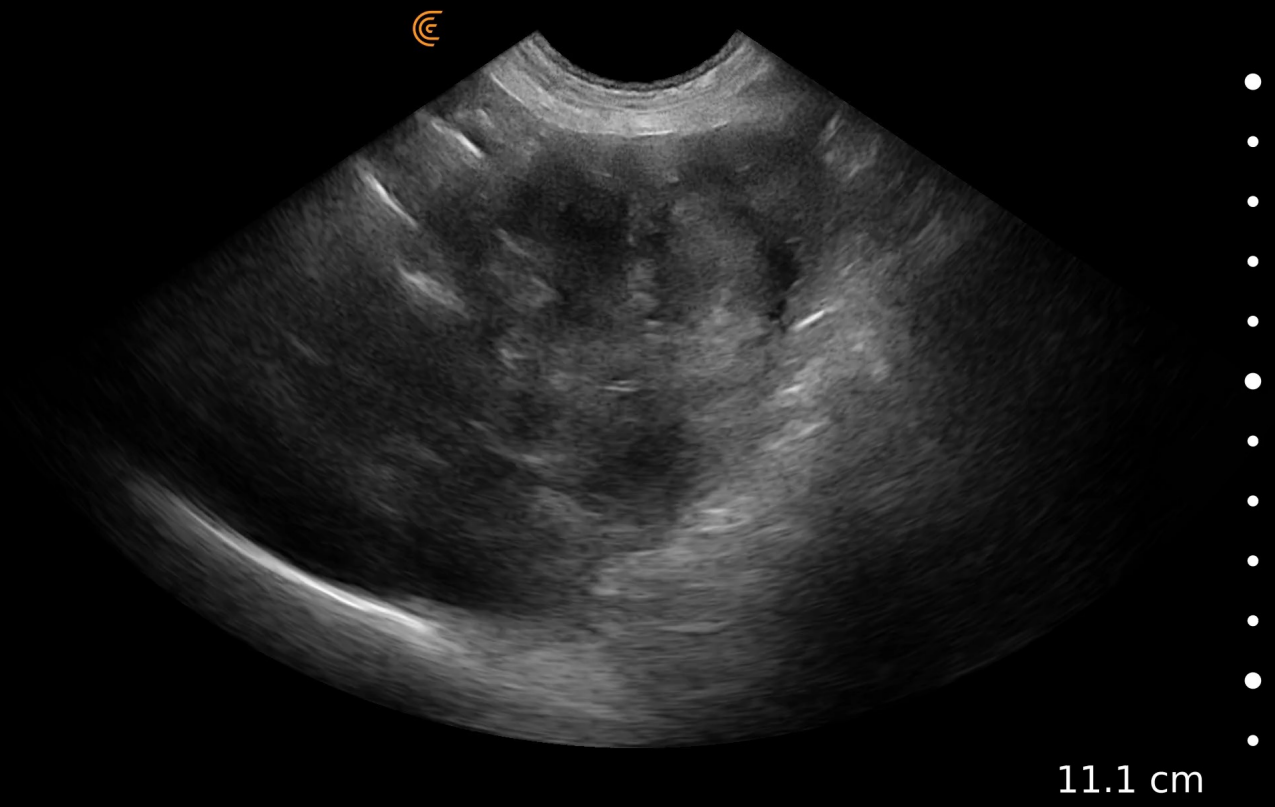
Case 2

03



Case 2

04



Case 2

Outcome

- Right kidney has an associated mass
- Size – 8cm x 5cm
- Shape – large oval mass extending ventrally and medially from right kidney
- Position – normal position of right kidney
- Echogenicity/echotexture – hyperechoic to medulla, heterogenous
- Edge – Margin of the mass is uneven
- Distribution – focal – associated with the medulla of the right kidney
- Circulation – some circulation seen – not very vascular
- Fine needle aspirate of the mass taken – renal carcinoma
- Plan is surgery to remove affected kidney

Ultrasound is useful to investigate

spread or invasion of local organs or lymph nodes

- Using ultrasound you can assess for local invasion
- Observe in two planes
- Use colour flow mapping Doppler
- Assess all organs systematically to look for potential metastatic spread

Case 3

Signalment

11yo, Mn, Cockerpoo

History

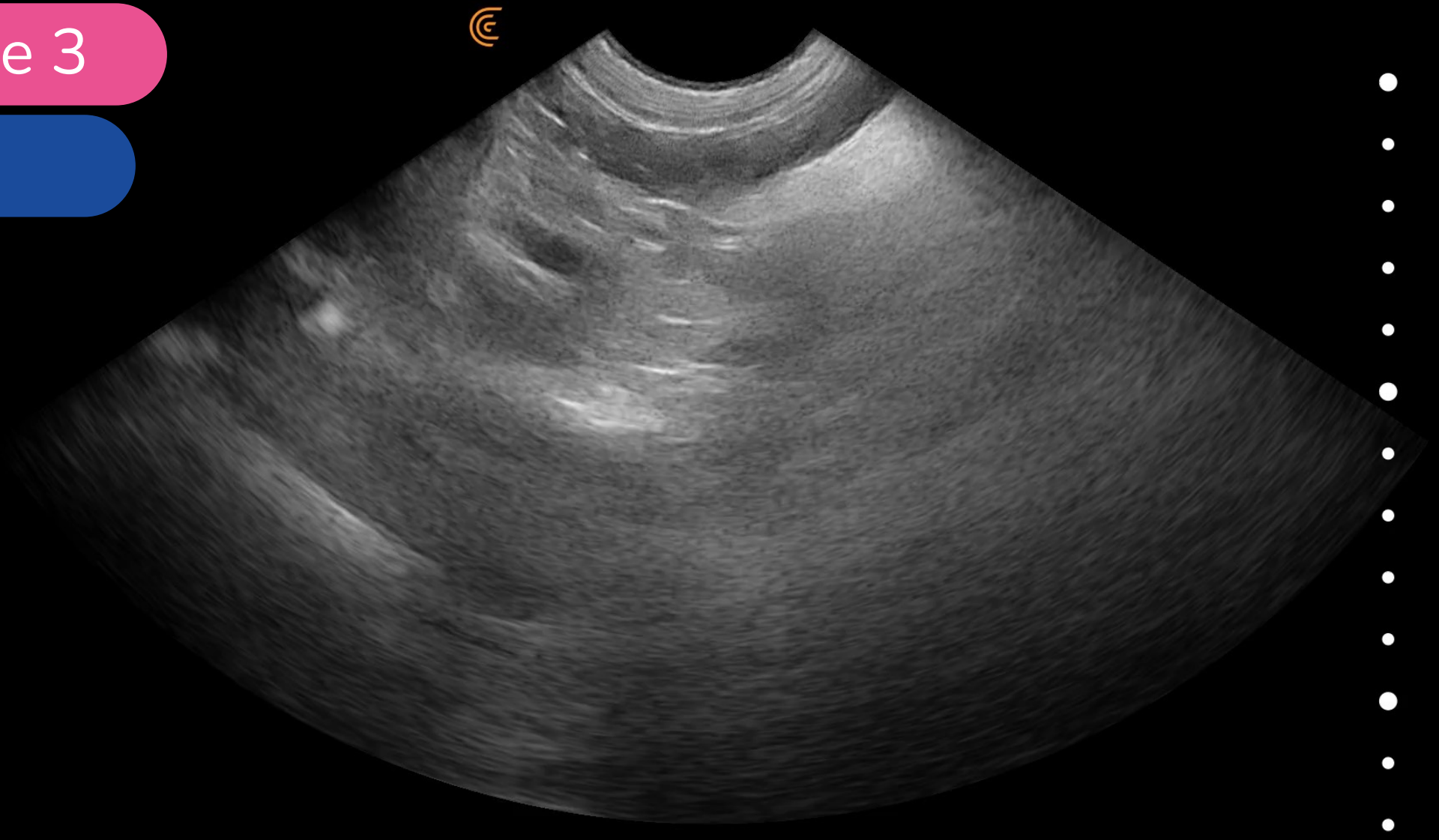
Sudden development of ascites – high protein transudate

Case 3

01

Case 3

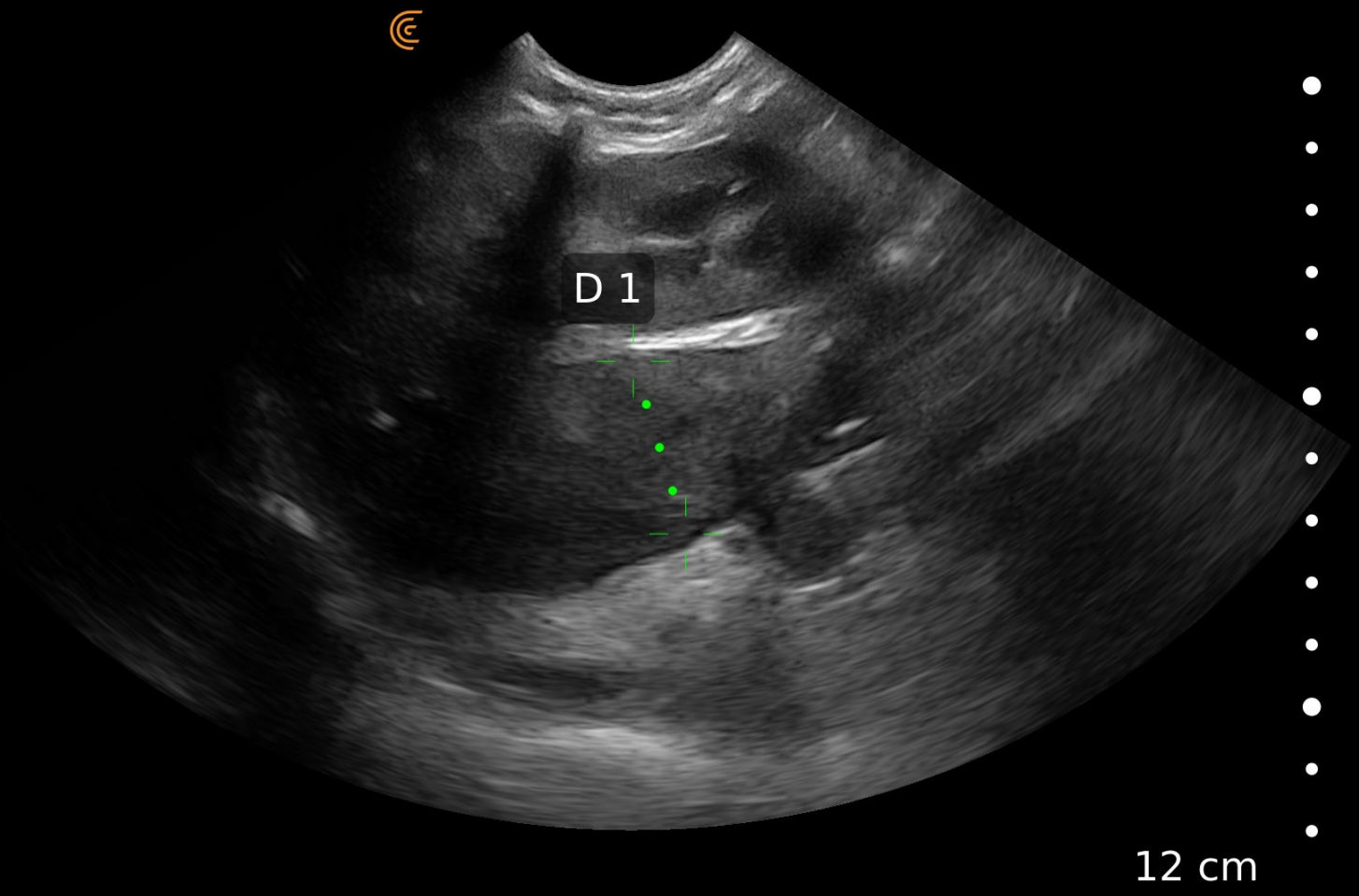
02



D 1 29.1 mm

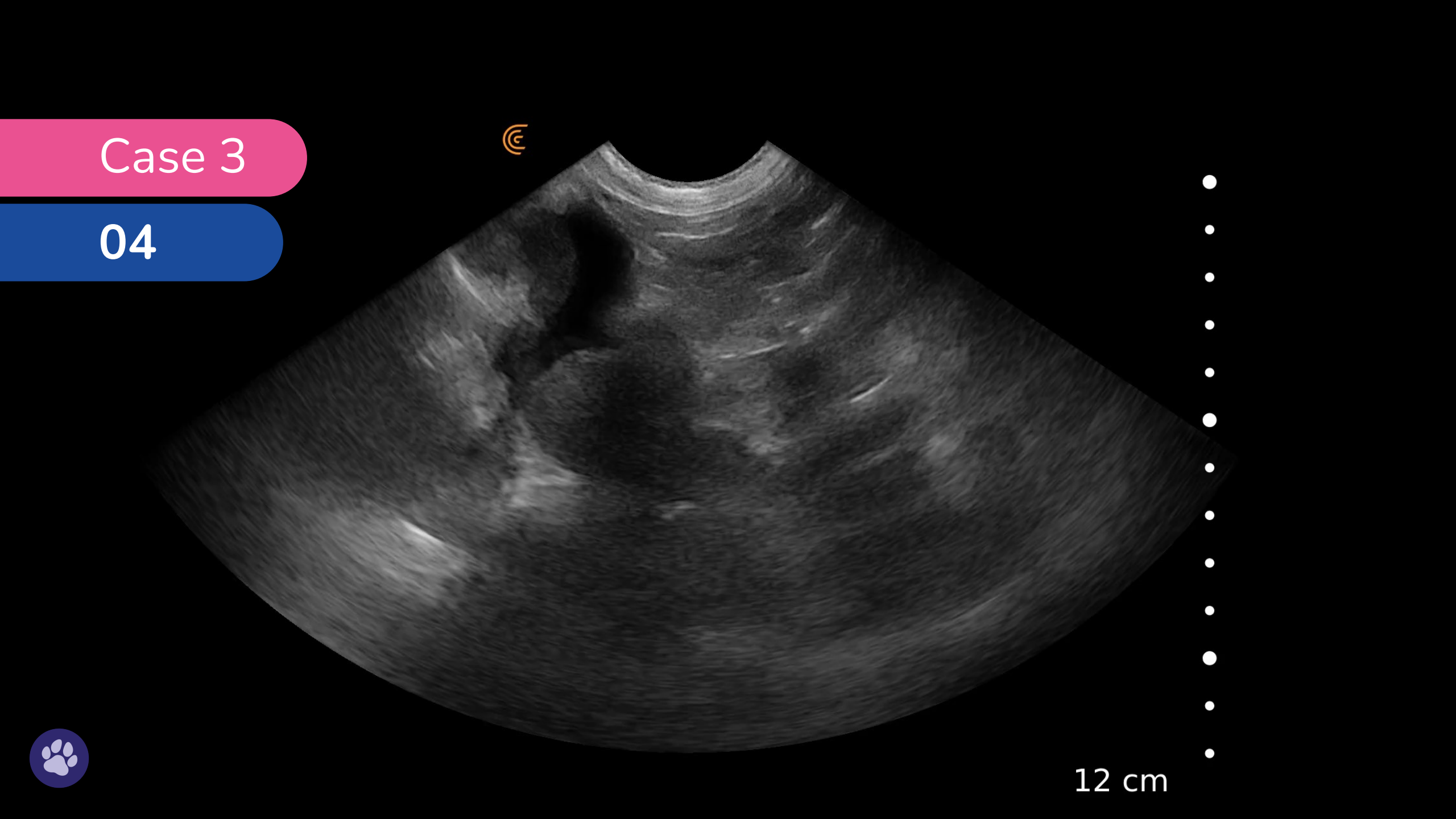
Case 3

03



Case 3

04



Case 3

Outcome

- Bilaterally massively enlarged adrenal glands - homogenous, deformed shape.
- Right adrenal gland appeared to be invading caudal vena cava - this has been known to cause Budd-Chiari Syndrome which causes a high protein transudate ascites when blood flow from the abdomen is blocked as in this case.
- Due to the dog appearing well other than ascites I assume this is a non-functional tumour, but it's size makes malignancy more likely.

Ultrasound guided sampling can help

gain a definitive diagnosis and give prognosis.

Fine needle aspiration or biopsy

Relatively very safe

Often gives a definitive diagnosis

This means you can give a good idea of prognosis to your client


Video
VC7HD3012108A0100
General Vet
MI 1.10
TIS 0.14
TIB 0.21
7 cm
B

Case 4

Signalment

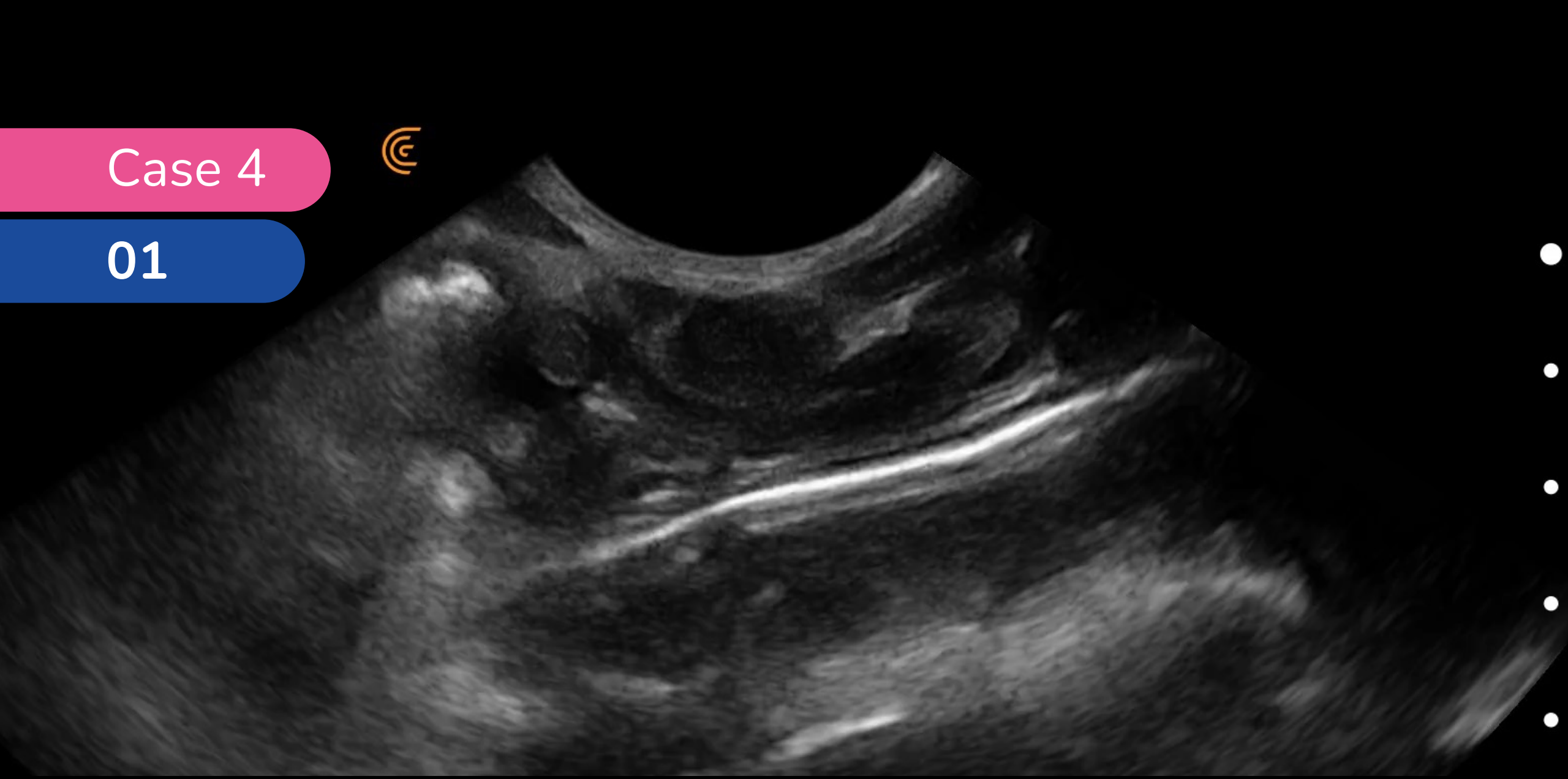
19yo, Fn, DSH

History

Off food, Weight Loss

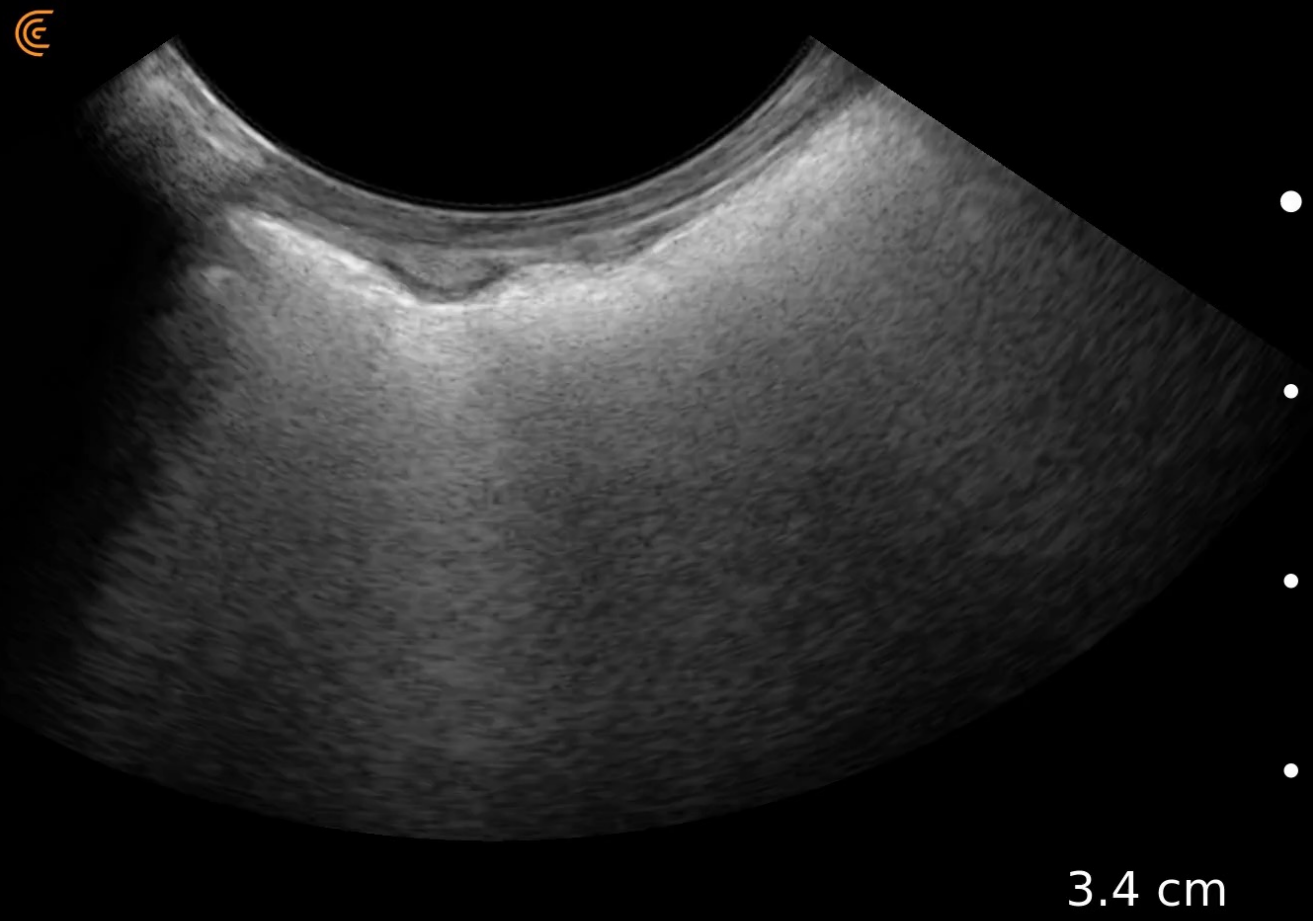
Case 4

01



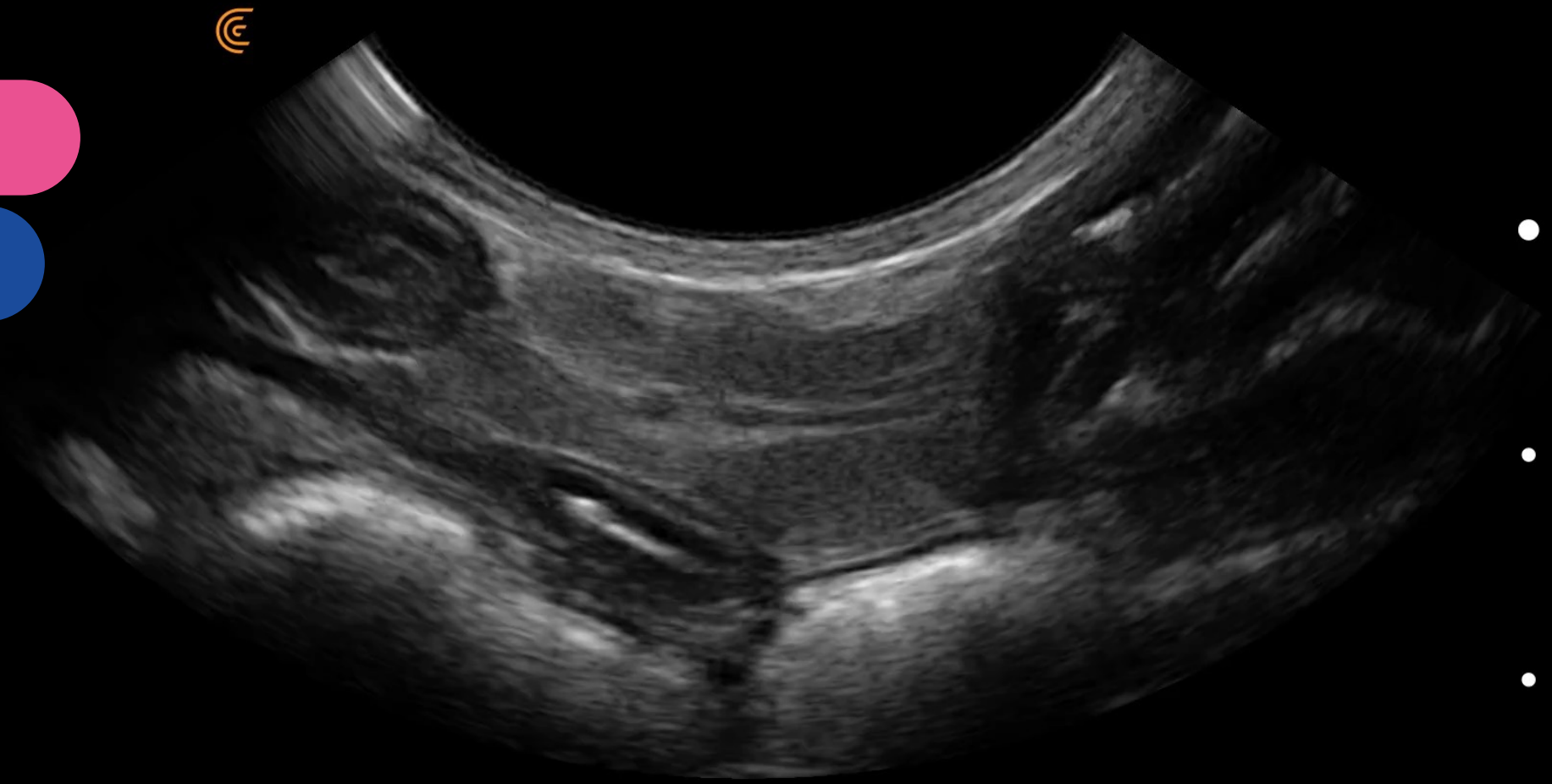
Case 4

02



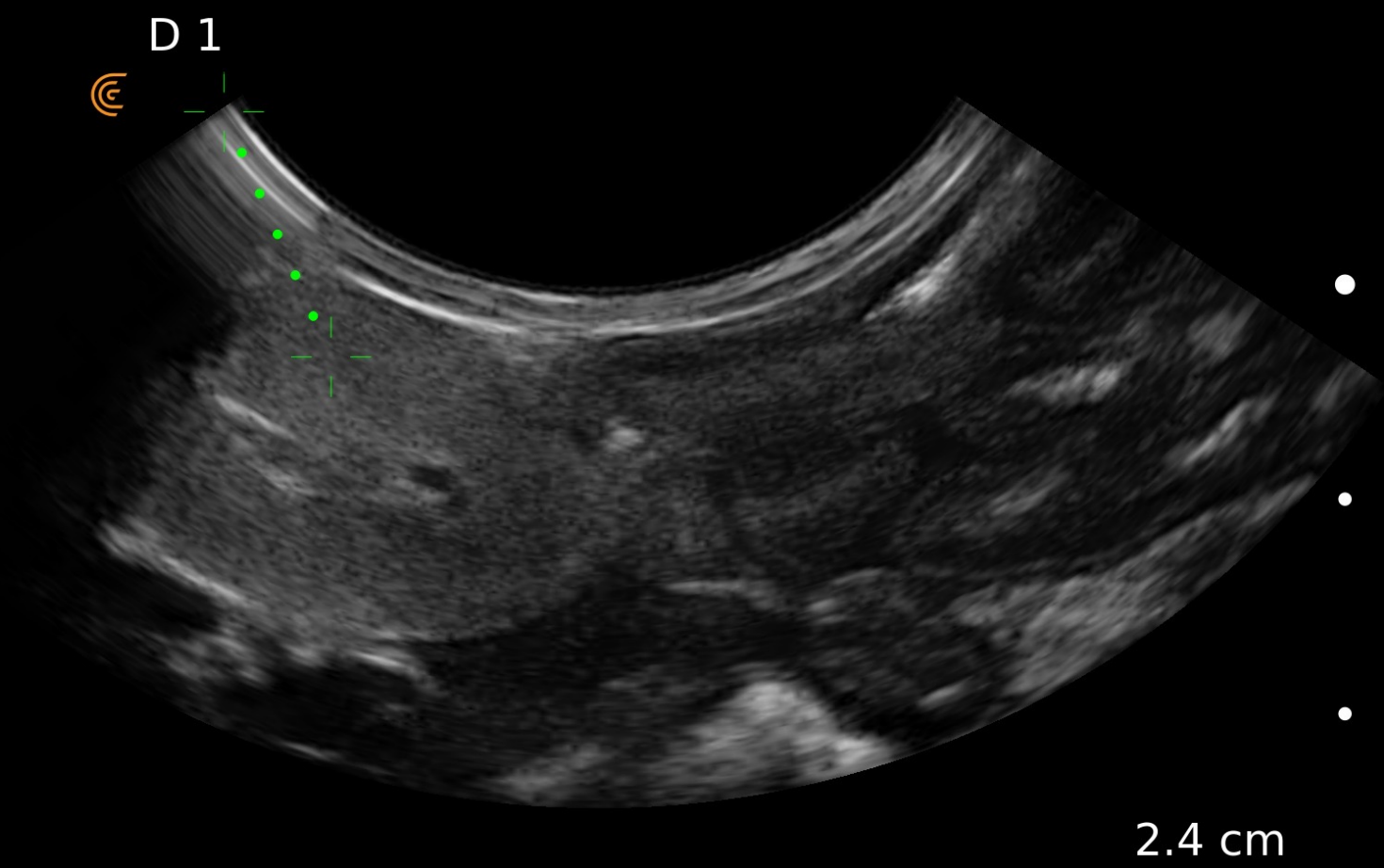
Case 4

03



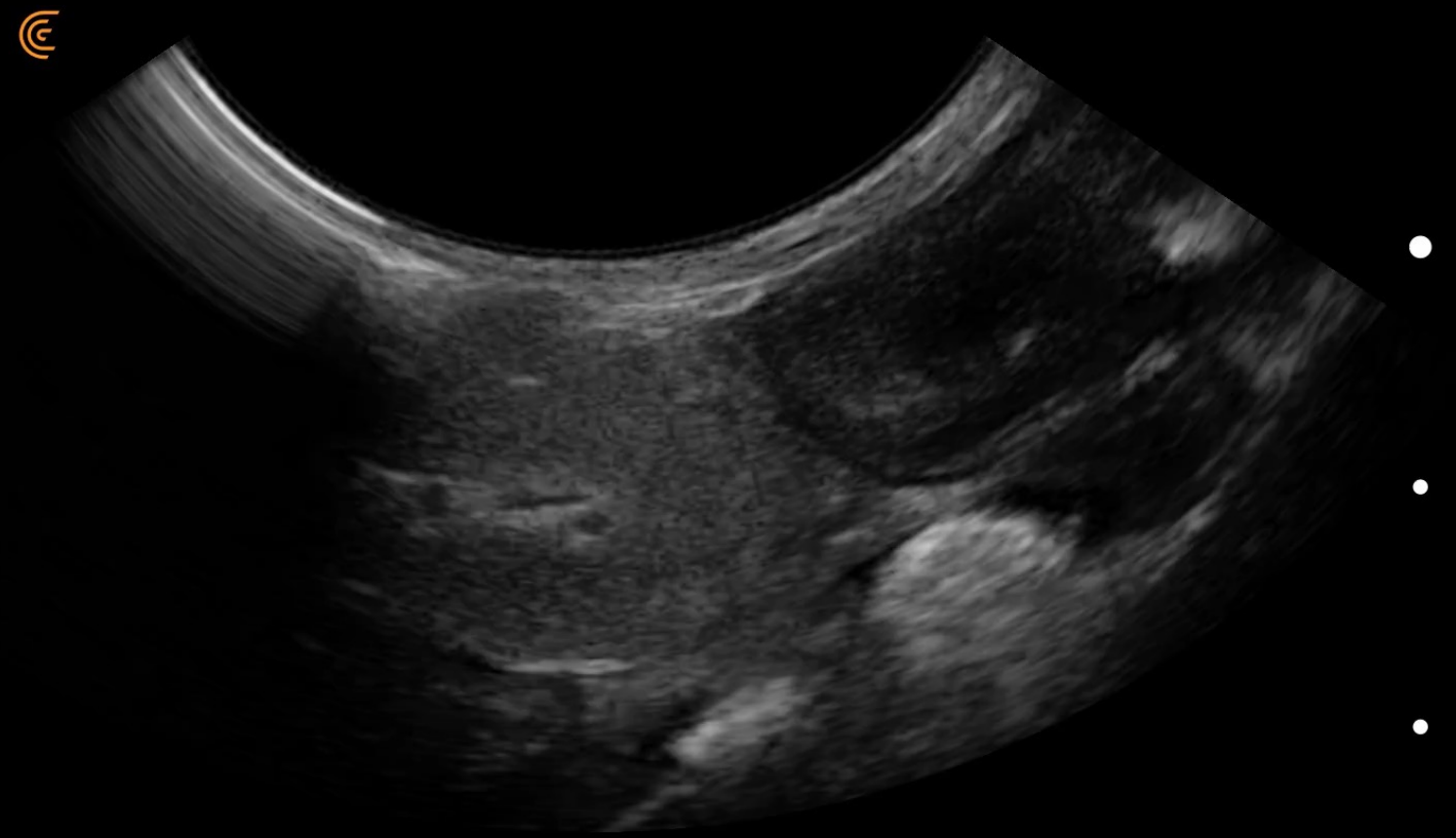
Case 4

04



Case 4

05



Case 4

Outcome

- Thickened muscularis layer throughout the jejunum
- Enlarged hypoechoic jejunal lymph nodes
- Without FNA we are left with differential diagnoses of inflammatory intestinal disease versus neoplasia such as lymphoma
- FNA of lymph node – mild reactive lymphoid hyperplasia

What are the take home messages today?

- Perform a systematic exam
- Characterise the mass
- Use ultrasound to look for local invasion and possible metastatic spread
- Use ultrasound guided sampling

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First Opinion Veterinary Ultrasound

Scanning the Emergency Patient

25th September 2023

The Basics

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Live Demonstration

Shelley Guenther, CRGS, CRCS

Sonographer | Clinical Marketing Manager

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Poll

Practical Small Animal Ultrasound: Guiding Diagnosis and Management of Disease in the Gastrointestinal Tract

Dr. Camilla Edwards,
Wednesday September 27, 2023
2PM Pacific | 5PM Eastern

www.clarius.com/ultrasound-webinars

Questions

Dr. Camilla Edwards

First Opinion Veterinary Ultrasound

Dr. Oron Frenkel

Emergency Physician

Shelley Guenther

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Thank you!