ELEVATING AND UNITING SPORTS MEDICINE
DUBLIN | 16-18 OCTOBER, 2025

MSK Ultrasound Workshop: Knee & Thigh

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Timetable

Time	Activity/Content
13:00-13:30	**Introduction to Diagnostic MSK Ultrasound**
13:30-13:45	**Ultrasound of the knee and thigh:** Quadriceps tendon, suprapatellar joint recess, suprapatellar fat pad, prefemoral fat pad, femoral trochlea cartilage, patellar tendon, superficial and deep infrapatellar bursae, prepatellar bursa, Hoffa's fat pad
13:45-14:45	**Practical hands-on**
14:45-15:00	**Pathology cases**

Clinical Consensus Guidelines for MSKUS

Table 1 Shoulder: Detailed results for evidence levels and final consensus, a comparison between 2012 and 2017

Clinical indication	Evidence level 2012	Final consensus 2012	Evidence level 2017	Final consensus 2017
Tendons and soft tissue				
Bursitis	C	3	Unchanged	Unchanged
Full thickness cuff tear	A	3	Unchanged	Unchanged
Partial thickness cuff tear	A	2	Unchanged	Unchanged
Rotator cuff muscle atrophy	B	1	Unchanged	Unchanged
Postoperative cuff failure	B	2	Unchanged	Unchanged
Calcific tendonitis	B	3	Unchanged	Unchanged
Long head biceps tendon: rupture	B	3	Unchanged	Unchanged
Long head biceps tendon: dislocation	B	3	Unchanged	Unchanged
Long head biceps tendon: tendinopathy	B	2	Unchanged	Unchanged
Adhesive capsulitis	B	0	Unchanged	1
Pectoralis/deltoid tears	C	2	Unchanged	Unchanged
Septic arthritis	C	3	Unchanged	Unchanged

Sconfienza LM et al. European Radiology (2018) - ESSR

Hip region, bones, and intra-articular structures => average grade 0-1

Types of ultrasound systems

Types of ultrasound probes

Use of high frequency sound waves (2-24 MHz) to image soft tissues and bony structures in the body for the purposes of diagnosing pathology or guiding interventional procedures.

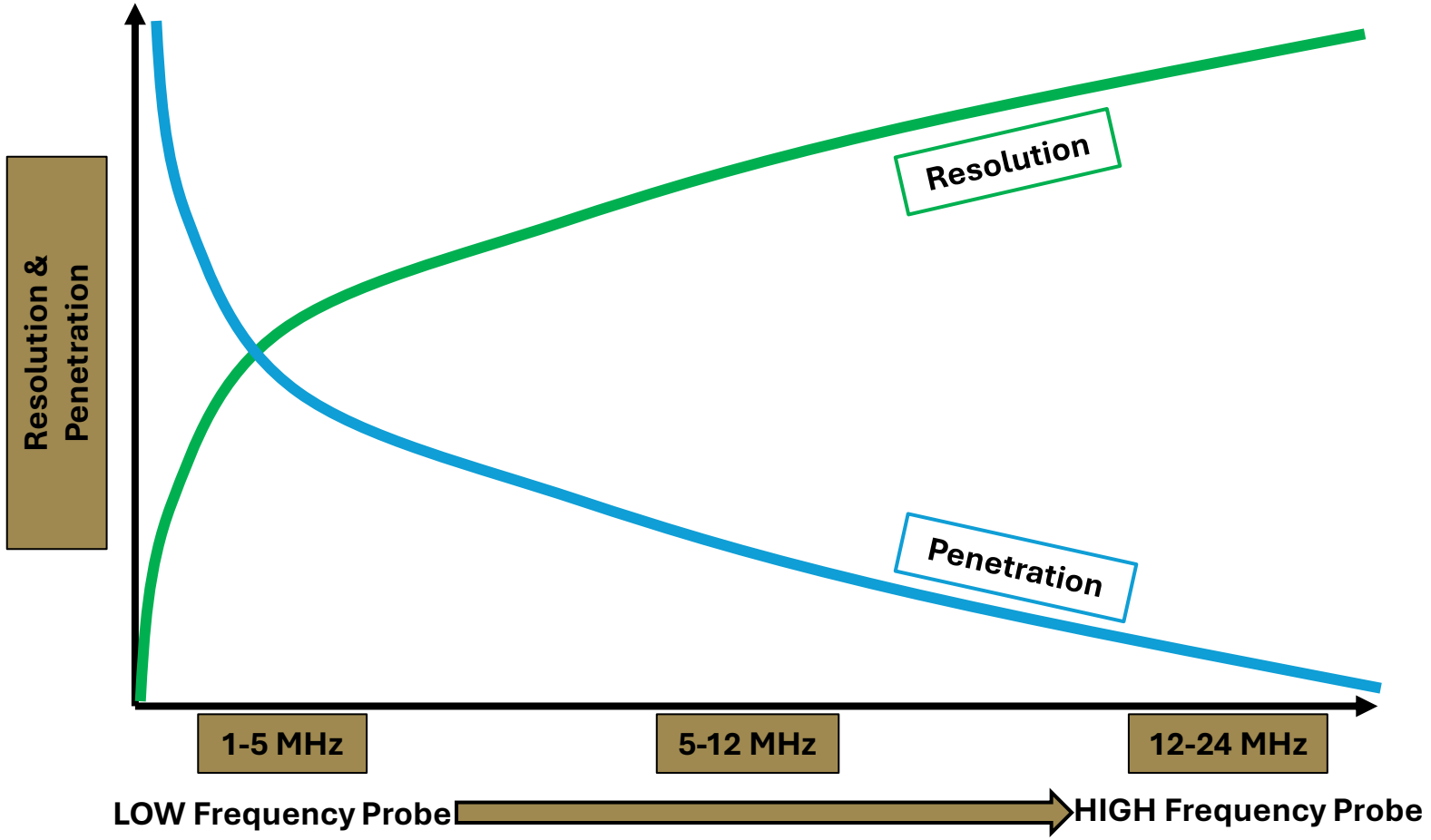
Types of MSK ultrasound probes

Linear probe
Frequency range: 5-24 MHz

Curvilinear probe
Frequency range: 2-8 MHz

Hockey-stick probe
Frequency range: 6-24 MHz

Frequency: Resolution & Penetration



Advantages and Limitations on MSKUS

ADVANTAGES

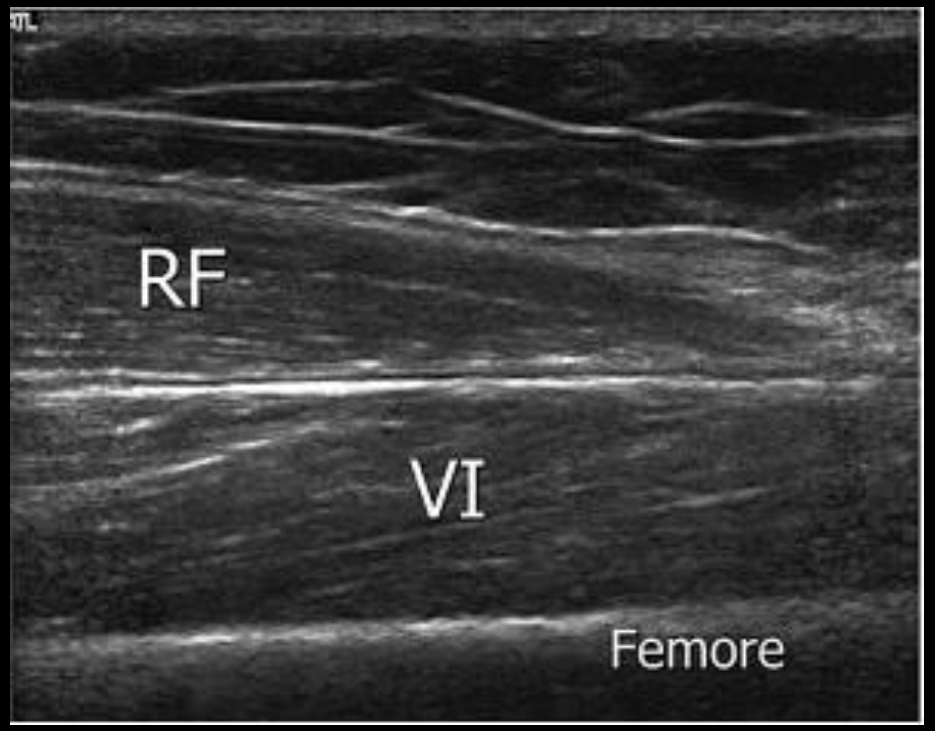
- First choice imaging modality for superficial structures
- Image in real-time = fast
- No radiation to patient or provider
- Exam of contralateral limb for comparison
- Dynamic assessment
- Relatively inexpensive

LIMITATIONS

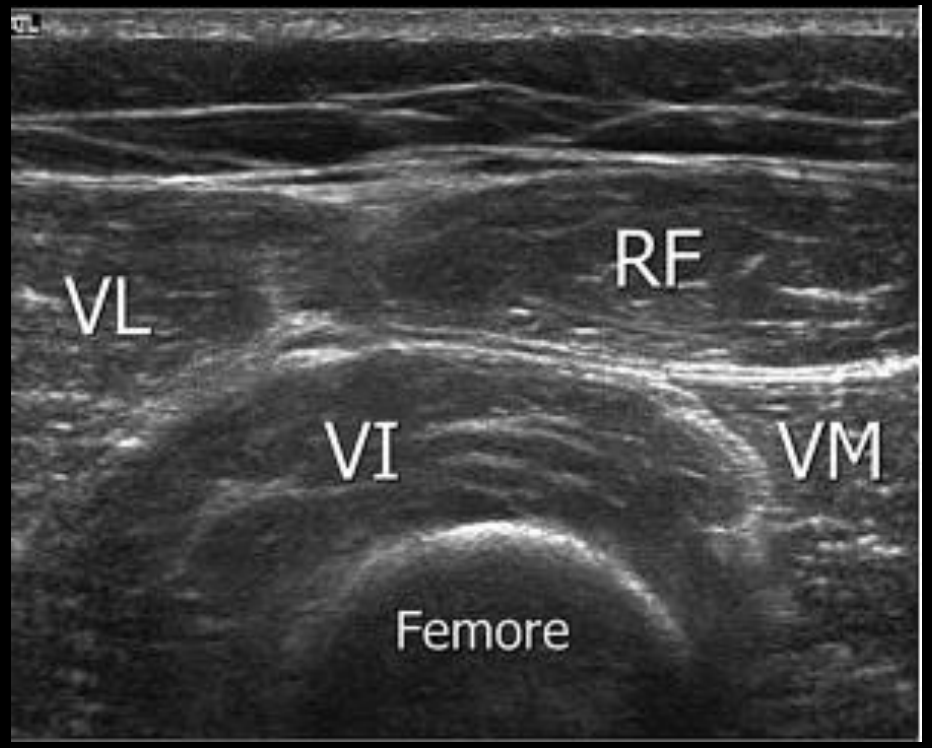
- Limited penetration (Lower resolution at greater depths)
- Unable to penetrate bone
- Operator dependent

Baloch N et al. Int J Surgery (2018)

US Imaging Interpretation – Echogenicity & Planes

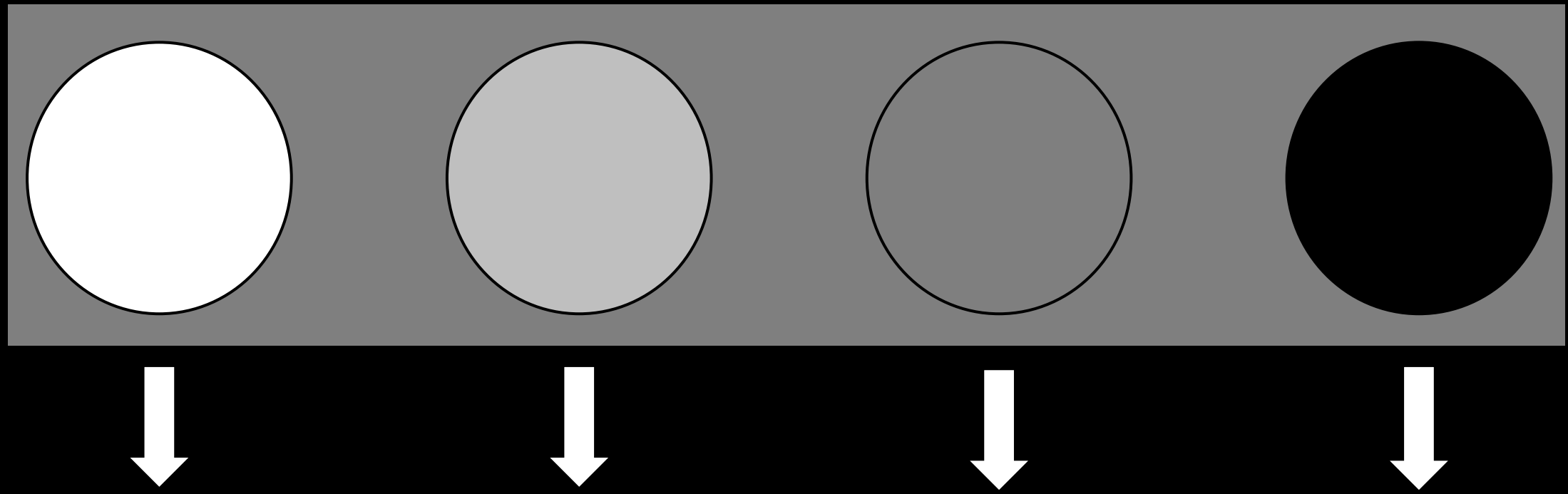


Longitudinal (long axis)



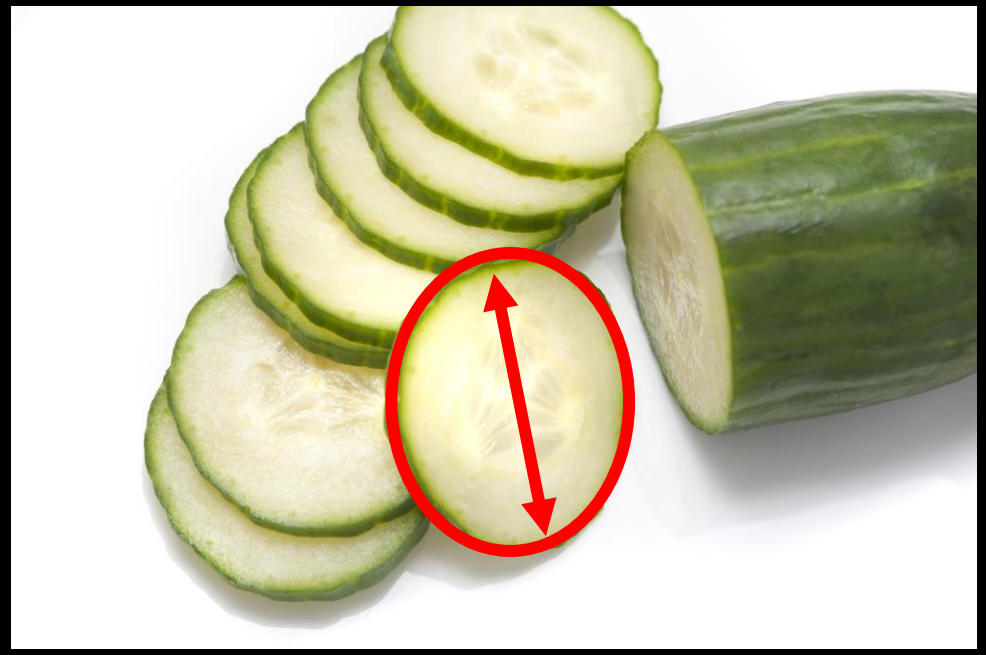
Transverse (short axis)

US Imaging Interpretation – Echogenicity



US Imaging Interpretation – Planes

Longitudinal (long axis)

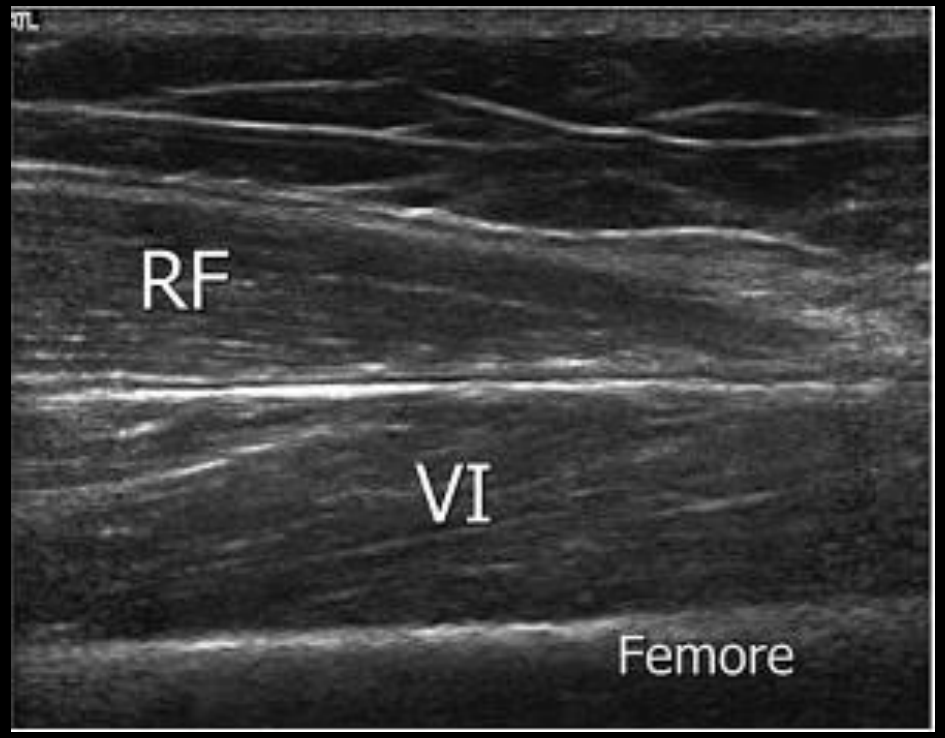


Transverse (short axis)

US Imaging Interpretation – Planes

S

P



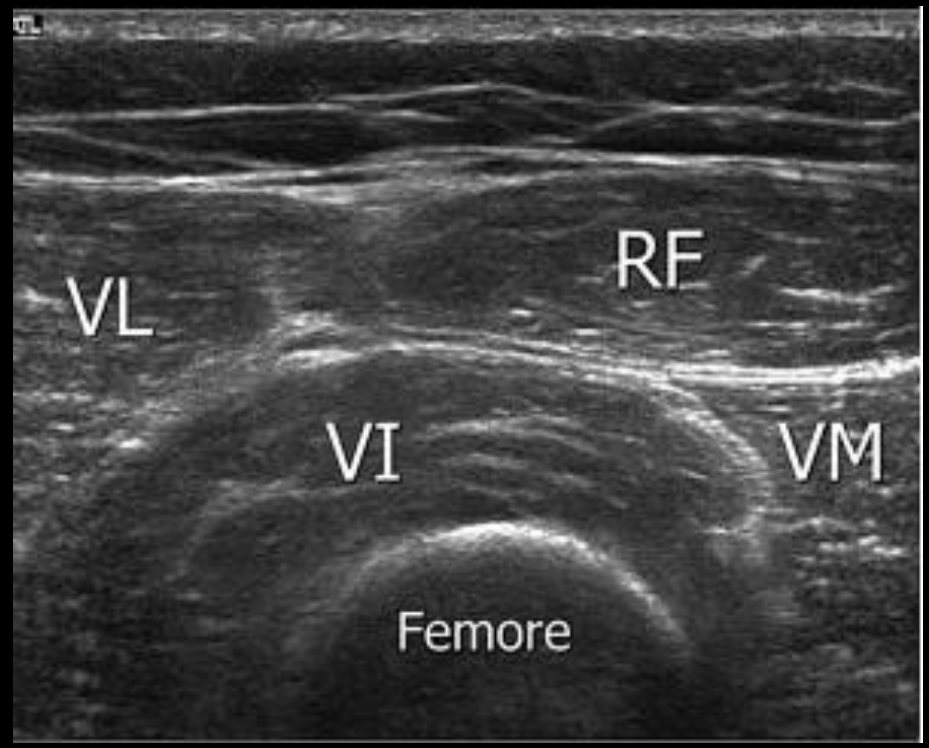
D

D

Longitudinal (long axis)

S

L

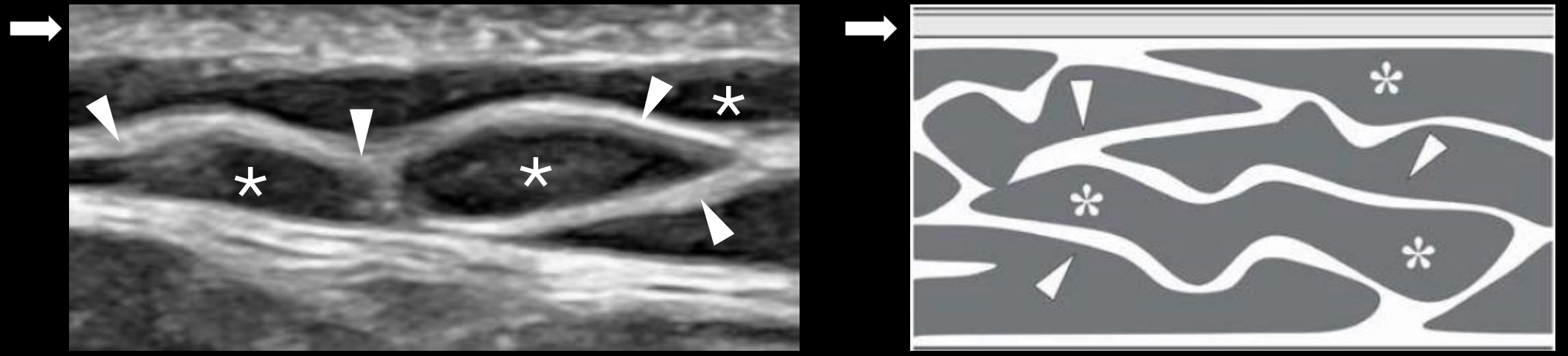


M

D

Transverse (short axis)

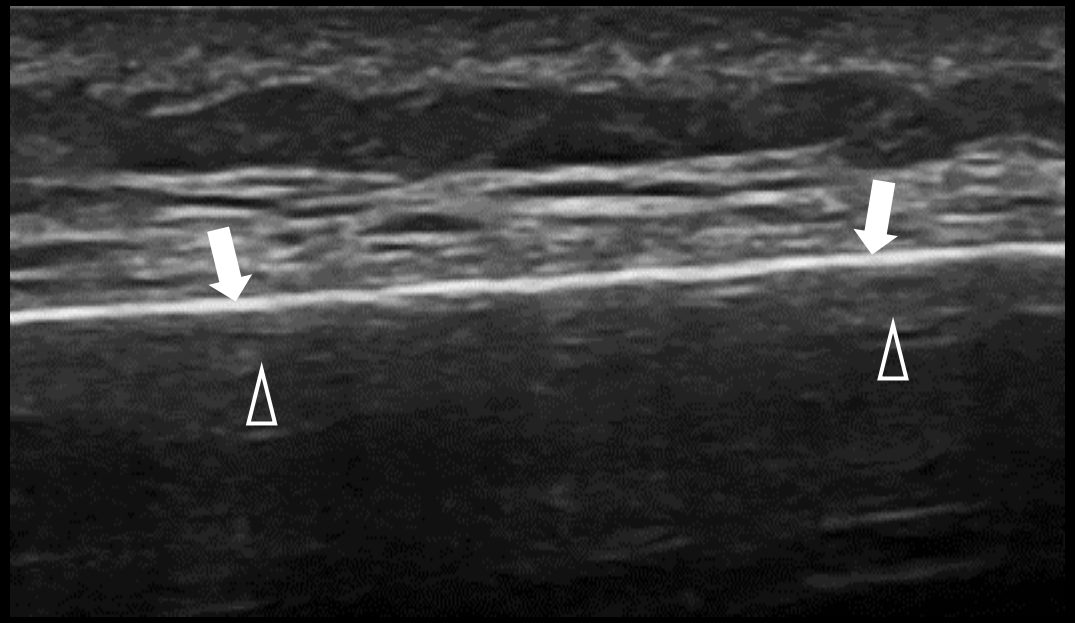
US Imaging Interpretation – Skin/Subcutaneous tissue Sonoanatomy



- Epidermis and dermis: homogeneously hyperechoic
- Subcutaneous tissue: hyperechoic strands due to connective septa and hypoechoic fat lobules

US Imaging Interpretation – Bone Sonoanatomy

Longitudinal (long axis)

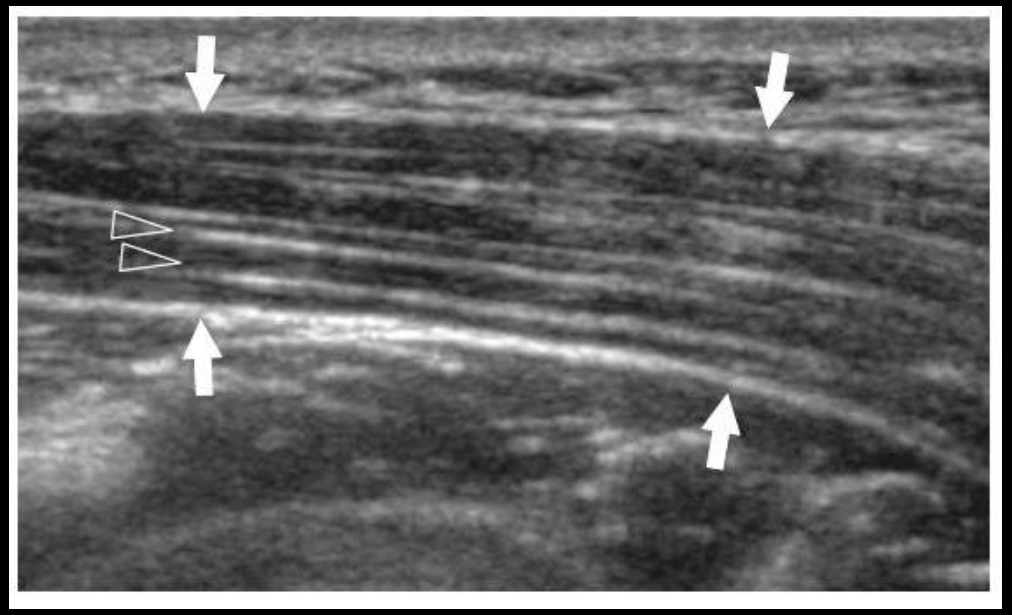


Transverse (short axis)

- Bone cortex: continuous hyperechoic line
- Internal cortical architecture/endosteum/trabecular bone: Inaccessible

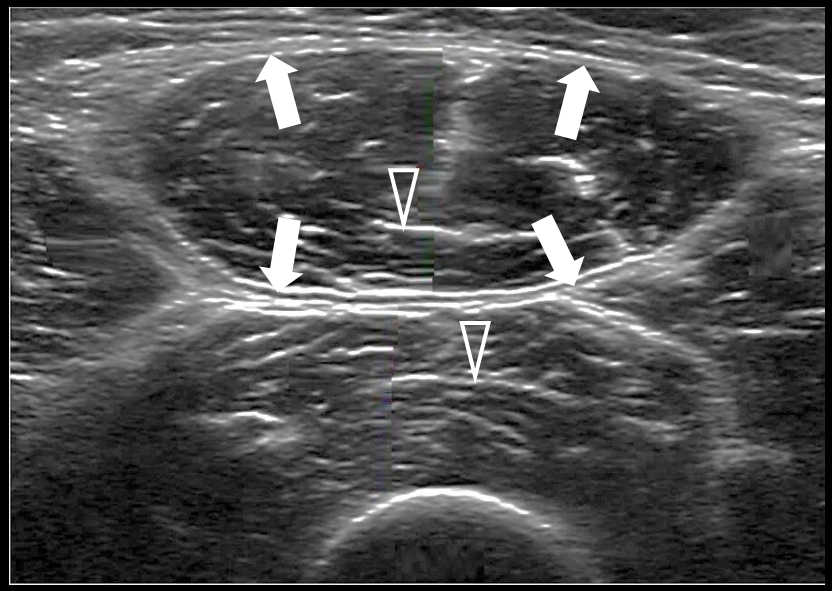
US Imaging Interpretation – Muscle Sonoanatomy

Longitudinal (long axis)



- Epimysium: hyperechoic
- Perimysium: hyperechoic lines
- Muscle fibres: hypoechoic

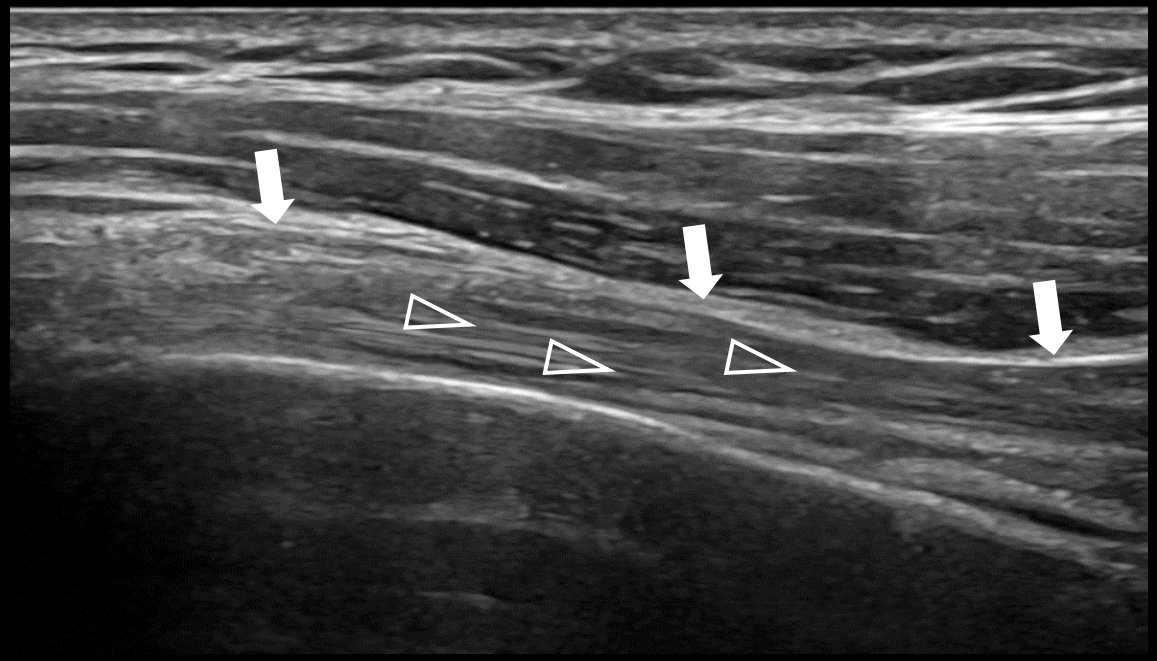
Transverse (short axis)



- Epimysium: hyperechoic
- Perimysium: hyperechoic dots/striations
- Muscle fibres: hypoechoic

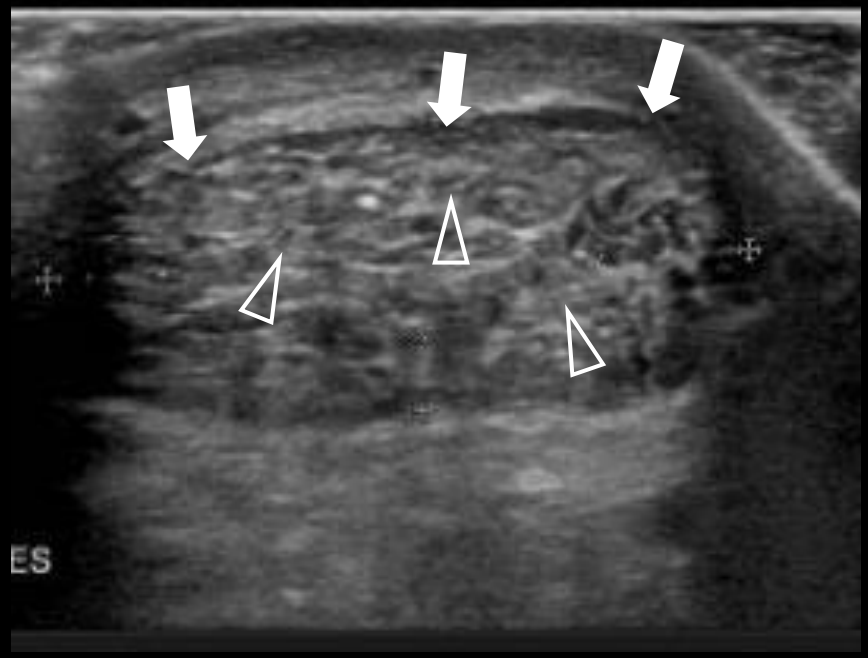
US Imaging Interpretation – Tendon Sonoanatomy

Longitudinal (long axis)



- Epitendineum: hyperechoic
- Tendon fibres: hyperechoic striated lines

Transverse (short axis)



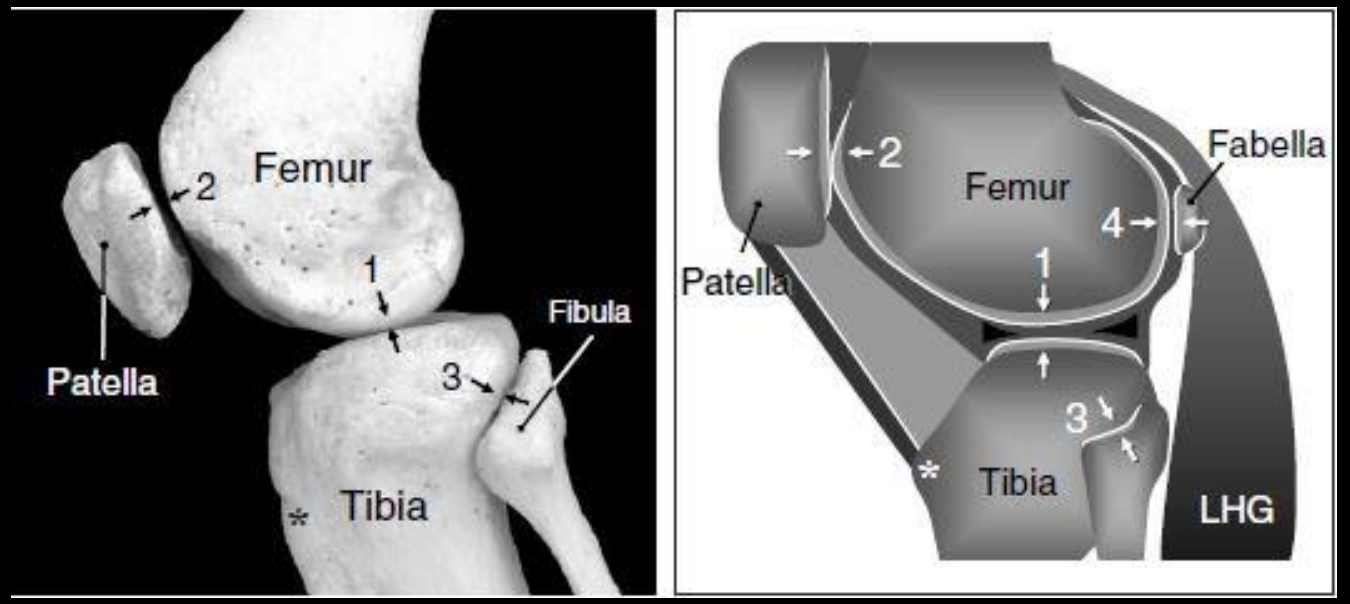
- Epitendineum: hyperechoic
- Tendon fibres: hyperechoic clustered dots

US Imaging Interpretation – Ligament Sonoanatomy

Longitudinal (long axis)

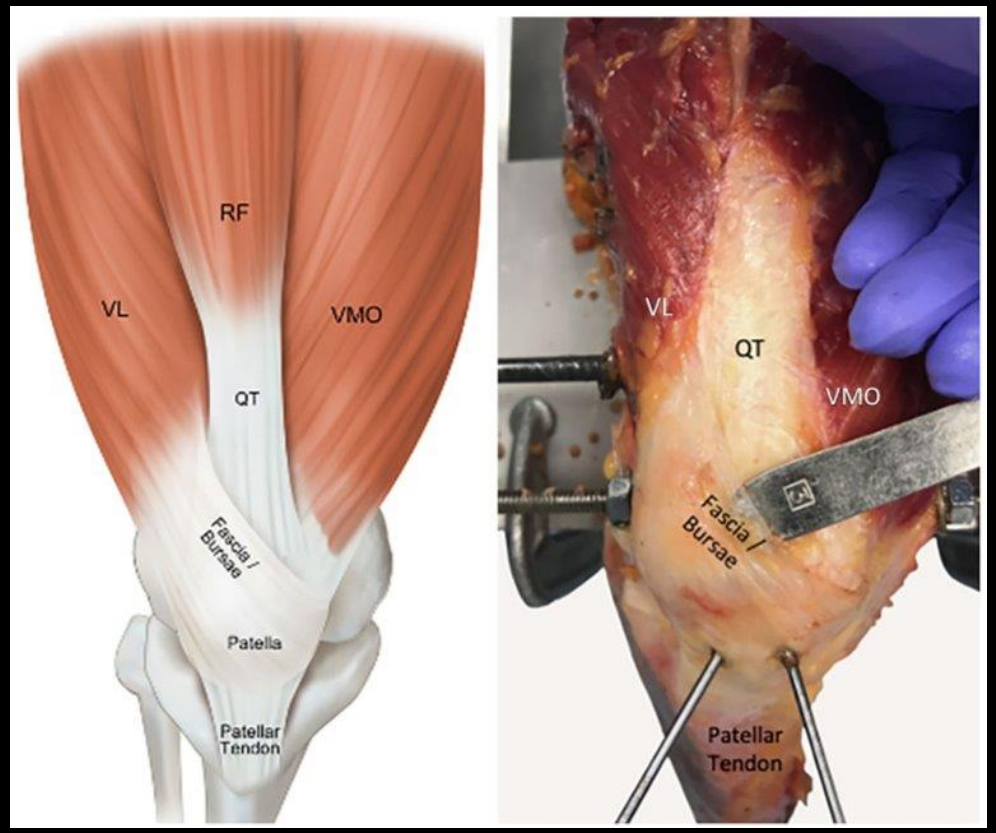
- Ligament fibres: hyperechoic striated lines

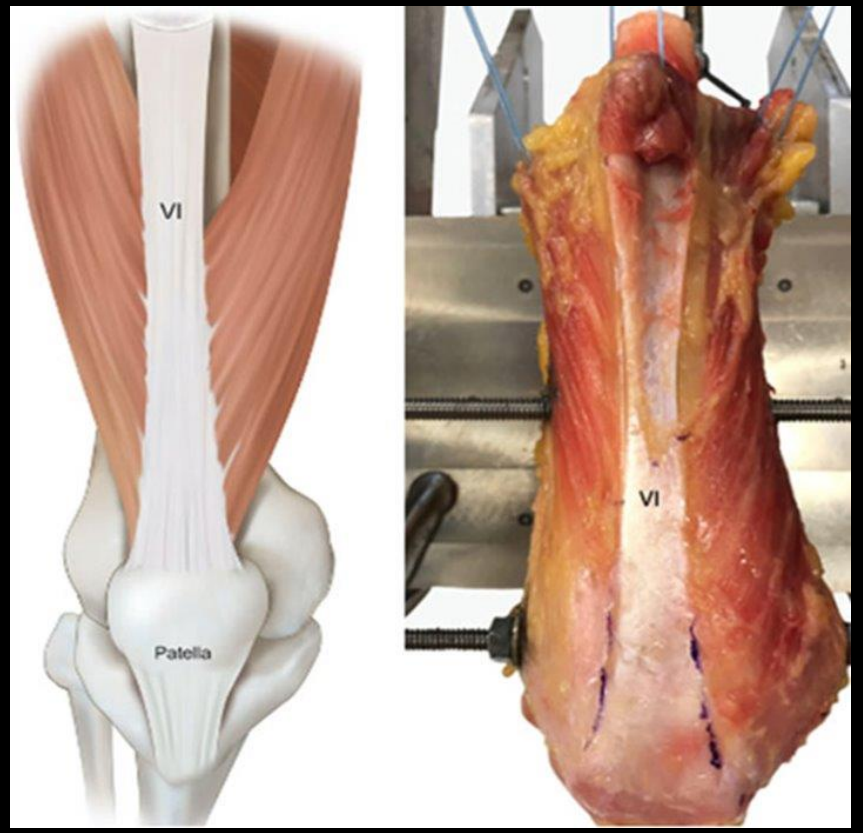
Anatomy of the knee – Bony landmarks



Dalip D., et al. 2018; Hirschmann et al. 2015; Bianchi S., et al. 2007

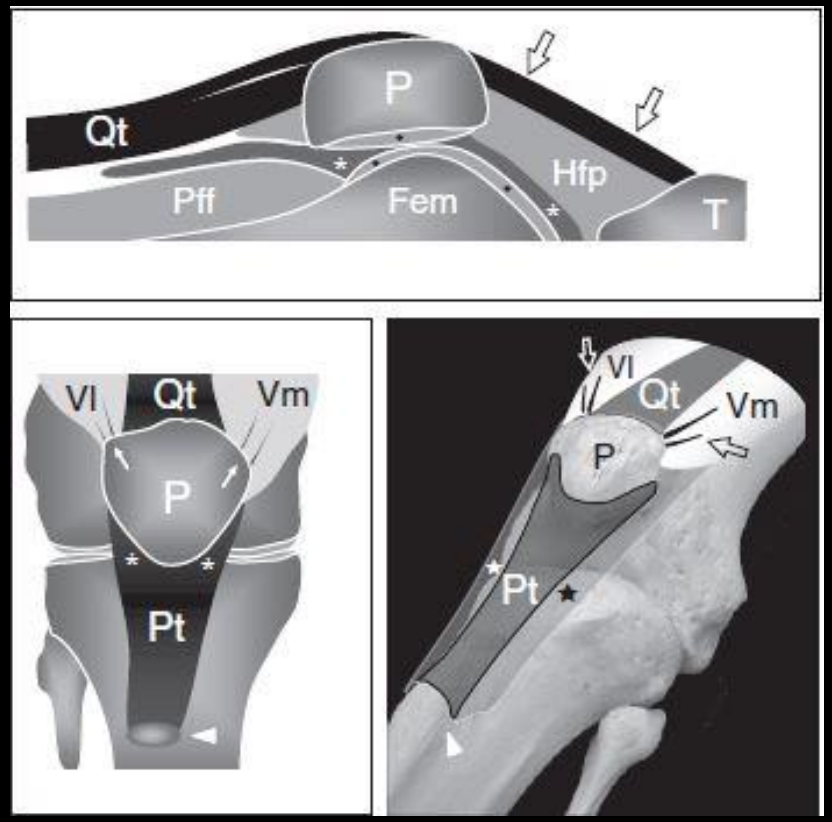
Anatomy of the knee – Muscles and tendons

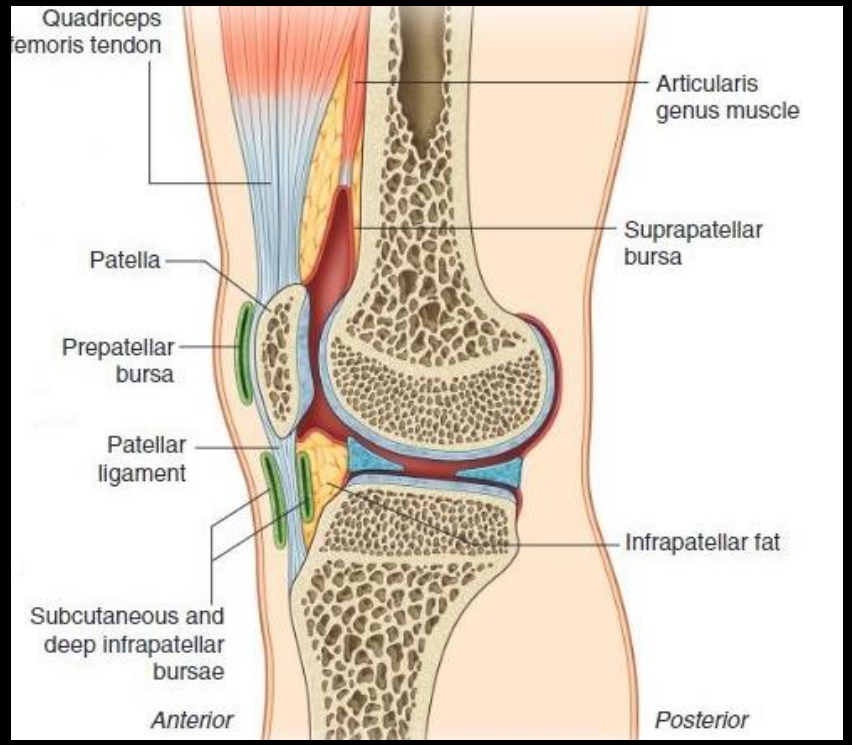




Straus et al, 2021

Anatomy of the knee – Joint recess, bursae and fat pads





Hirschmann et al. 2015; Standring, 2015; Bianchi S., et al. 2007

Demonstration – Knee & Thigh

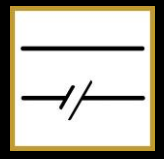
1. Quadriceps tendon, suprapatellar joint recess, suprapatellar fat pad, prefemoral fat pad
2. Patellar tendon, superficial and deep infrapatellar bursae, prepatellar bursa, Hoffa's fat pad
3. Femoral trochlea cartilage

Pathology checklist

1. Shape/Morphology
Has the morphology changed?

2. Echogenicity
Has the echogenicity changed?

3. Tissue pattern
Has the pattern of the fibres/tissue changed?



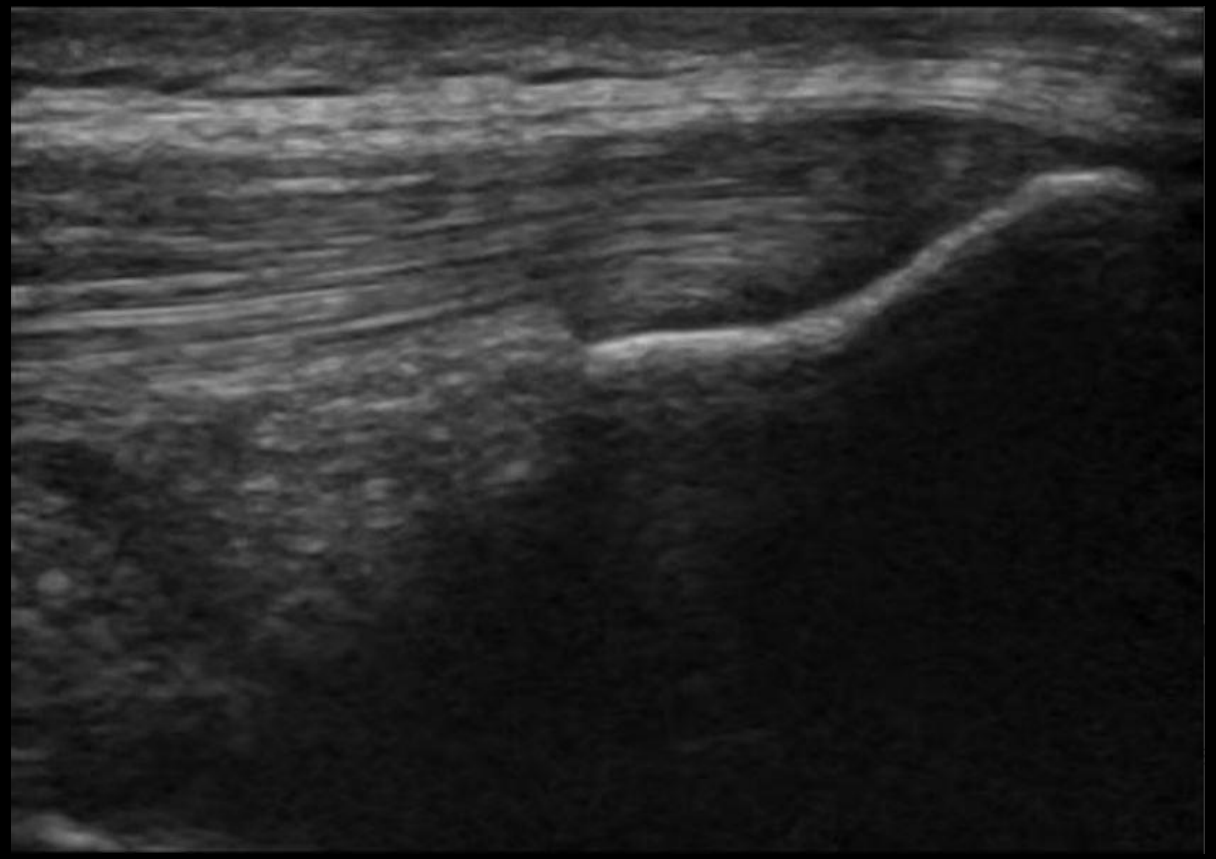
4. Continuity
Is there any cortical/fibre/soft tissue discontinuity?

5. Colour/Power Doppler
Are there any signs of hyperaemia?

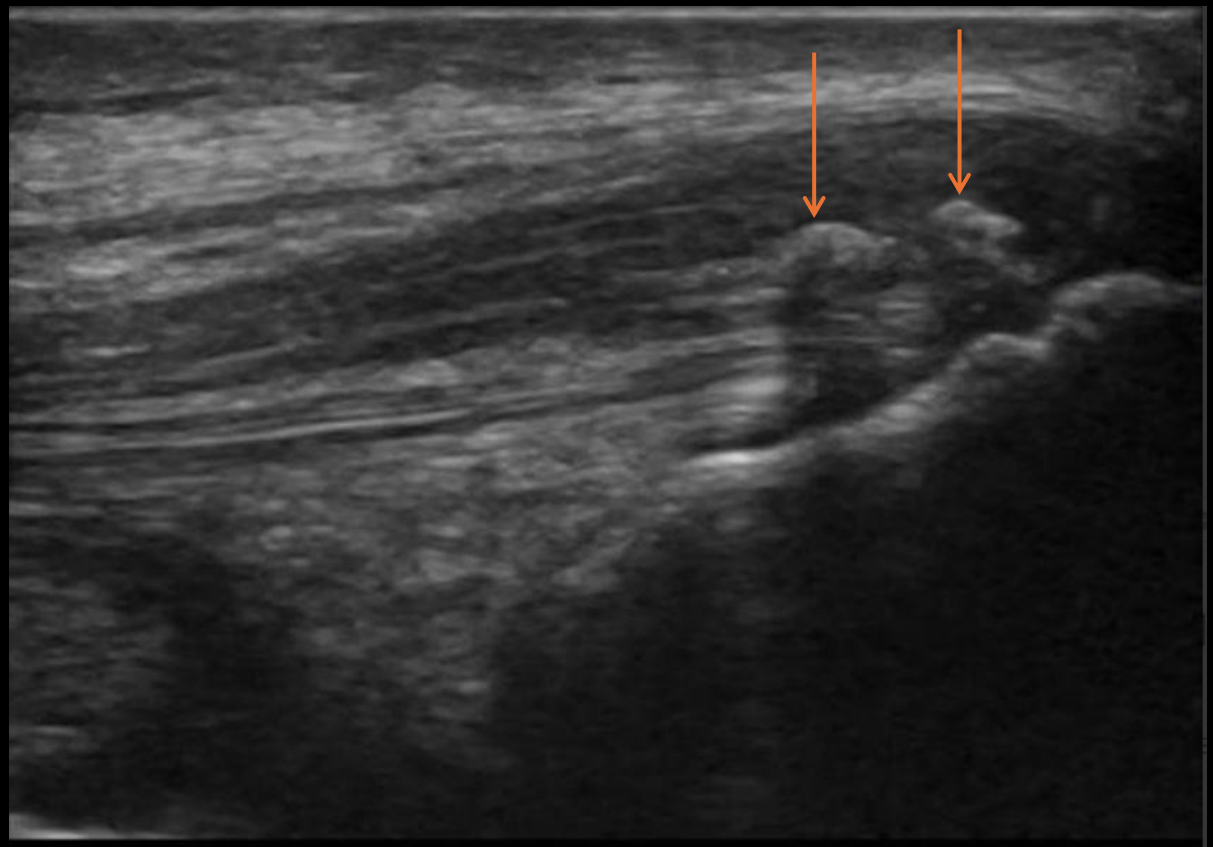
6. Other entities
Are there any cystic lesions/foreign bodies/deposits?

7. Dynamic forces
How does the structure react dynamically?

Quadriceps tendon – tendinopathy with calcifications

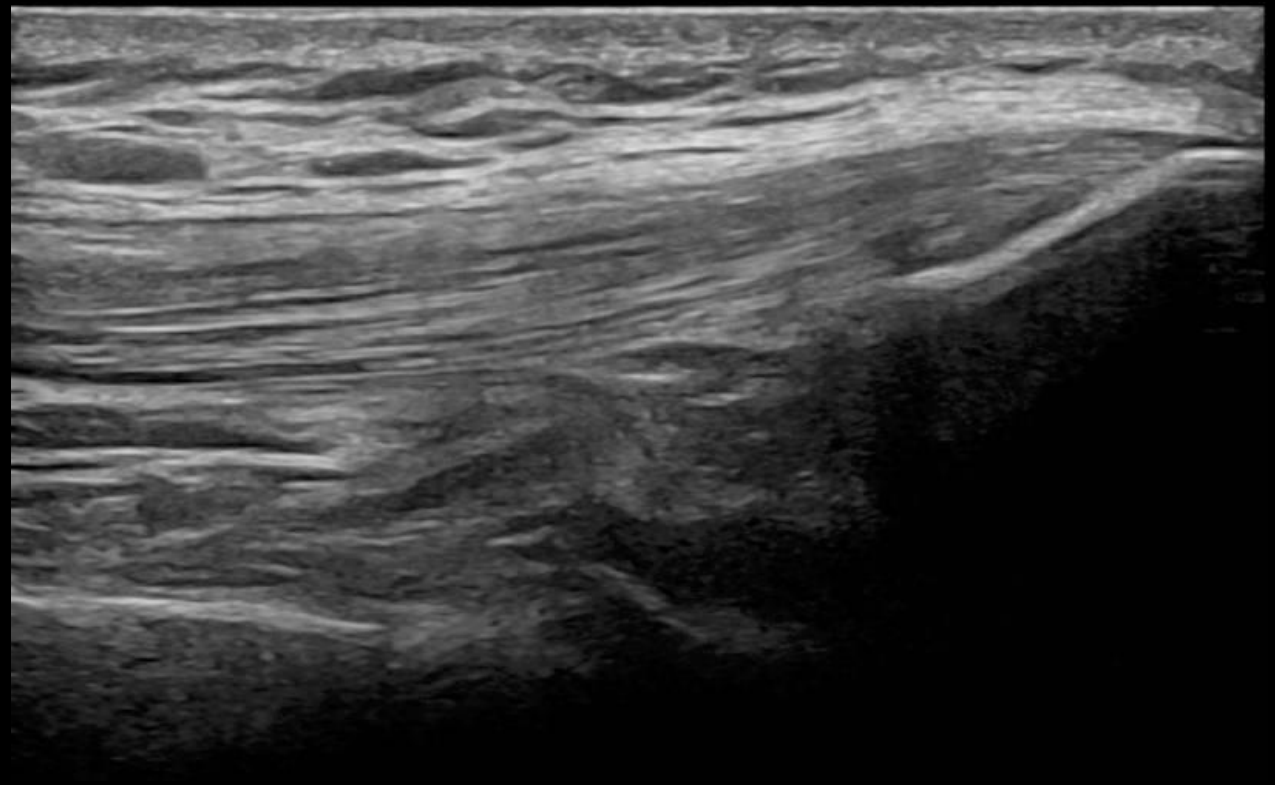


Normal appearance



Pathologic finding

Quadriceps tendon – knee joint effusion



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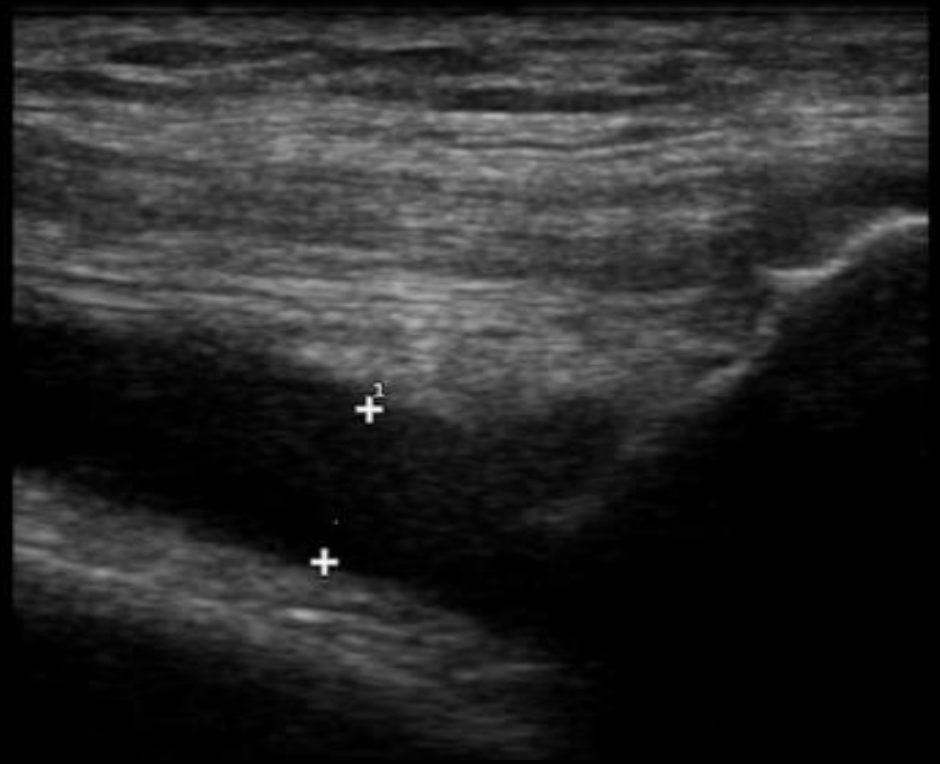
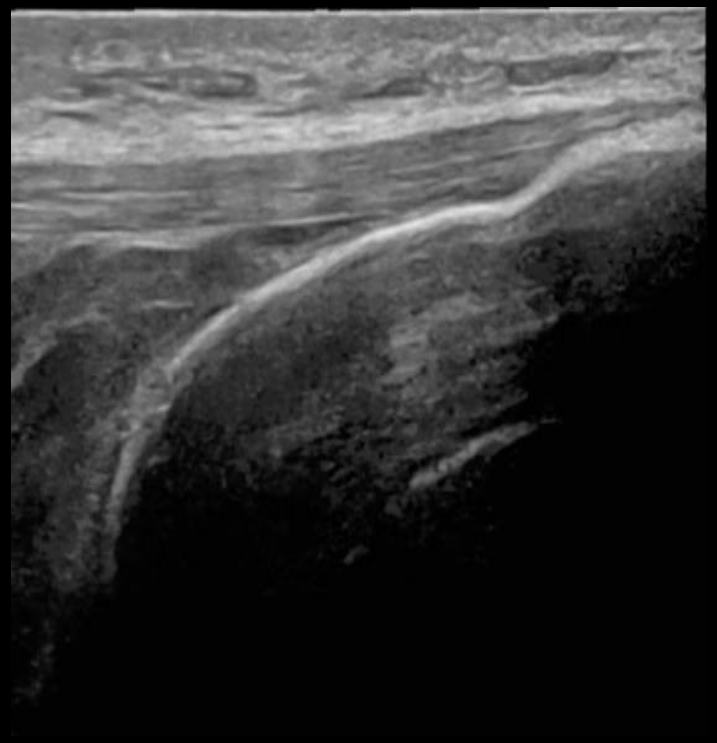


Pathologic finding

Quadriceps tendon – Osgood Schlatter disease



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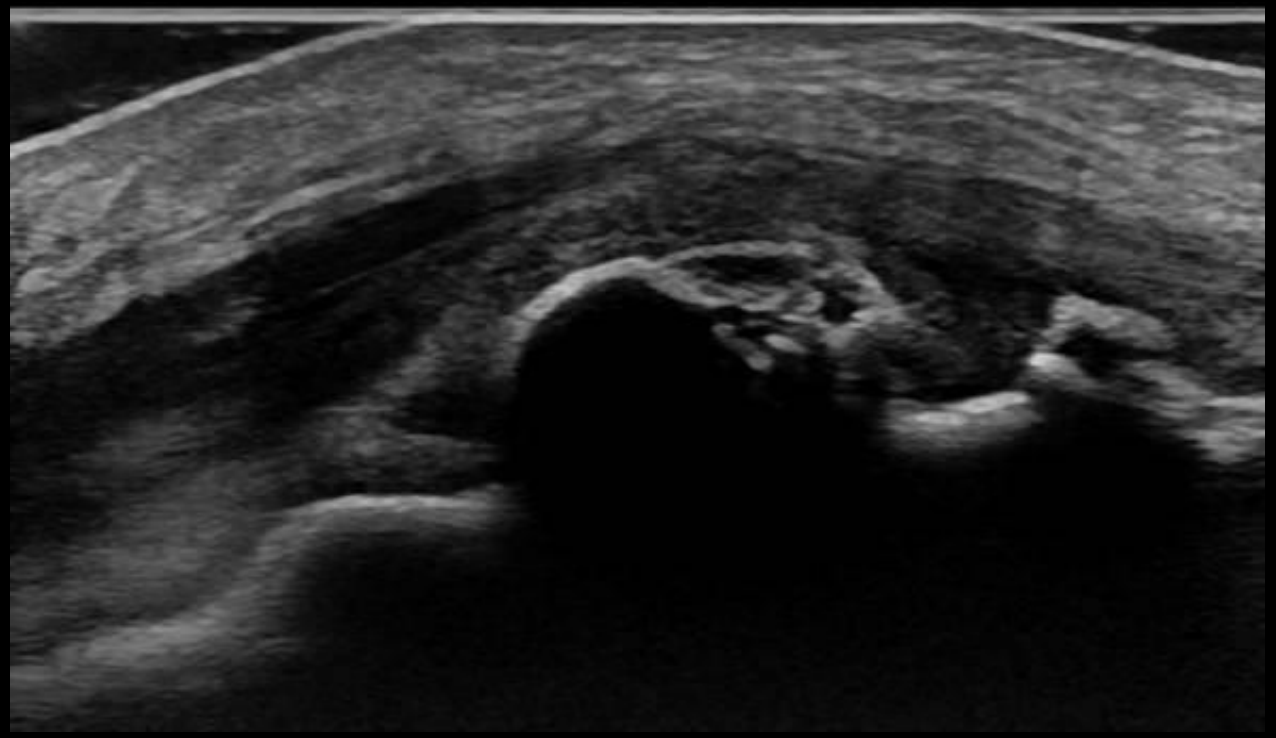
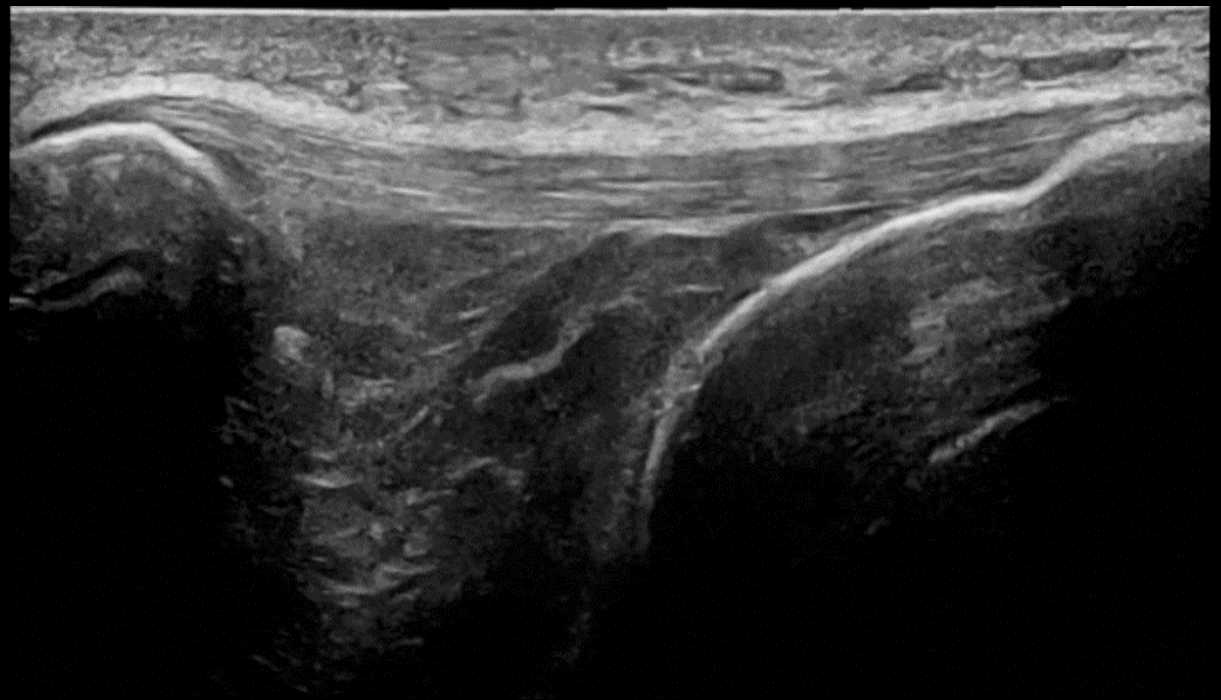


Pathologic finding

Quadriceps tendon – Deep infrapatellar bursal effusion



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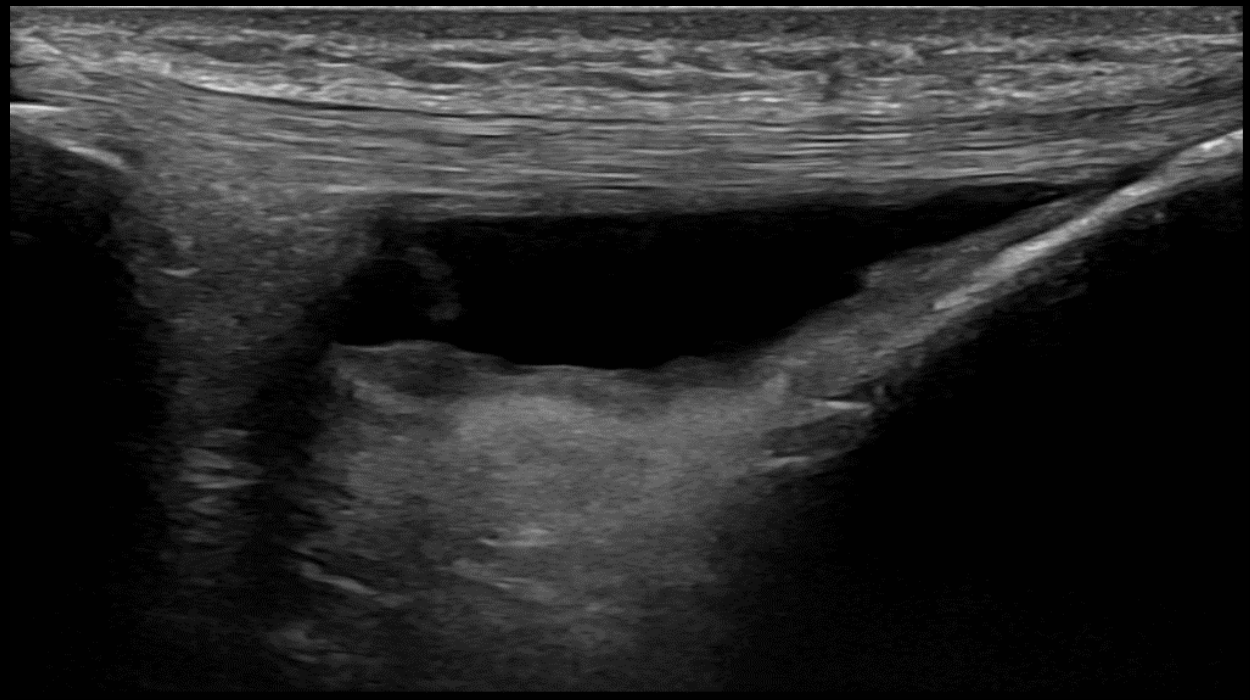

Pathologic finding

Thank you

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