



**WINFOCUS World Congress 2024**  
November 22nd- 23rd, 2024

# **Traumatic Tendon Injuries**

**Kuo-Chih Chen**  
Shuang Ho Hospital, Ministry of Health and Welfare  
Taipei Medical University

[www.winfocus.org](http://www.winfocus.org)

# Chen Kuo-Chih M.D.

TSEM ultrasound instructor  
TSUM ultrasound instructor  
WINFOCUS director / instructor

Certified Interventional Pain Sonologist  
Taiwan Pain Society Specialist

Emergency & Critical care  
Advanced Intervention  
Acute Pain Management



# DISCLOSURE STATEMENT

Consultant : Apache Wireless Ultrasound

Invited Speaker: GE Vscan Air





**Core Applications (2023 ACEP Emergency Ultrasound Guidelines)**  
**15項急診超音波核心應用**

陳國智醫師

Aorta

DVT

Trauma

Thoracic/Airway

Cardia/HD assessment

Procedural Guidance

US-guided NB

Testicular

Ocular

Skin & Soft tissue

Hepatobiliary

Urinary tract

Pregnancy

Bowel

MSK





# European Society of MusculoSkeletal Radiology

Musculoskeletal Ultrasound Technical Guidelines

 European Society of MusculoSkeletal Radiology	 European Society of MusculoSkeletal Radiology	 European Society of MusculoSkeletal Radiology	 European Society of MusculoSkeletal Radiology	 European Society of MusculoSkeletal Radiology	 European Society of MusculoSkeletal Radiology
<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>I. Shoulder</b>	<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>II. Elbow</b>	<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>III. Wrist</b>	<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>IV. Hip</b>	<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>V. Knee</b>	<b>Musculoskeletal Ultrasound Technical Guidelines</b> <b>VI. Ankle</b>
Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy	Ian Beggs, UK Stefano Bianchi, Switzerland Angel Bueno, Spain Michel Cohen, France Michel Court-Payen, Denmark Andrew Grainger, UK Franz Kainberger, Austria Andrea Klauser, Austria Carlo Martinoli, Italy Eugene McNally, UK Philip J. O'Connor, UK Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy	Ian Beggs, UK Stefano Bianchi, Switzerland Angel Bueno, Spain Michel Cohen, France Michel Court-Payen, Denmark Andrew Grainger, UK Franz Kainberger, Austria Andrea Klauser, Austria Carlo Martinoli, Italy Eugene McNally, UK Philip J. O'Connor, UK Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy	Ian Beggs, UK Stefano Bianchi, Switzerland Angel Bueno, Spain Michel Cohen, France Michel Court-Payen, Denmark Andrew Grainger, UK Franz Kainberger, Austria Andrea Klauser, Austria Carlo Martinoli, Italy Eugene McNally, UK Philip J. O'Connor, UK Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy	Ian Beggs, UK Stefano Bianchi, Switzerland Angel Bueno, Spain Michel Cohen, France Michel Court-Payen, Denmark Andrew Grainger, UK Franz Kainberger, Austria Andrea Klauser, Austria Carlo Martinoli, Italy Eugene McNally, UK Philip J. O'Connor, UK Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy	Ian Beggs, UK Stefano Bianchi, Switzerland Angel Bueno, Spain Michel Cohen, France Michel Court-Payen, Denmark Andrew Grainger, UK Franz Kainberger, Austria Andrea Klauser, Austria Carlo Martinoli, Italy Eugene McNally, UK Philip J. O'Connor, UK Philippe Peetrons, Belgium Monique Reijnierse, The Netherlands Philipp Rempalik, Germany Enzo Silvestri, Italy

REVIEW

Open Access



# An overview of point-of-care ultrasound for soft tissue and musculoskeletal applications in the emergency department

Kuo-Chih Chen<sup>1,2</sup>, Aming Chor-Ming Lin<sup>1,2\*</sup>, Chee-Fah Chong<sup>1,2</sup> and Tzong-Luen Wang<sup>1,2</sup>

Soft tissue infection  
Joint effusion  
Foreign body  
Long bone fracture  
Muscle & Tendon injury  
Vascular occlusion  
Procedures



## Musculoskeletal Ultrasound in the Emergency Department

Vito Chianca, MD<sup>1</sup> Francesco Di Pietto, MD, PhD<sup>2</sup> Marcello Zappia, MD, PhD<sup>3</sup>  
Domenico Albano, MD<sup>1,4</sup> Carmelo Messina, MD<sup>1,5</sup> Luca Maria Sconfienza, MD, PhD<sup>1,5</sup>

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<sup>2</sup>Dipartimento di Diagnostica per immagini, Regina Grande Hospital, Castel Volturno (CE), Italy

<sup>3</sup>Department of Medicine and Health Sciences, Università del Molise, Campobasso, Italy

<sup>4</sup>Section of Radiological Sciences, Department of Biomedicine, Neurosciences and Advanced Diagnostics, University of Palermo, Palermo, Italy

<sup>5</sup>Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milano, Italy

*Semin Musculoskelet Radiol* 2020,24:167–174.

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ELSEVIER

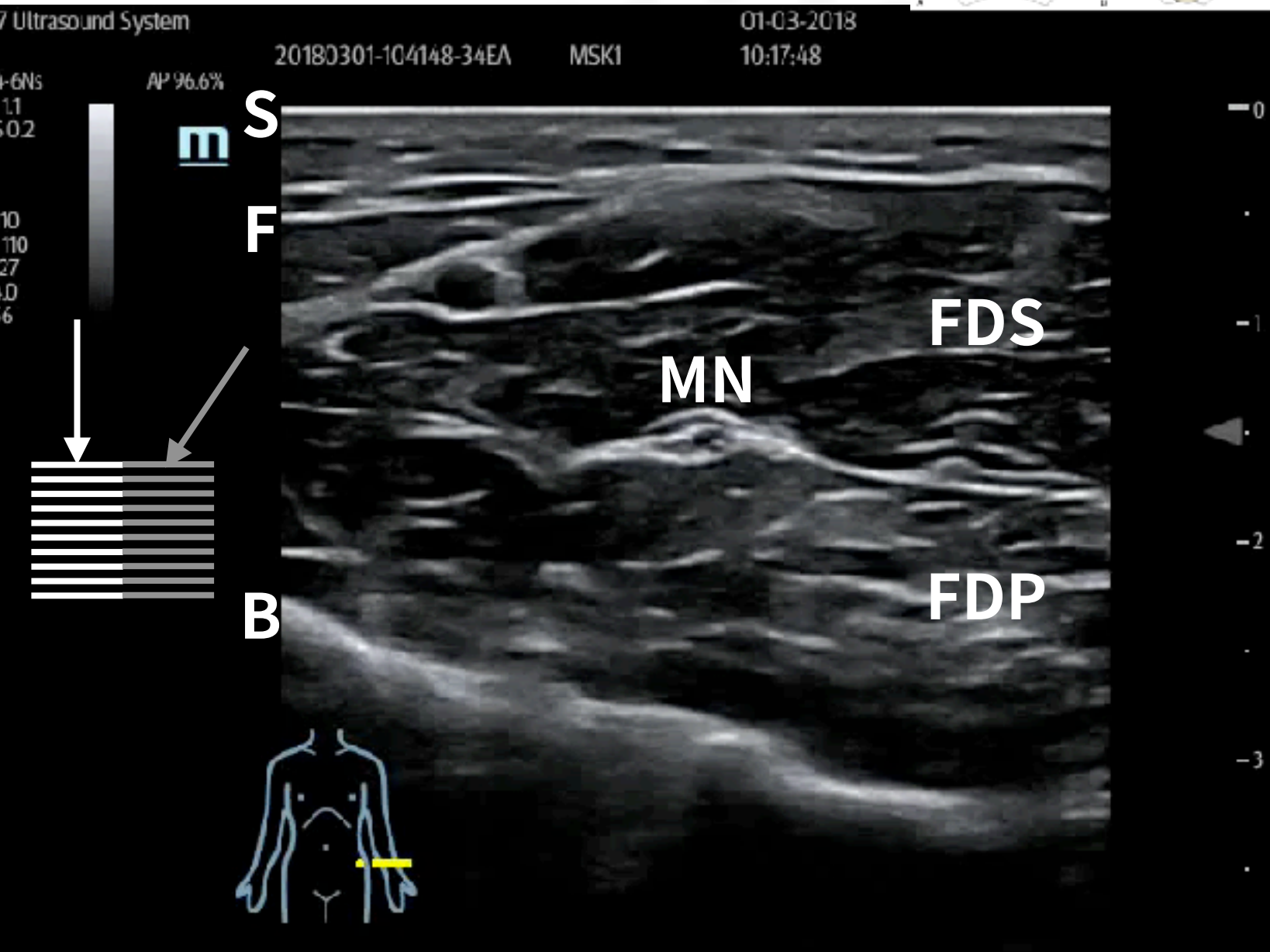
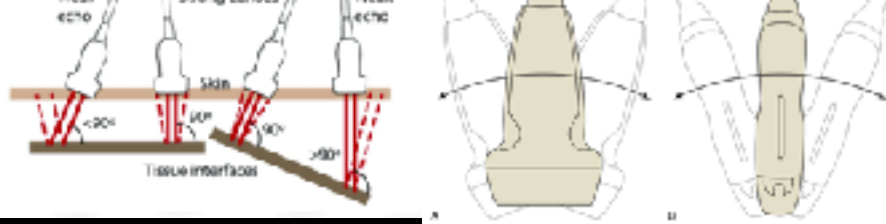
Seminars in  
ROENTGENOLOGY

## Musculoskeletal Ultrasound in the Emergency Department: Is There a Role?

Michael V. Perone, MD, and Corrie M. Yablon, MD

<https://doi.org/10.1053/j.ro.2020.09.004>

# Anisotropy



Tendon

Nerve

Muscle

# 72M, Knee cellulitis



00519500 2022Mar04 18:14

Gen MB

Abscess

PT

— Vas  
HFL  
19%  
MI  
0.7  
TIS  
0.1

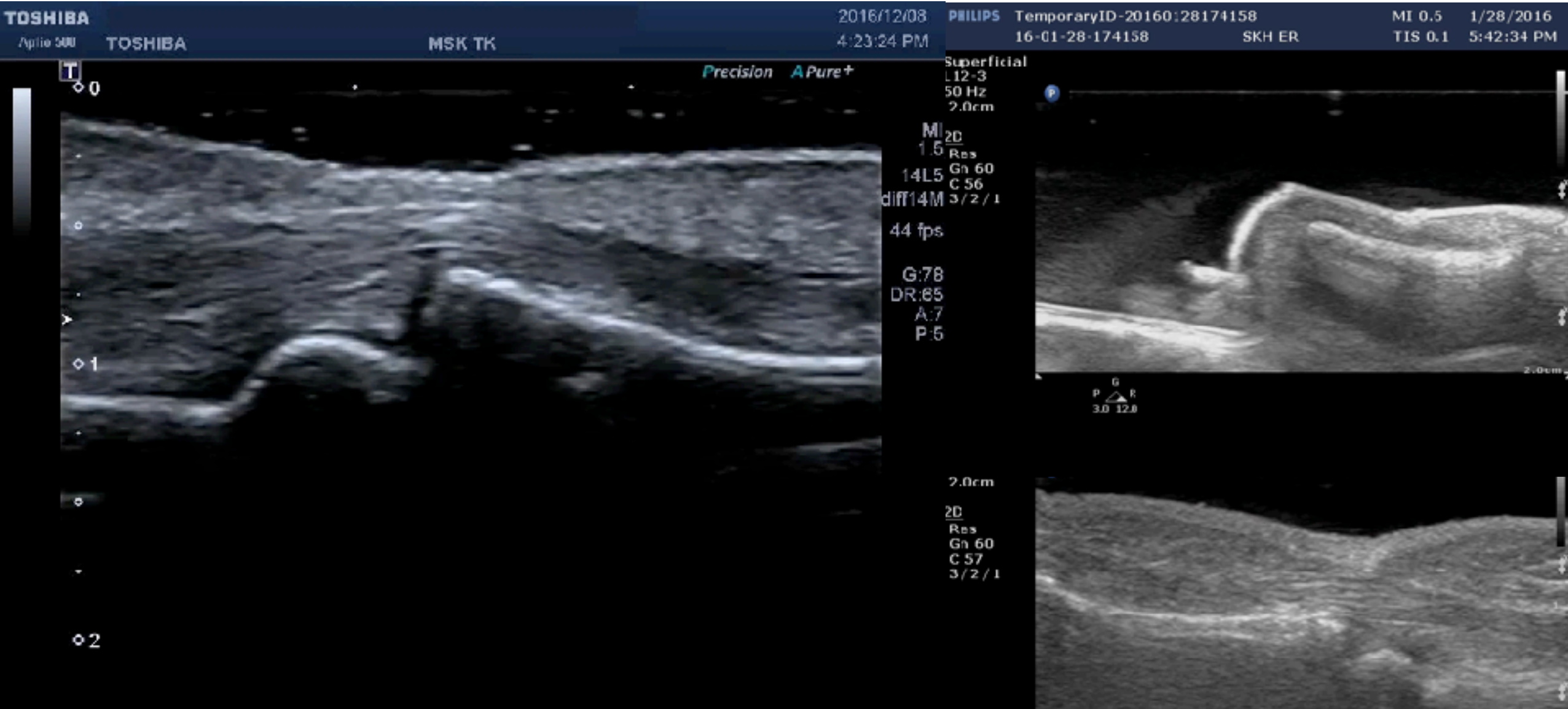
Patient

Auto Gain

Gen

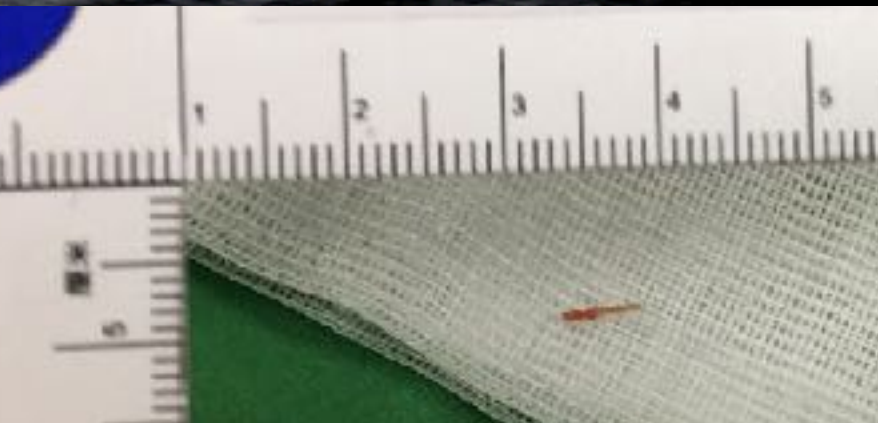
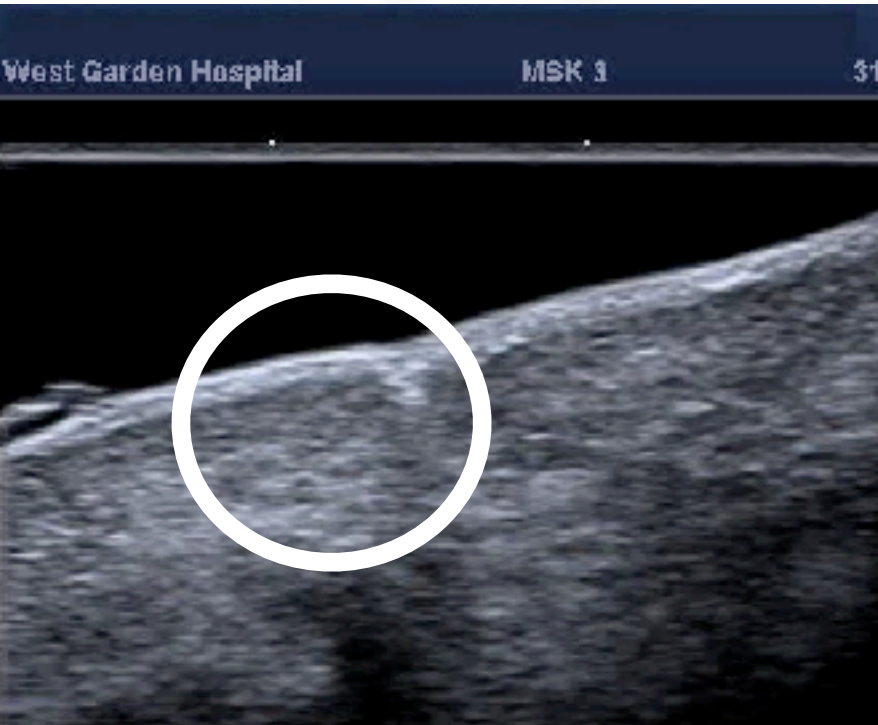


# Water bath method

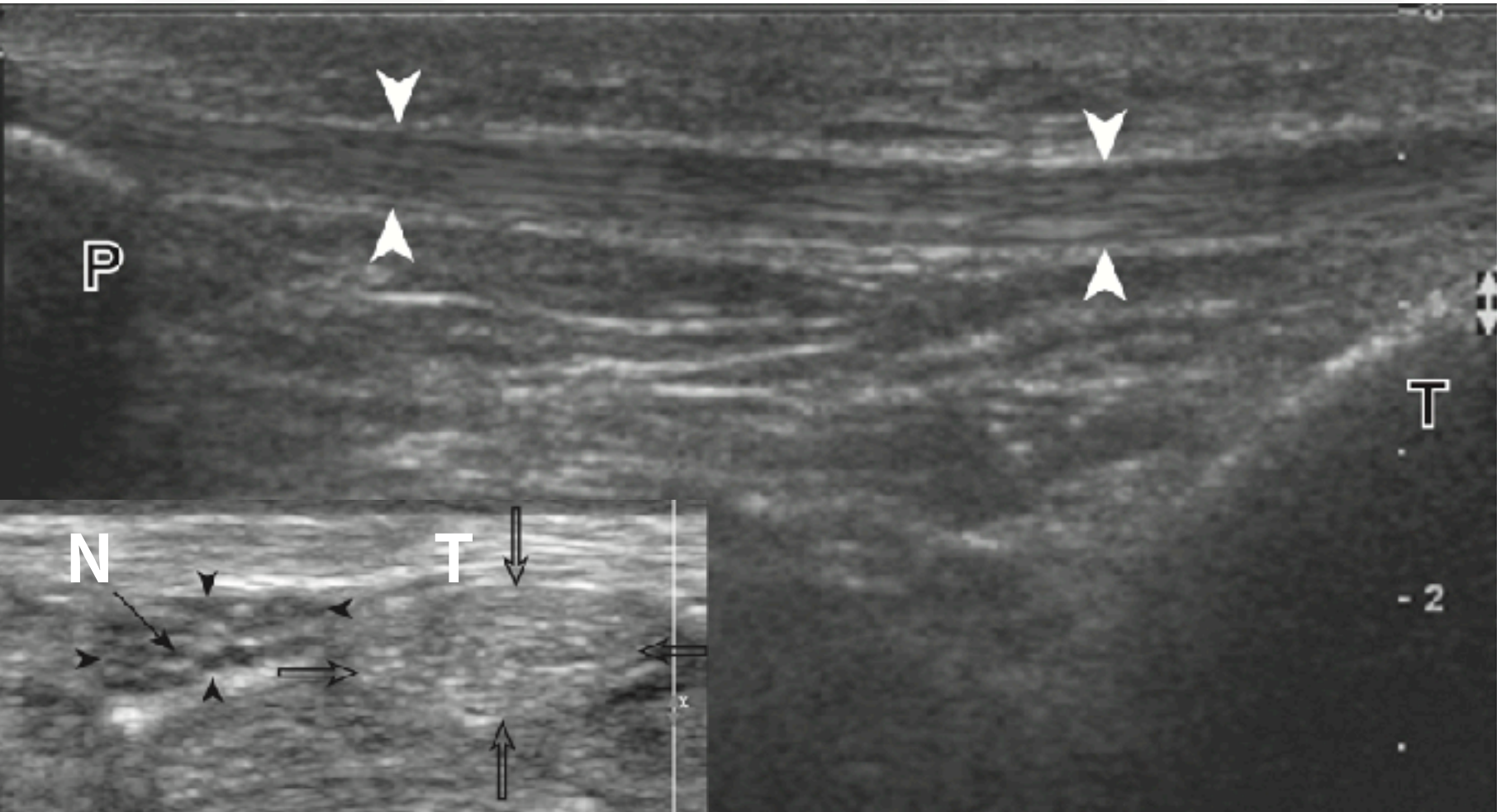




# Water bath method



# Tendon / Ligament



**Hyperechoic**

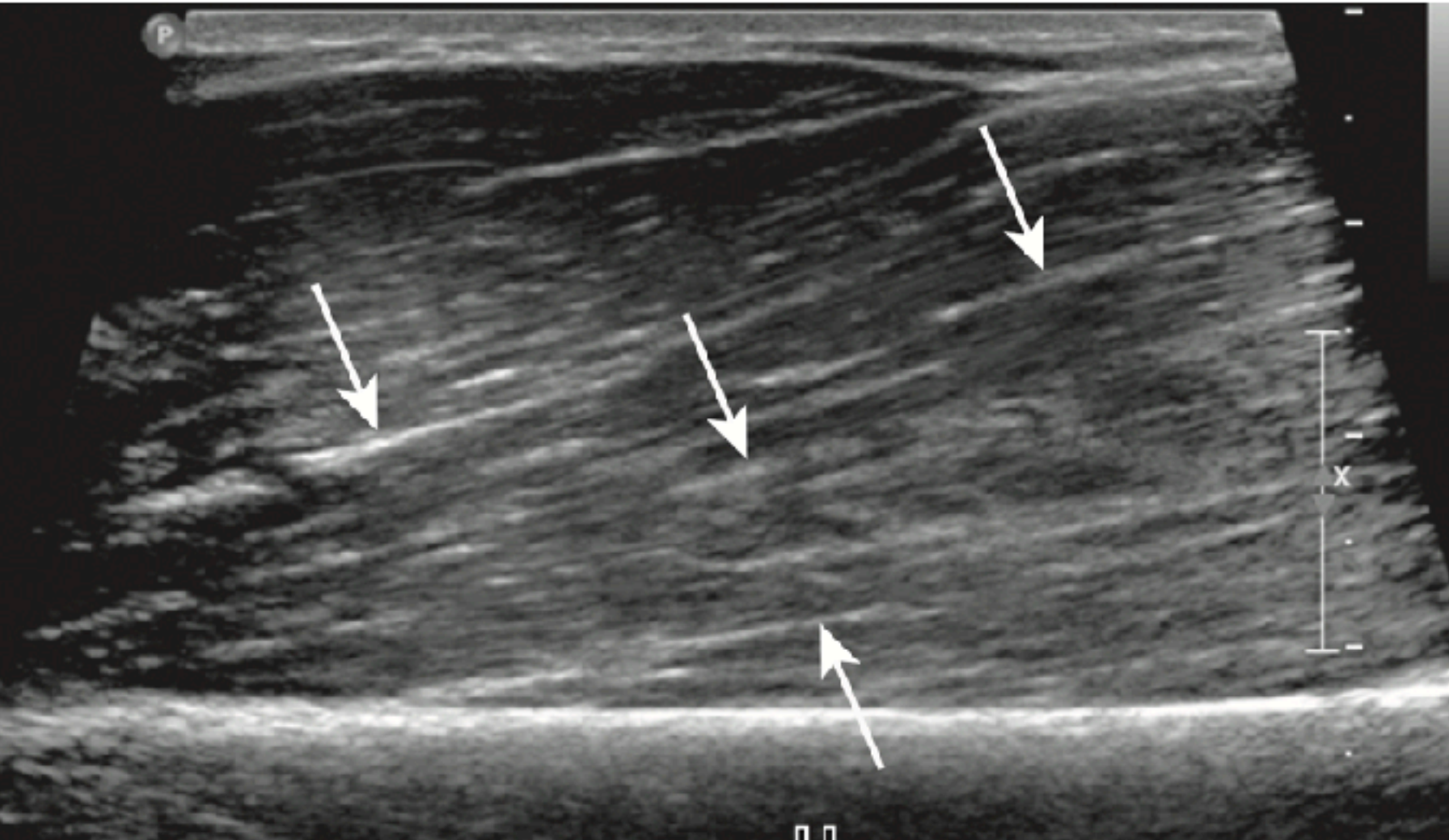
**Fibrillar**

**Grade of Injury**

- I : no fiber disruption
- II : partial fiber disruption
- III: complete fiber disruption



# Muscle



**Bristal brush**

**Hypoechoic  
mucle**

**Hyperechoic  
fibroadipose tissue**

**Grade of Injury**

- I : no fiber disruption
- II : partial fiber disruption
- III: complete fiber disruption

58M, right leg pain while running

## Grade III injury

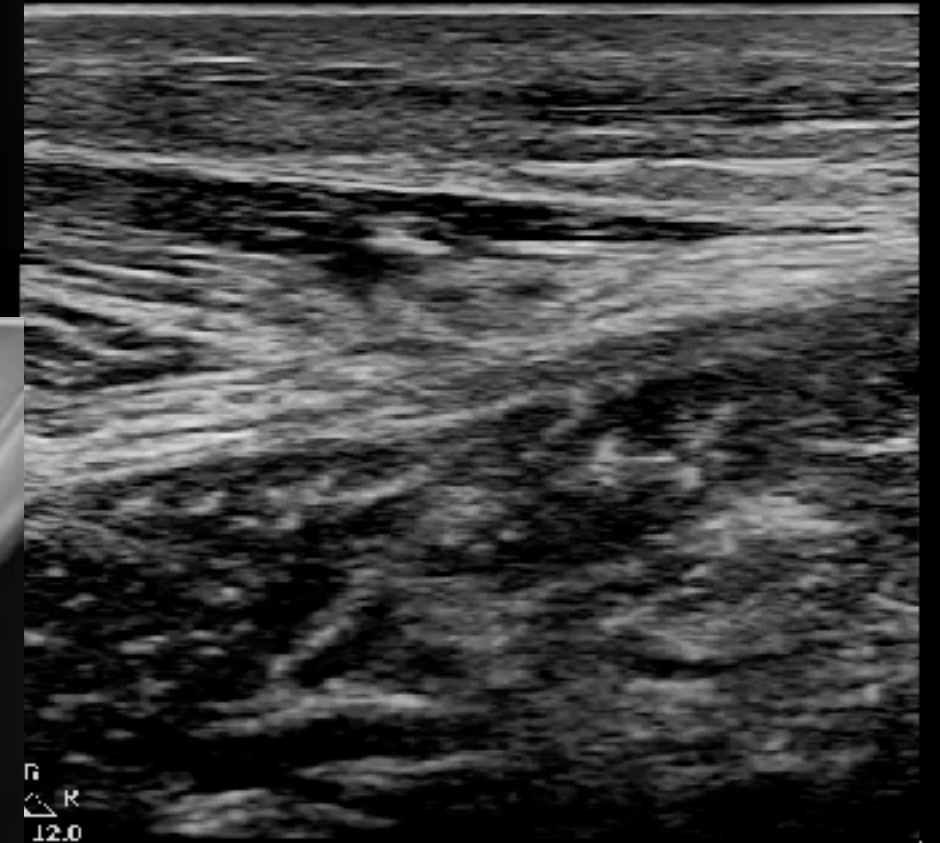
StudyID-20111101192002 MT 0.5 11/4/20  
04 192002 Philips Healthcare TIS 0.0 7:30:14



**R gastrocnemius m**

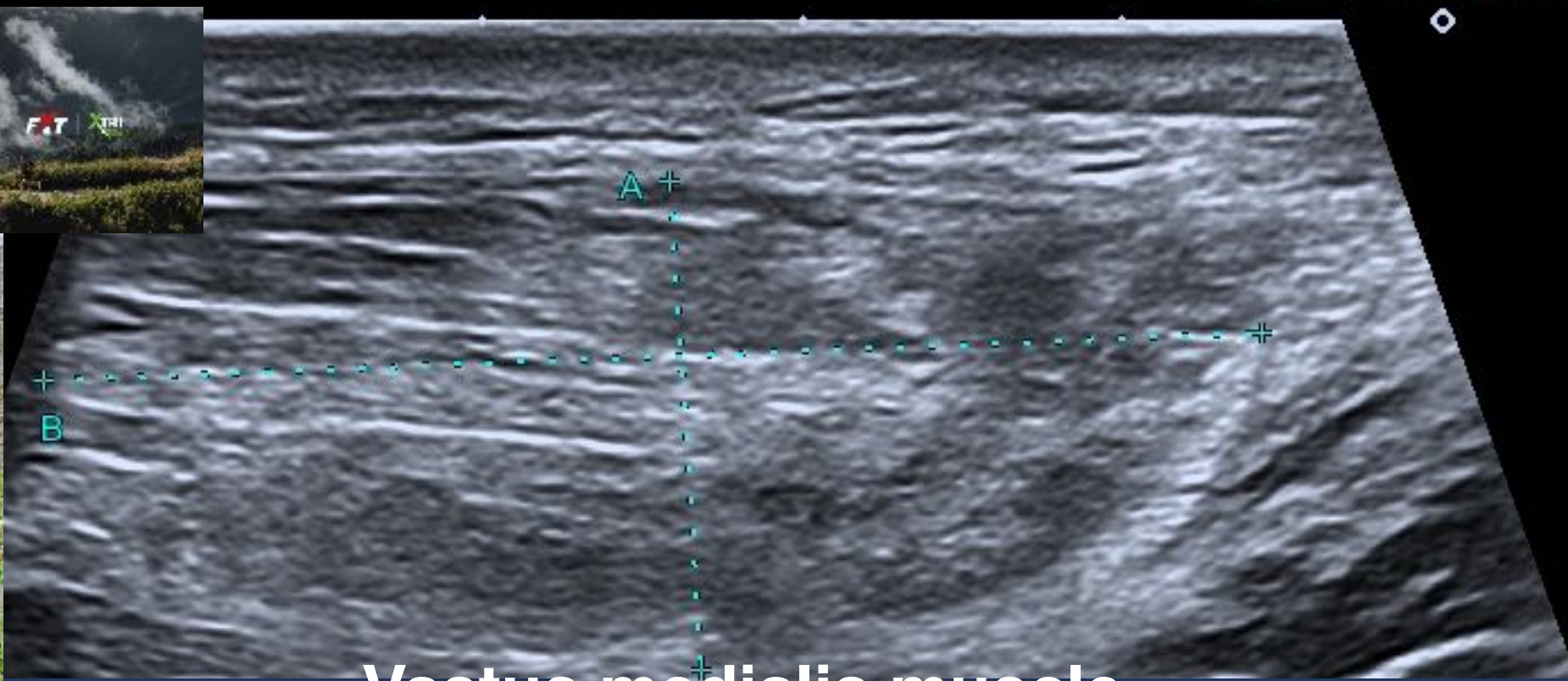


StudyID-20111101192002 MT 0.5 11/4/20  
2002 Philips Healthcare TIS 0.0 7:31:17



**L gastrocnemius m**





18L7  
diffT 14.0  
30 fps  
Qscan  
G:90  
DR:60  
A:6  
P:3

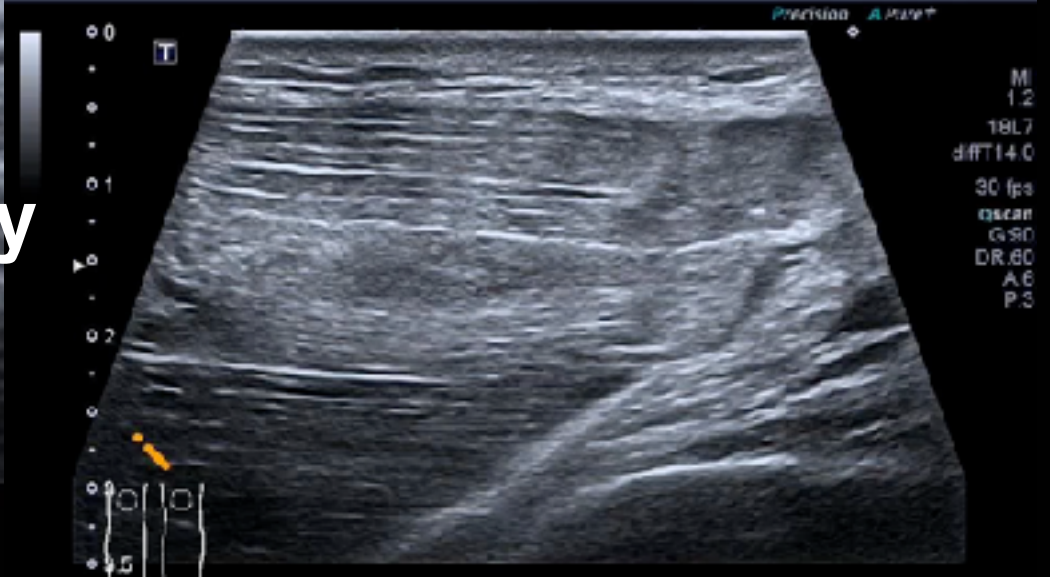
Vastus medialis muscle

TOSHIBA West Garden Hospital MSK 3 3158 2021/12/01 11:21:37 AM



M: 1.2  
18L7  
diffT 14.0  
30 fps  
Qscan  
G:90  
DR:60  
A:6  
P:3

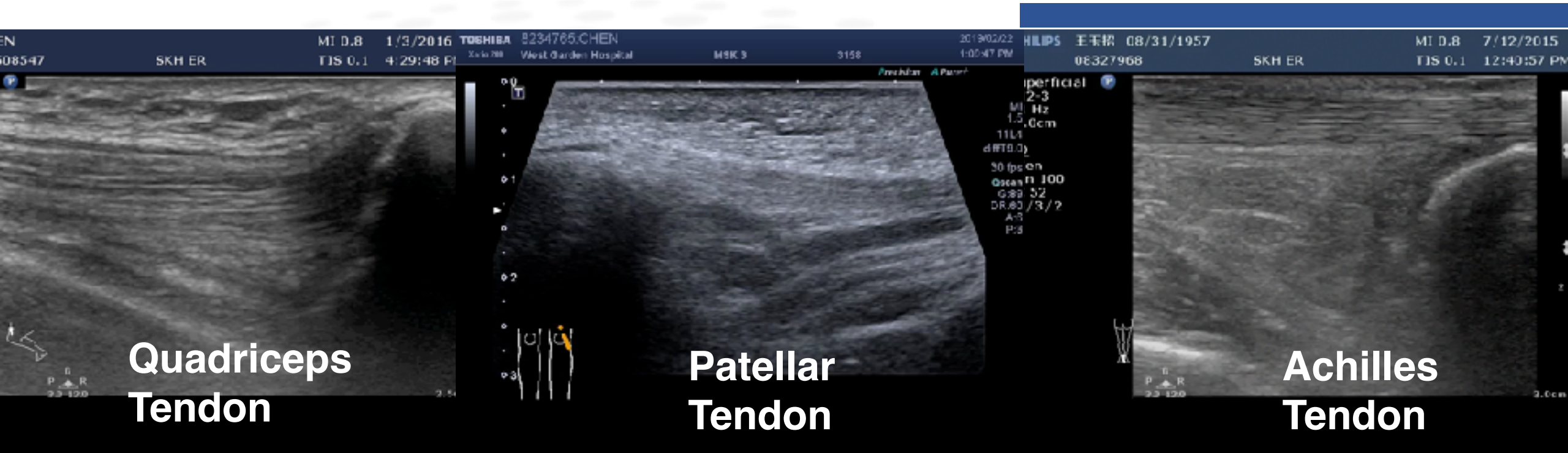
Grade II injury



M: 1.2  
18L7  
diffT 14.0  
30 fps  
Qscan  
G:90  
DR:60  
A:6  
P:3

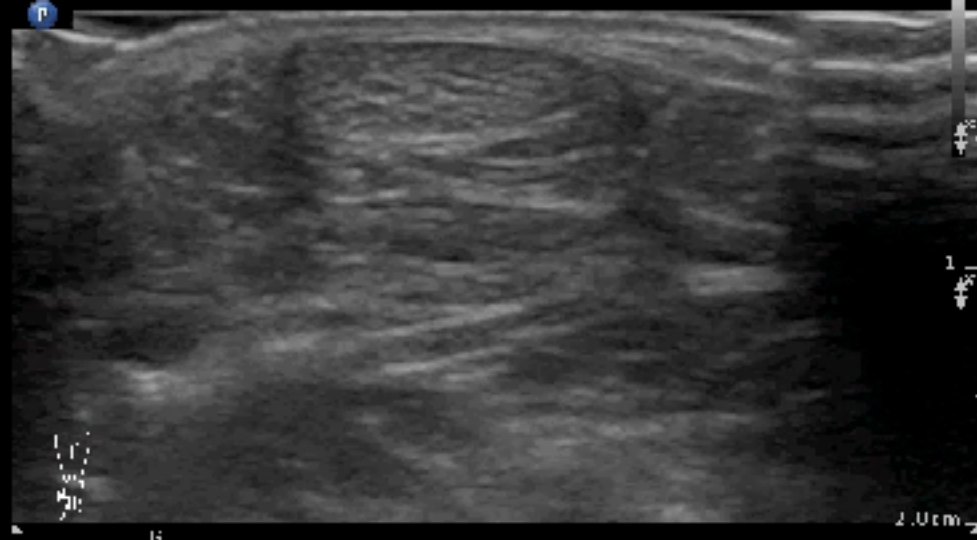


# Anterior approach for tendon

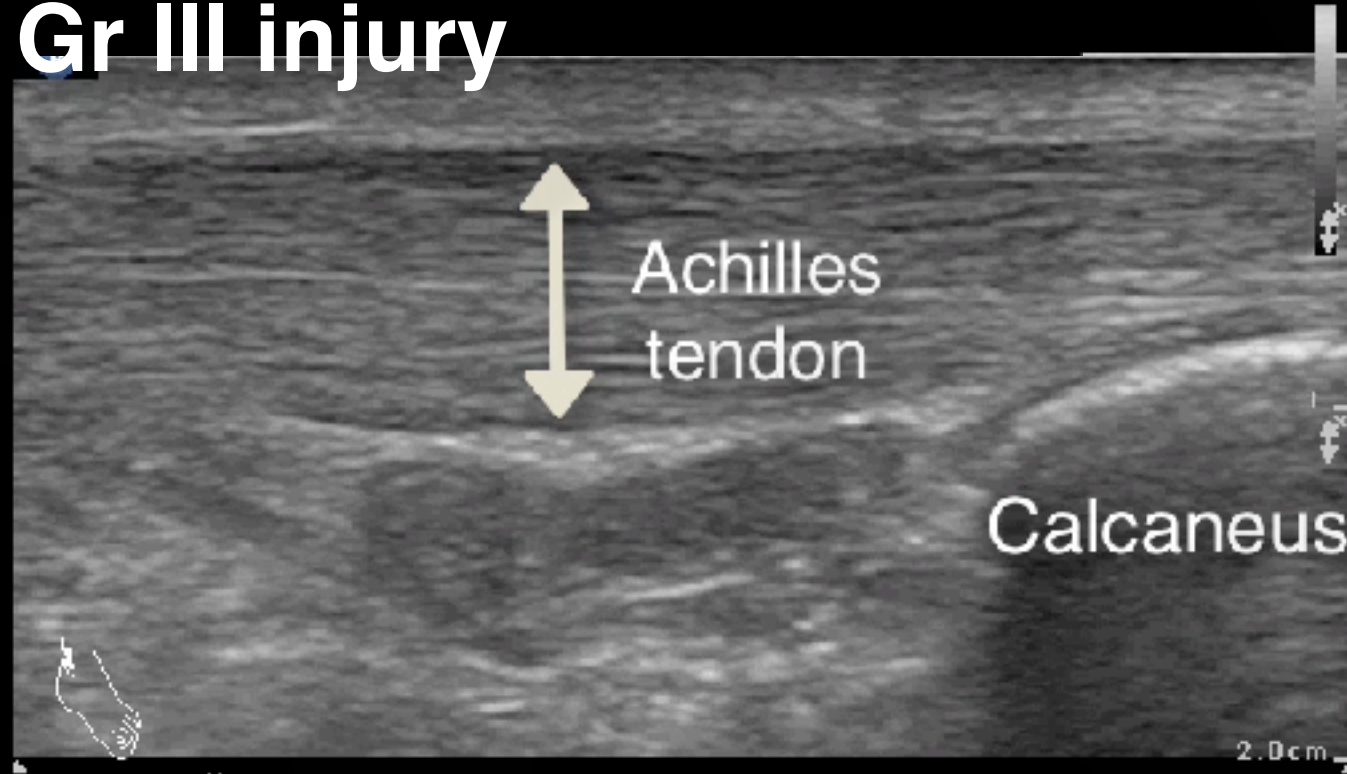
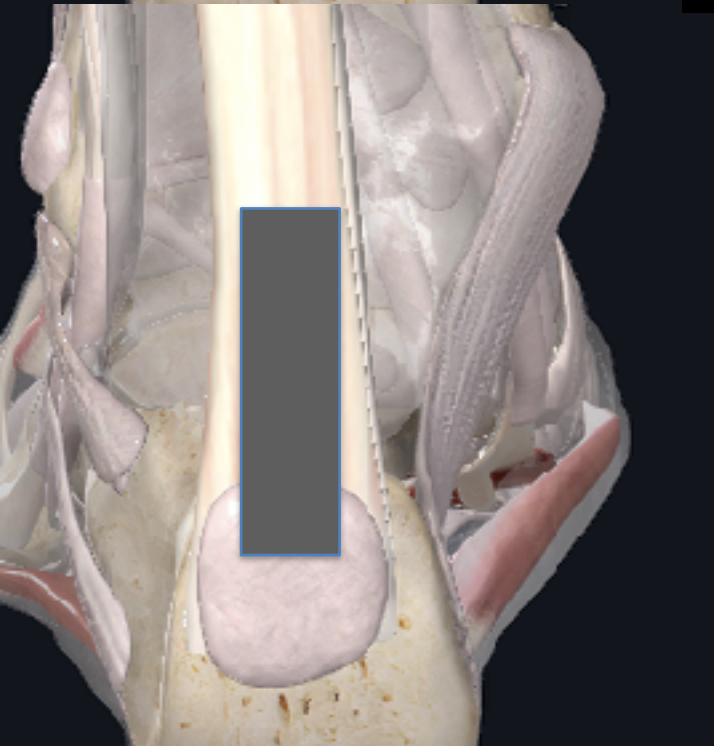




34 Hz  
2.0cm  
2D  
Cien  
Gn 9-1  
C: 52  
1/3/2



# Achilles tendon rupture Gr III injury





# Achilles tendon rupture Gr III injury

20160425100747

MI 0.5

4/25/2016

ryID-20160425101611

MI 0.6

4/

47

SKH ER

TIS 0.1

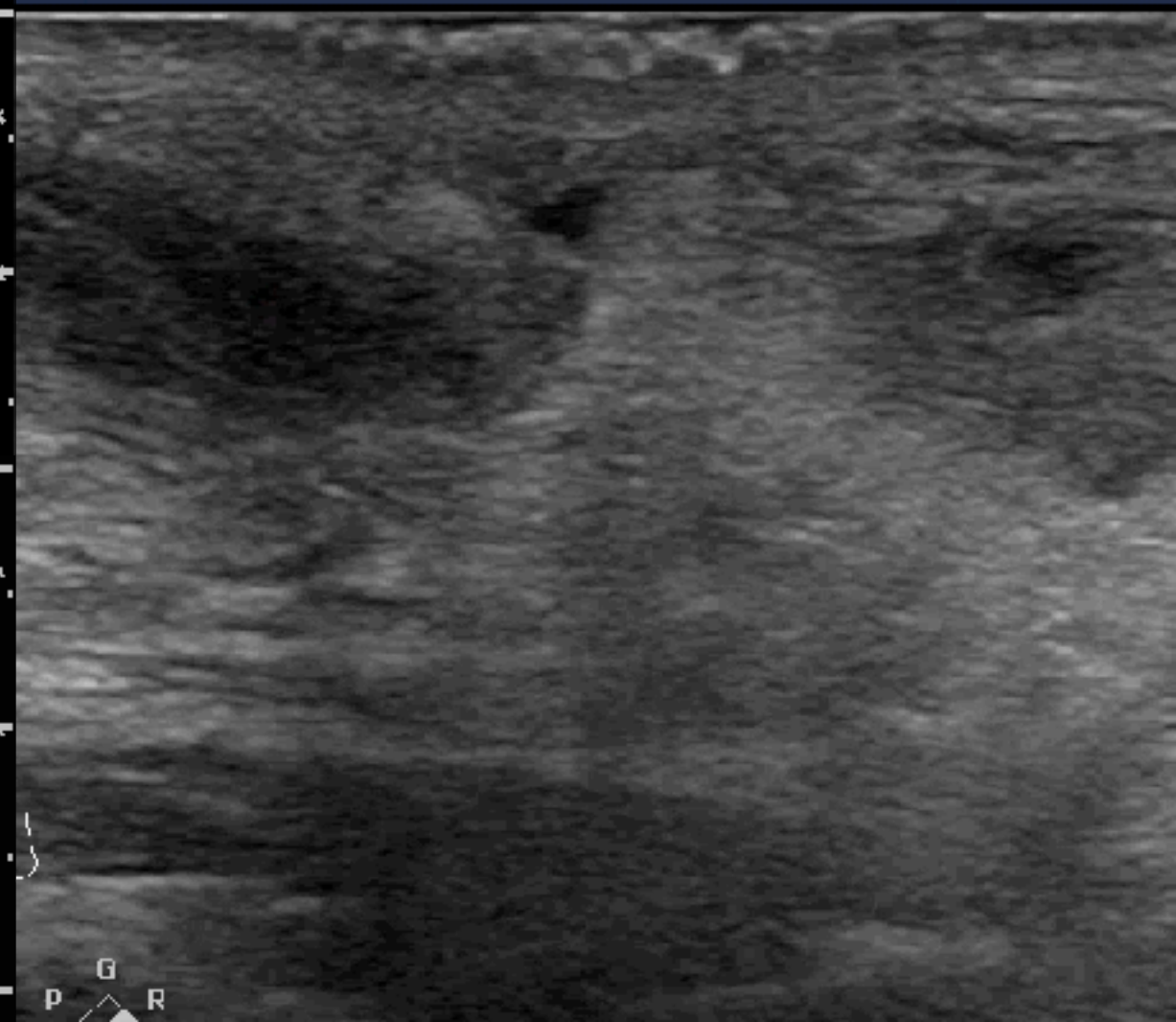
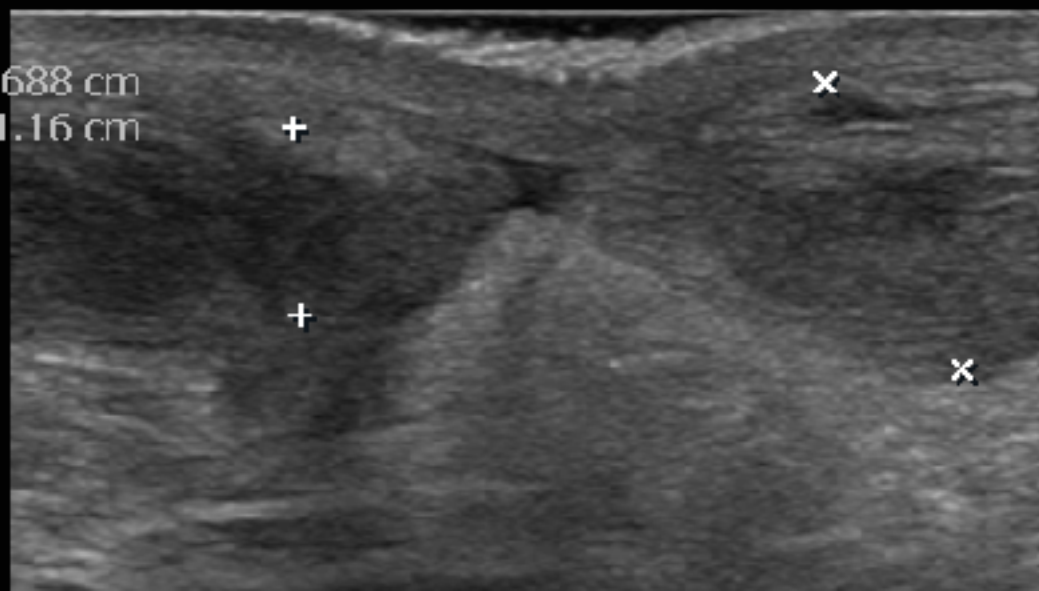
10:14:48 AM

101611

SKH ER

TIS 0.1

10



87268

SKH ER

MI 0.7

10/30/2015

TIS 0.1

2:14:49 PM

P

**Achilles tendon rupture  
Gr III injury  
Dynamic examination with passive dorsiflexion**

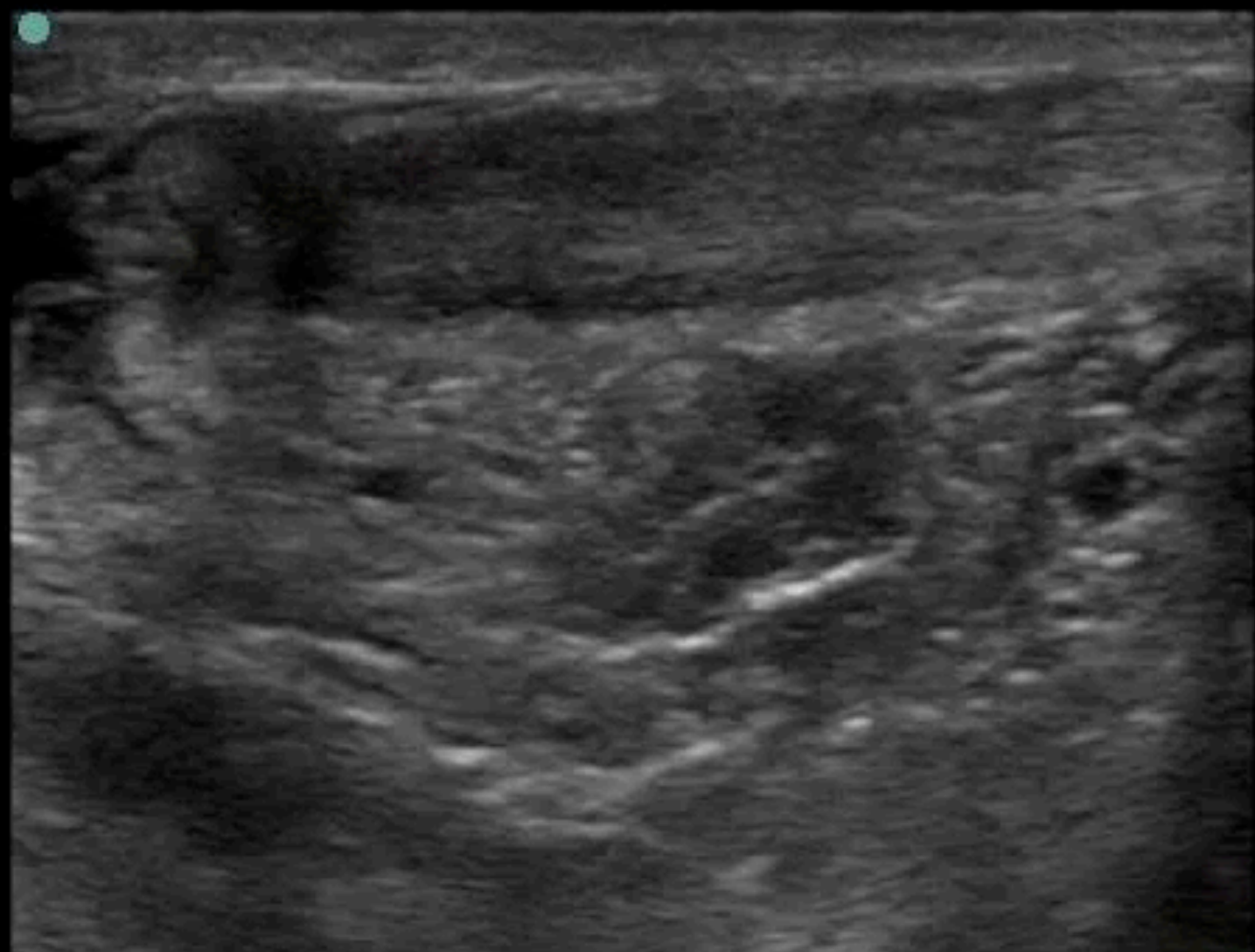
1

53F, heel



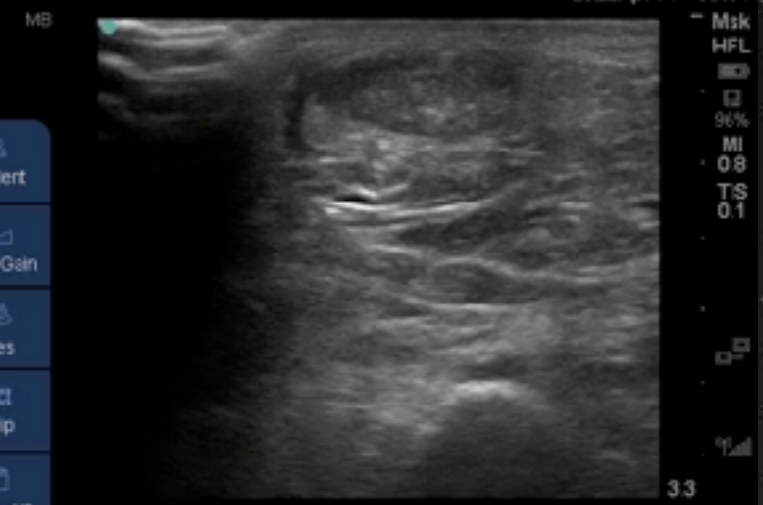
MB

2022Apr14 09:01



Msk  
HFL  
←  
□  
97%  
MI  
0.8  
TS  
0.1

2022Apr14 09:01

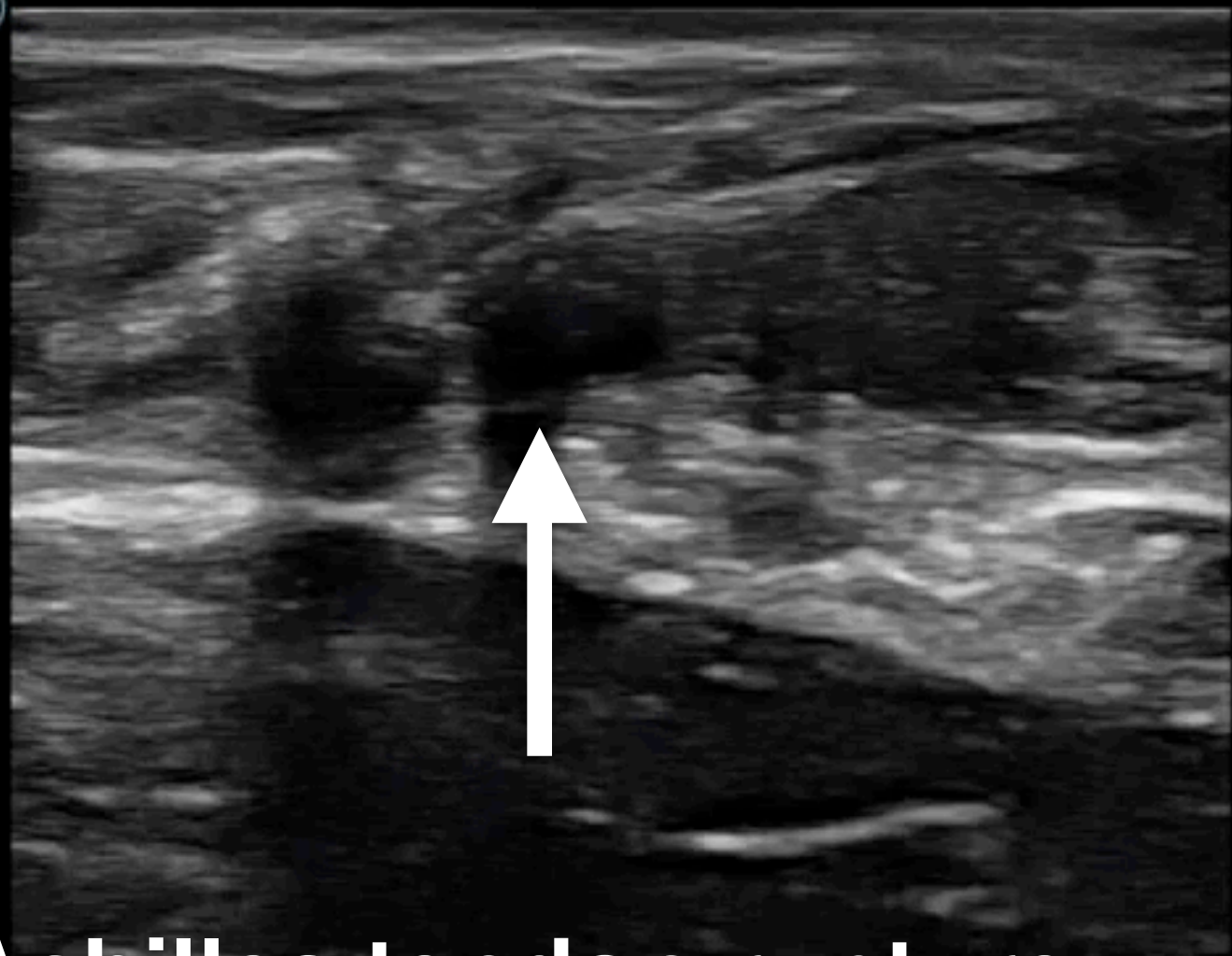


Msk  
HFL  
□  
96%  
MI  
0.8  
TS  
0.1

33



A



**Achilles tendon rupture  
Gr III injury**

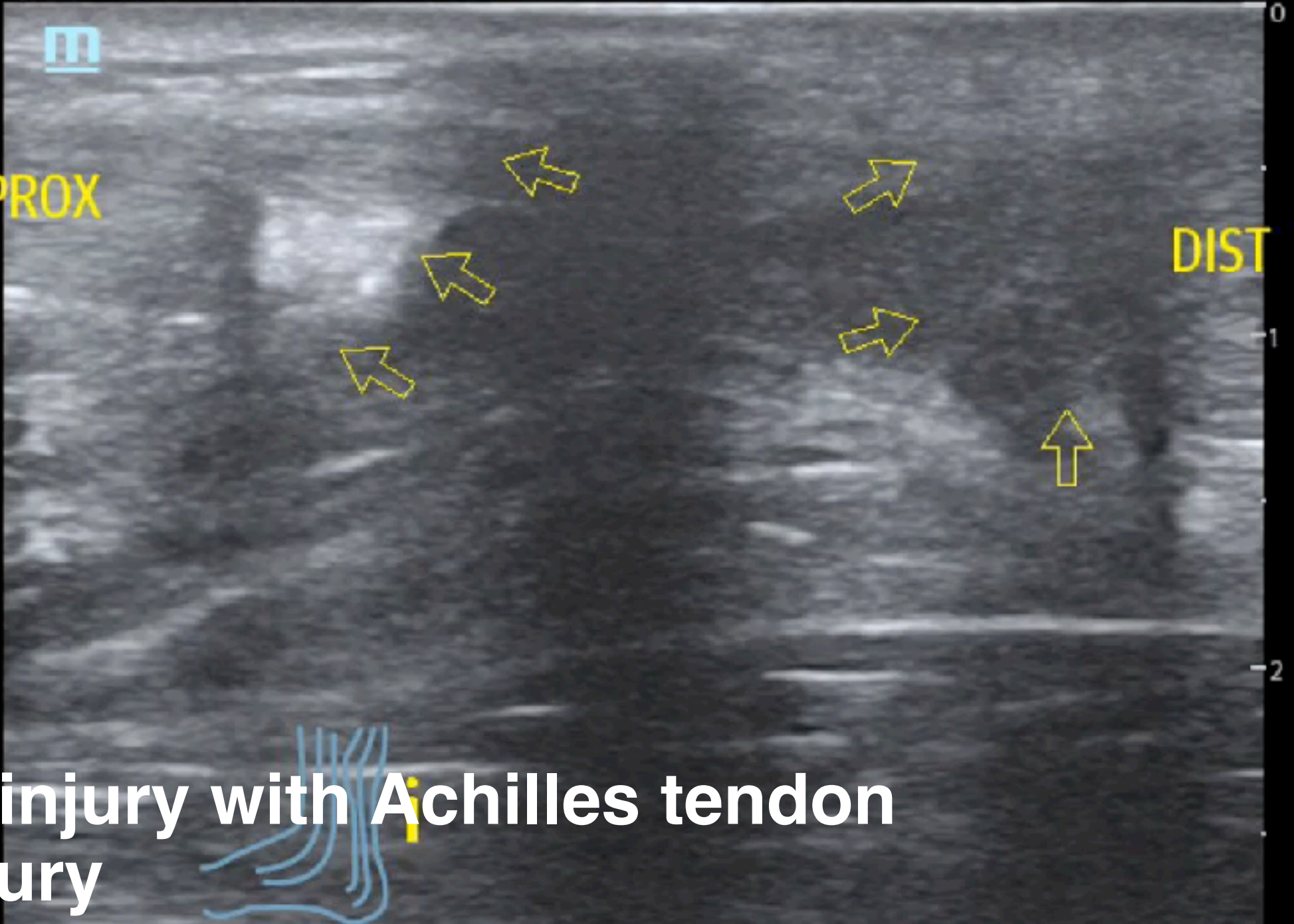


F

B  
FH10.0  
DR 105  
FR 31  
D 3.0  
G 84

PROX

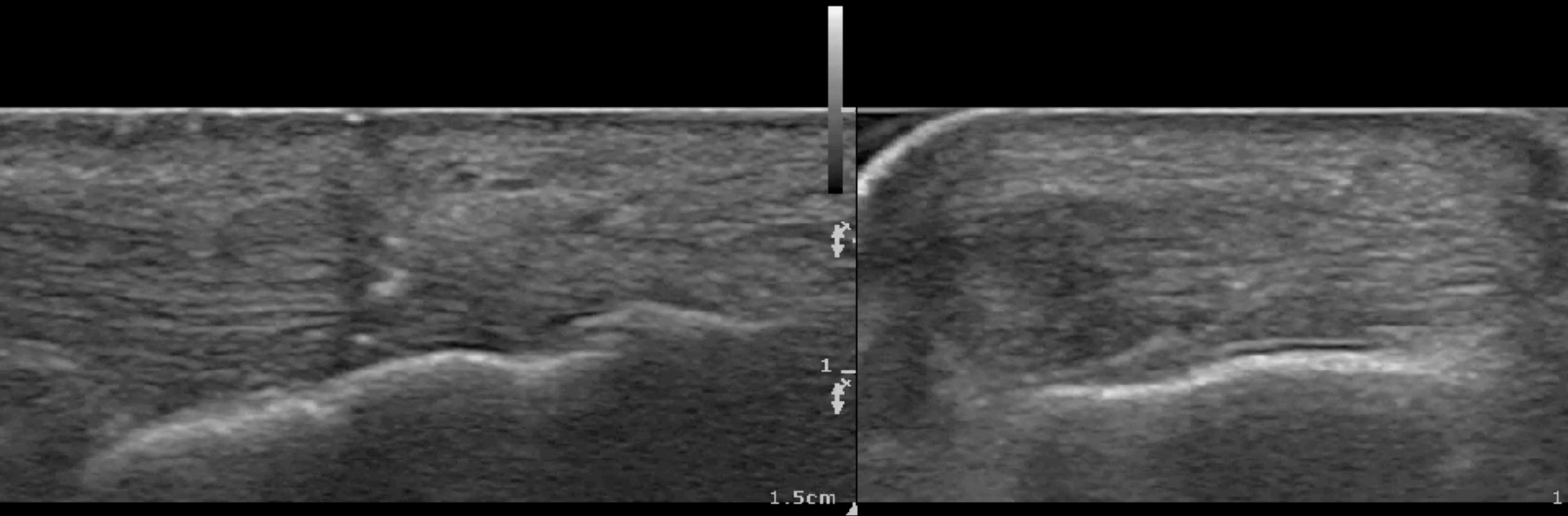
DIST



iNeedle

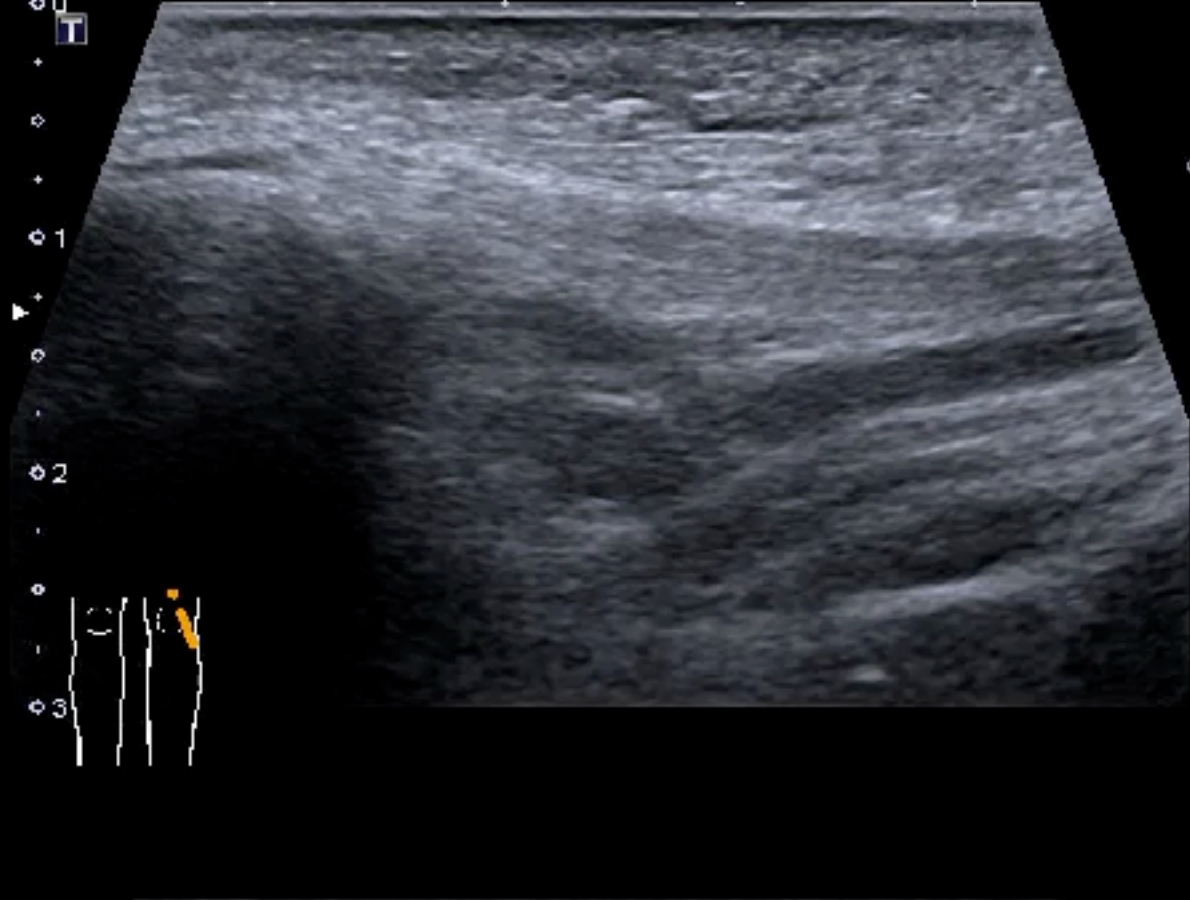
**Cutting injury with Achilles tendon  
Gr III injury**





**Cutting injury with Achilles tendon  
Gr II injury**

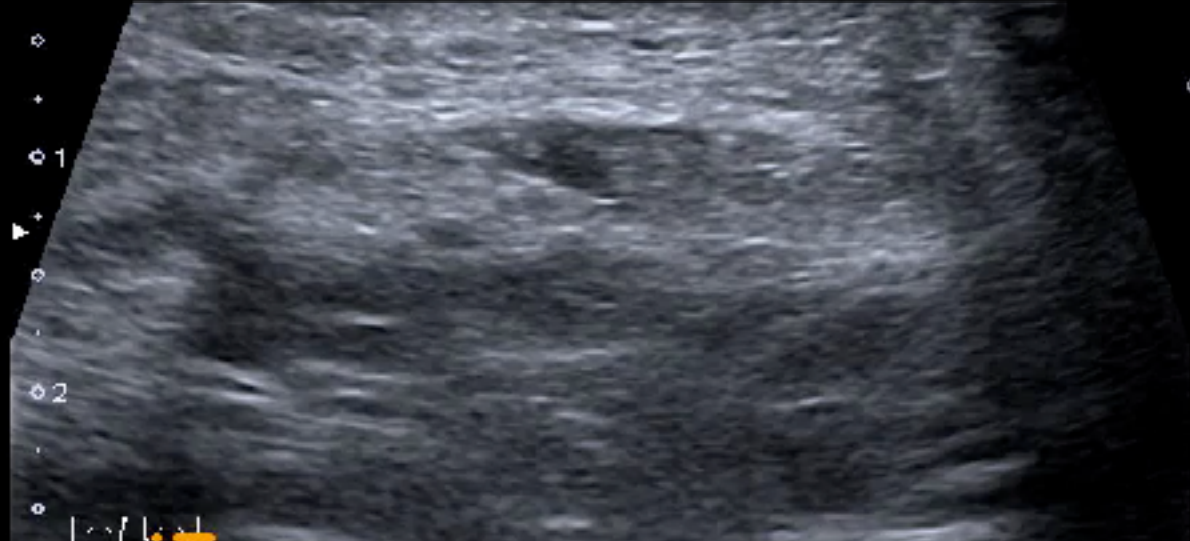




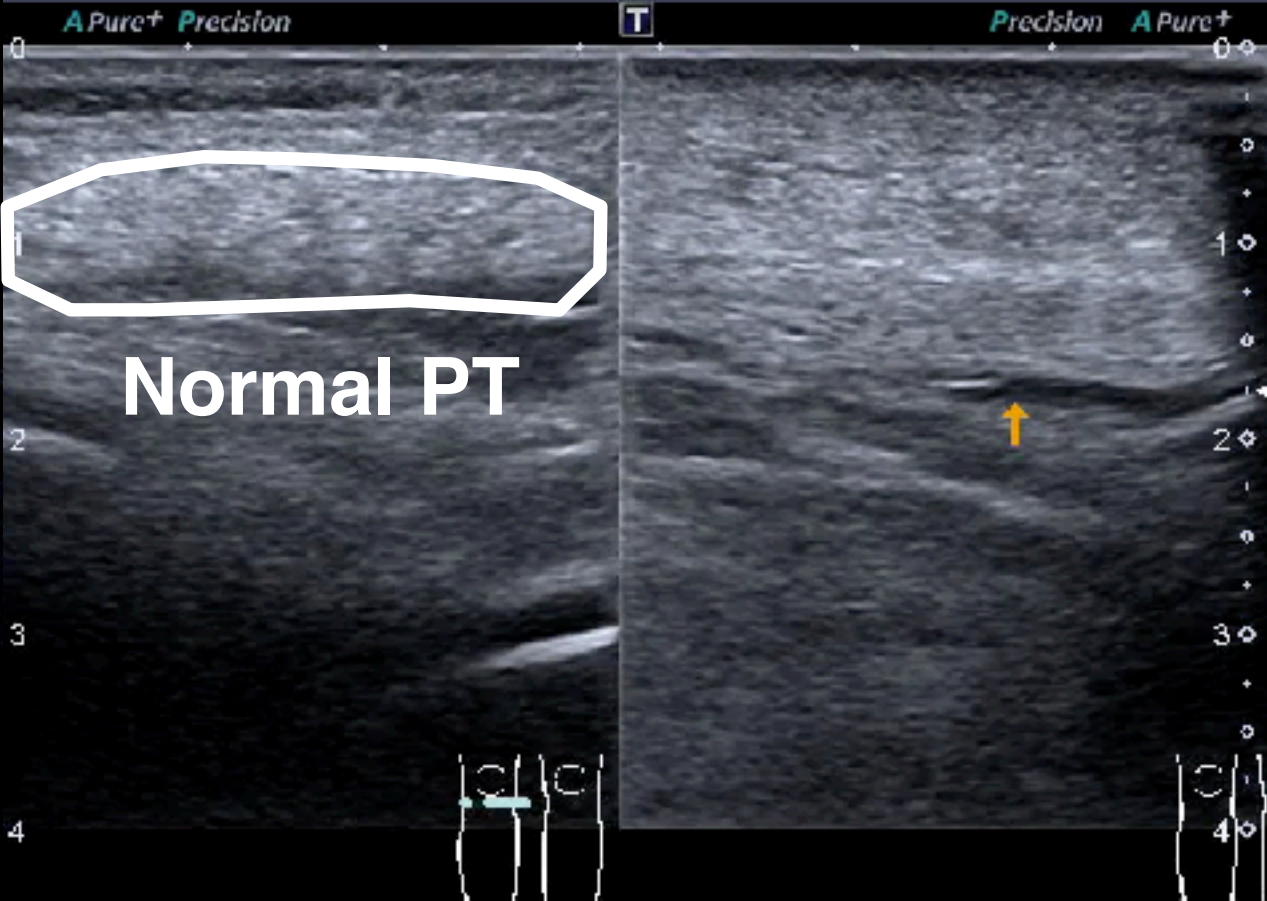
MI  
1.5  
11L4  
diffT9.0  
30 fps  
Qscan  
G:89  
DR:60  
A:8  
P:3

# Patellar tendon Gr II injury

8234765:CHEN West Garden Hospital MSK 3 3158 2019/ 1:12:5

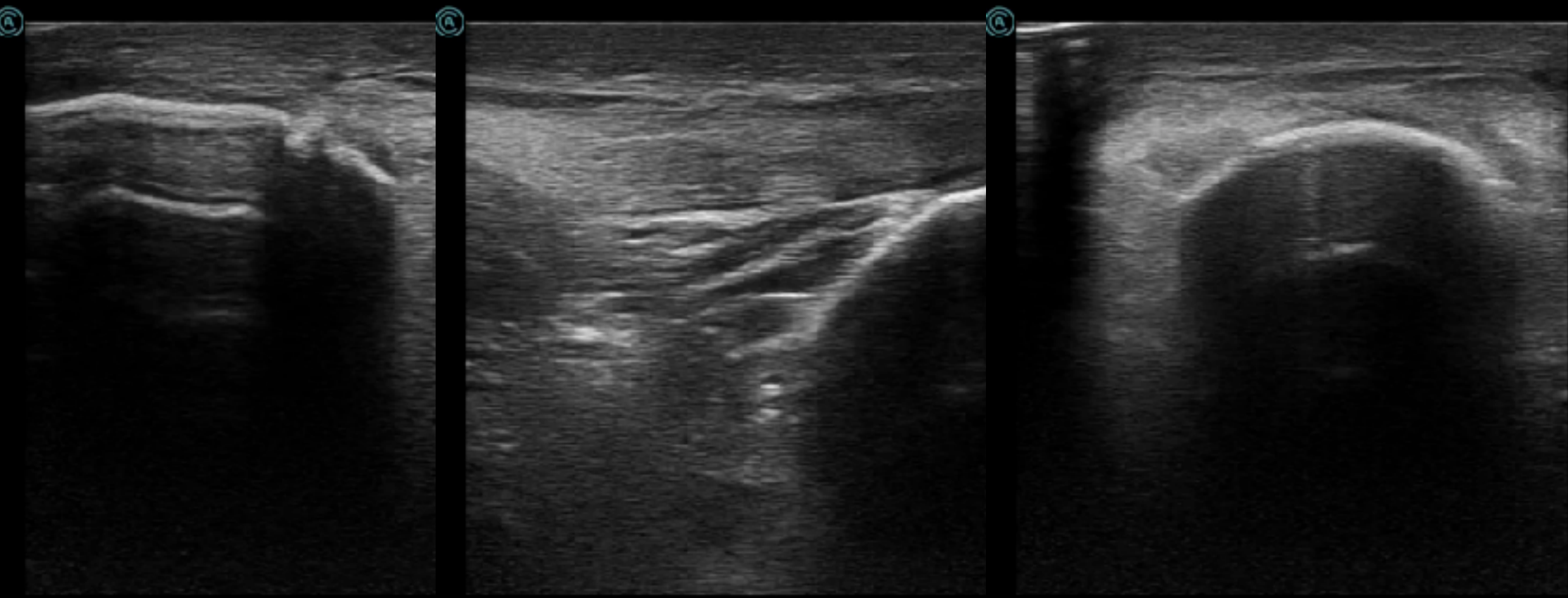
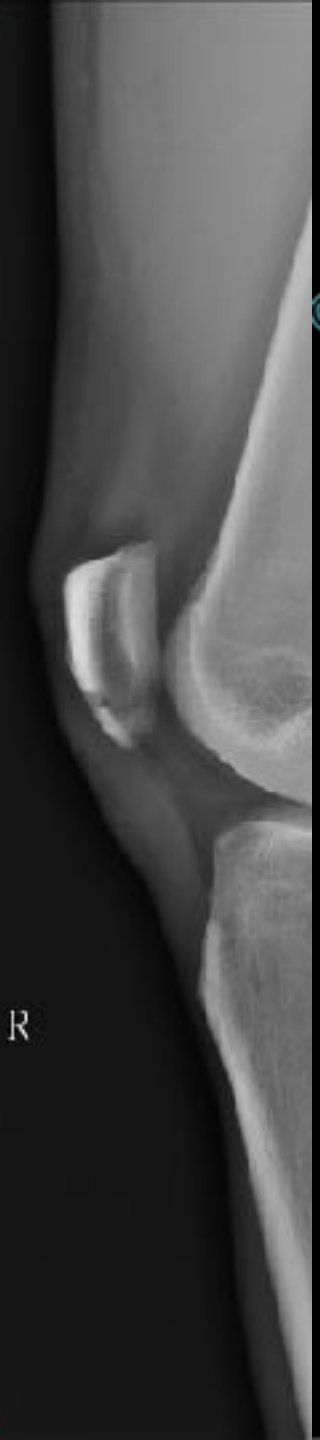


MI  
1.5  
11L4  
diffT9.0  
30 fps  
Qscan  
G:89  
DR:60  
A:8  
P:3



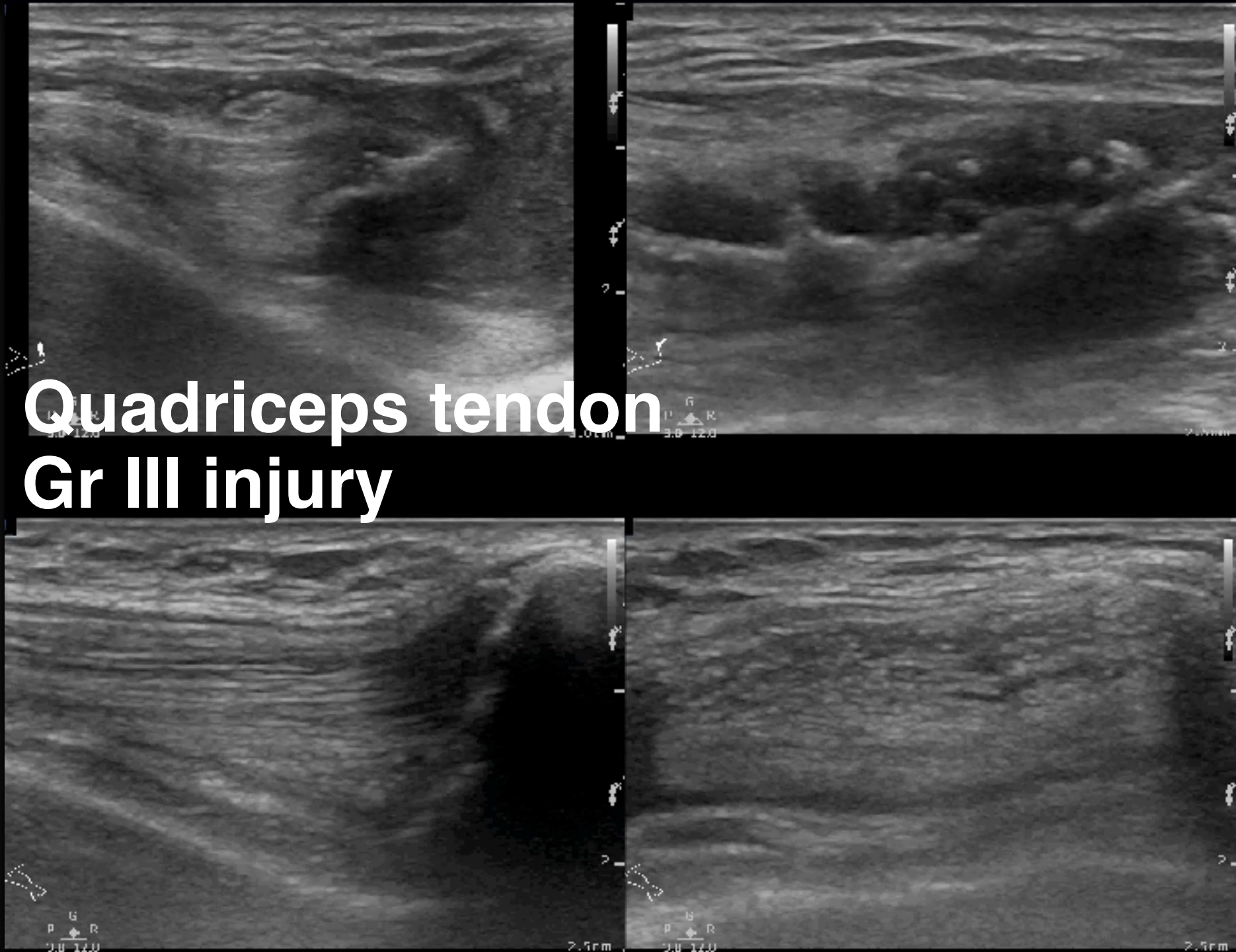
Normal PT





**Patella fx with Patellar tendon Gr II injury**

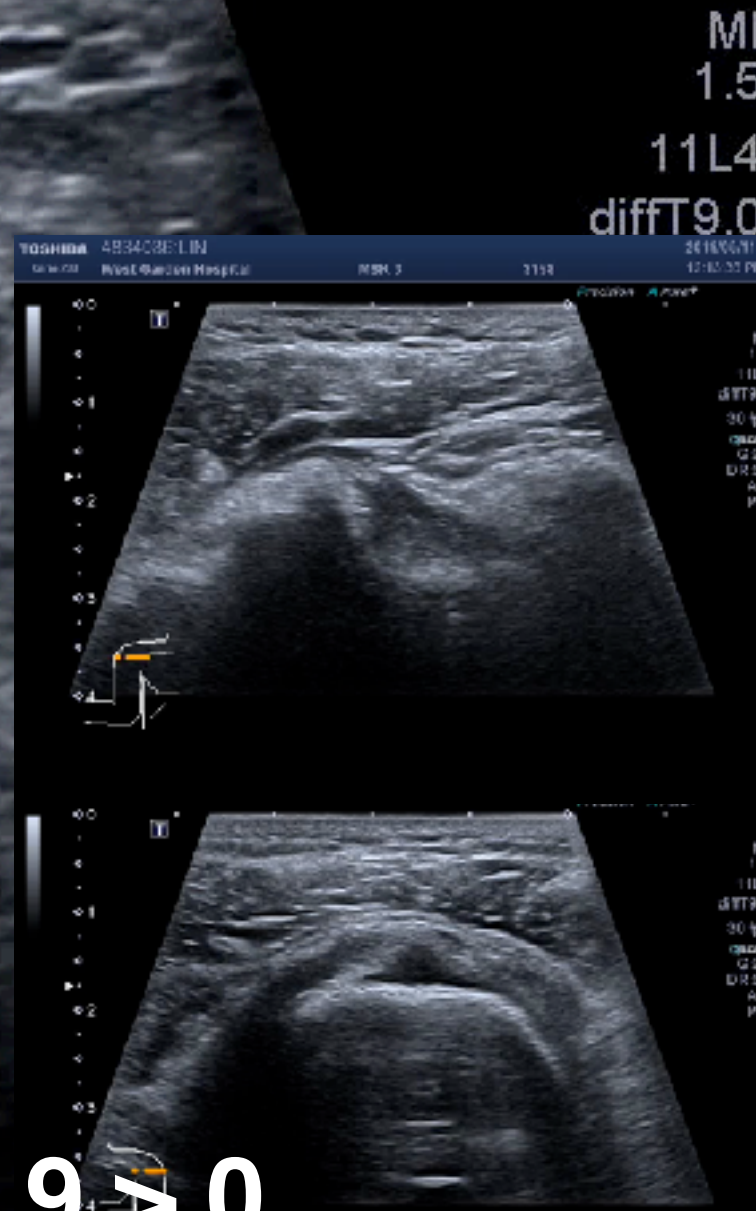
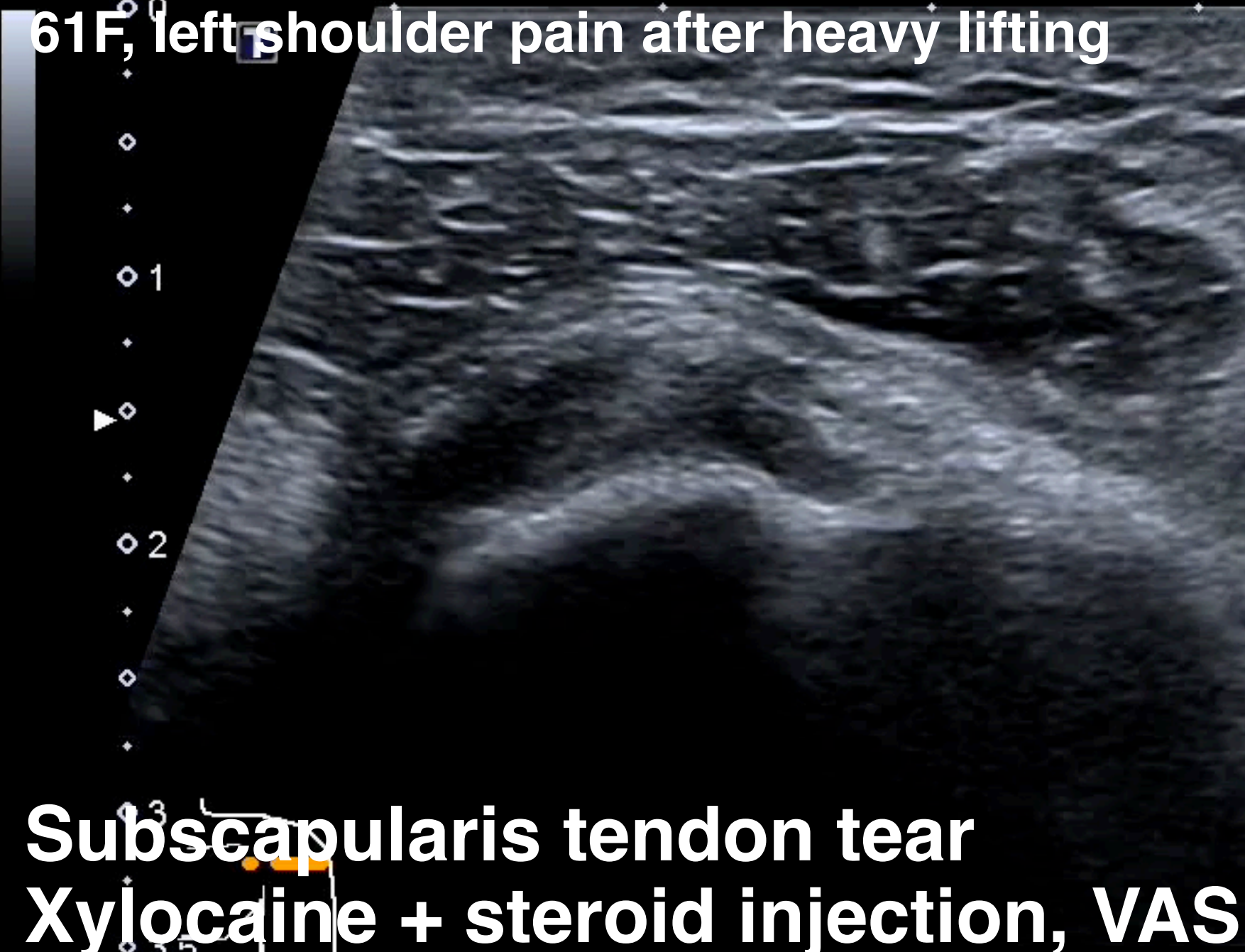




**Quadriceps tendon  
Gr III injury**

61F, left shoulder pain after heavy lifting

Precision A Pure+

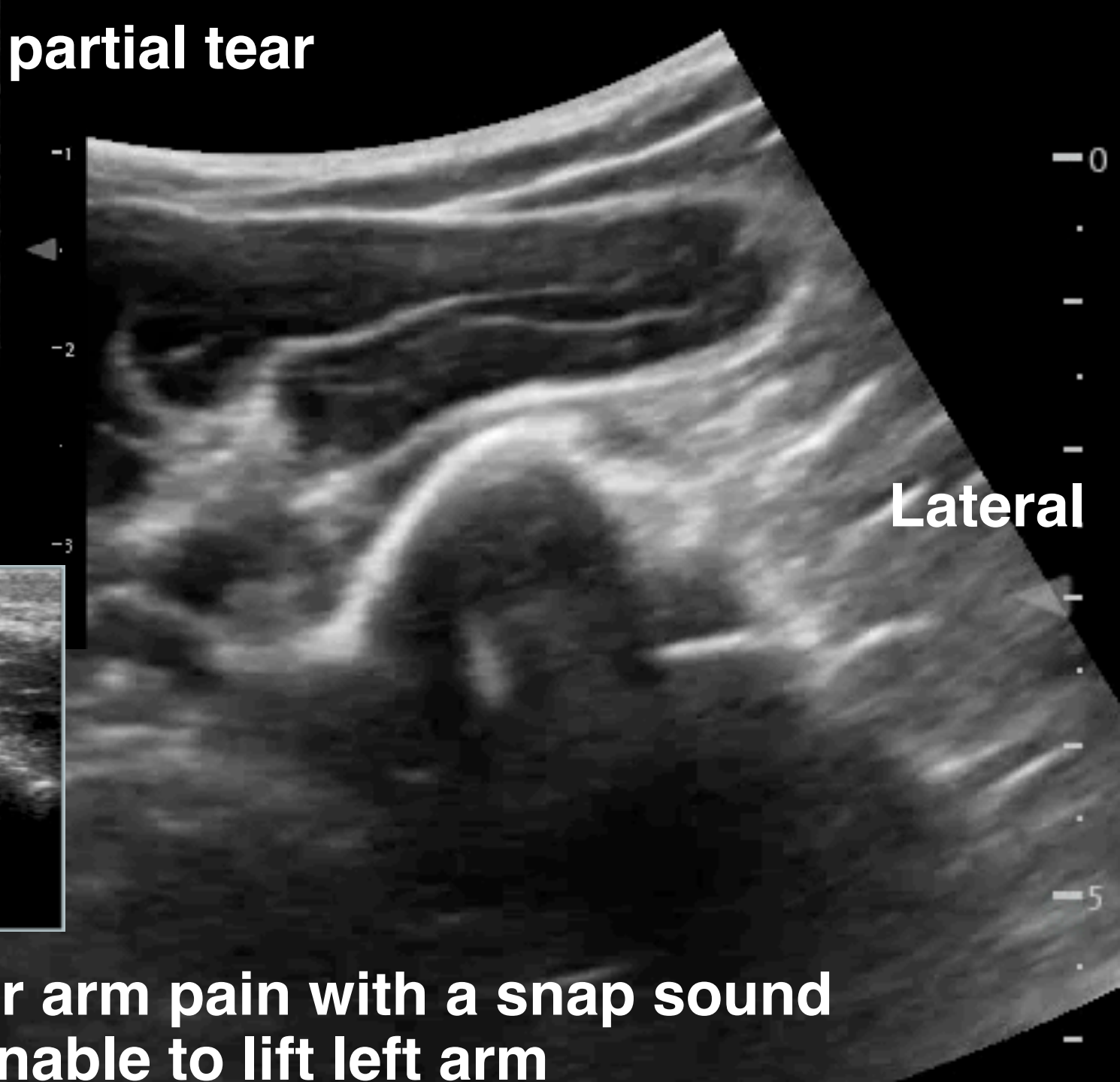


Subscapularis tendon tear  
Xylocaine + steroid injection, VAS 9 > 0

3.5



# Biceps tendon long head partial tear



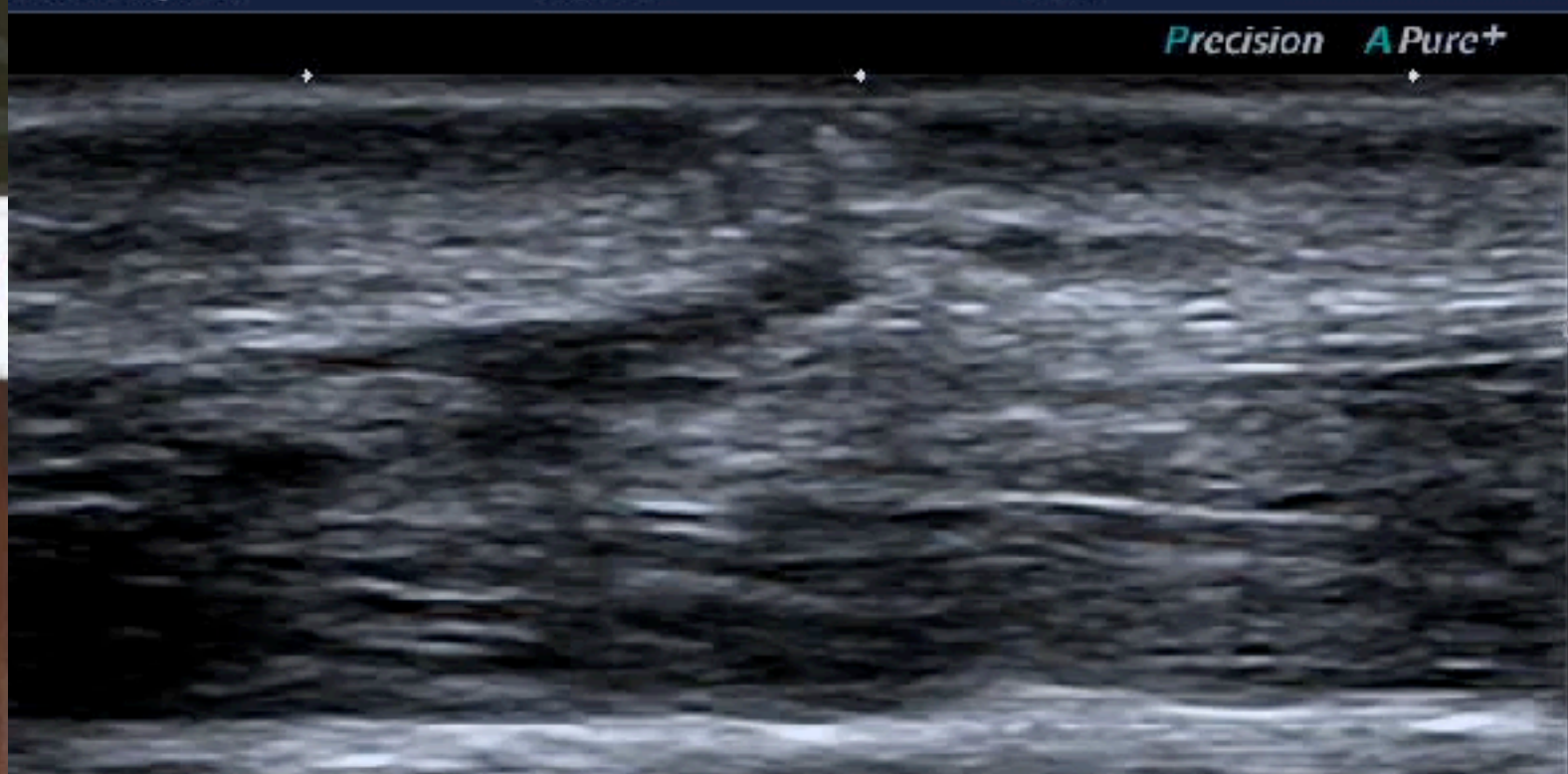
Medial

Lateral

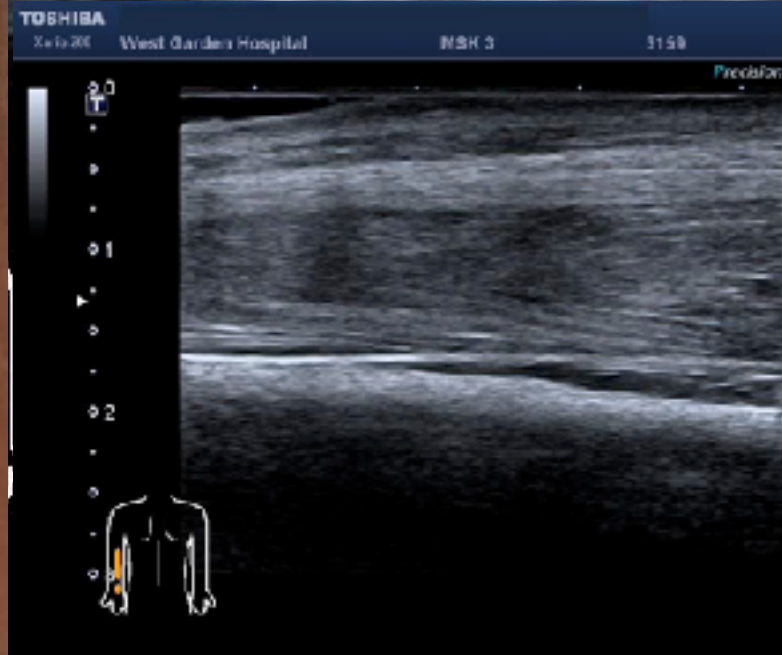


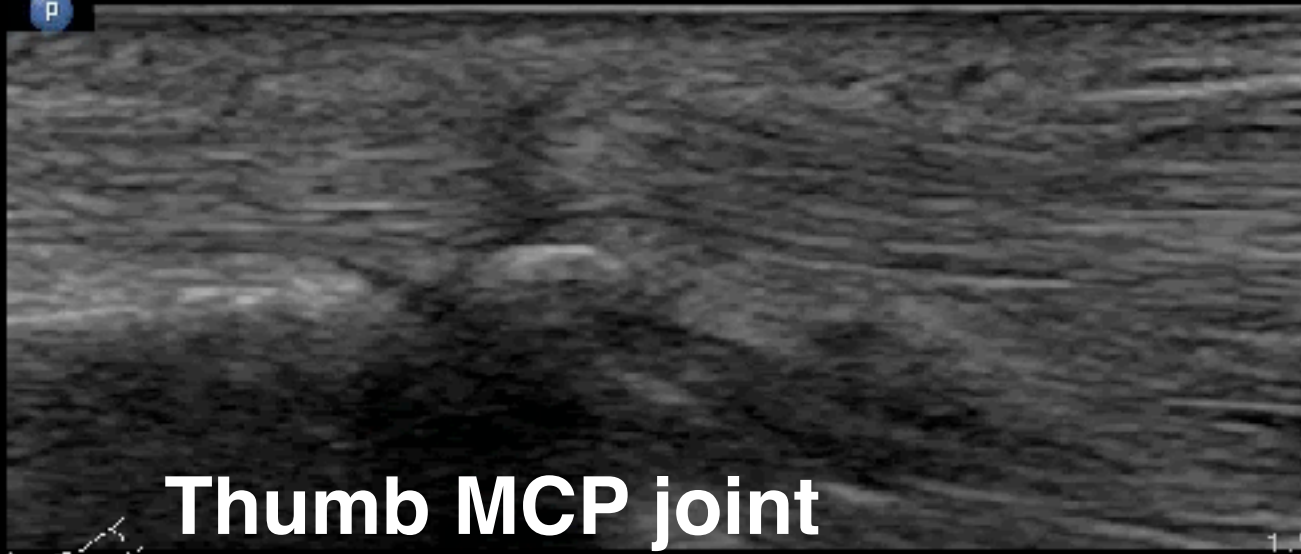
51M, sudden onset left upper arm pain with a snap sound while lifting heavy object ; unable to lift left arm



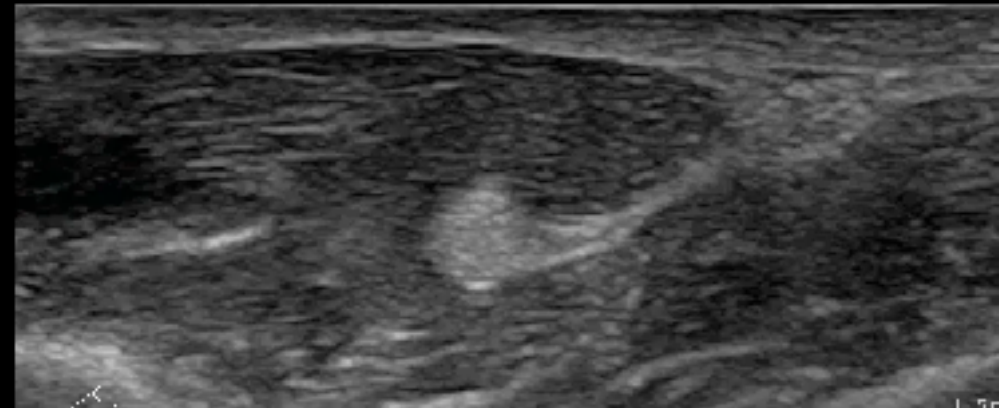


MI  
1.5  
11L4  
diffT9.0  
30 fps  
G:86  
DR:60  
A:6  
P:3

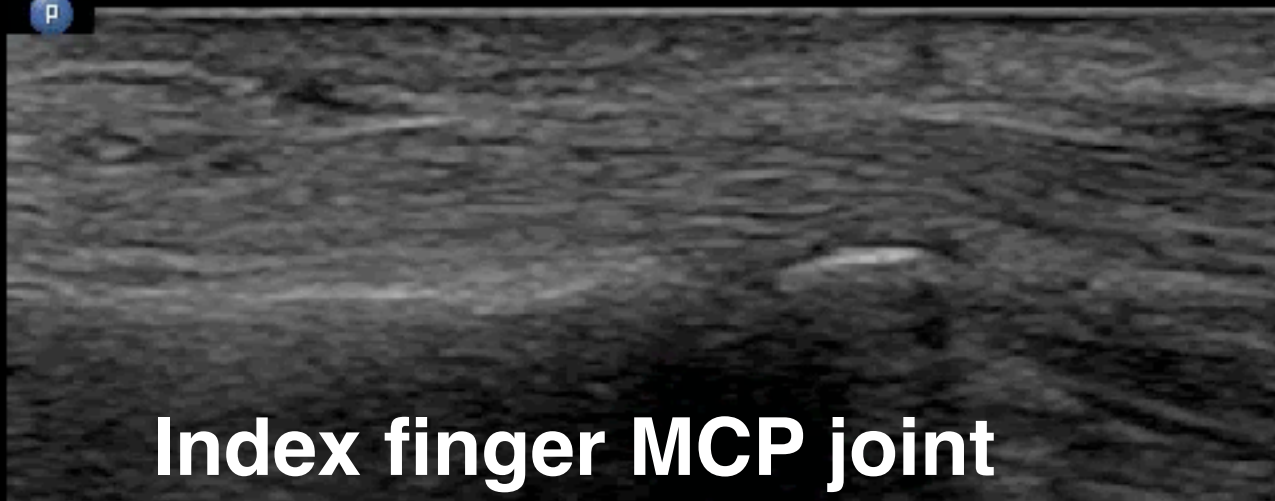




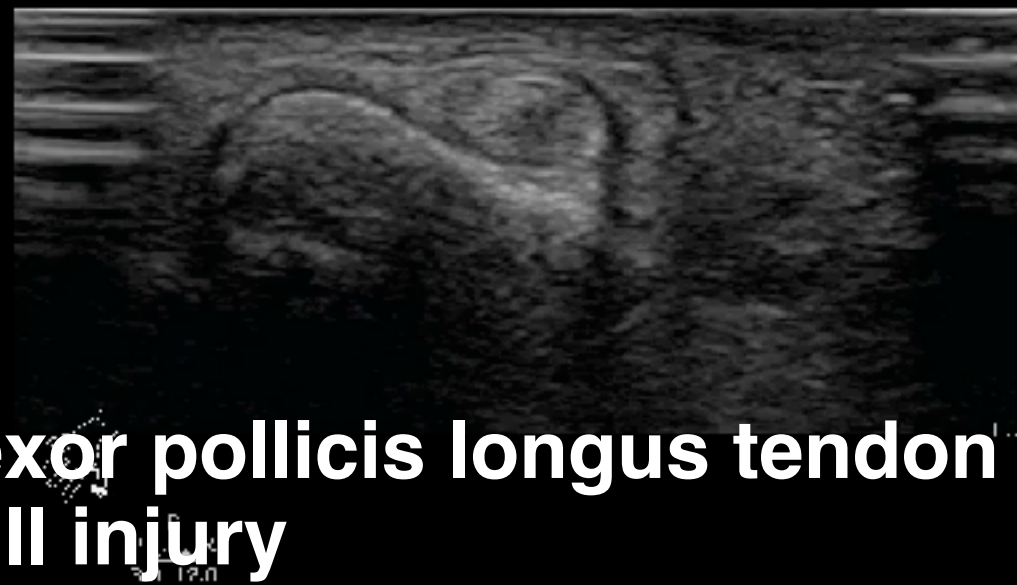
**Thumb MCP joint**



**47M, left thumb painful swelling during basketball**



**Index finger MCP joint**



**Flexor pollicis longus tendon  
Gr II injury**

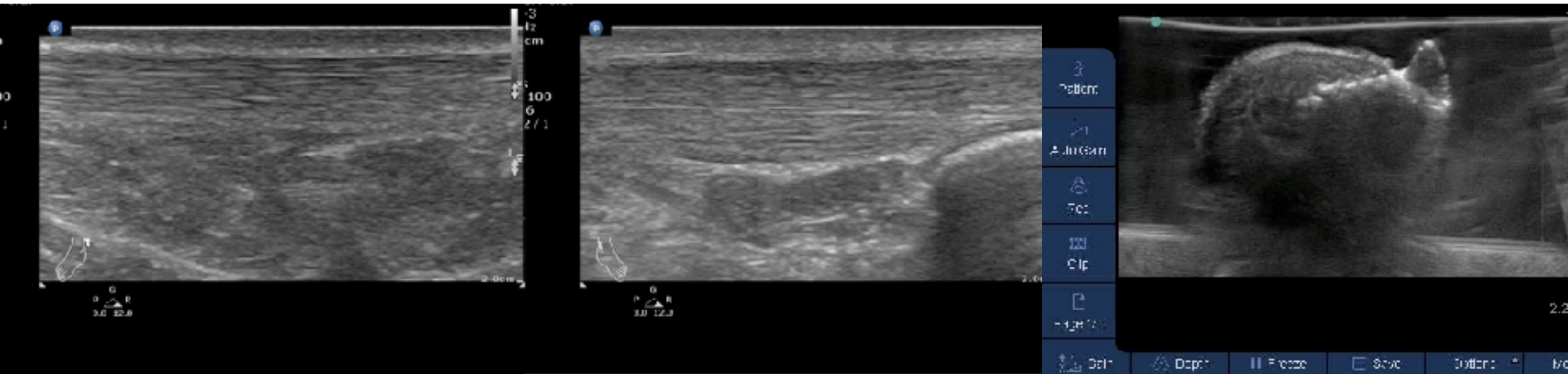


# Take Home Message

Sonoanatomy

Comparison

Window







# WINFOCUS World Congress 2024

THANK YOU!

Kuo-Chih Chen

web-site: [POCUSacademy.com](http://POCUSacademy.com)

twitter: [@juice119](https://twitter.com/juice119)

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