

ECHOGRAPHIE ET PATHOLOGIE DU POIGNET

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INTRODUCTION

Pathologie du poignet fréquente chez le sportif

Echographie : disponible, peu coûteuse, dynamique

Trois types de pathologie :

traumatisme aigu : fracture (scaphoïde+++) ou lésion ligamentaire (LSL+++)

Pathologie microtraumatique (surmenage, malpositions) :
tendinopathies, syndromes canaux

Pathologie intercurrente : rhumatismale ou dégénérative

Examen clinique

Imagerie : RX, **US**, TDM, Arthro-TDM, Arthro-IRM?

MÉTHODE

Sonde haute fréquence

Haute résolution

Doppler

Harmonique



Kendi AT, Gudemez E. Sonographic evaluation of scapholunate ligament: value of tissue harmonic imaging. J Clin Ultrasound. 2006 Mar-Apr;34(3):109-12.

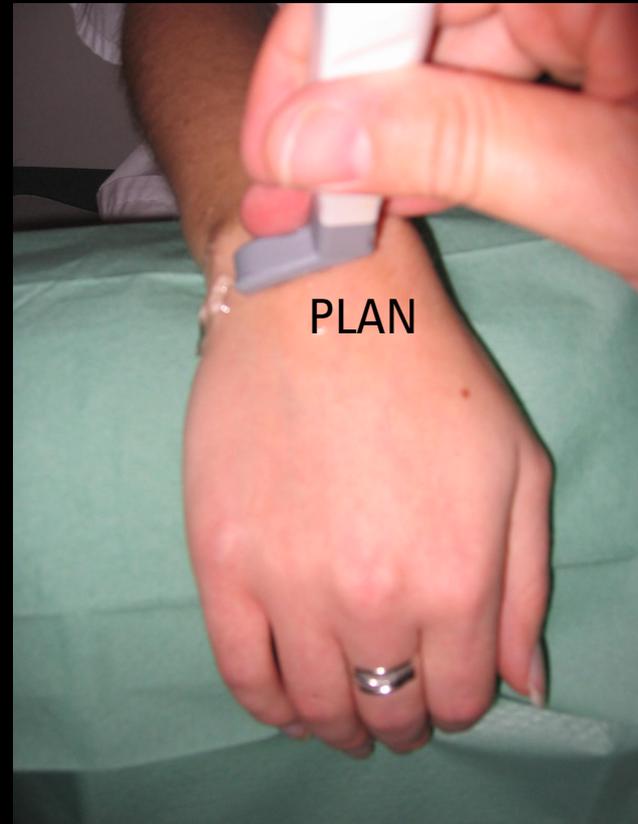
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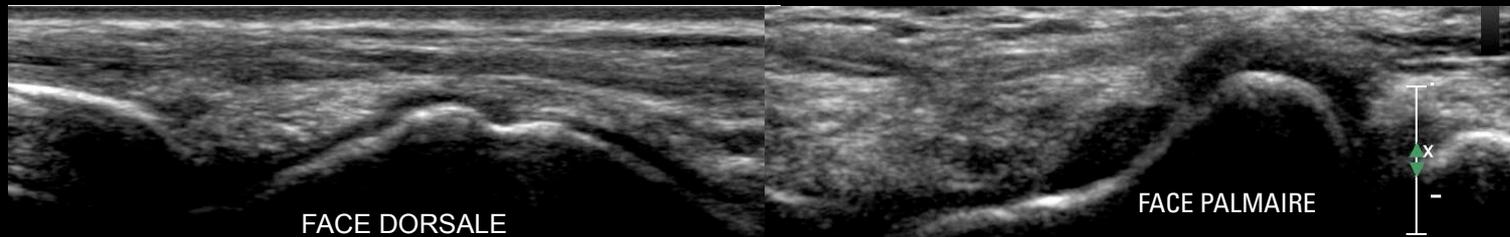
1. PATHOLOGIE OSSEUSE

En cas de traumatisme récent, il faut éliminer en premier lieu une fracture

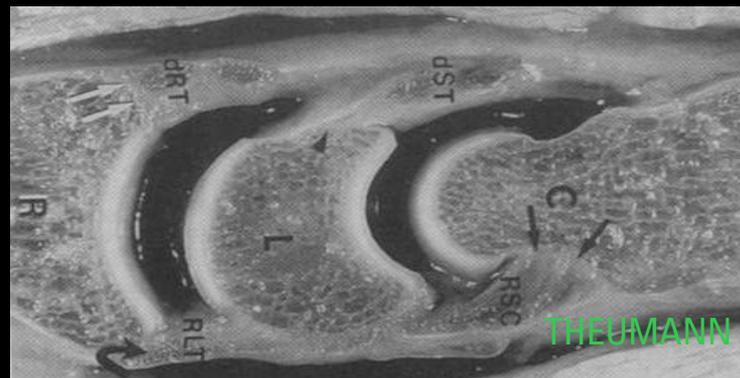
US = Séméiologie simple

Corticale

Scaphoïde



- Lunatum, Capitulum



Fracture du Scaphoïde

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Occult fractures of the waist of the scaphoid: early diagnosis by high-spatial-resolution sonography.
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Fracture du Scaphoïde

Fracture du scaphoïde

Haltérophile (arraché)

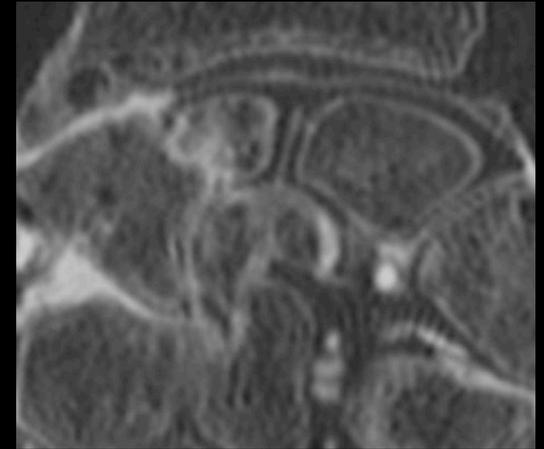
Complications : pseudarthrose, nécrose, SNAC wrist

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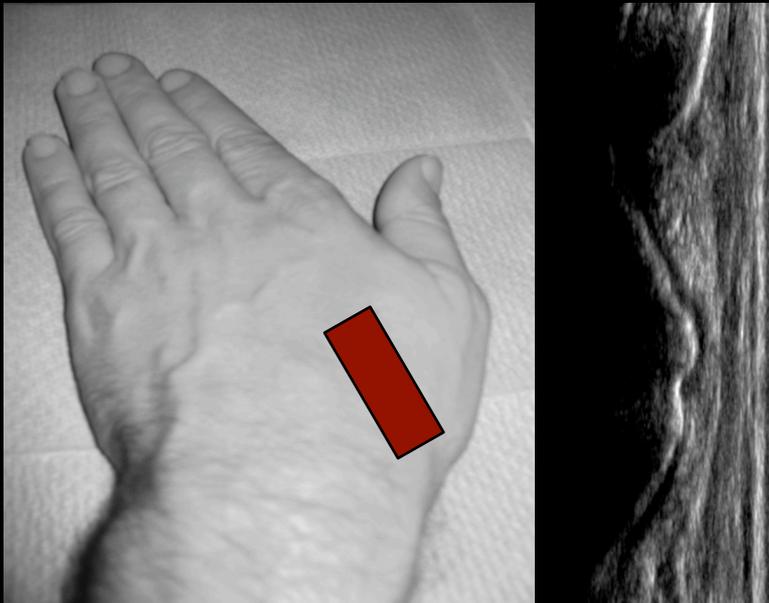
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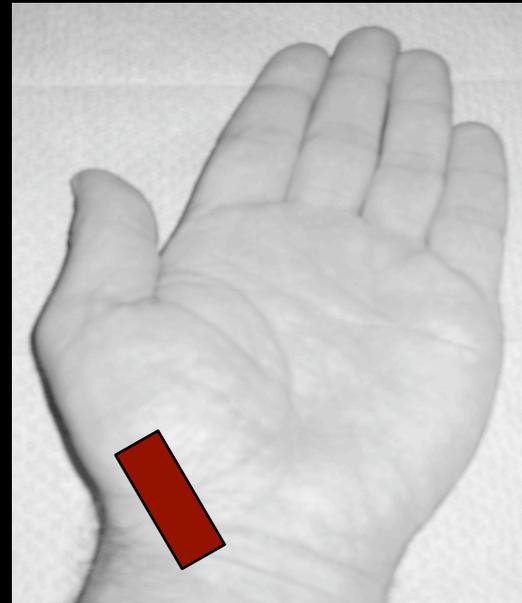
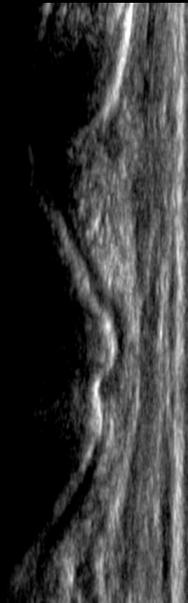
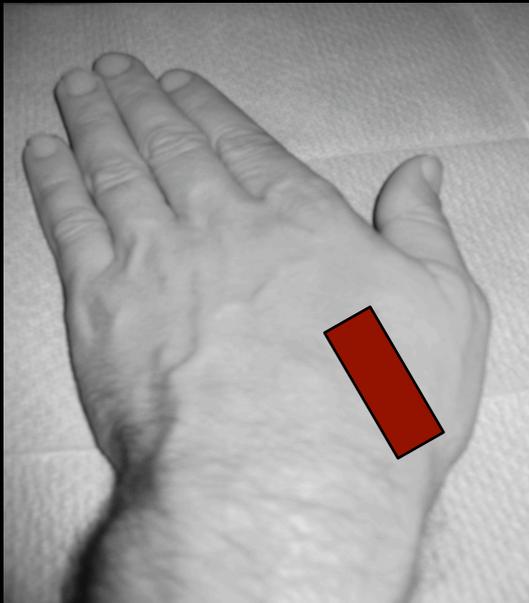
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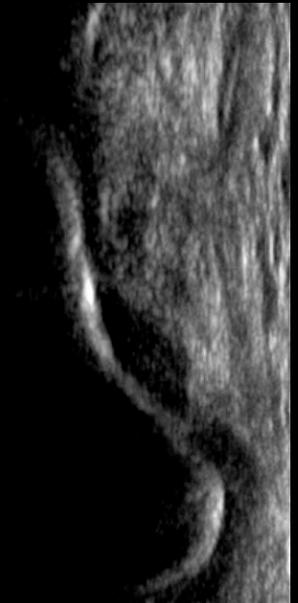
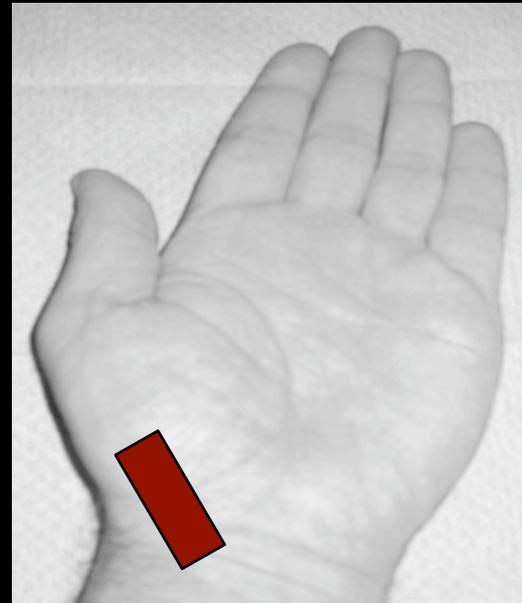
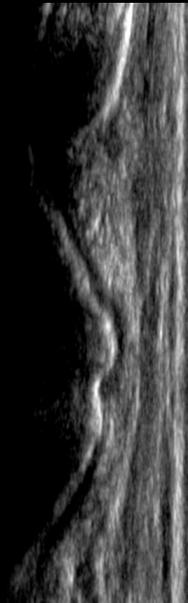
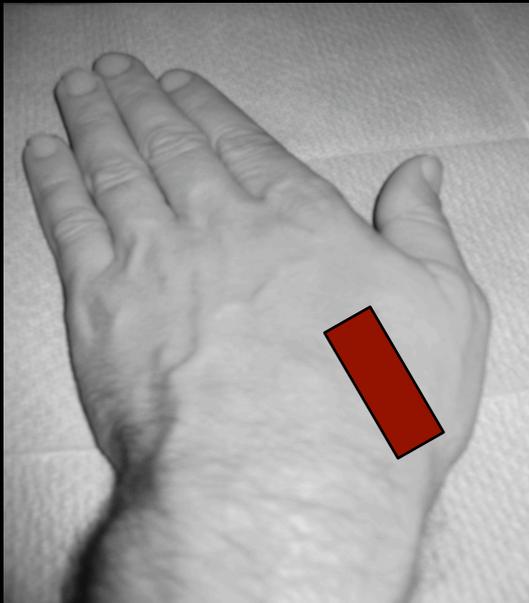
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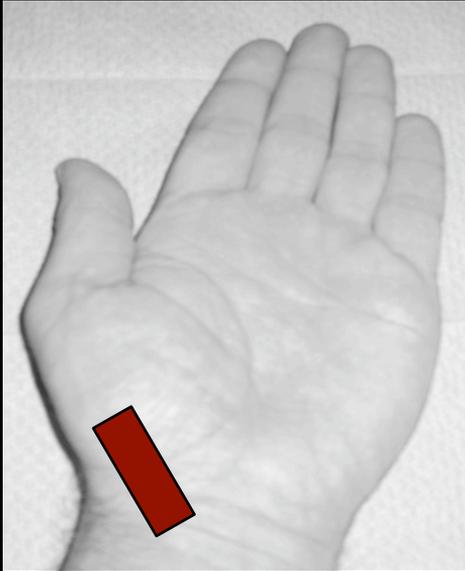
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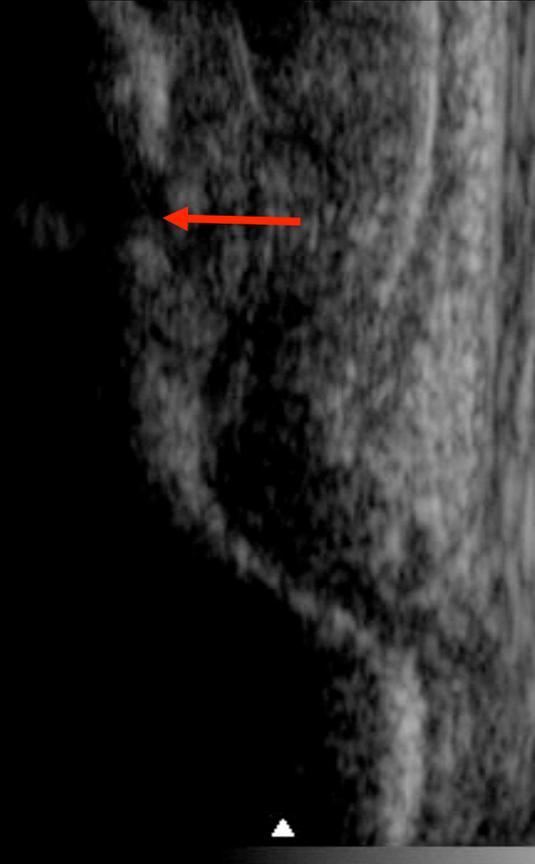


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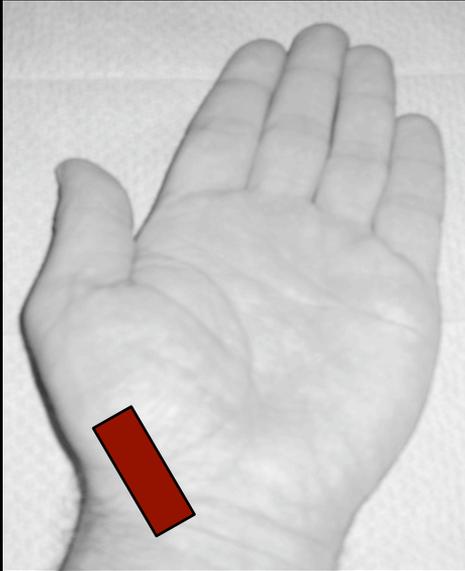
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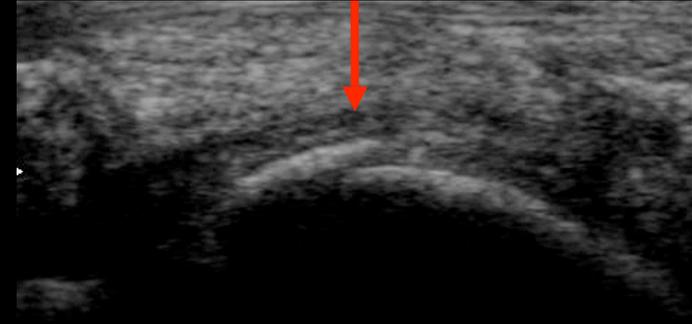
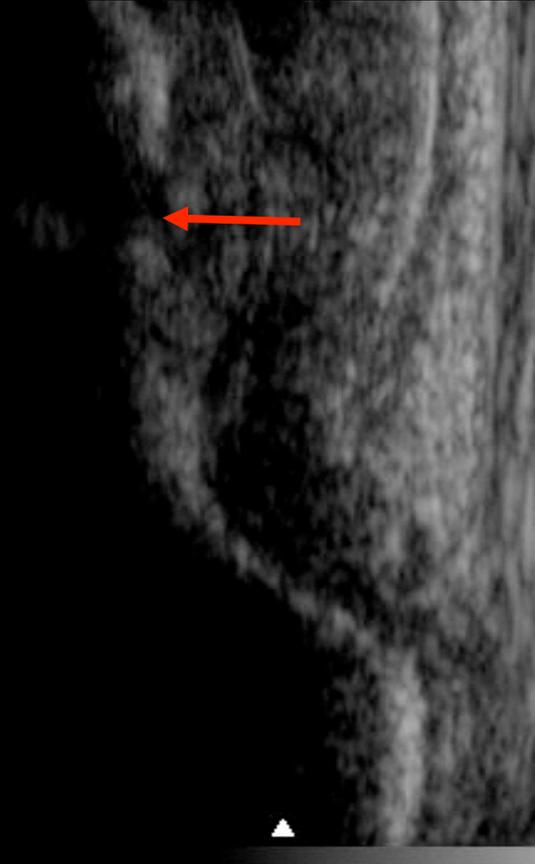
Interruption corticale
Hématome

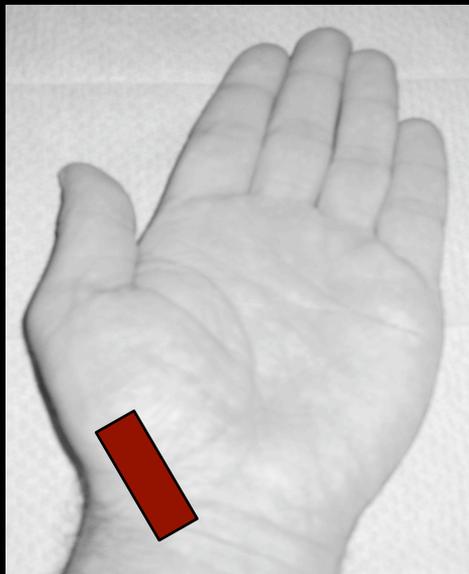


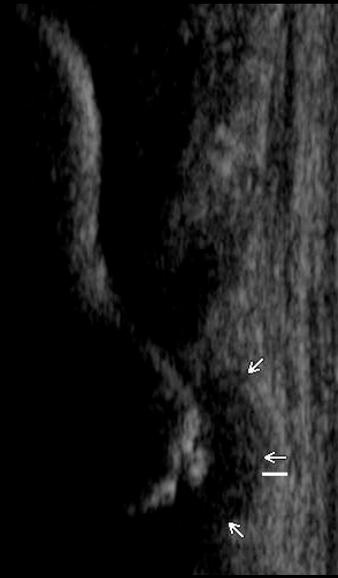
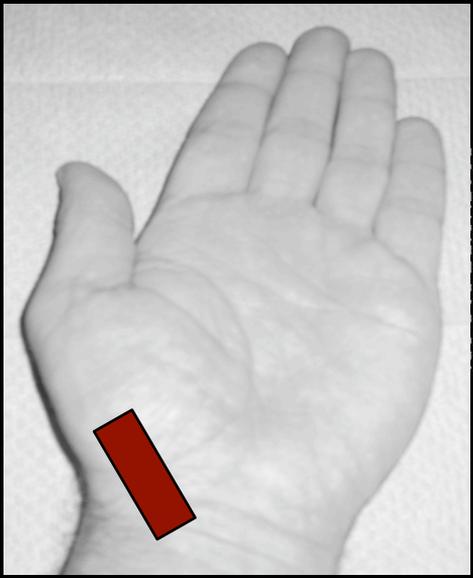
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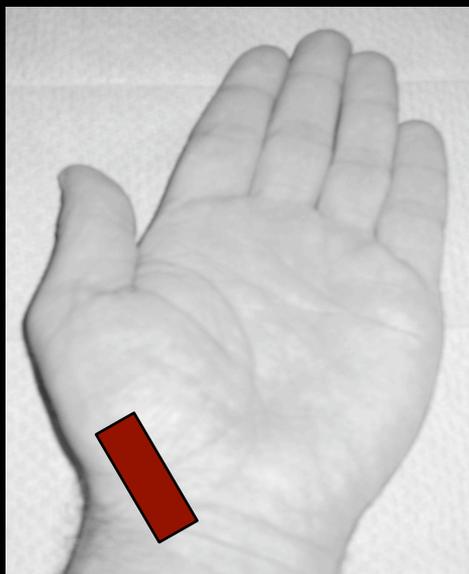
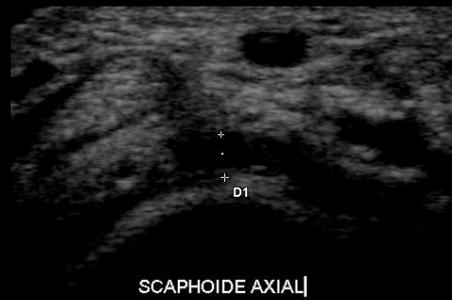


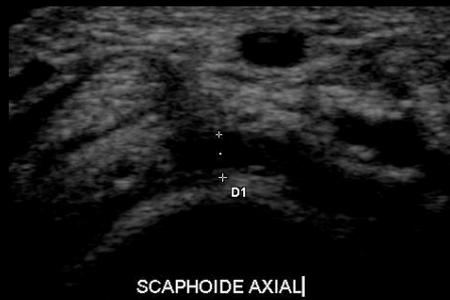
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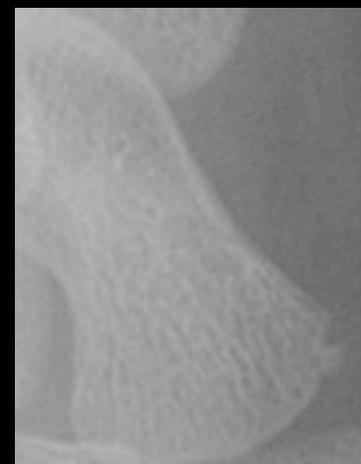
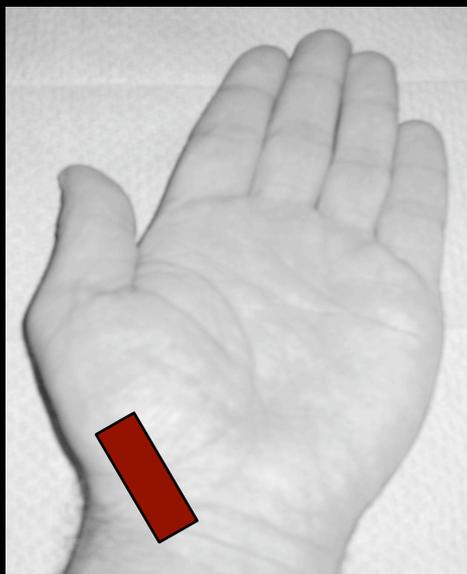








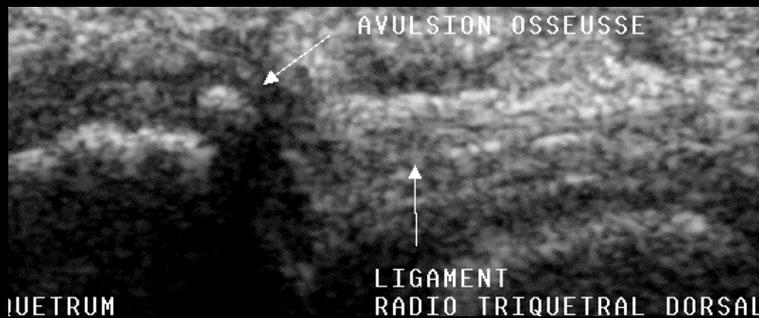
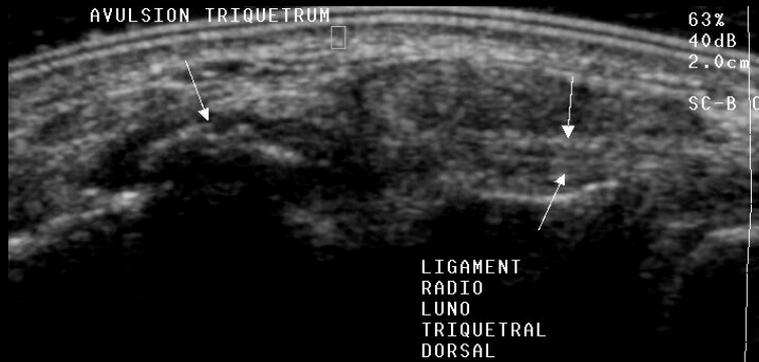
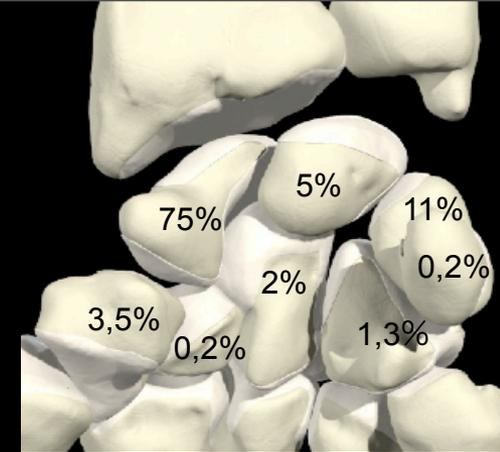
SCAPHOIDE AXIAL



Fractures du Triquetrum

10-20%

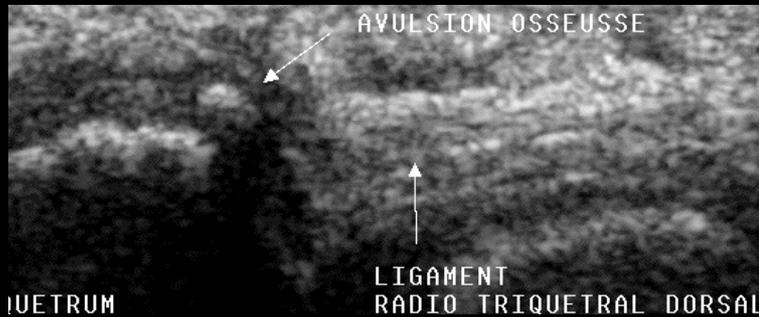
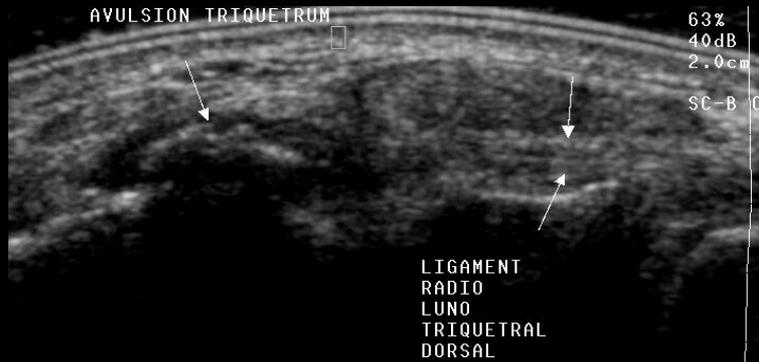
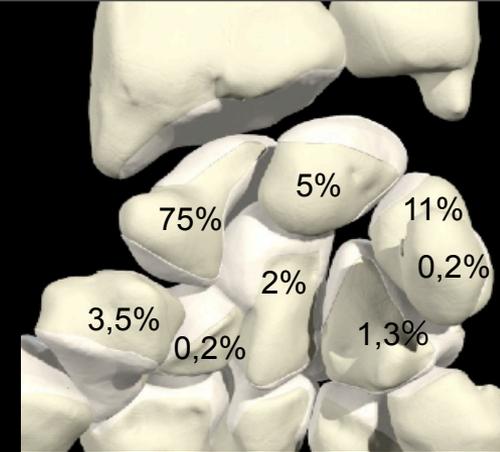
corps (trauma à haute énergie - LPL)
tubercule dorsal : sangle dorsale



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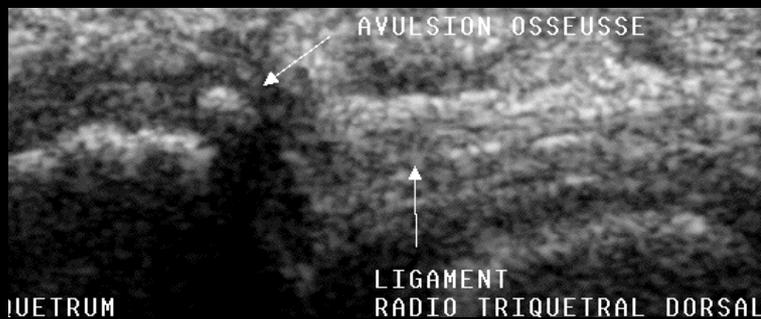
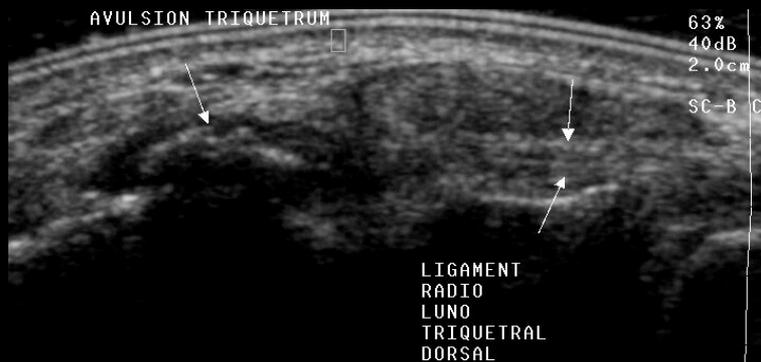
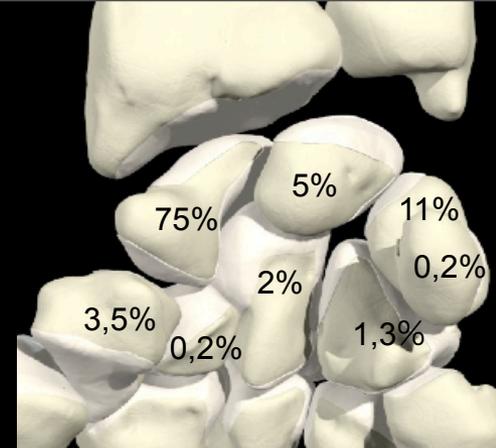
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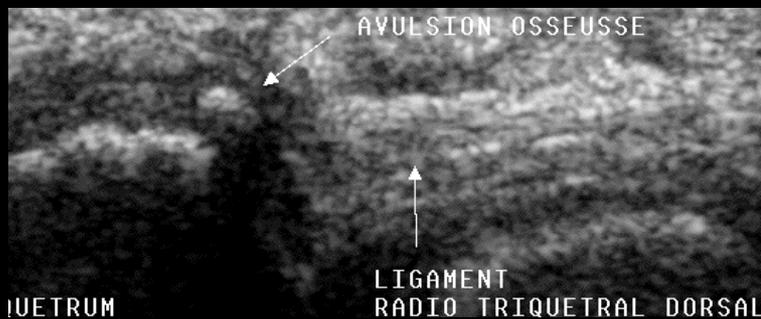
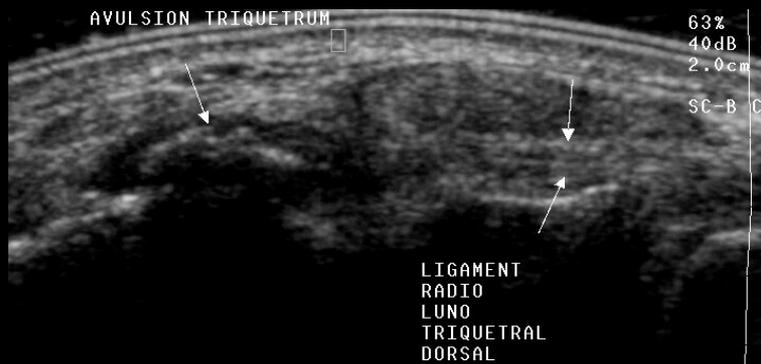
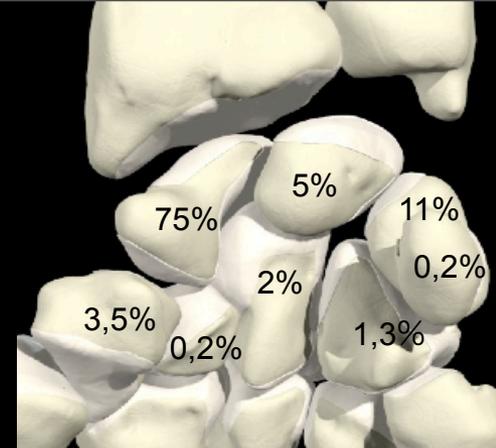
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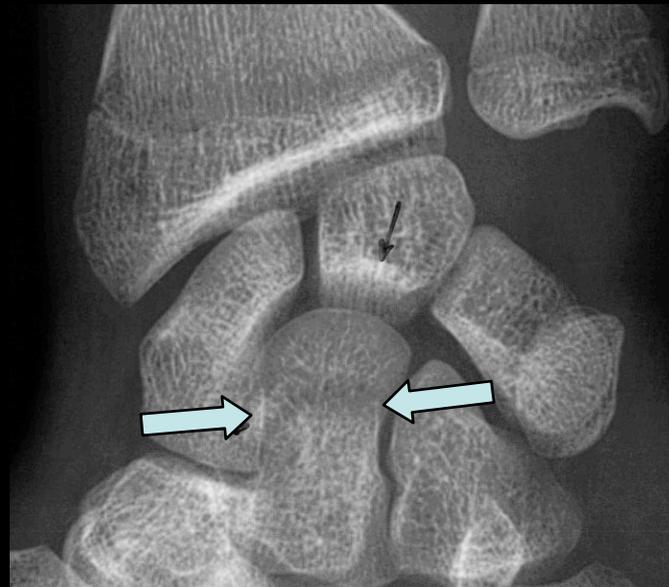
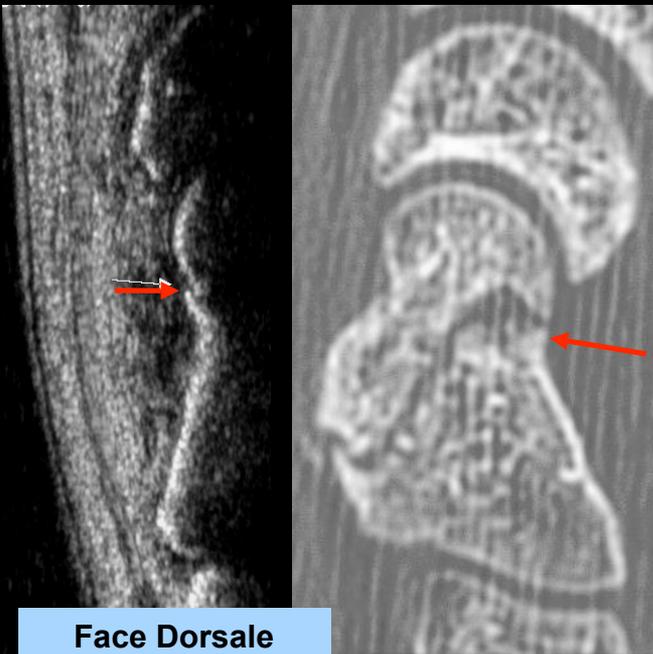
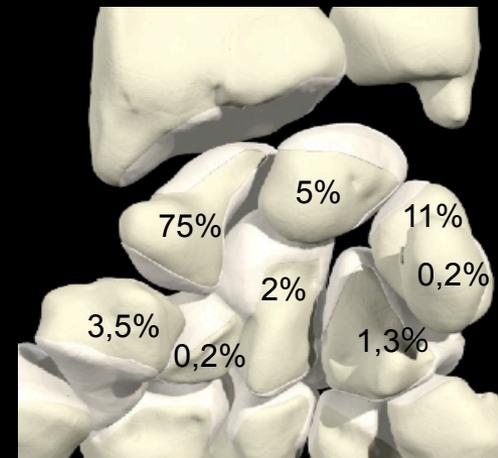
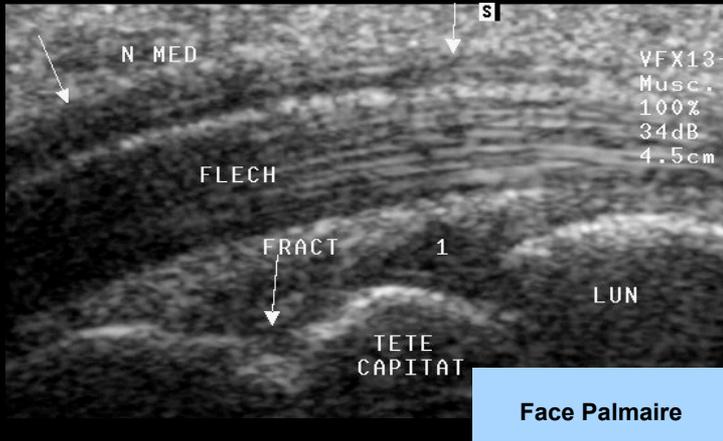
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Fractures du Capitatum



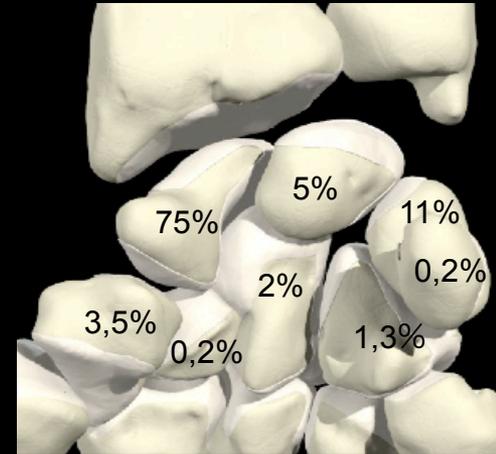
Fractures des Os du carpe

Au Total

- **ECHOGRAPHIE**

= Complément indispensable en cas de bilan RX normal

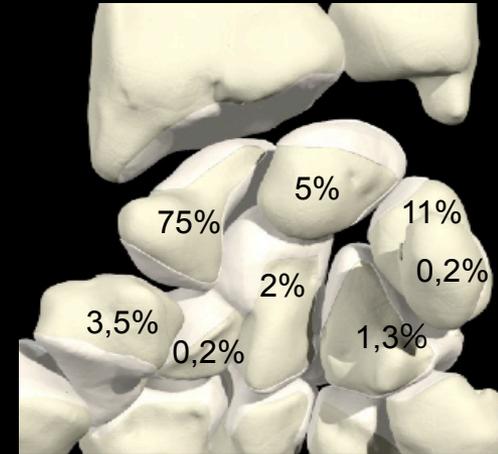
- **PREMIERE RANGEE : 90%**



Fractures des Os du carpe

Au Total

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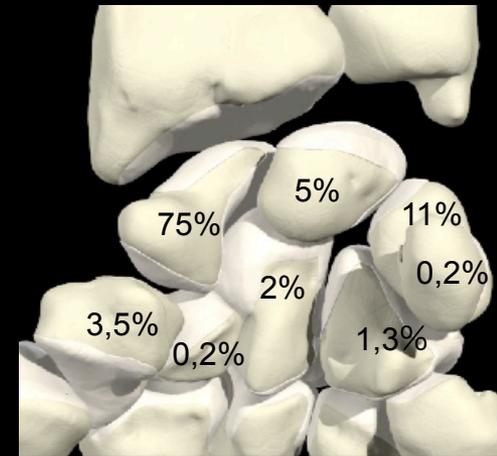
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- **FRACTURE = SOLUTION DE CONTINUITÉ +/- HEMATOME**



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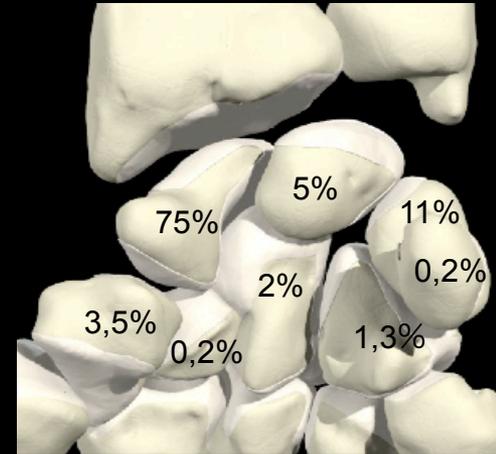
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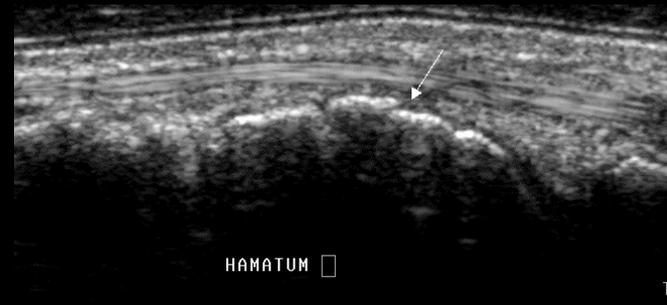
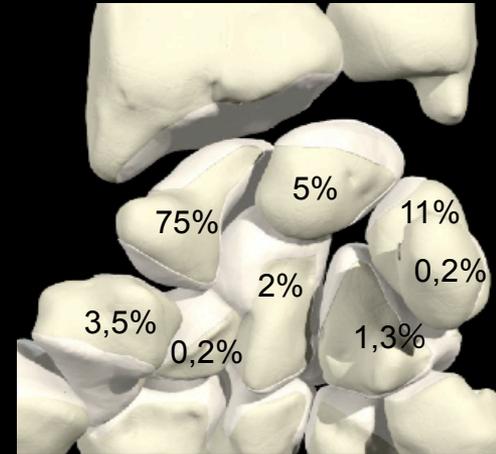
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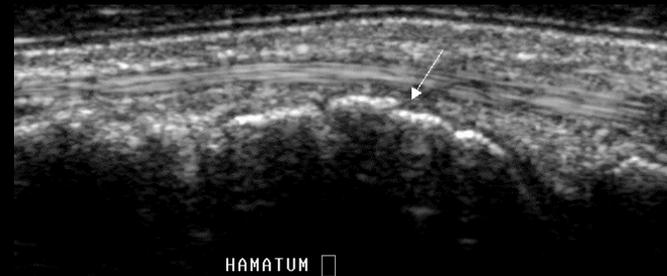
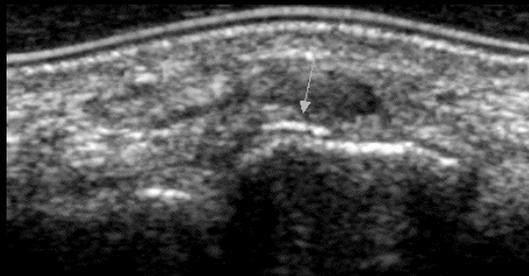
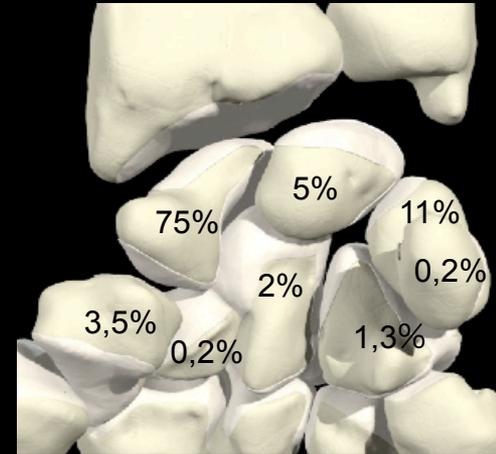
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- **LIMITE** : Mauvaise visualisation de certaines régions

Fractures des Os du carpe

Au Total

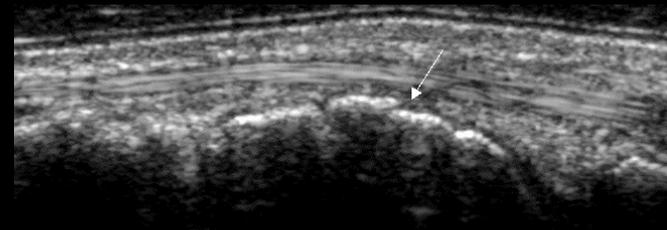
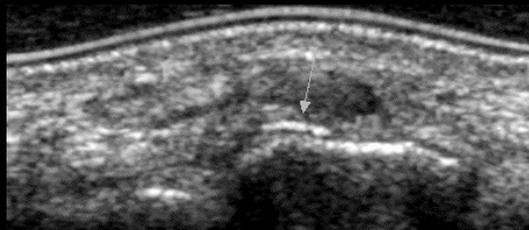
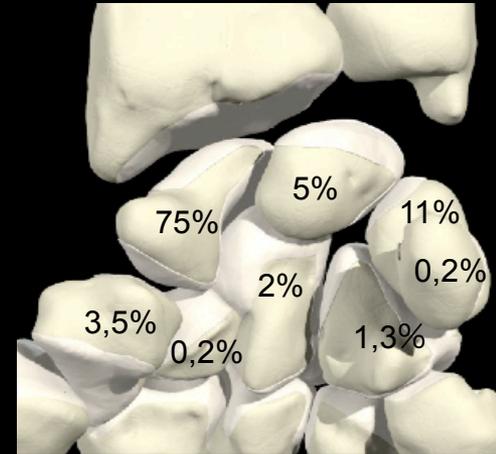
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HAMATUM □

T

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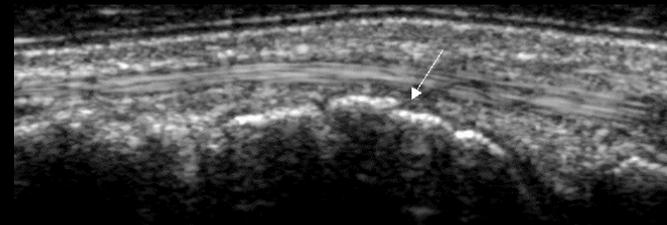
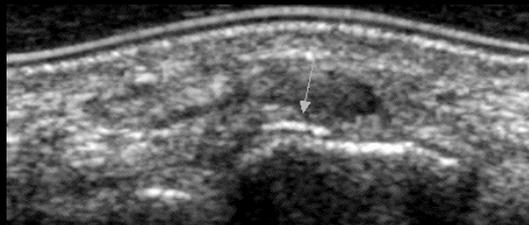
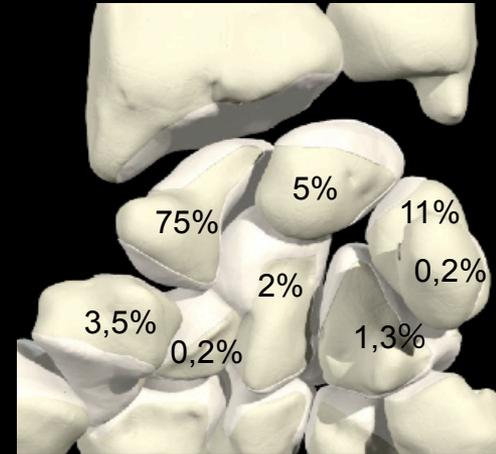
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HAMATUM □

T

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2. PATHOLOGIE LIGAMENTAIRE

Ligaments du poignet :

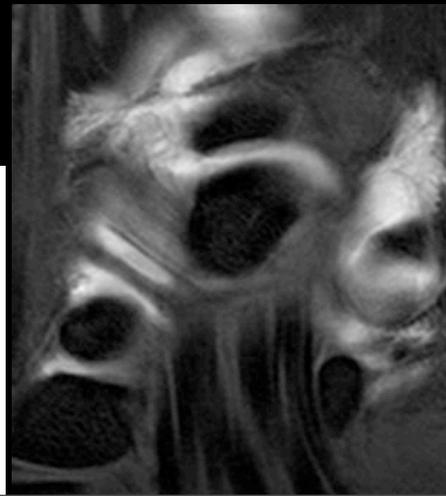
Ligaments intrinsèques : scapho-lunaire et luno-triquétral

Ligaments extrinsèques

TFCC

RX dynamiques, Arthro-TDM et Arthro-IRM
= stade évolué ou pré-opératoire

US : disponibilité +++



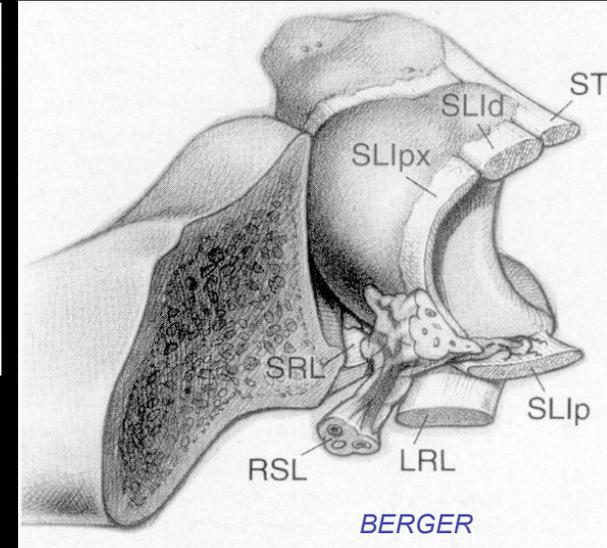
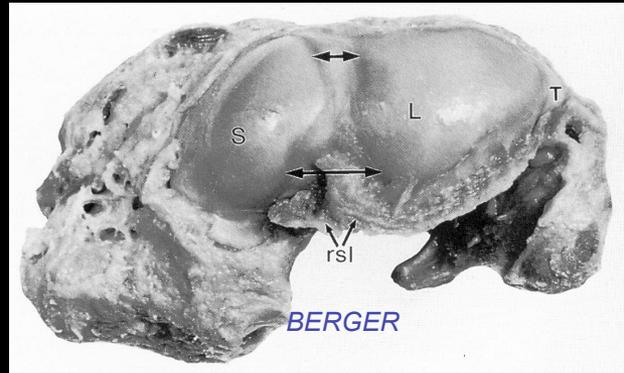
EDUCATION EXHIBIT

1577

Normal Sonographic Anatomy of the Wrist and Hand¹

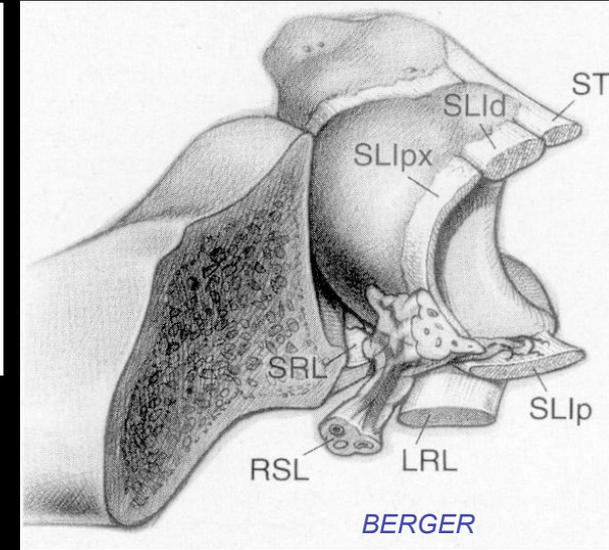
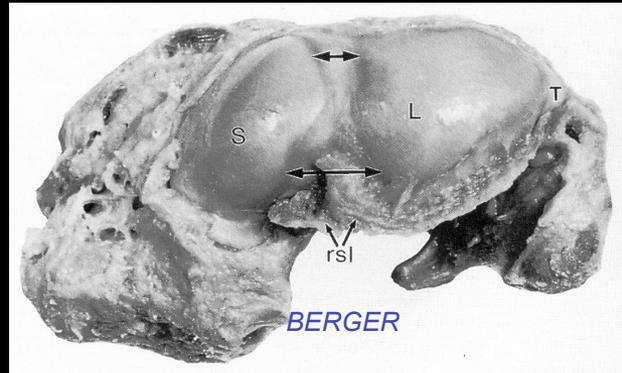
Justin C. Lee, FRCR • Jeremiah C. Healy, FRCR

Ligament Scapho-Lunaire



- rôle majeur dans la stabilité du carpe
- instabilité SL = chondrolyse rapide (SLAC)

Ligament Scapho-Lunaire

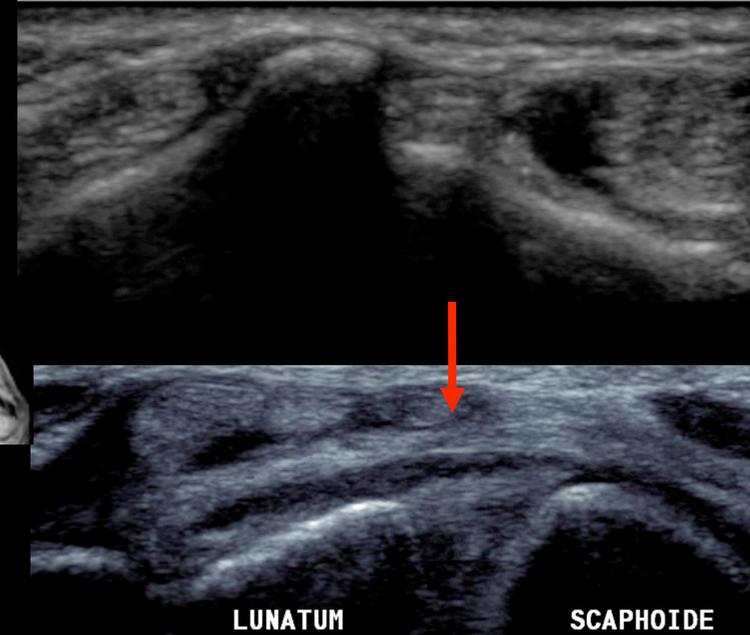
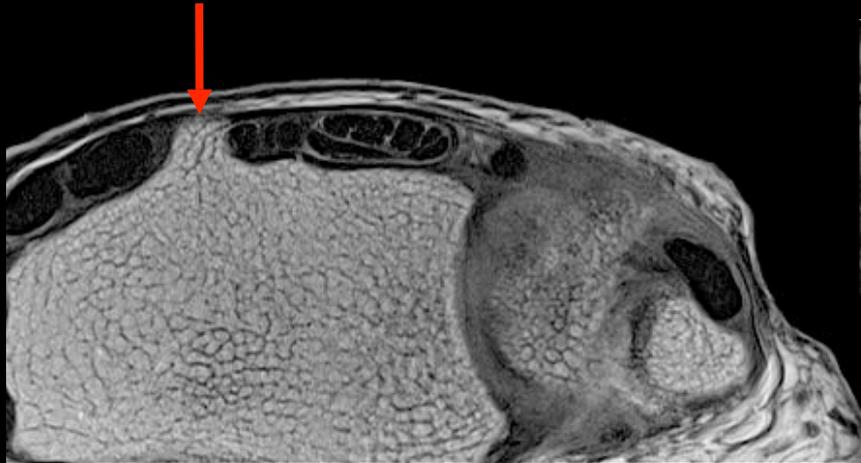
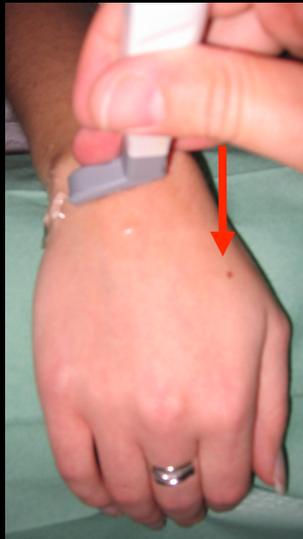
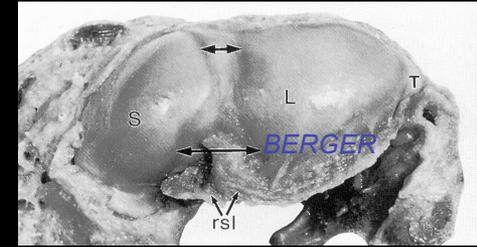


- rôle majeur dans la stabilité du carpe
- instabilité SL = chondrolyse rapide (SLAC)

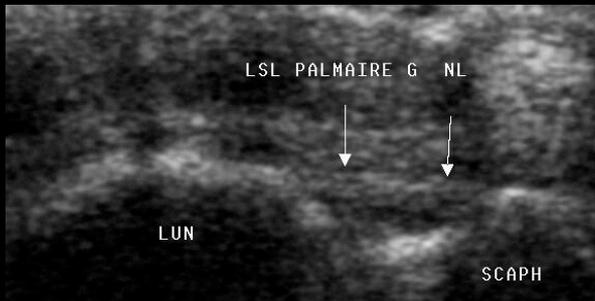


Ligament Scapho-Lunaire

faisceau dorsal du LSL = en distalité du tubercule de Lister (97%)



faisceau palmaire



Skeletal Radiol (2005) 34: 513-521
DOI 10.1007/s00256-005-0929-4

SCIENTIFIC ARTICLE

Nathalie Boutry
Franck Lapegue
Laetitia Masi
Antoine Claret
Xavier Demondion
Anne Cotten

Ultrasonographic evaluation of normal extrinsic and intrinsic carpal ligaments: preliminary experience

Ligament Scapho-Lunaire



Skeletal Radiol (2004) 33:85-90
DOI 10.1007/s00256-003-0698-x

ARTICLE

K. Finlay
R. Lee
L. Friedman

**Ultrasound of intrinsic wrist ligament
and triangular fibrocartilage injuries**

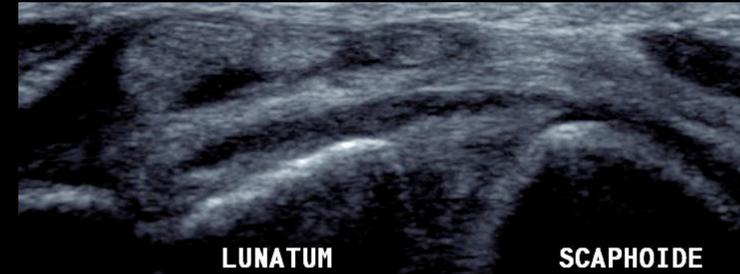
Ligament Scapho-Lunaire

Distension



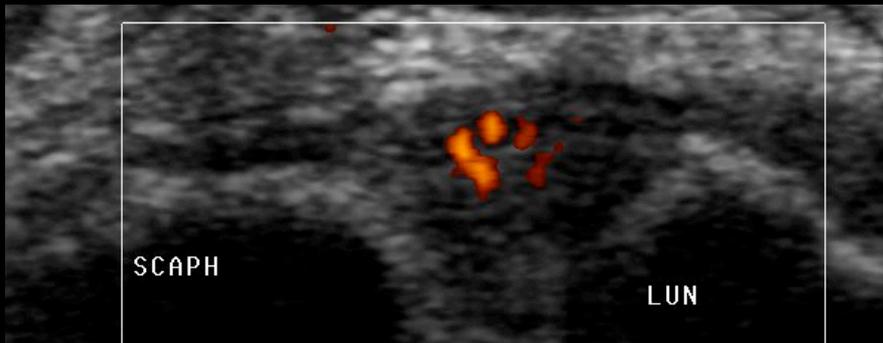
Ligament Scapho-Lunaire

Distension

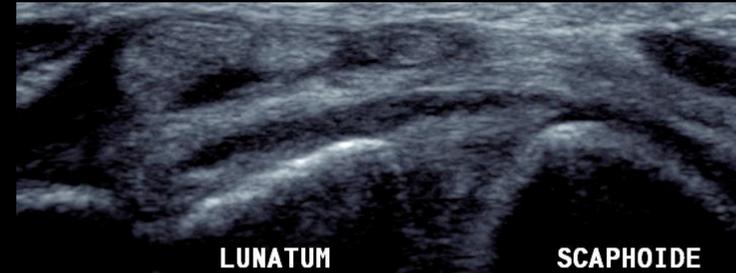


Ligament Scapho-Lunaire

Distension



Solution de continuité

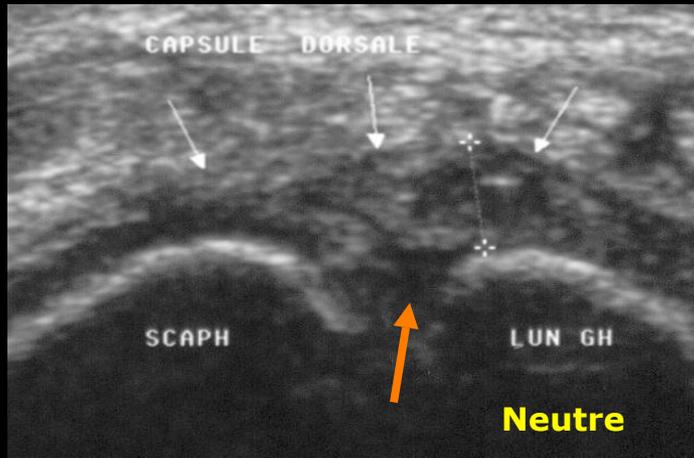


Ligament Scapho-Lunaire

Distension



Solution de continuité

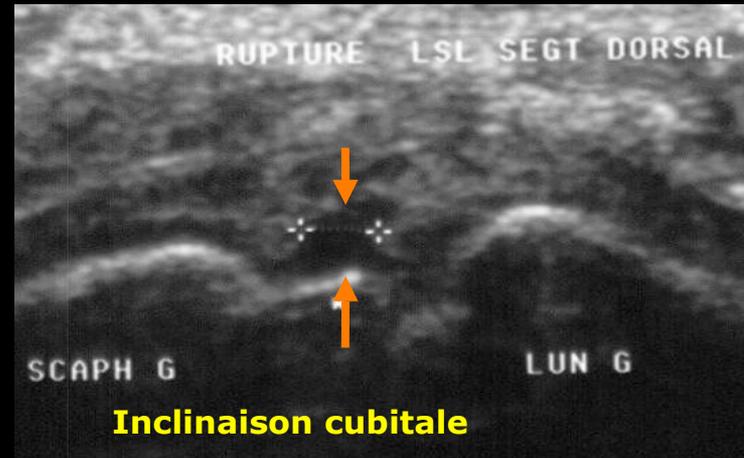
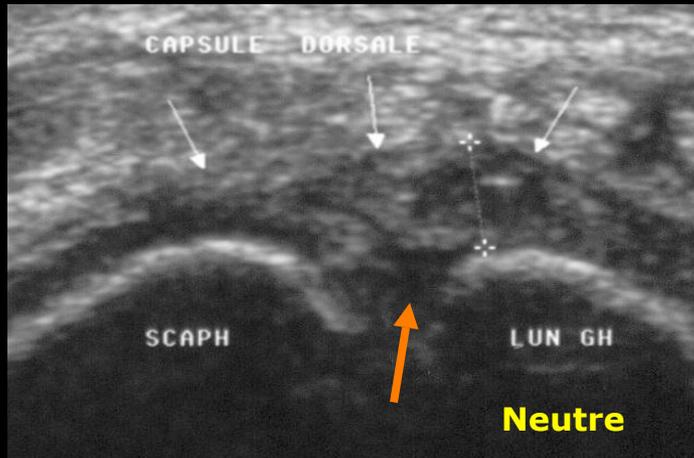


Ligament Scapho-Lunaire

Distension



Solution de continuité



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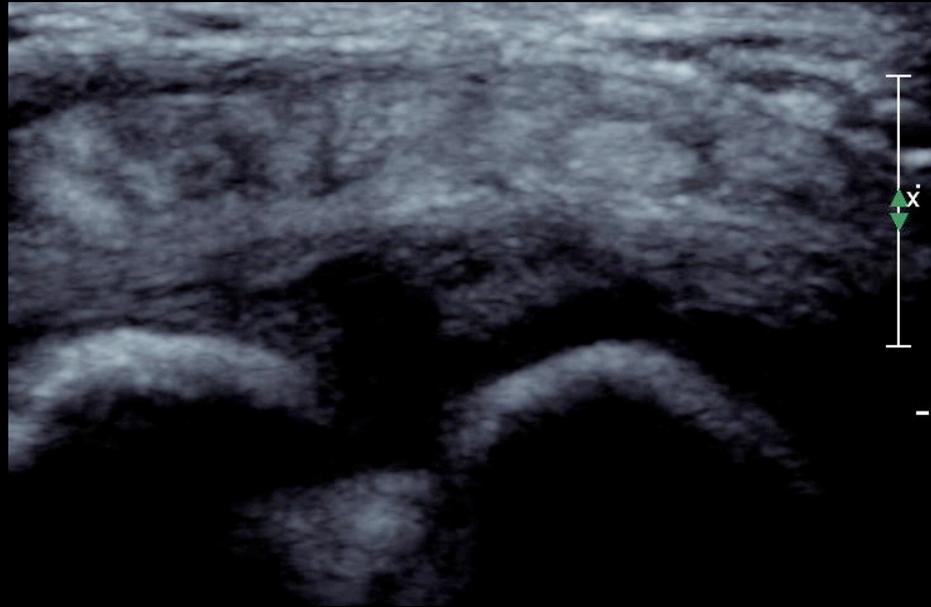
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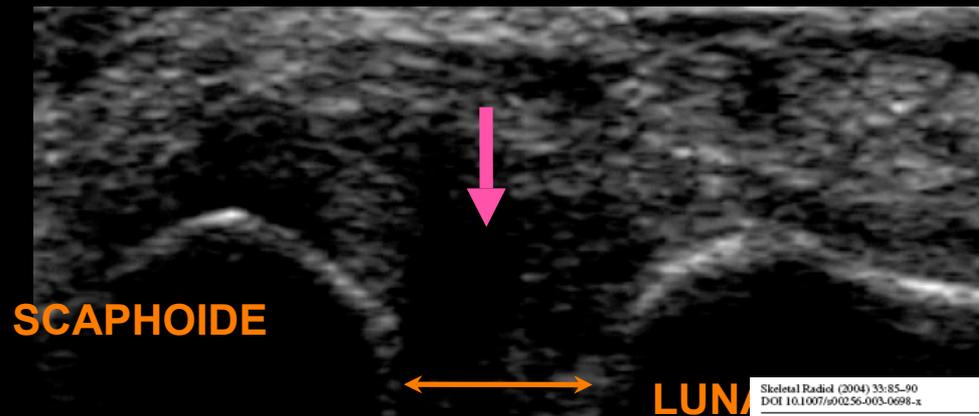
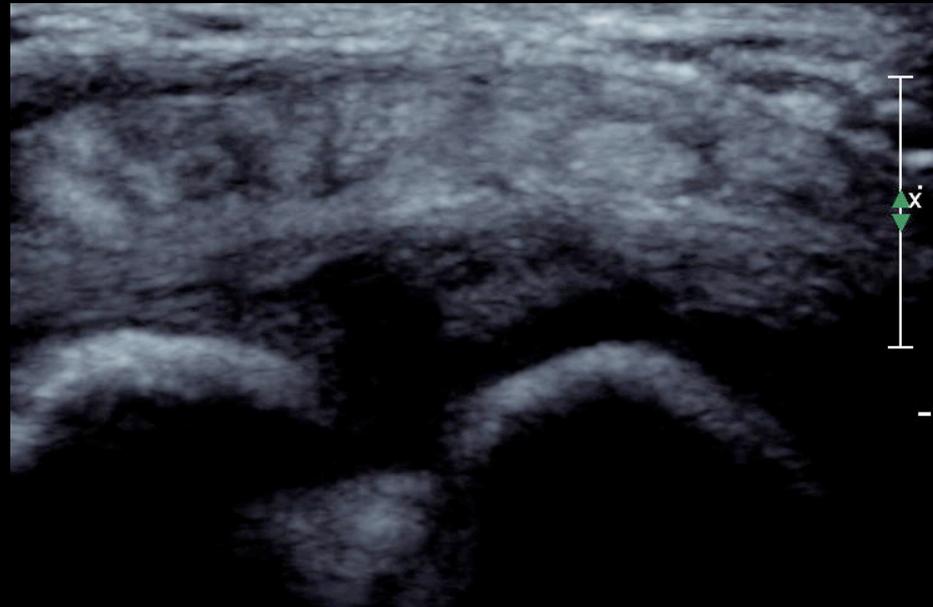
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**Ultrasound of intrinsic wrist ligament
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Ligament Scapho-Lunaire



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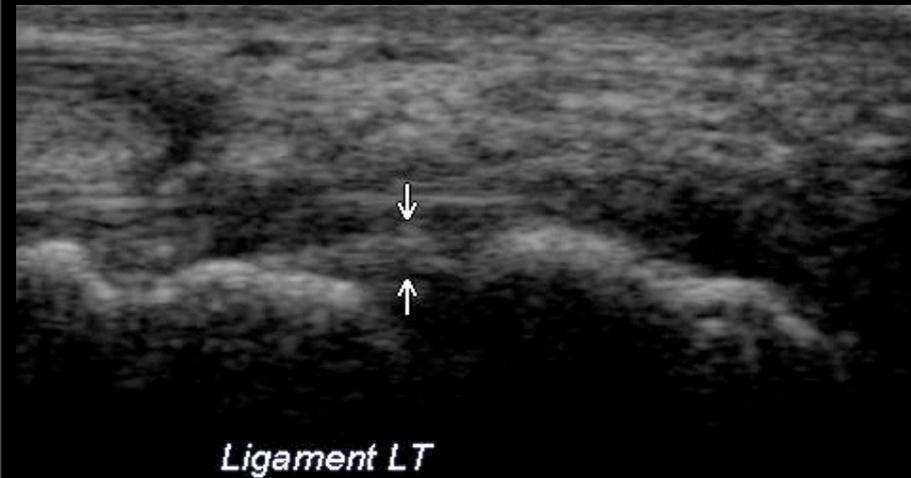
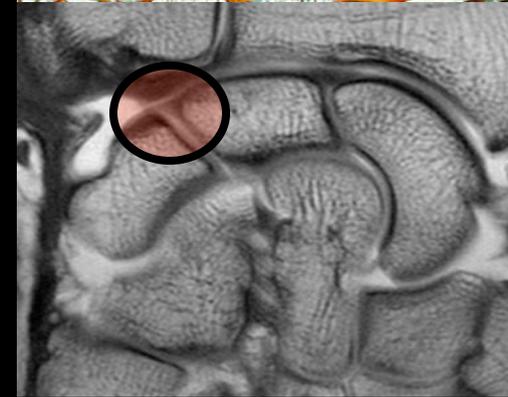
ARTICLE

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Ultrasound of intrinsic wrist ligament
and triangular fibrocartilage injuries

Ligament Luno-Triquétral

- Visibilité inconstante (61%)
- 6 X Moins d'instabilité (VISI)
- Atteinte dégénérative
- Séméiologie identique
- Sensibilité faible (25%)



Ligament LT



coupe axiale dorsale

Skeletal Radiol (2005) 34: 513-521
DOI 10.1007/s00256-005-0929-4

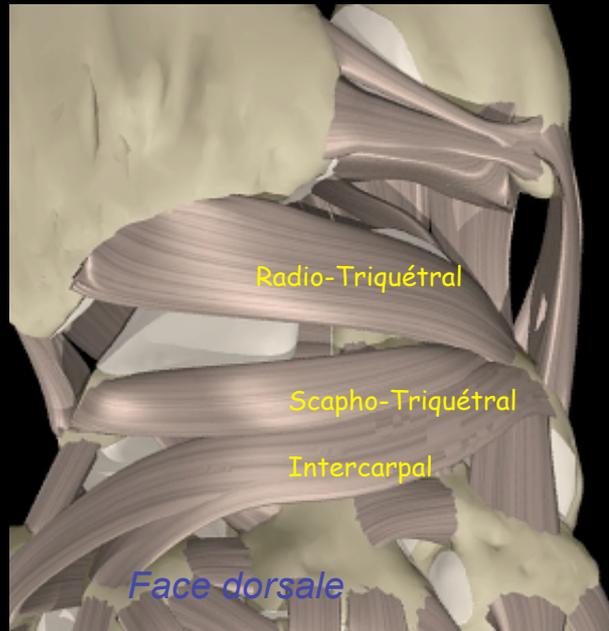
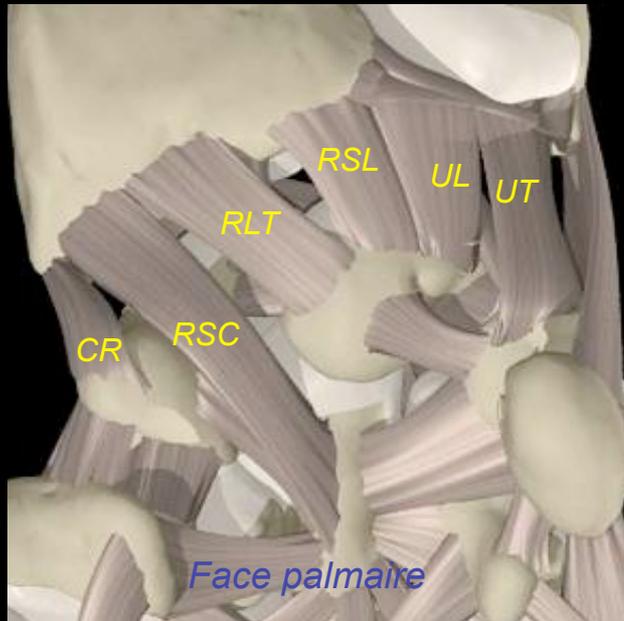
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preliminary experience

Ligaments Extrinsèques

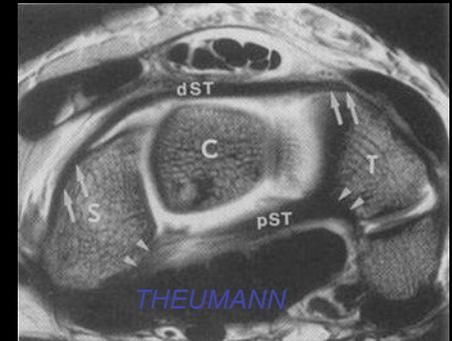
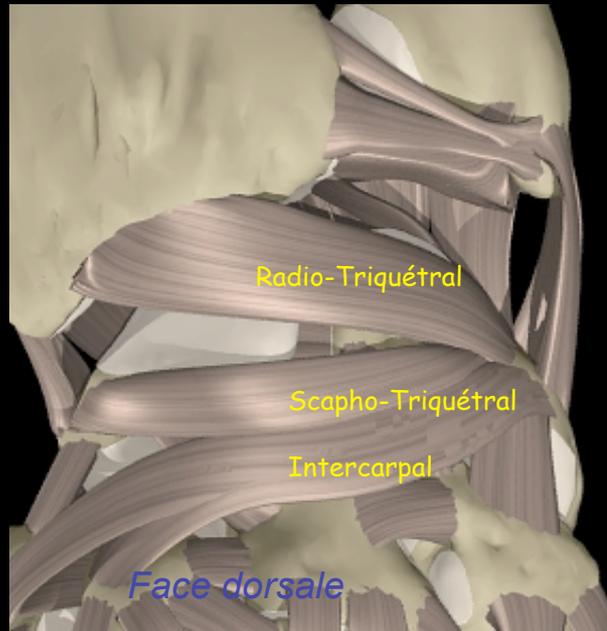
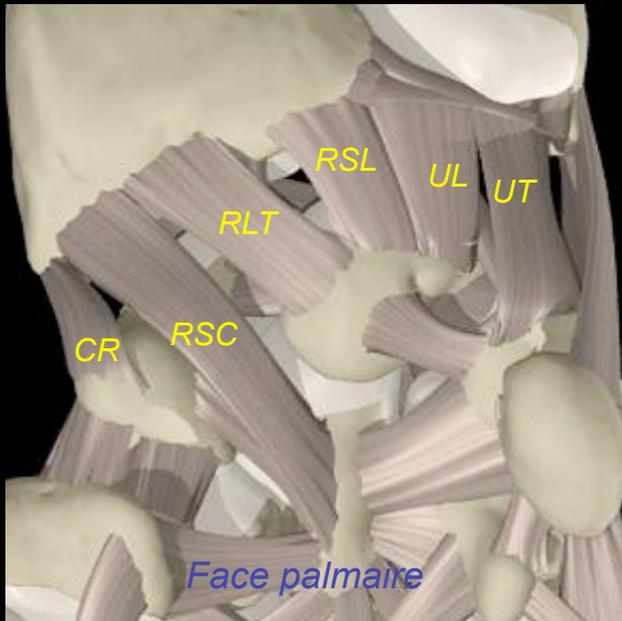
1. Anatomie



THEUMANN

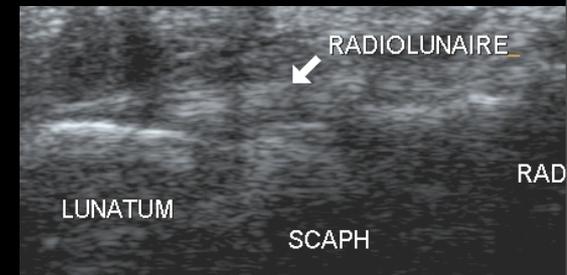
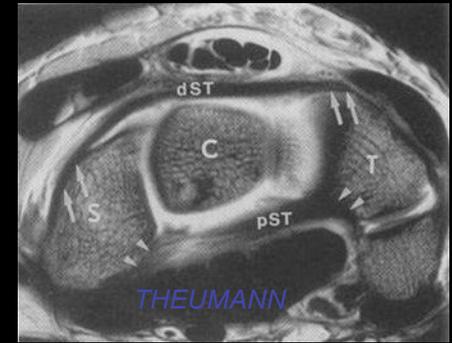
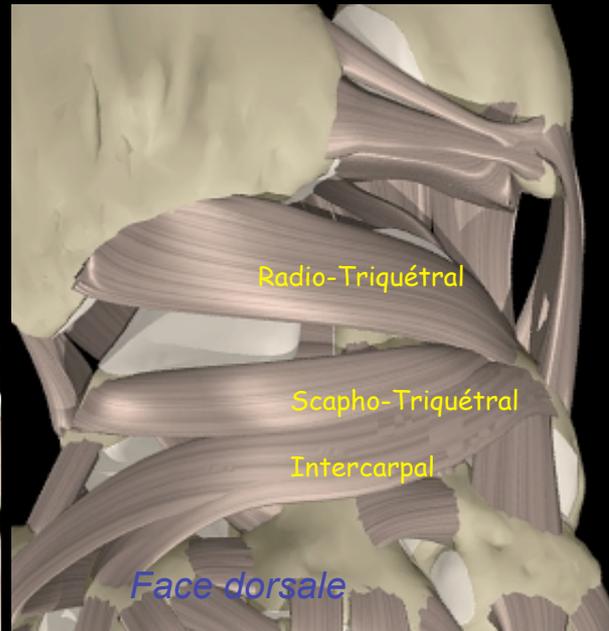
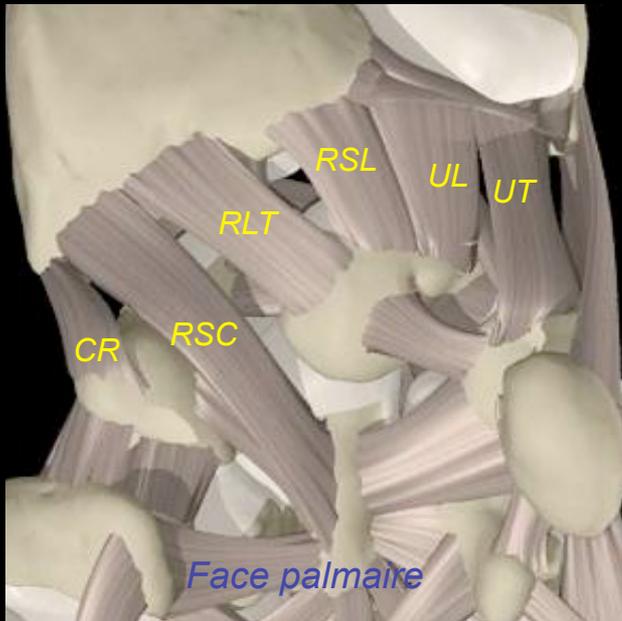
Ligaments Extrinsèques

1. Anatomie



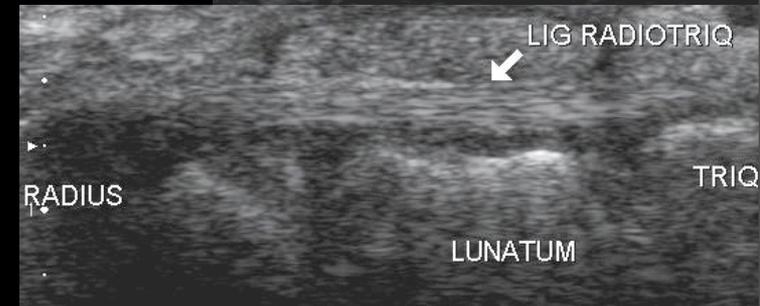
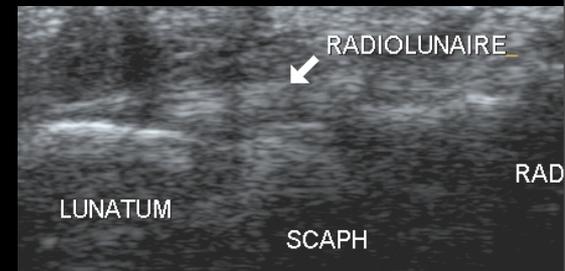
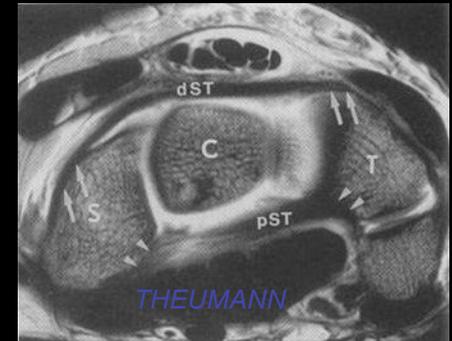
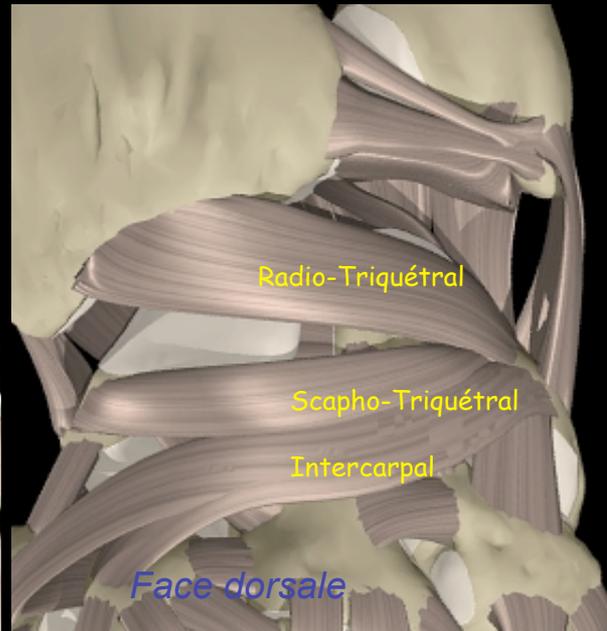
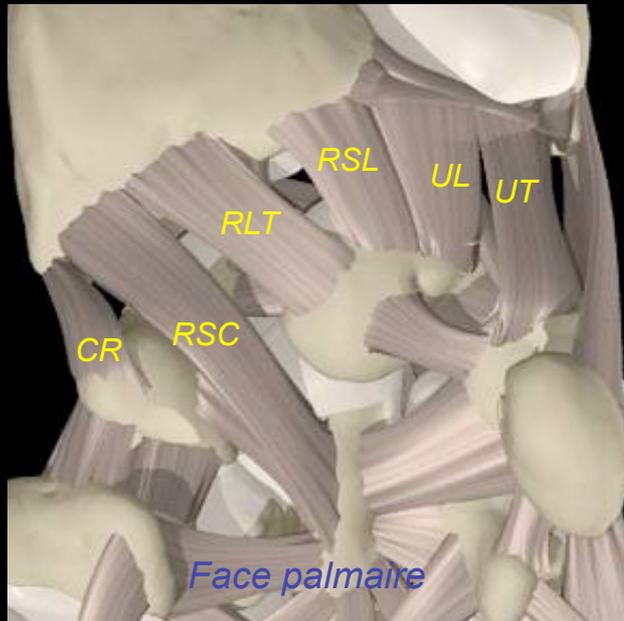
Ligaments Extrinsèques

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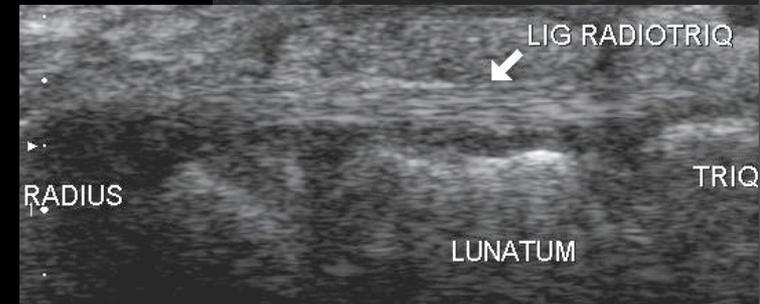
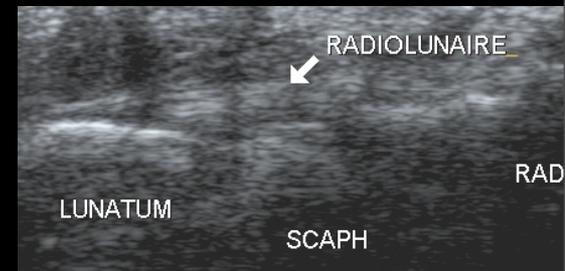
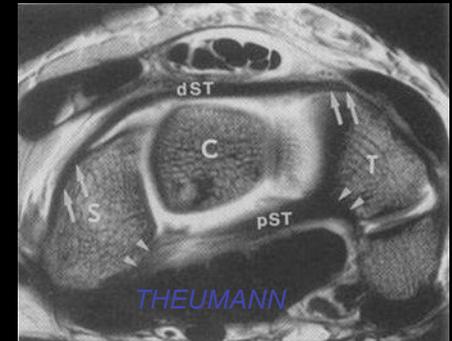
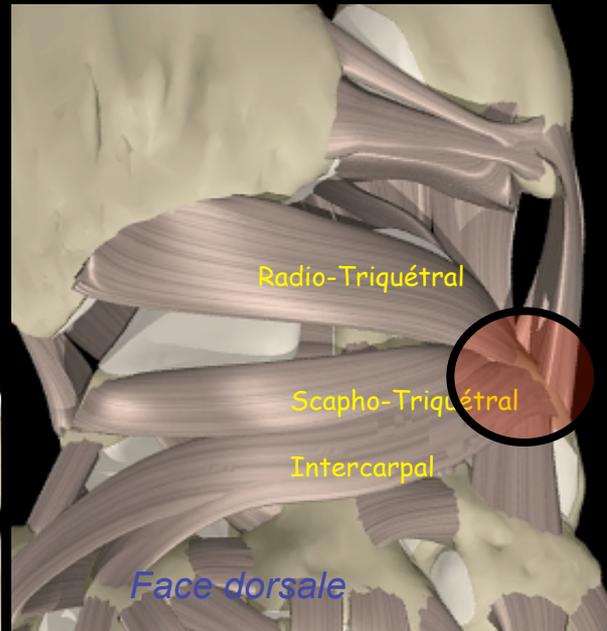
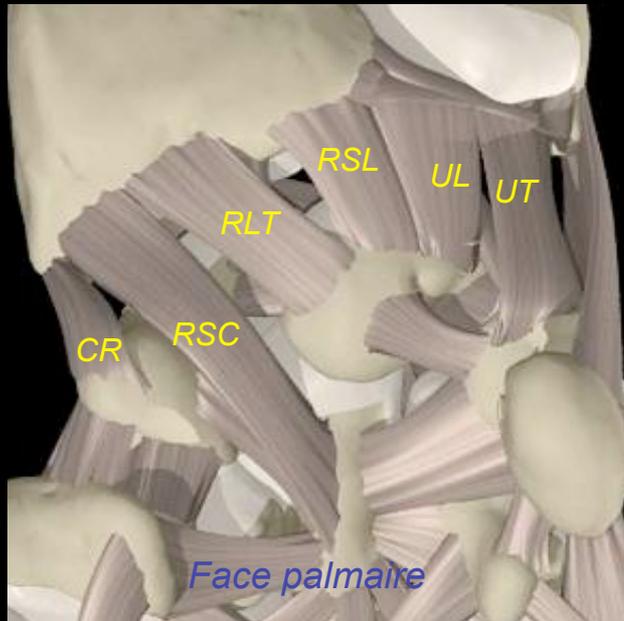
Ligaments Extrinsèques

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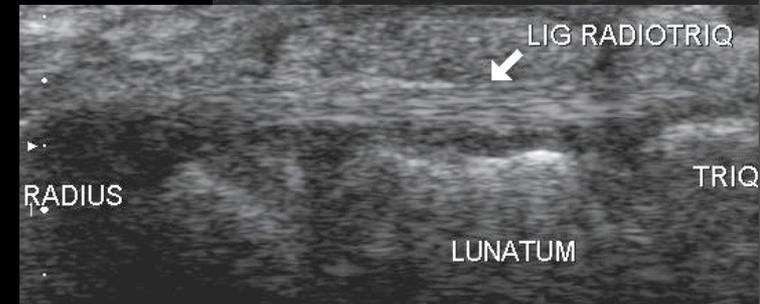
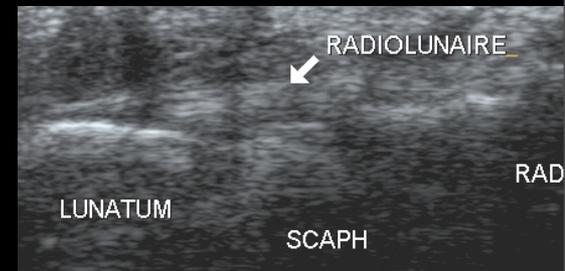
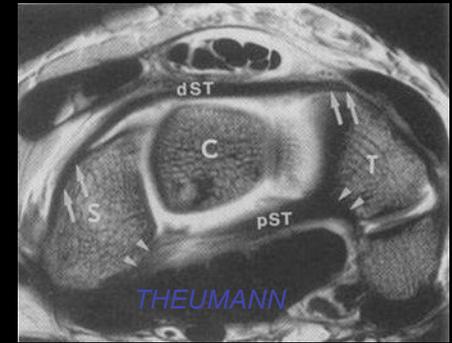
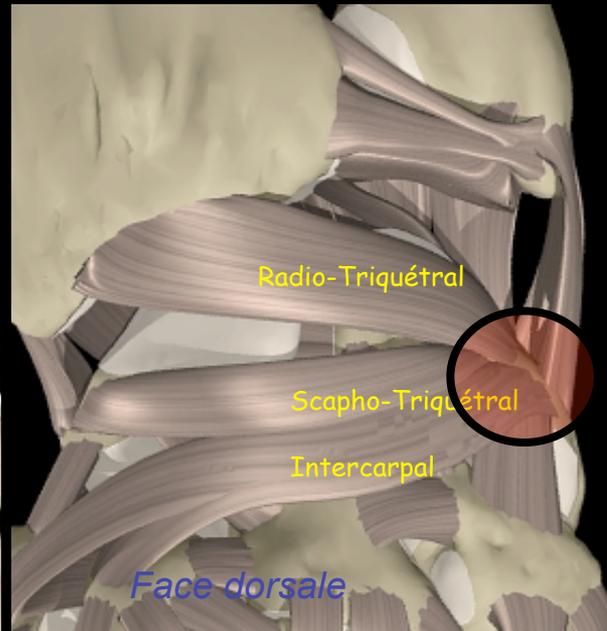
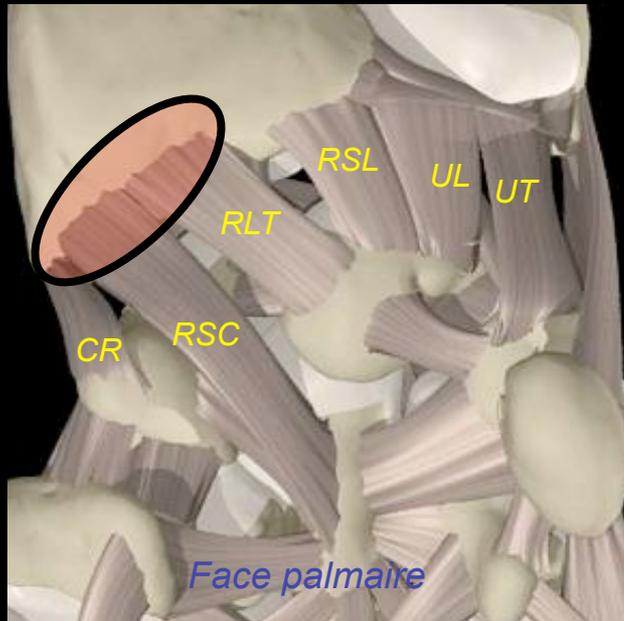
Ligaments Extrinsèques

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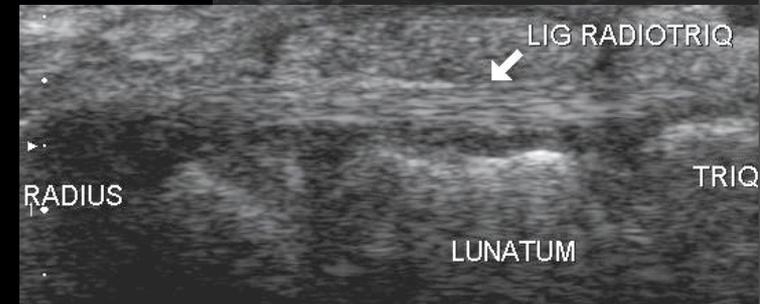
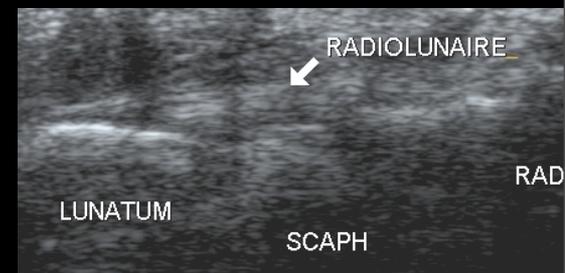
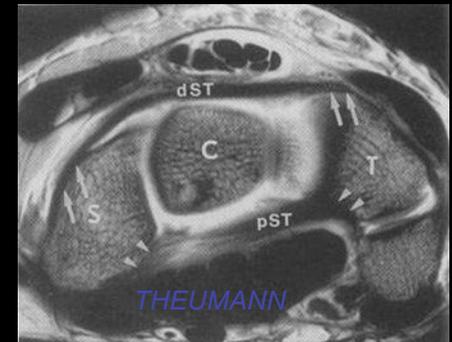
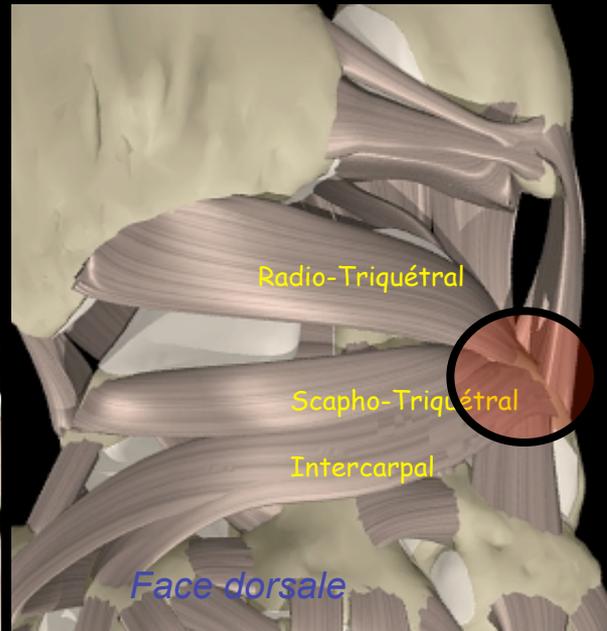
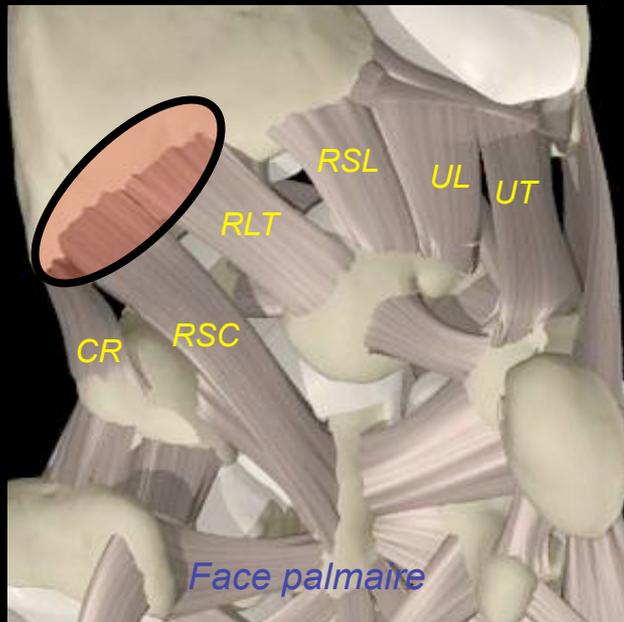
Ligaments Extrinsèques

1. Anatomie



Ligaments Extrinsèques

1. Anatomie



2. Pourquoi les explorer?

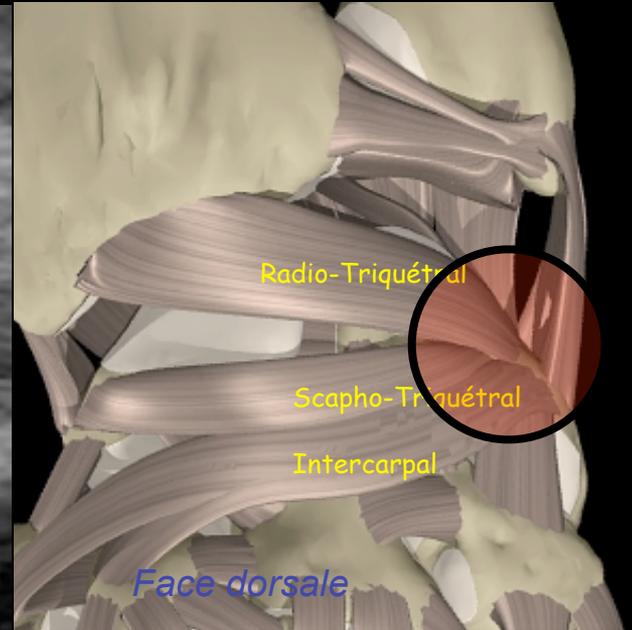
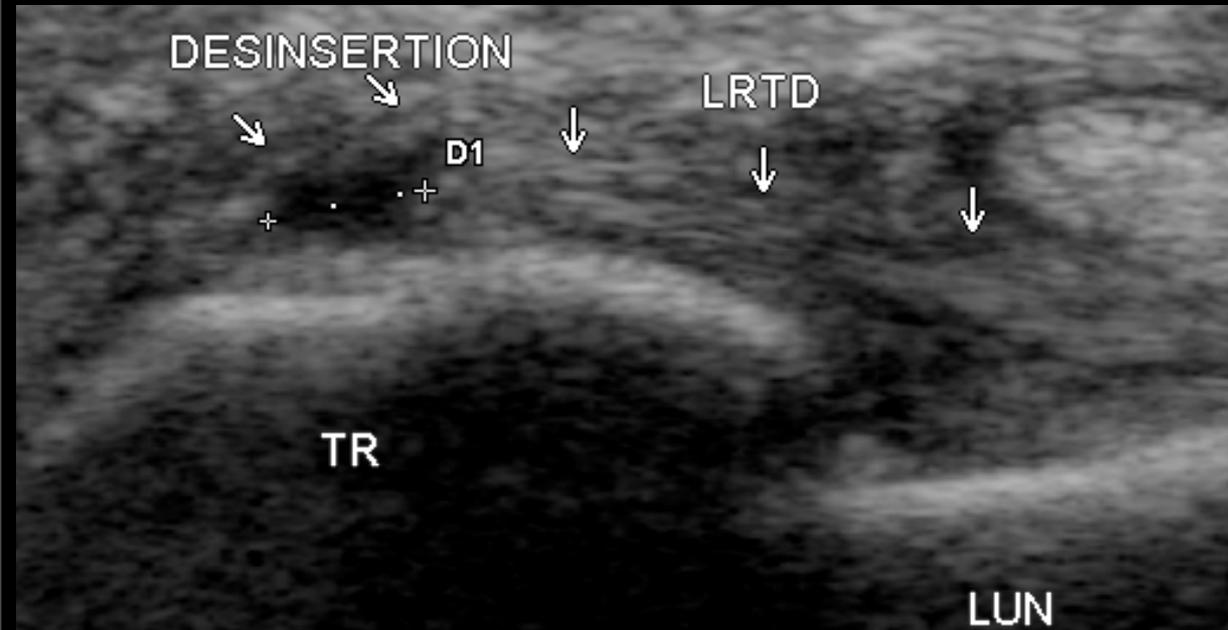
structures superficielles

face dorsale : avulsions osseuses

face palmaire : instabilité SL

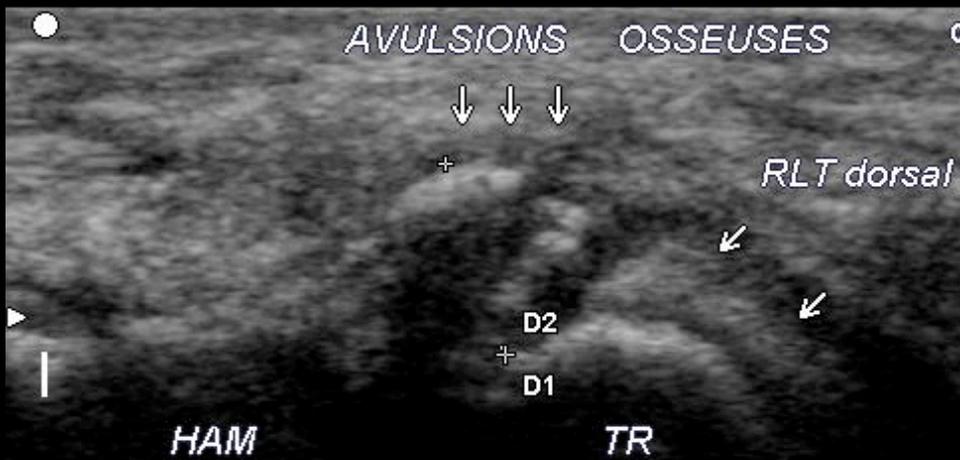
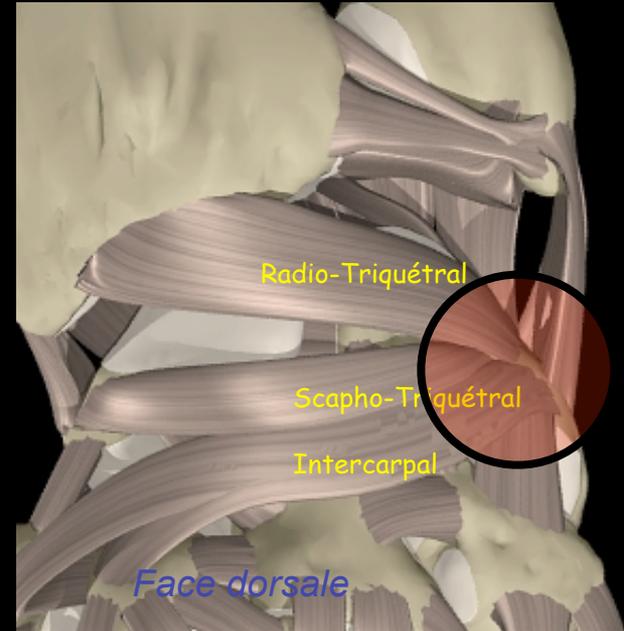
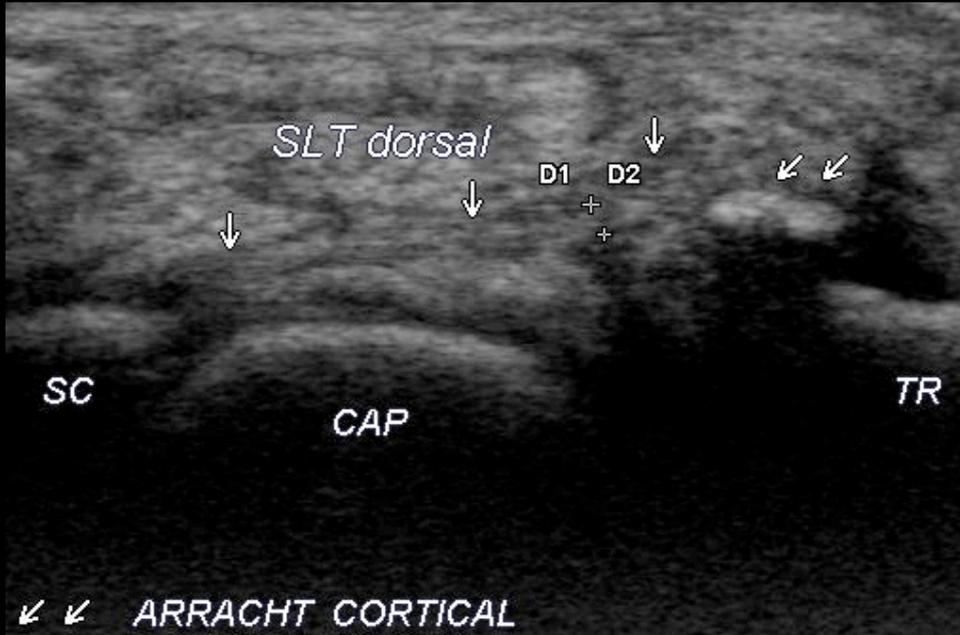
Ligaments Extrinsèques

Lésions de la sangle dorsale



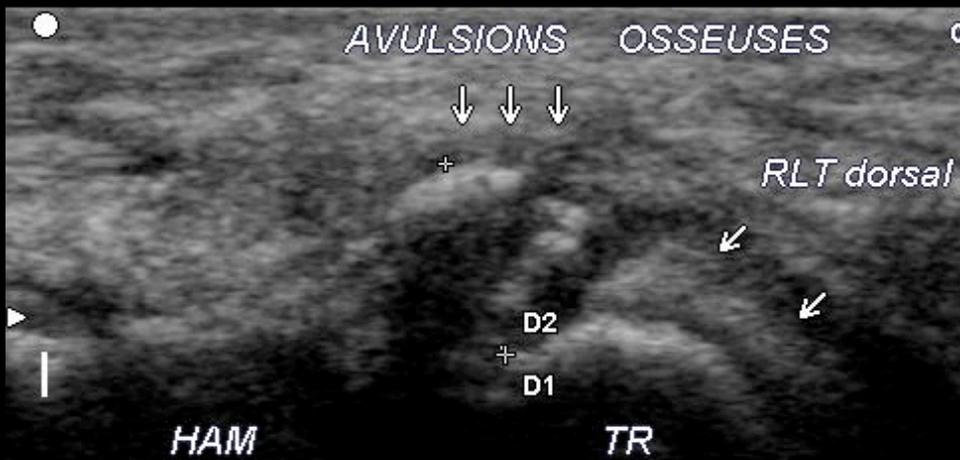
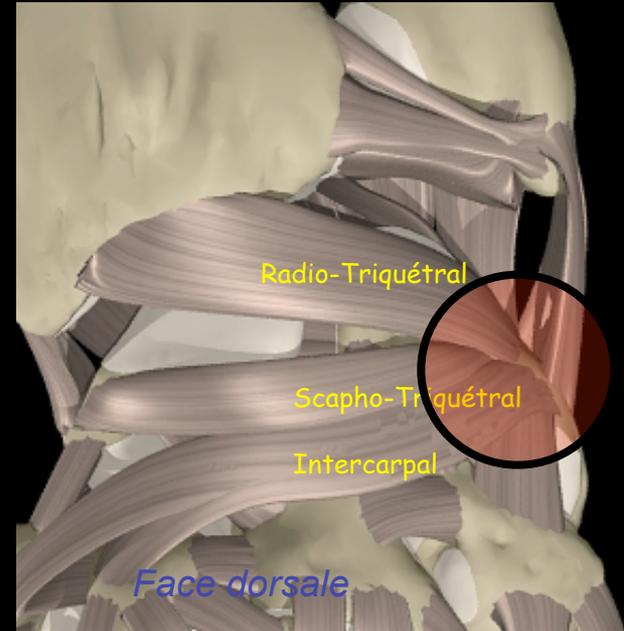
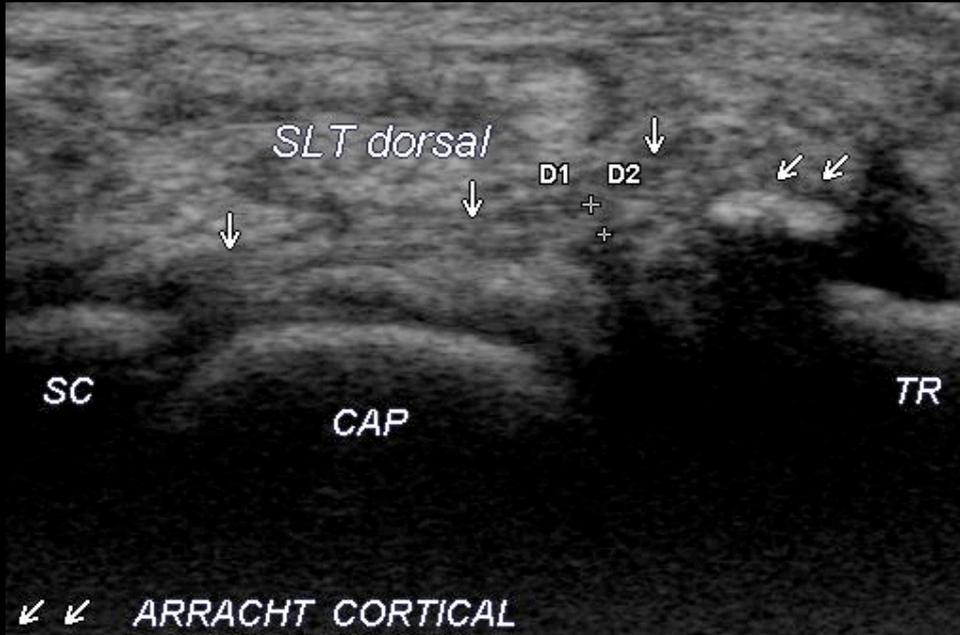
Ligaments Extrinsèques

Lésions de la sangle dorsale



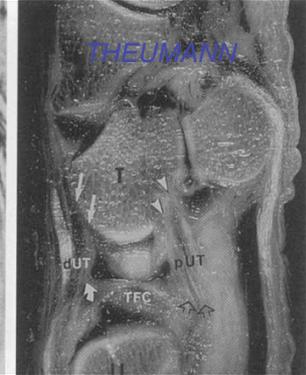
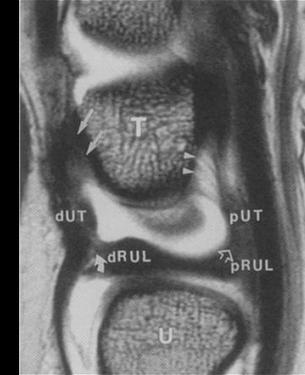
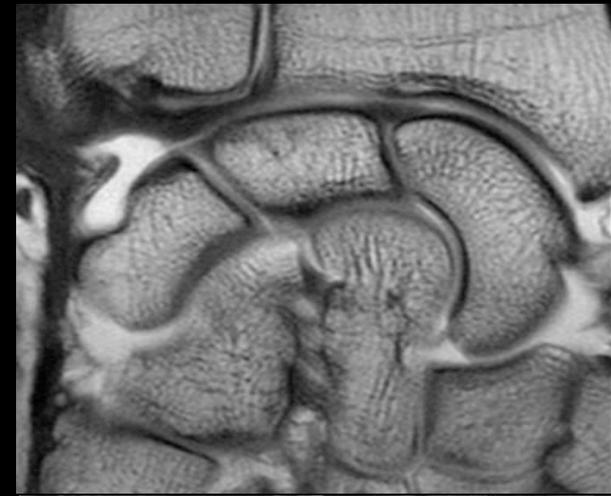
Ligaments Extrinsèques

Lésions de la sangle dorsale



TFCC

- Disque articulaire
- Ligaments radio-ulnaires
- Ligaments ulno-lunaire et ulno-triquetral
- Ménisque homologue
- Gaine du tendon de l'EUC
- (Ligament collatéral ulnaire)

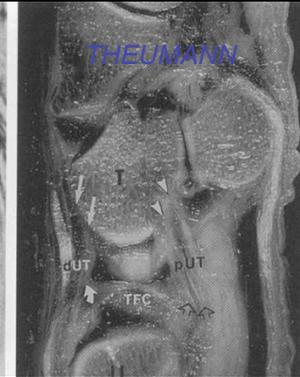
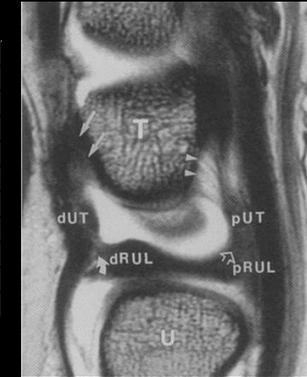


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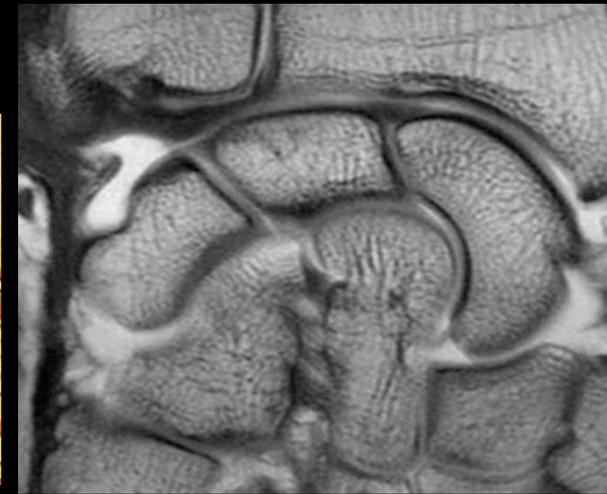


PALMER TRAUMATIQUE	
IA	Perforation centrale
IB	Avulsion de l'insertion ulnaire
IC	Avulsion distale: ligaments UC
ID	Avusion de l'insertion radiale
PALMER DEGENERATIF	
IIA	Amincissement du TFC
IIB	IIA + Chondromalacie
IIC	Perforation du TFC + Chondromalacie
IID	IIC + Perforation du Ligament Luno-triquétral
IIE	IID + Arthrose ulno-carpienne

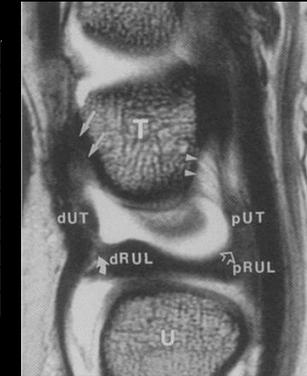


TFCC

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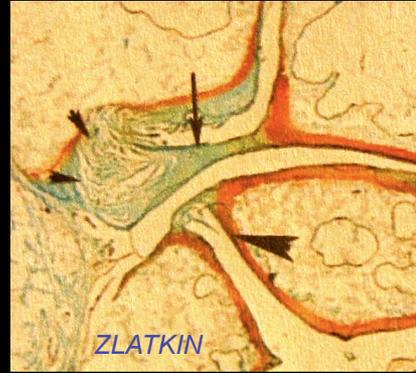
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PALMER DEGENERATIF	
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<i>IID</i>	IIC + Perforation du Ligament Luno-triquétral
<i>IIE</i>	IID + Arthrose ulno-carpienne



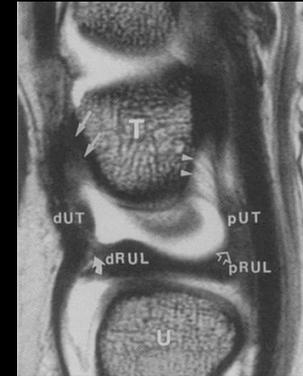
ECHOGRAPHIE ?

TFCC

- Disque articulaire
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- Ligaments ulno-lunaire et ulno-triquetral
- Ménisque homologue
- Gaine du tendon de l'EUC
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PALMER TRAUMATIQUE	
<i>IA</i>	Perforation centrale
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PALMER DEGENERATIF	
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<i>IIE</i>	IID + Arthrose ulno-carpienne



ECHOGRAPHIE ?

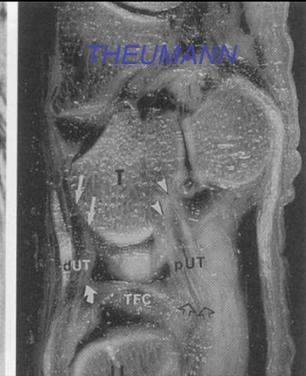
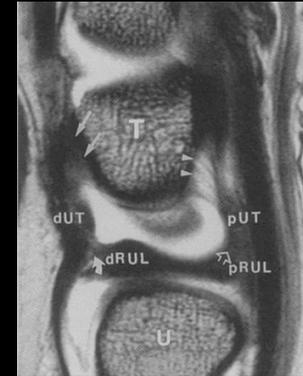


TFCC

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- Ligaments ulno-lunaire et ulno-triquetral
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IIE	IID + Arthrose ulno-carpienne



ECHOGRAPHIE ?



Echographie des Ligaments du Poignet

Echographie des Ligaments du Poignet

Ligament Scapho-Lunaire

- visualisation constante du faisceau dorsal du LSL

Echographie des Ligaments du Poignet

Ligament Scapho-Lunaire

- visualisation constante du faisceau dorsal du LSL

si normal : pas de risque d'instabilité SL

si anormal : imagerie en coupes ou arthroscopie

Echographie des Ligaments du Poignet

Ligament Scapho-Lunaire

- visualisation constante du faisceau dorsal du LSL

si normal : pas de risque d'instabilité SL

si anormal : imagerie en coupes ou arthroscopie

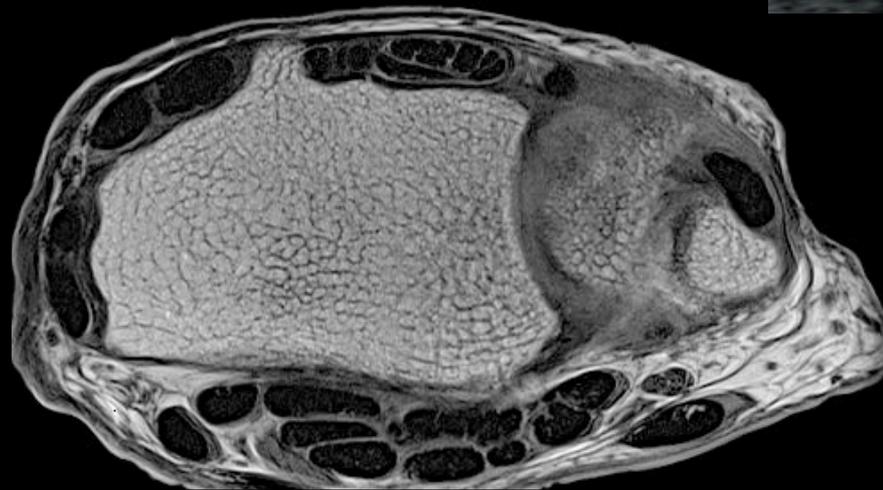
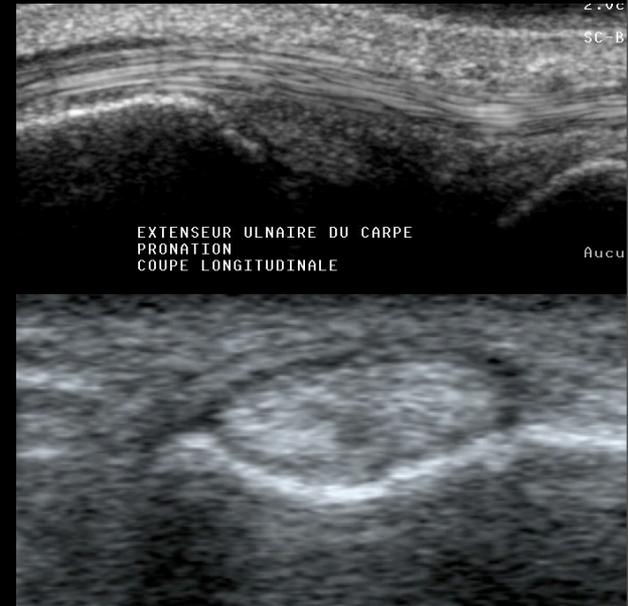
Ligament LT et TFCC : résultats décevants

= imagerie en coupes

Ligaments extrinsèques : lésions fréquentes

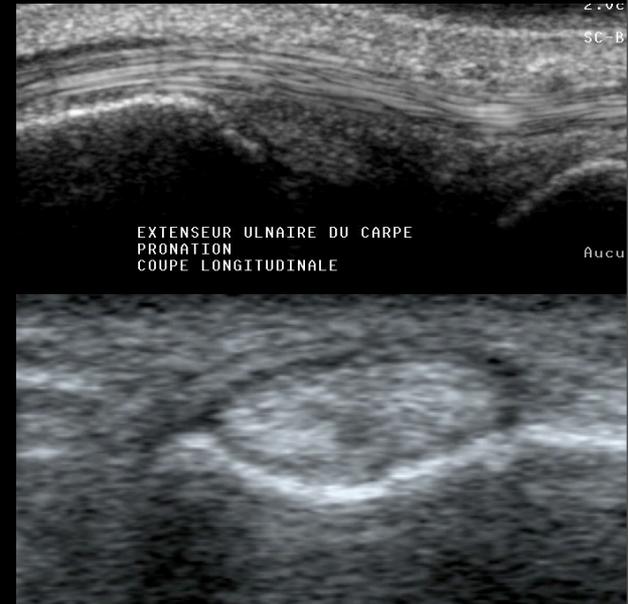
3. PATHOLOGIE TENDINEUSE

Aspect normal



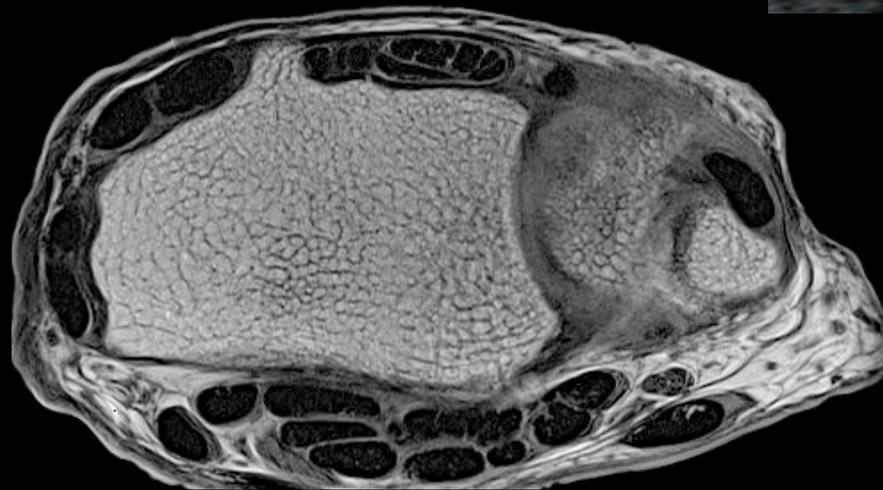
3. PATHOLOGIE TENDINEUSE

Aspect normal



Traumatique : rétinaculum de l'EUC

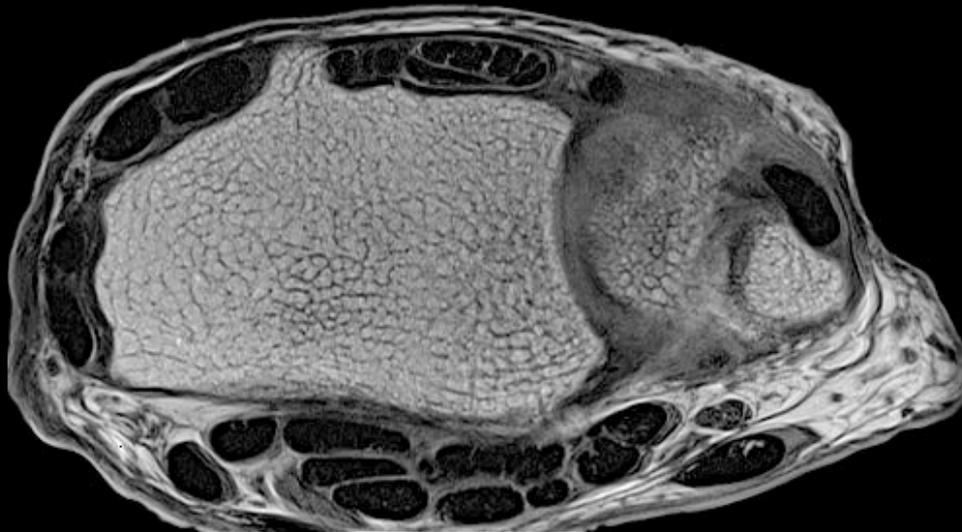
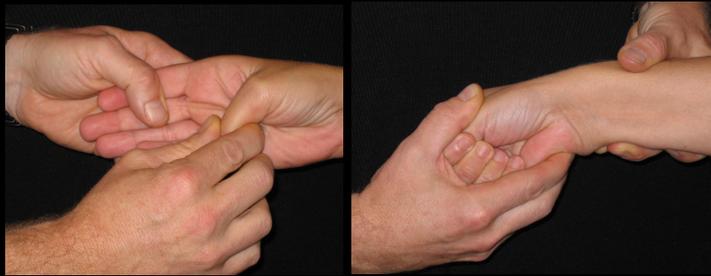
Microtraumatique : tendinopathies



Ténosynovite de De Quervain

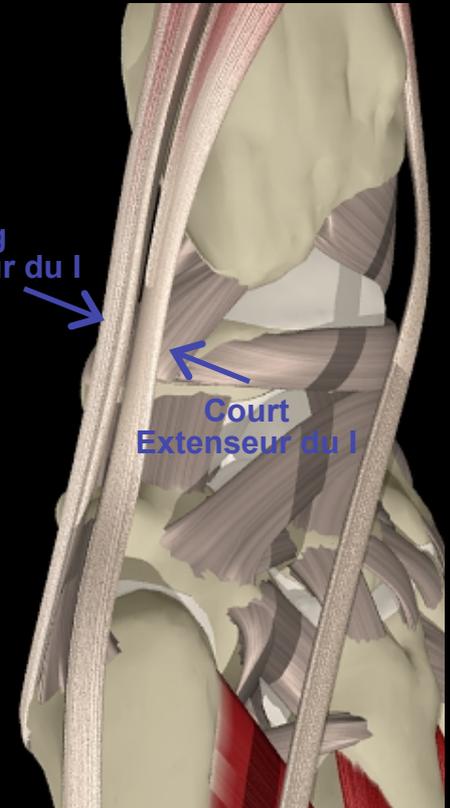
Tendons Long Abducteur et Court Extenseur du I
Variantes anatomiques : septum/crête osseuse

Escrime, golf, aviron, cyclisme, volley



Long
Abducteur du I

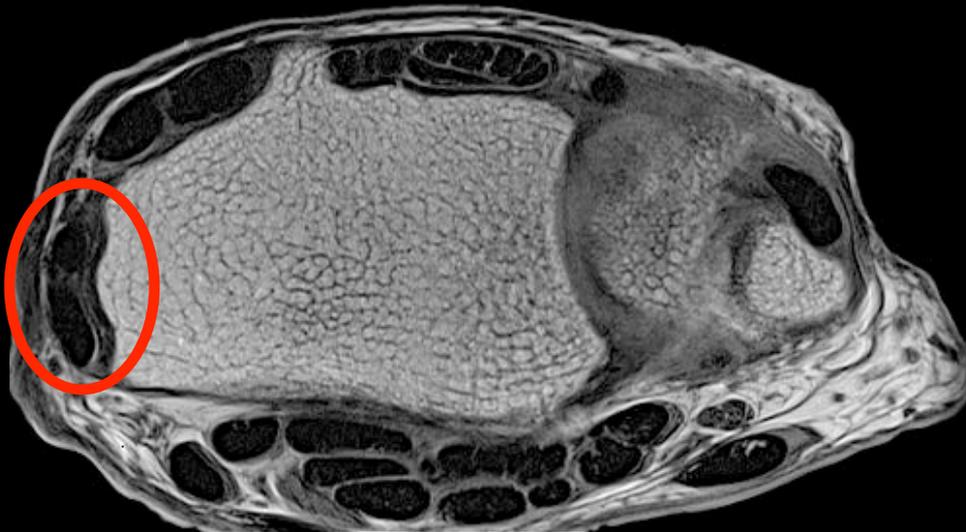
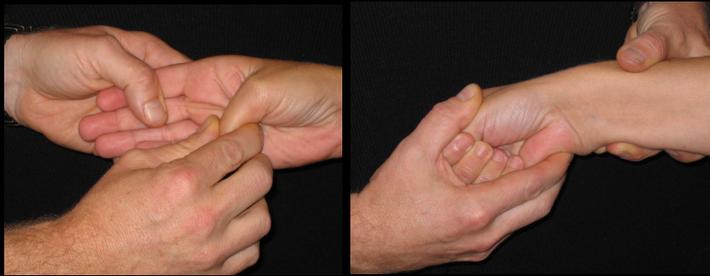
Court
Extenseur du I



Ténosynovite de De Quervain

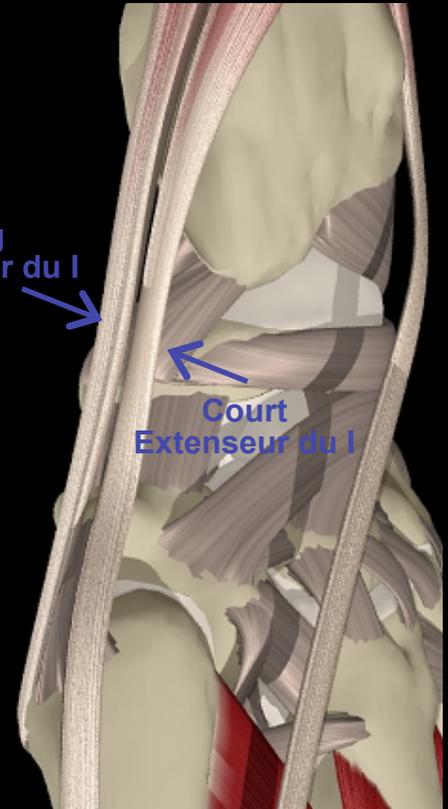
Tendons Long Abducteur et Court Extenseur du I
Variantes anatomiques : septum/crête osseuse

Escrime, golf, aviron, cyclisme, volley



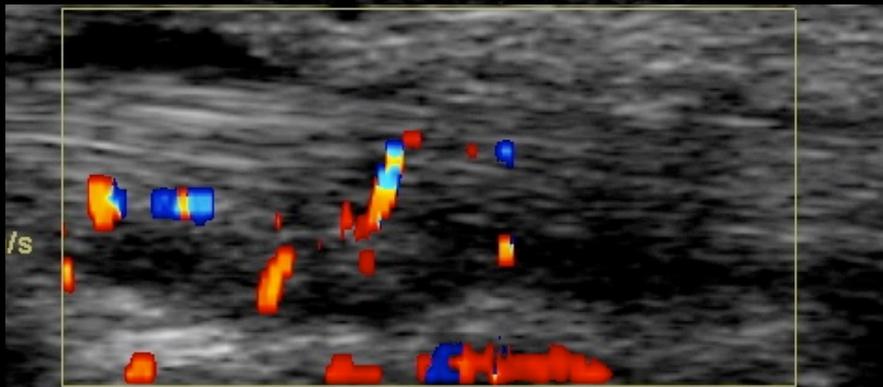
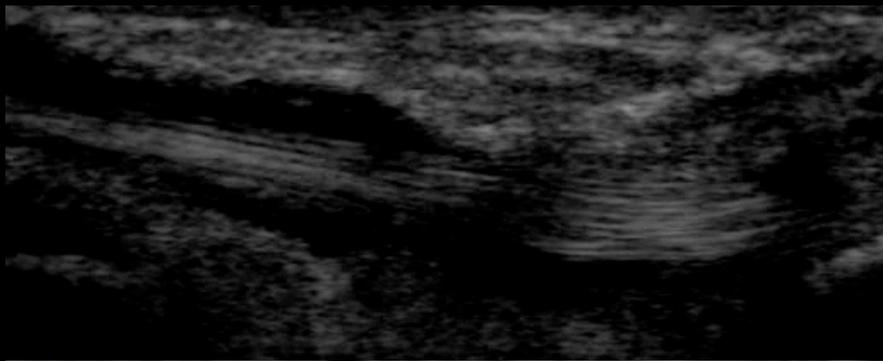
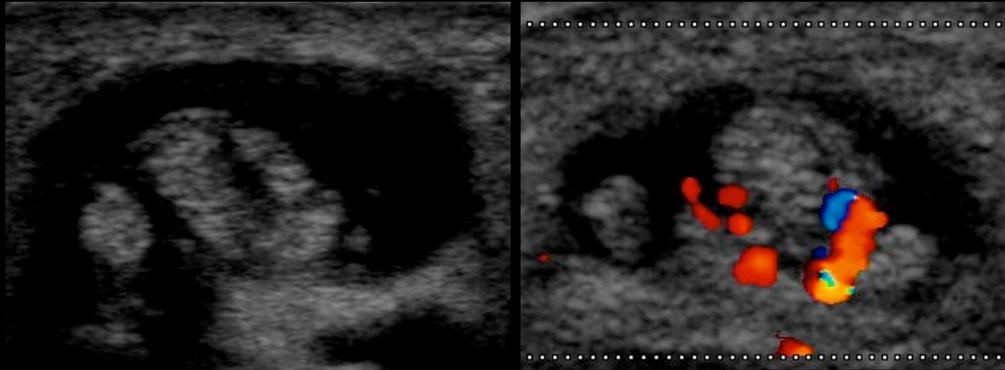
Long
Abducteur du I

Court
Extenseur du I



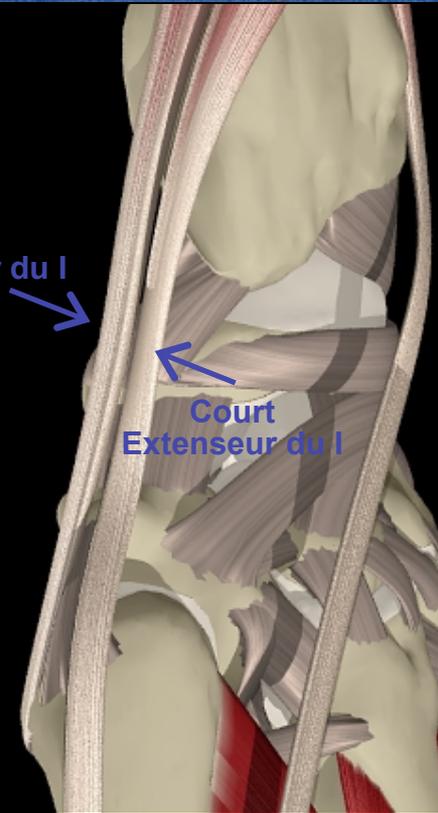
Ténosynovite de De Quervain

STADE DEBUTANT = EXSUDATIF



Long
Abducteur du I

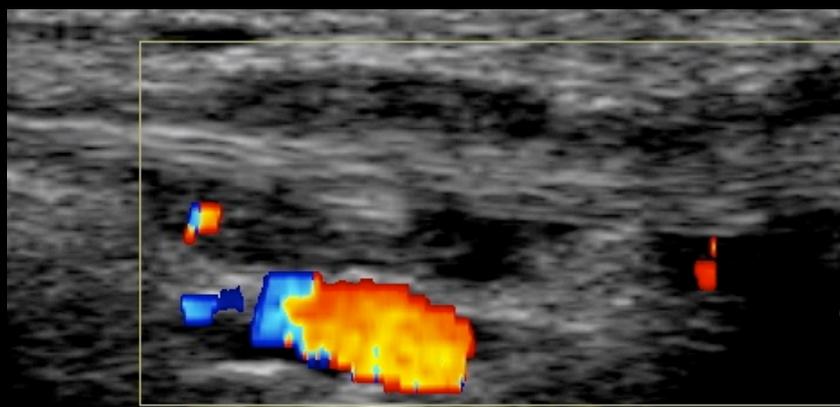
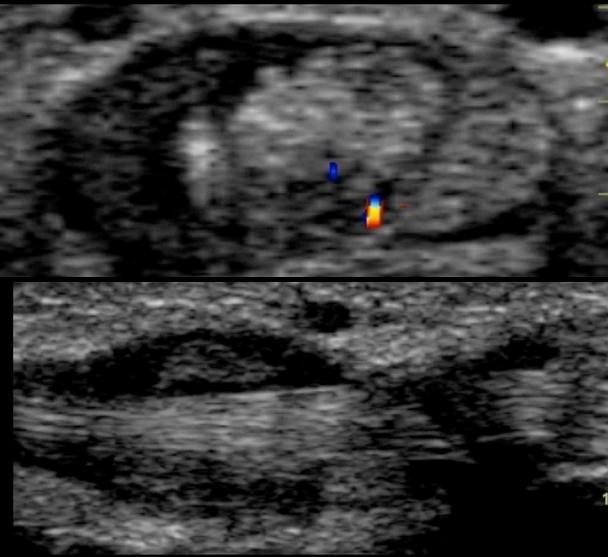
Court
Extenseur du I



Ténosynovite de De Quervain

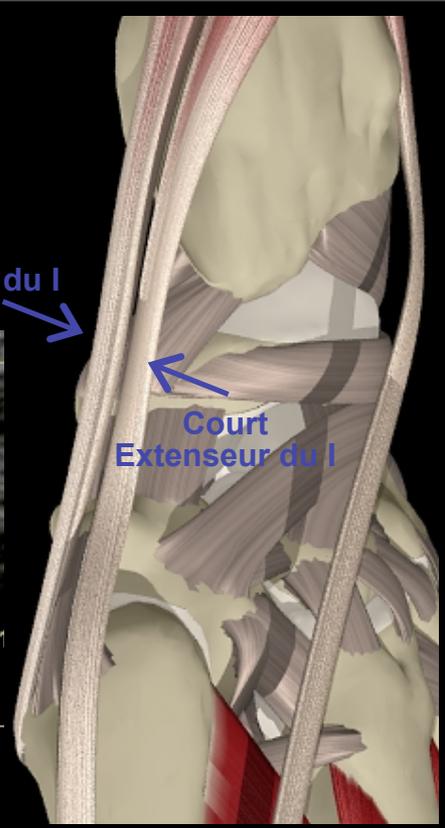
EVOLUTION CHRONIQUE et STENOSANTE

Stade fibreux

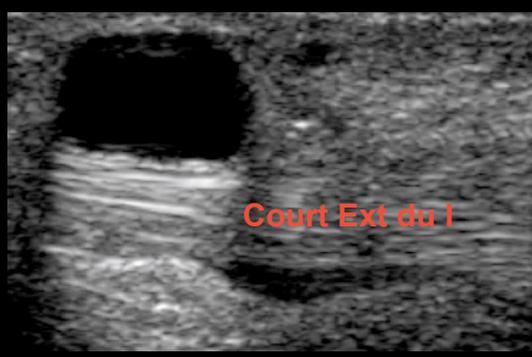
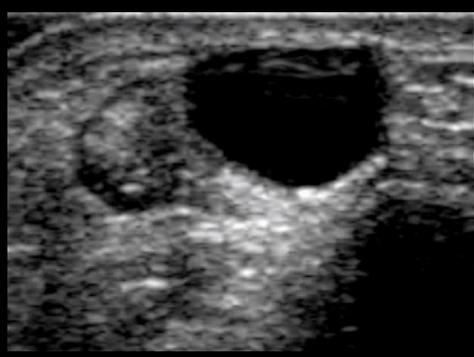
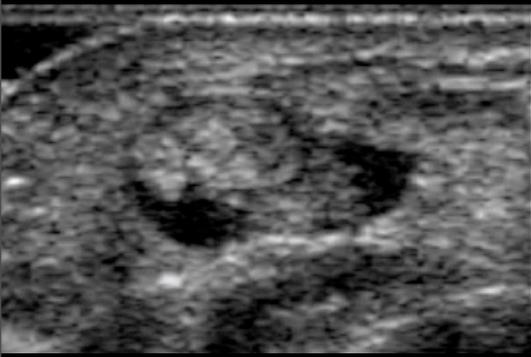


Long Abducteur du I

Court Extenseur du I



Stade kystique

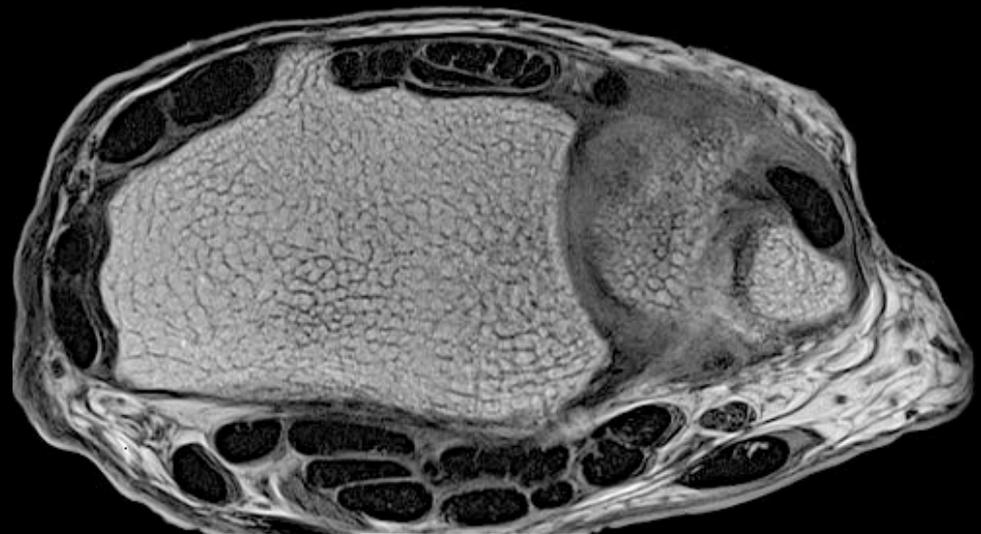
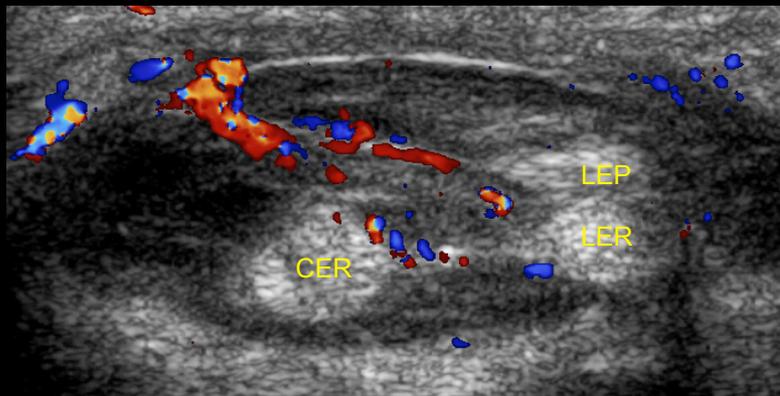
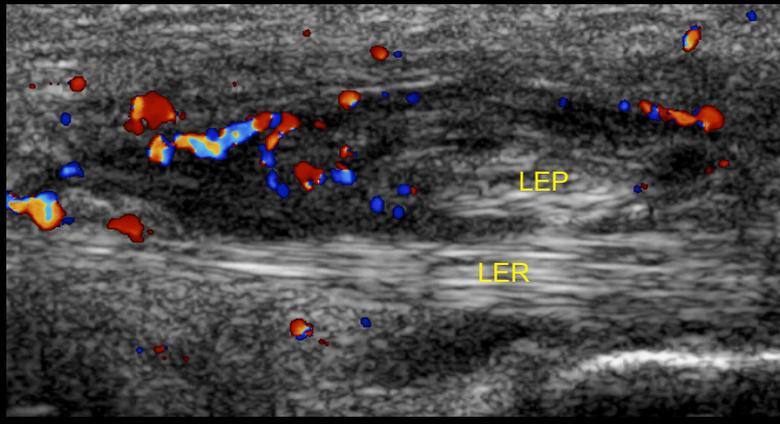


Court Ext du I



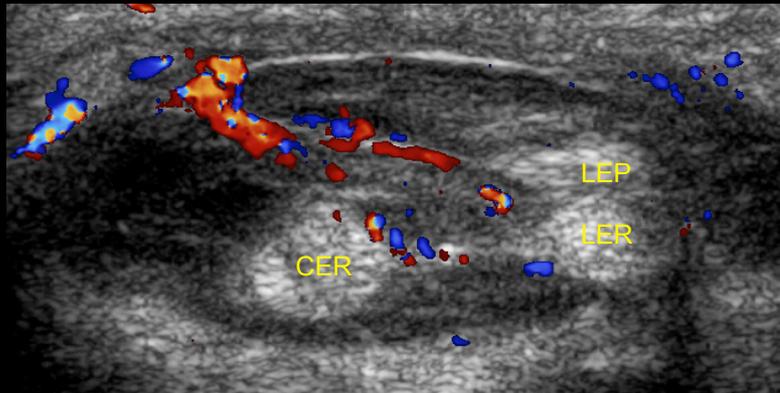
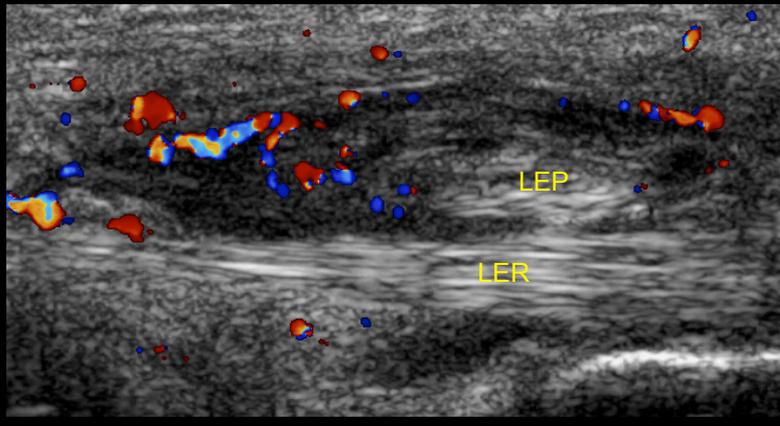
Court et Long Extenseurs Radiaux du Carpe

TENDINOPATHIE = Rameurs, windsurfers, motards (rare)



Court et Long Extenseurs Radiaux du Carpe

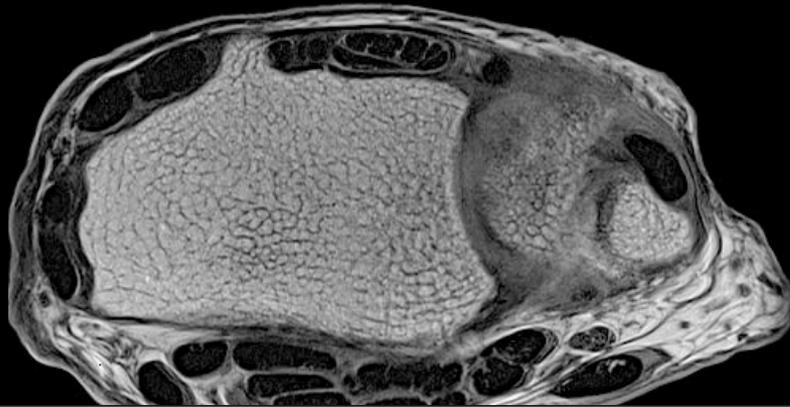
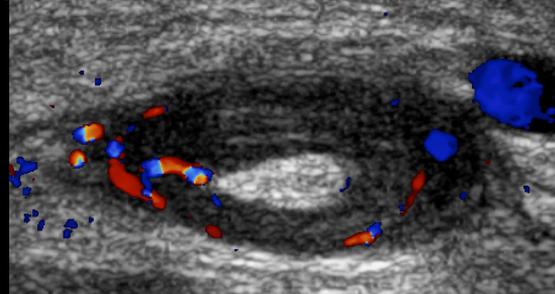
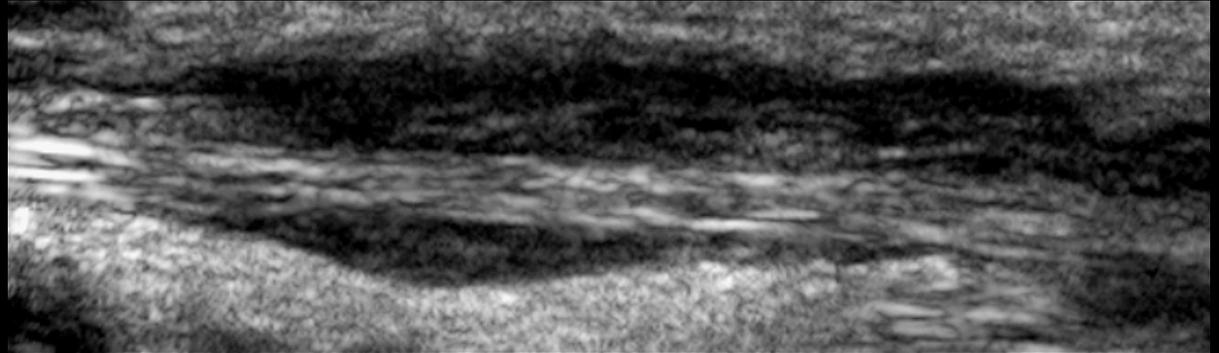
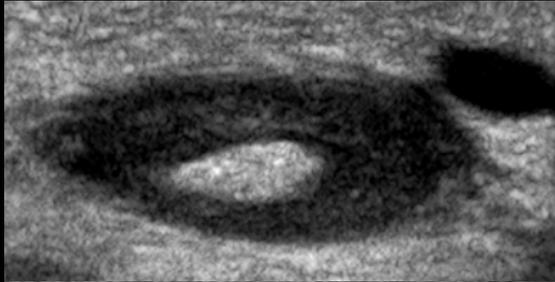
TENDINOPATHIE = Rameurs, windsurfers, motards (rare)



Ténosynovite du Long Extenseur du pouce

Golf, tennis, rallyes

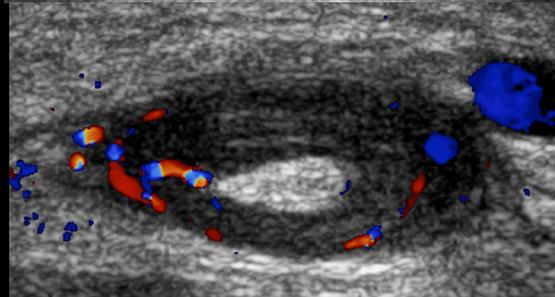
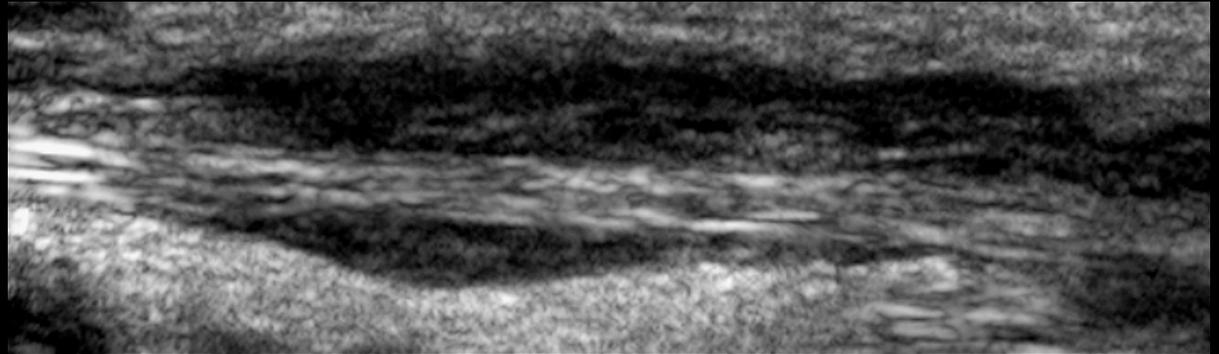
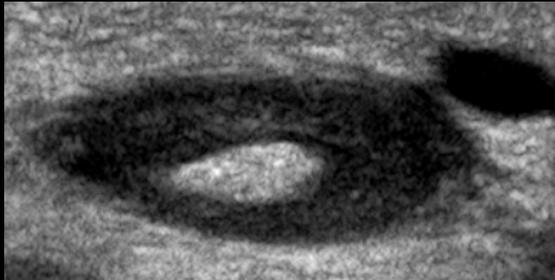
Lister = poulie de réflexion / Cal fracturaire du radius : rupture (3%)



Ténosynovite du Long Extenseur du pouce

Golf, tennis, rallyes

Lister = poulie de réflexion / Cal fracturaire du radius : rupture (3%)



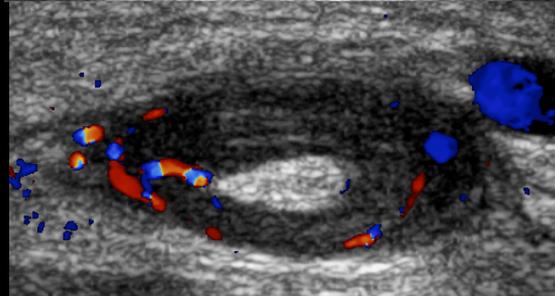
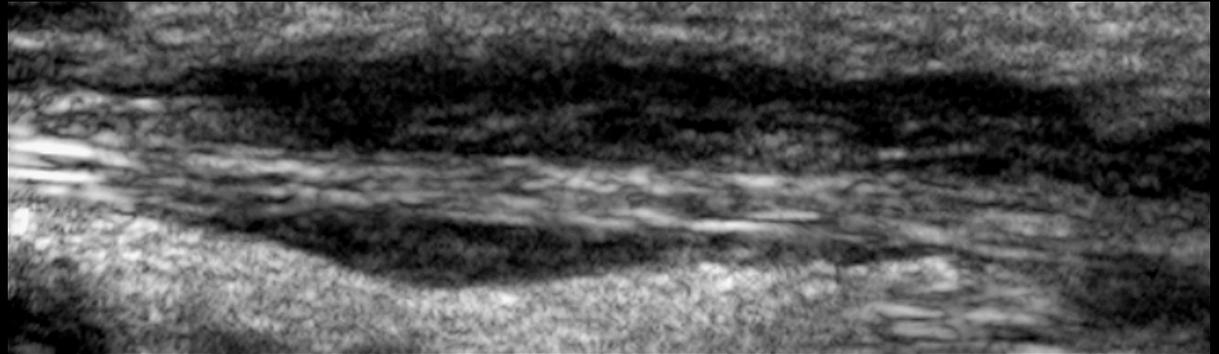
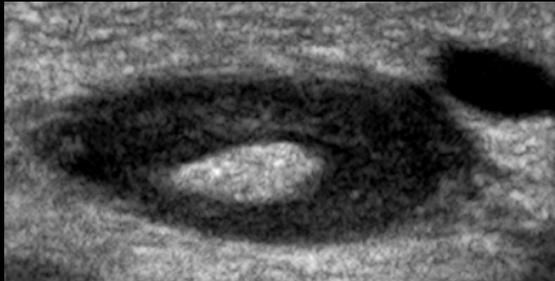
Ténosynovite du Long Extenseur du pouce

Golf, tennis, rallyes

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TENOSYNOVITE



SYNDROME DU CROISEMENT

Tendons LA et CE du I / CERC LERC
LEP du I / CERC LERC

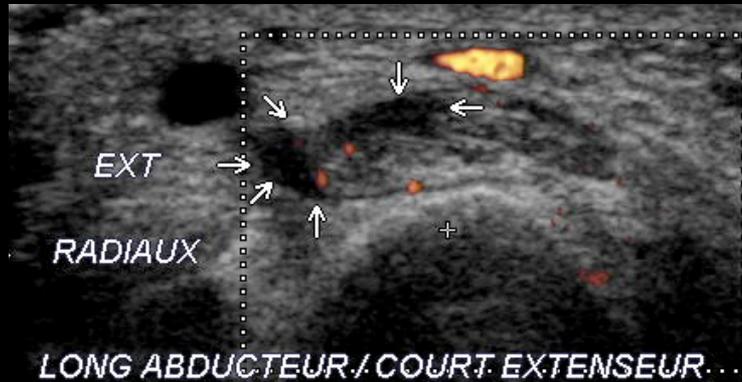
Hypersollicitation = rameurs
« Aï crépissant » - Bursite



SYNDROME DU CROISEMENT

Tendons LA et CE du I / CERC LERC
LEP du I / CERC LERC

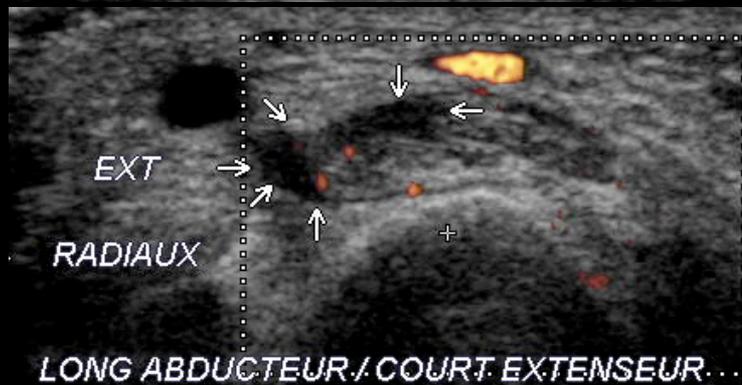
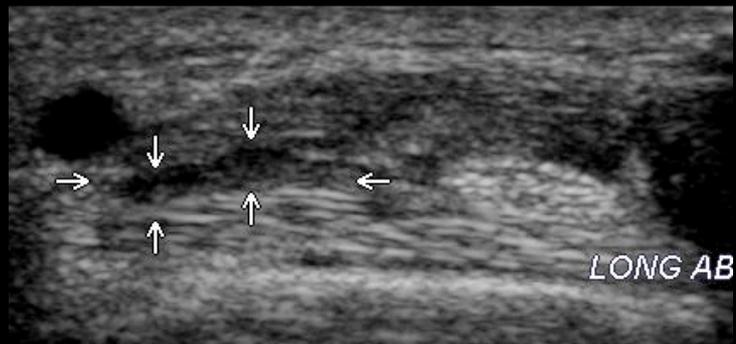
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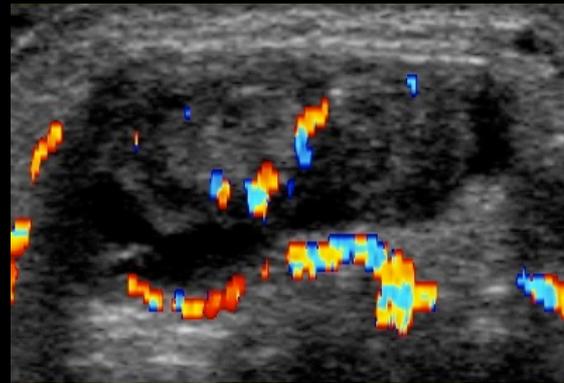
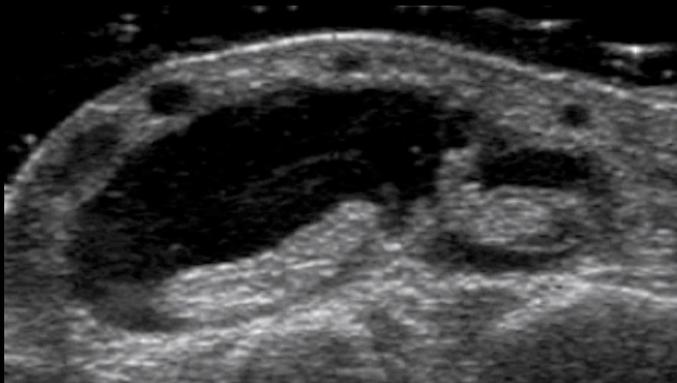
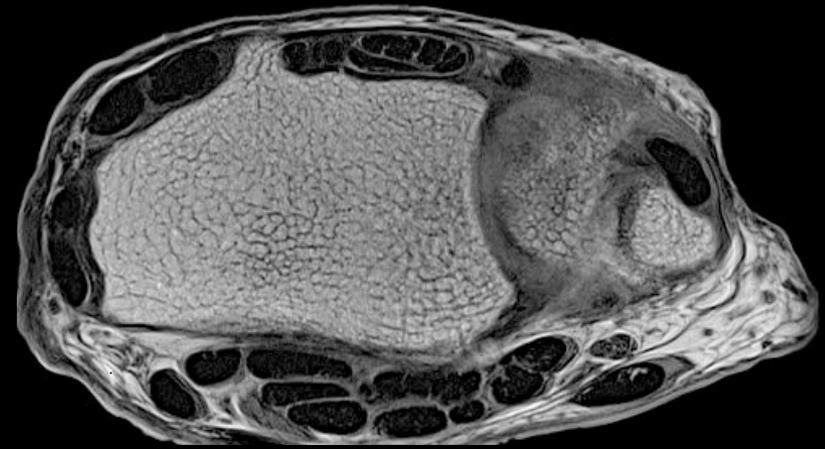
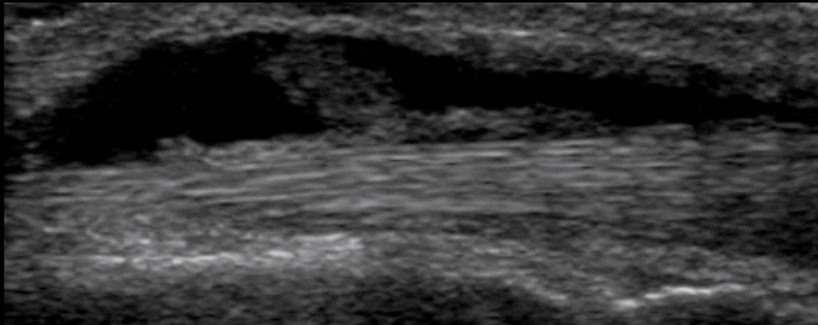
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Extenseur Commun des Doigts

Rhumatologique +++

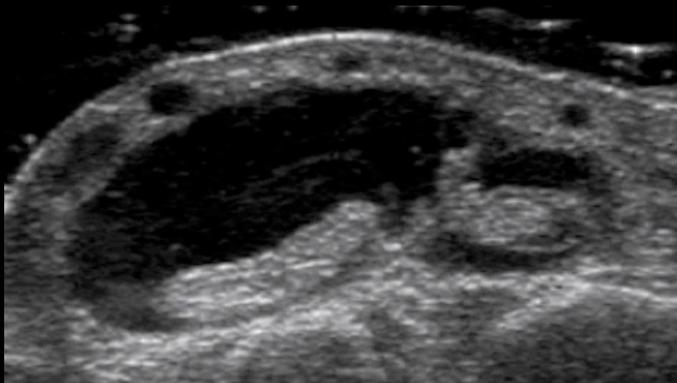
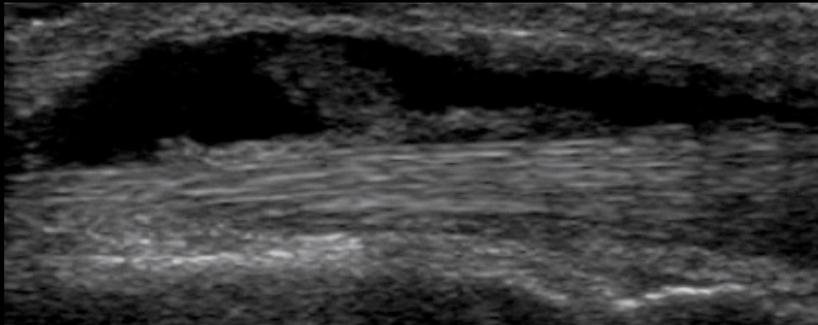
Hypersollicitation : Funboard, canoë



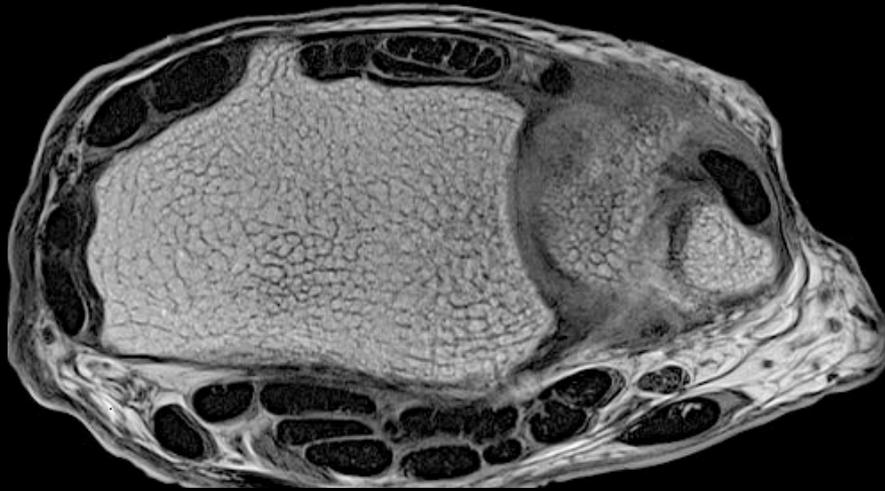
Extenseur Commun des Doigts

Rhumatologique +++

Hypersollicitation : Funboard, canoë



Extenseur Ulnaire du Carpe



Contexte variable : - rhumatologique
- instabilité aigüe
- tendinopathies



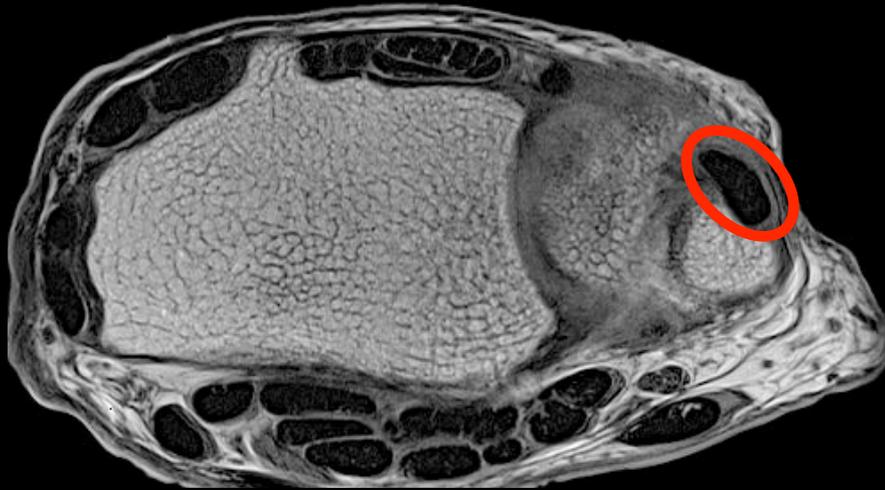
Extenseur Ulnaire du Carpe



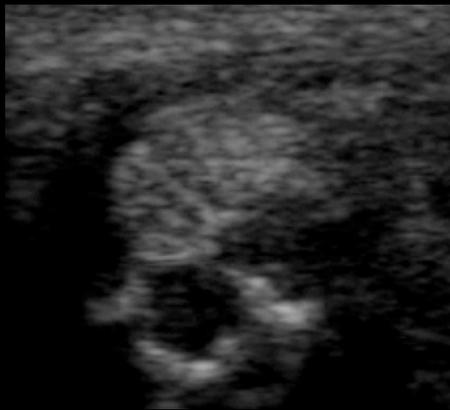
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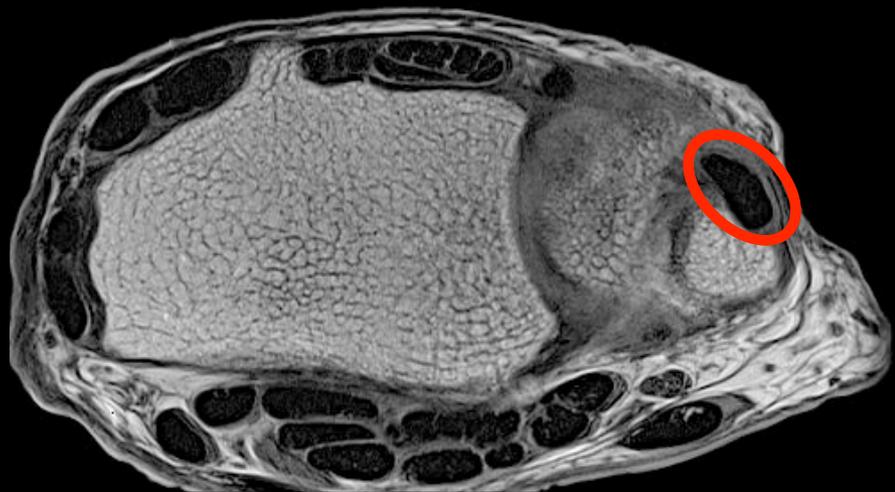
Extenseur Ulnaire du Carpe



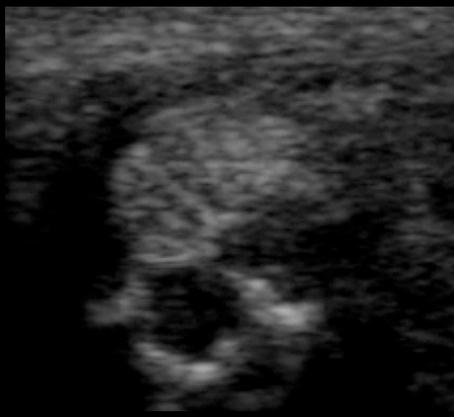
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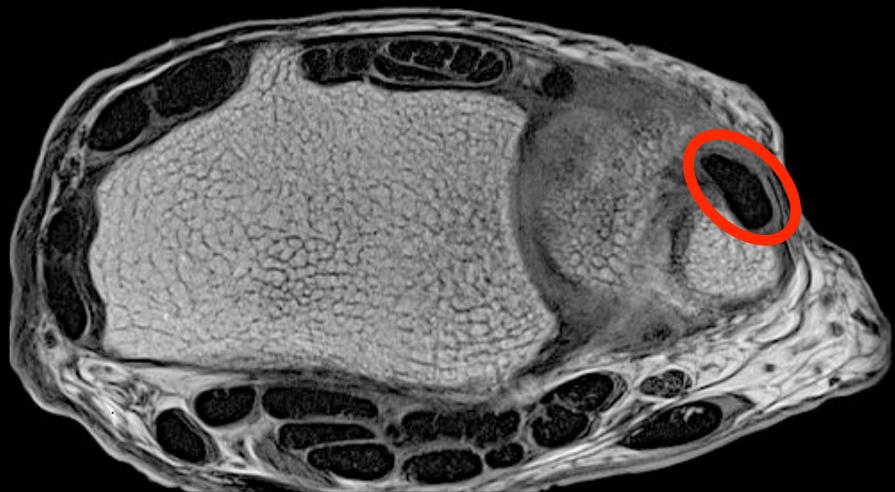
Extenseur Ulnaire du Carpe



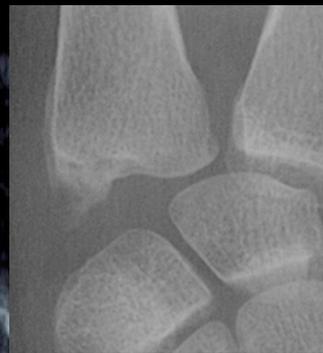
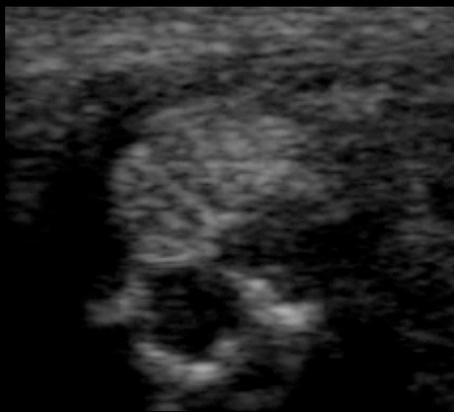
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Extenseur Ulnaire du Carpe



Contexte variable : - rhumatologique
- instabilité aigüe
- tendinopathies



Extenseur Ulnaire du Carpe - Instabilité

Tennis : lift

Golf : main G chez un droitier

Début brutal - arrêt du match

Œdème, ecchymose

Claquement audible ou ressaut

« sortie » ou luxation du tendon de sa gouttière en supination

Réintégration en pronation

US : « chambre » de décollement sur son versant ulnaire



Extenseur Ulnaire du Carpe - Instabilité

Tennis : lift

Golf : main G chez un droitier

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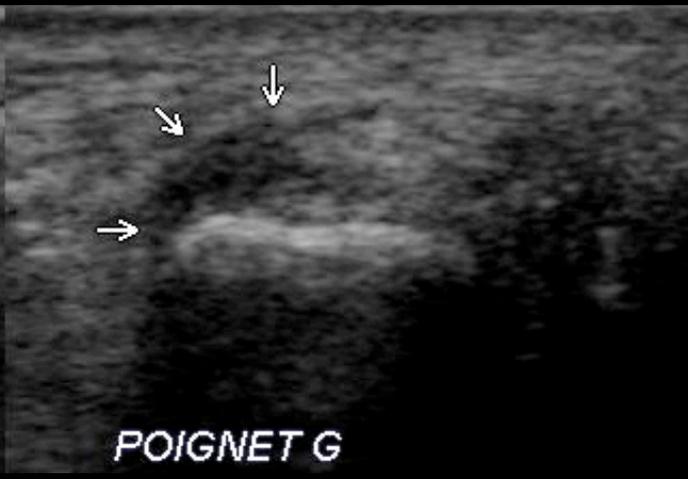
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POIGNET DRT

POIGNET G

Extenseur Ulnaire du Carpe - Instabilité

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Début brutal - arrêt du match

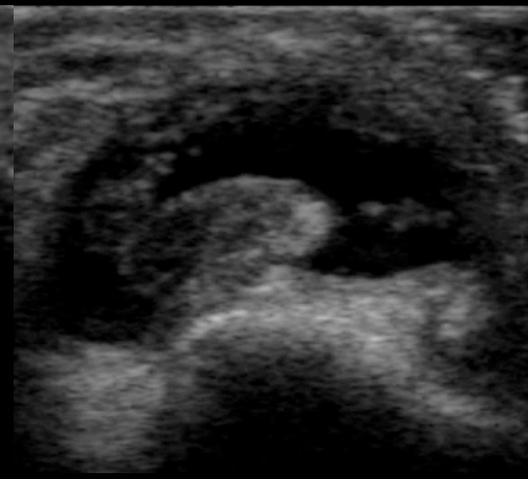
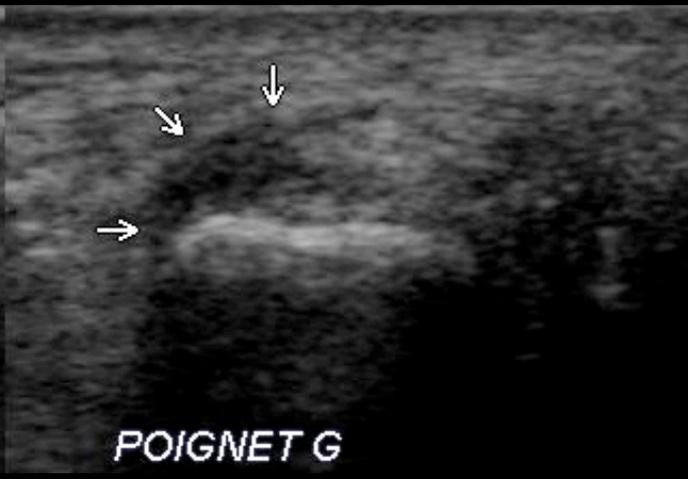
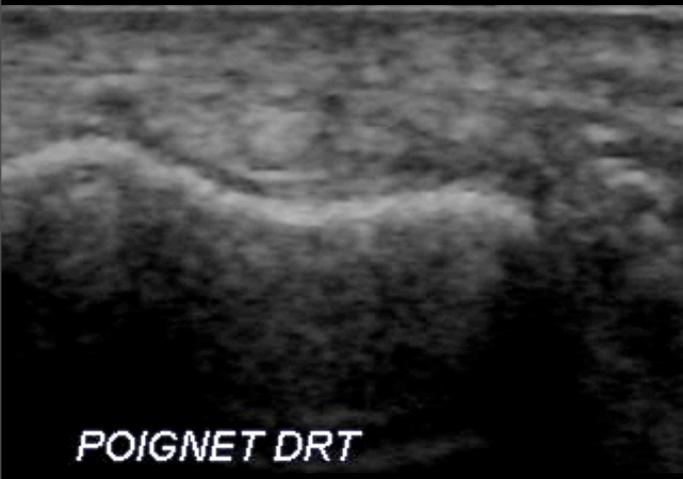
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Extenseur Ulnaire du Carpe:Tendinopathies



Extenseur Ulnaire du Carpe:Tendinopathies

VTT, Tennis

Installation progressive

Instabilité RUD associée - Dysplasie de la gouttière (Madelung)

Tuméfaction et douleur de la face ulnaire du poignet



Extenseur Ulnaire du Carpe:Tendinopathies

VTT, Tennis

Installation progressive

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US : - Pas de lésion du rétinaculum

- Modifications tendineuses

Tendinopathie +/- fissure : guérison en 1 à 9 mois



Extenseur Ulnaire du Carpe:Tendinopathies

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Tenosynovite



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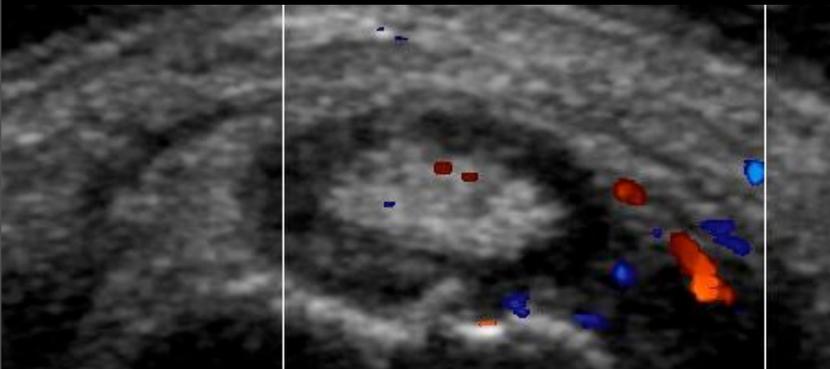
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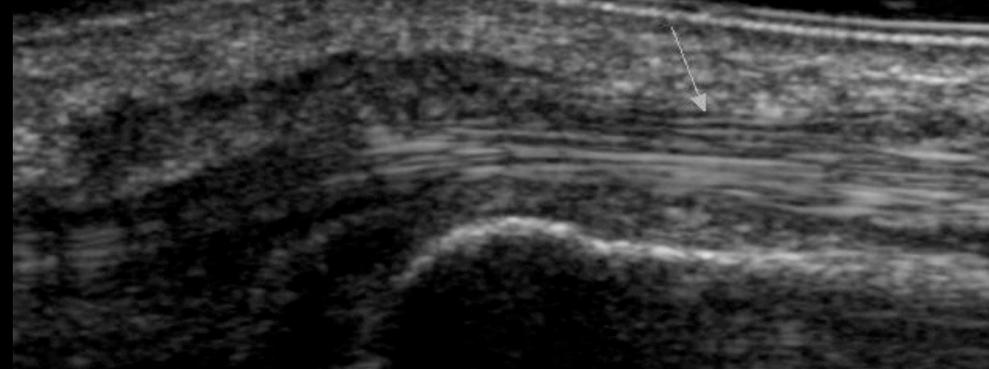
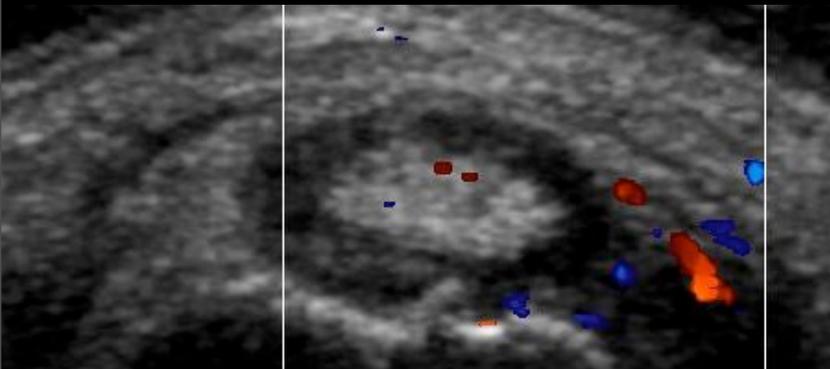
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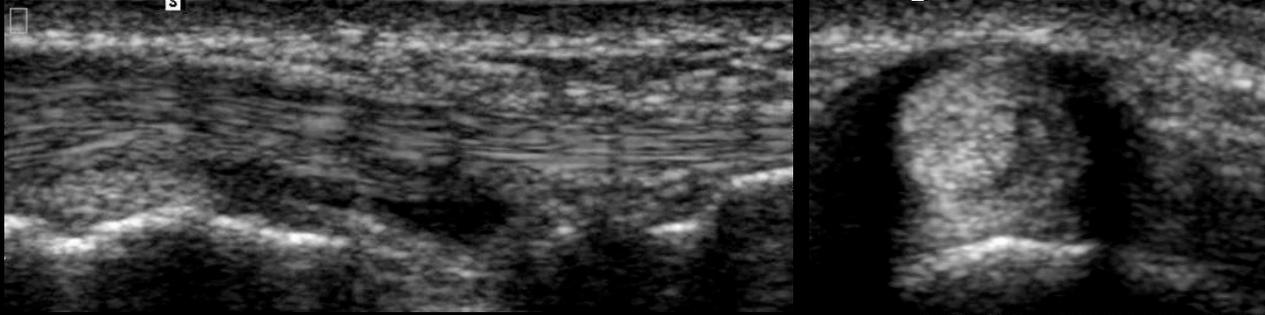
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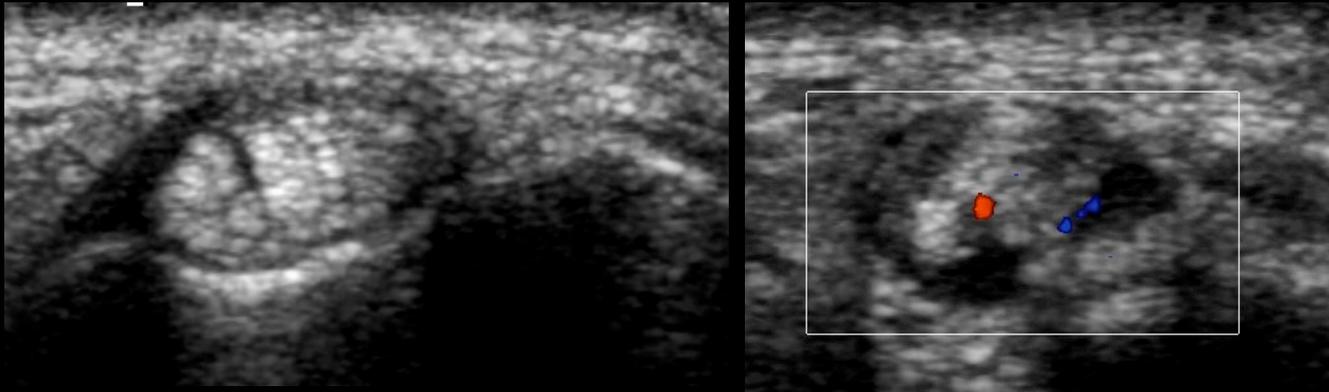


Extenseur Ulnaire du Carpe: Tendinopathies

Tendinopathie Hypertrophique



Tendinopathie Fissuraire

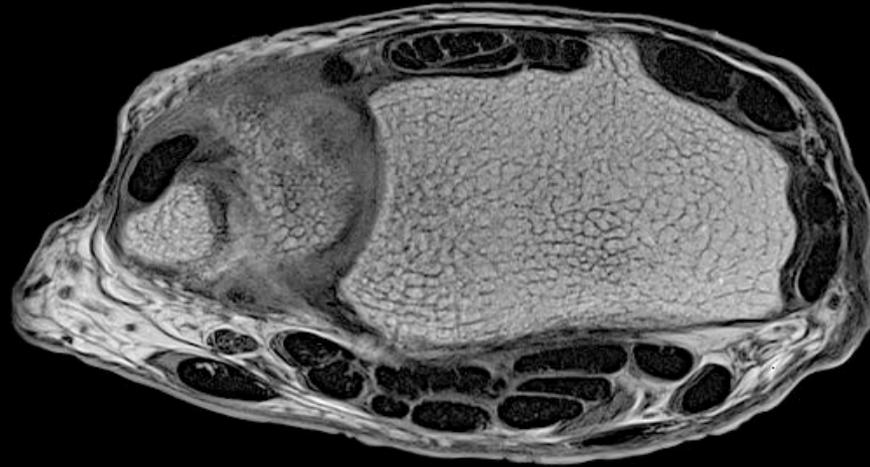


Rupture de l'ECU

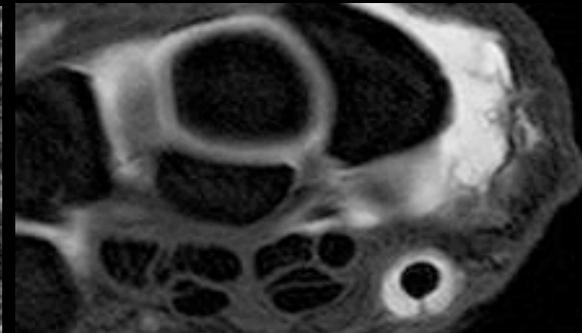
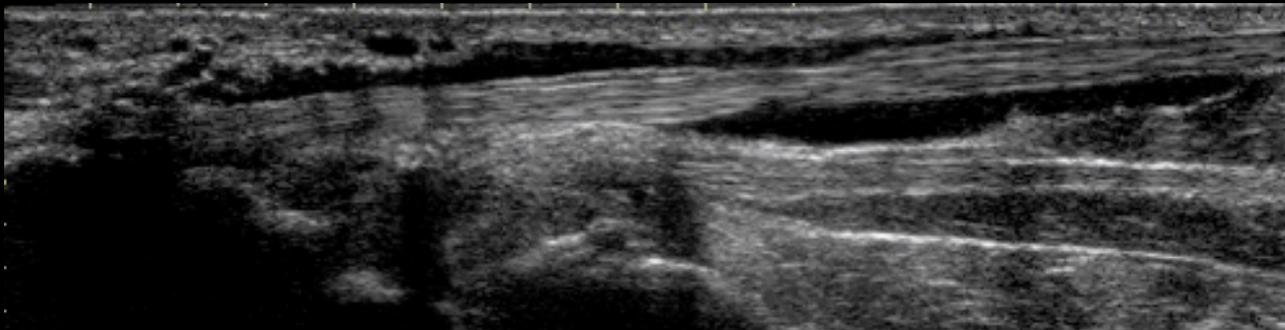
= Rare et favorisée par infiltrations de corticoïdes

TENDONS FLECHISSEURS

Rares chez le sportif
Causes secondaires

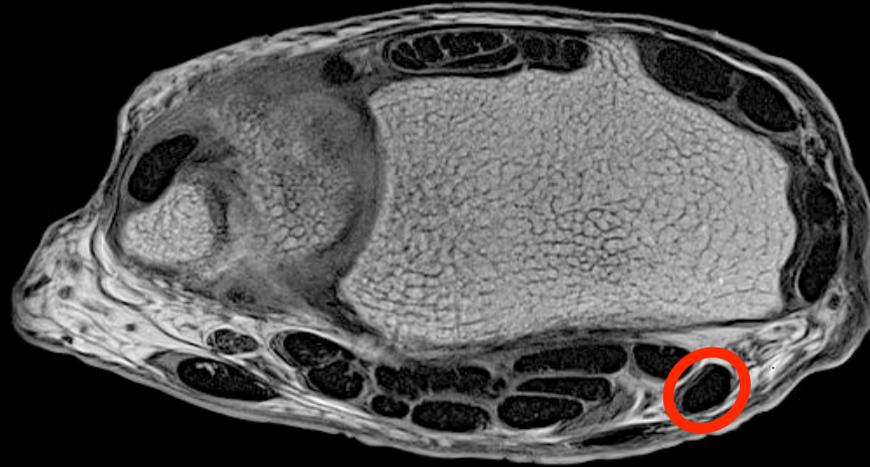


1. Tendinopathie du Fléchisseur Radial du Carpe
Grimpeurs
FDR : pathologie STT
Douleurs et tuméfaction de la gouttière du pouls

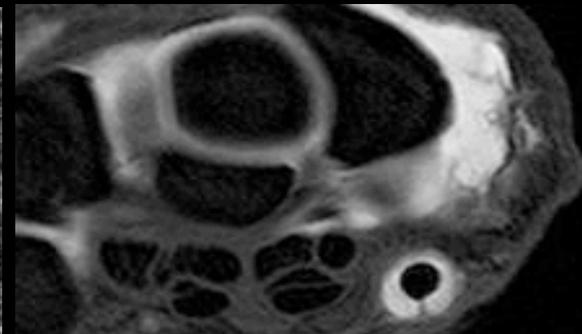
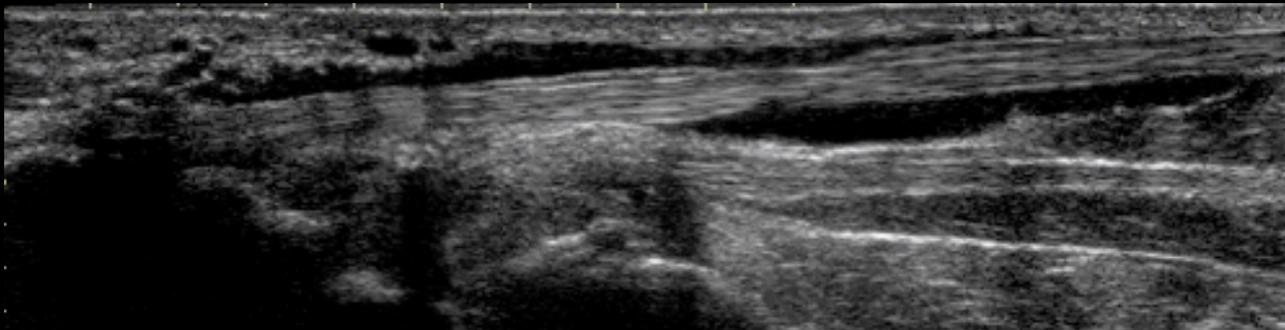


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Rares chez le sportif
Causes secondaires



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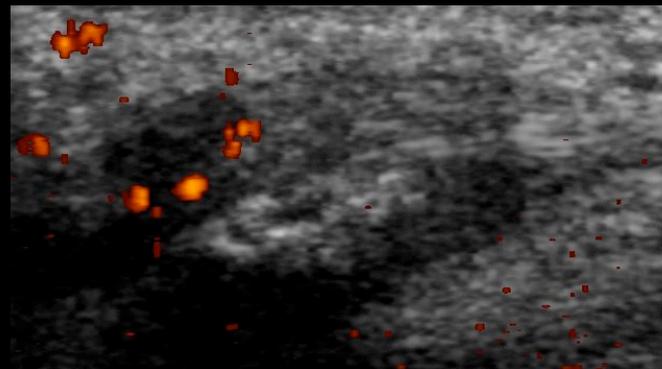
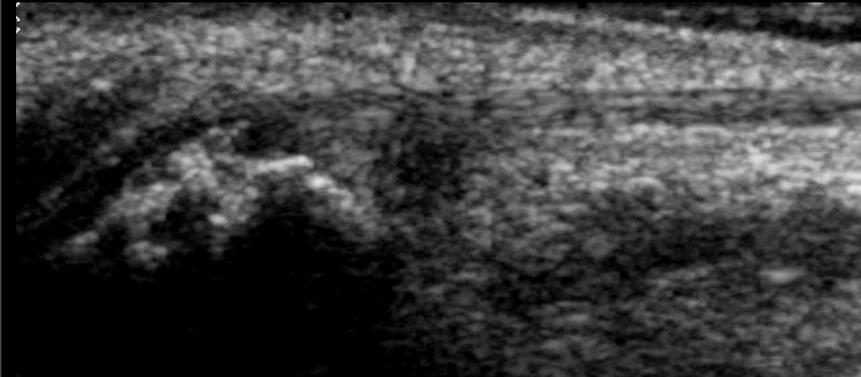
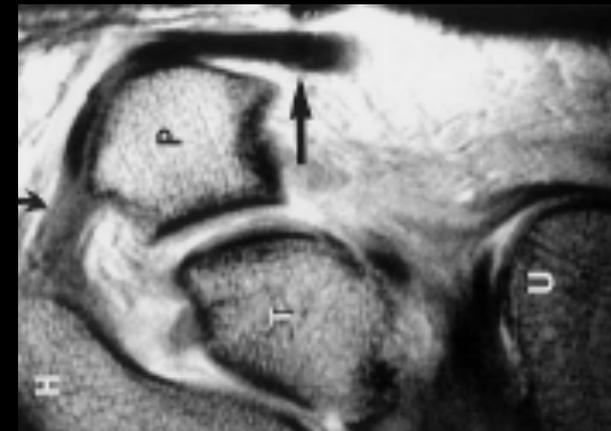
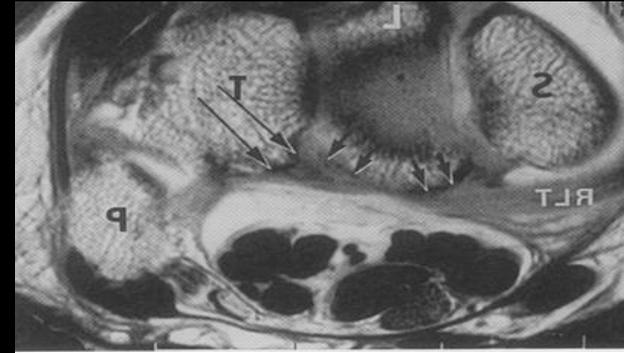
Tendinopathies Palmaires

Tendinopathie du Fléchisseur Ulnaire du Carpe

Pisiforme = sésamoïde du FCU

Appui ou impacts répétés sur le pisiforme
Inclinaisons ulnaires répétées (tennis)

Pathologie microcristalline
Arthropathie piso-triquétrale



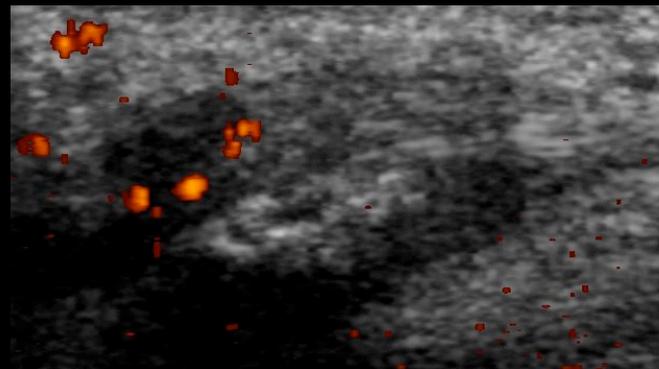
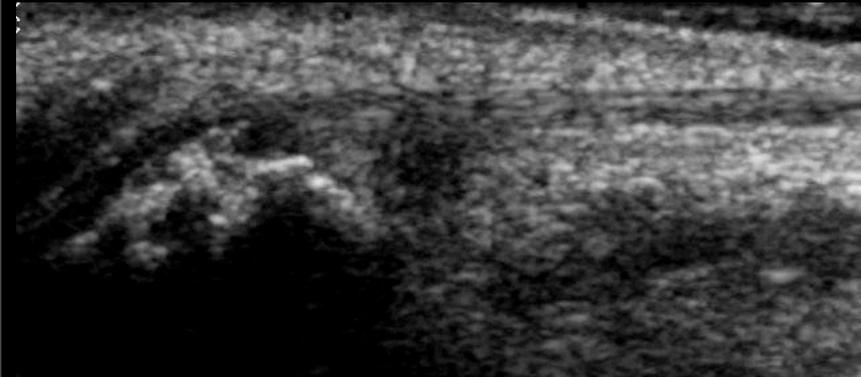
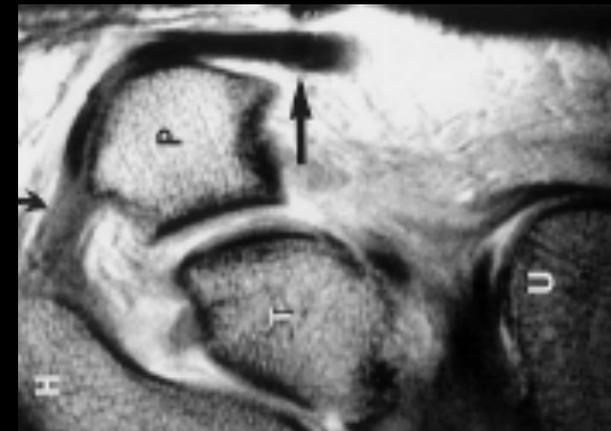
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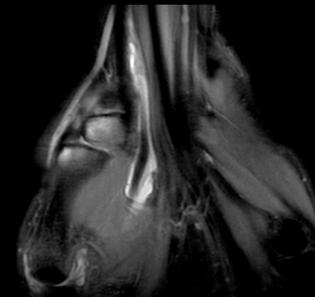
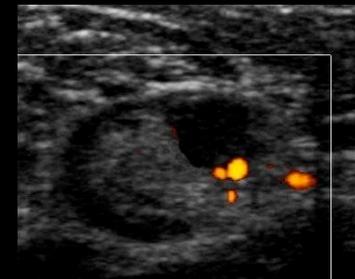
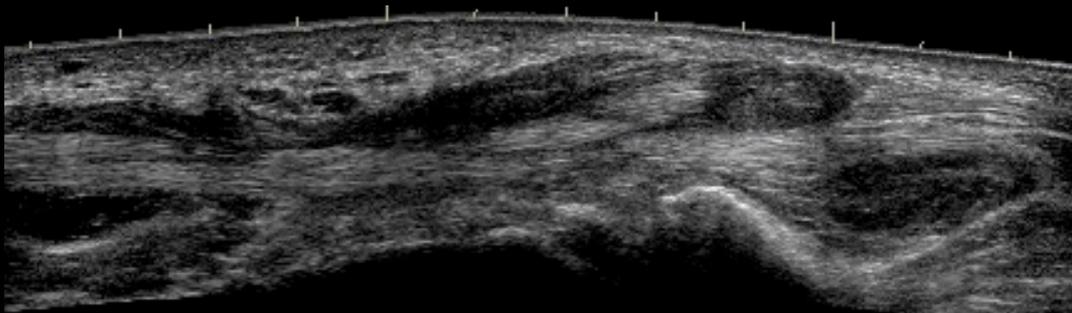
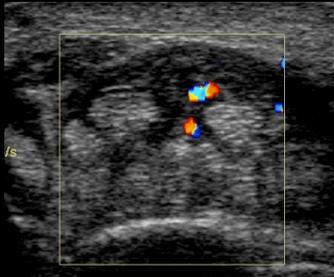
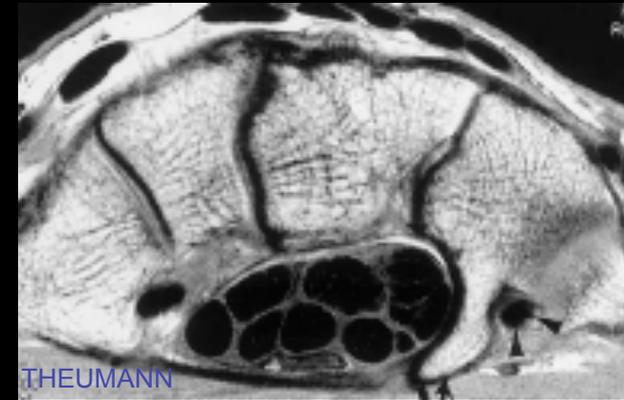
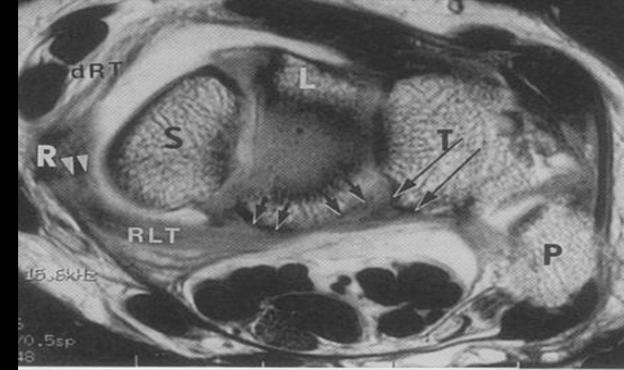


Tendinopathies Palmaires

Tenosynovite des Fléchisseurs

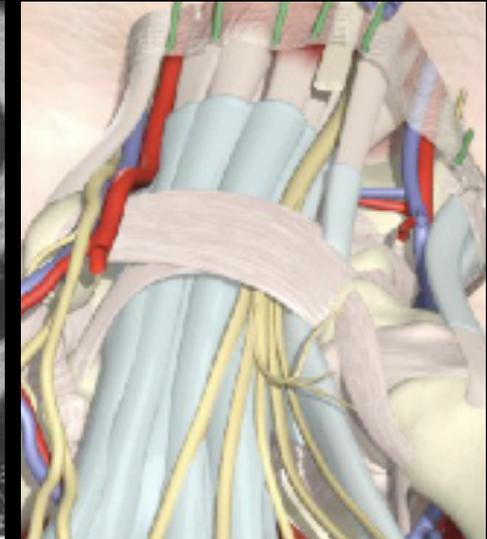
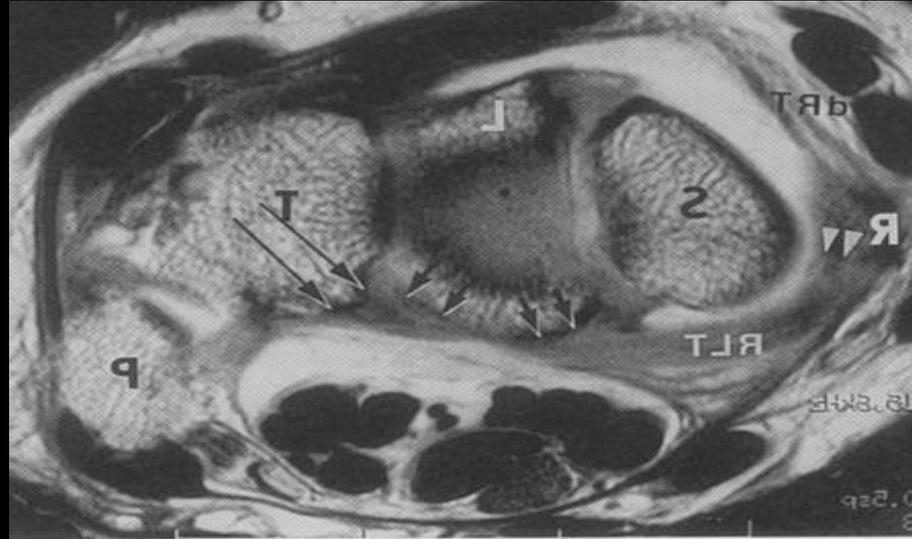
Symptomatologie de souffrance du Nerf Médian
Étiologie rhumatismale (PR) +++

Chez sujet jeune : cause mécanique
bandelette surnuméraire (Lindburg : LFP/FII)
muscle de Gantzer (muscle accessoire LFP ou FCP)
Cal vicieux, Kienbock, DISI

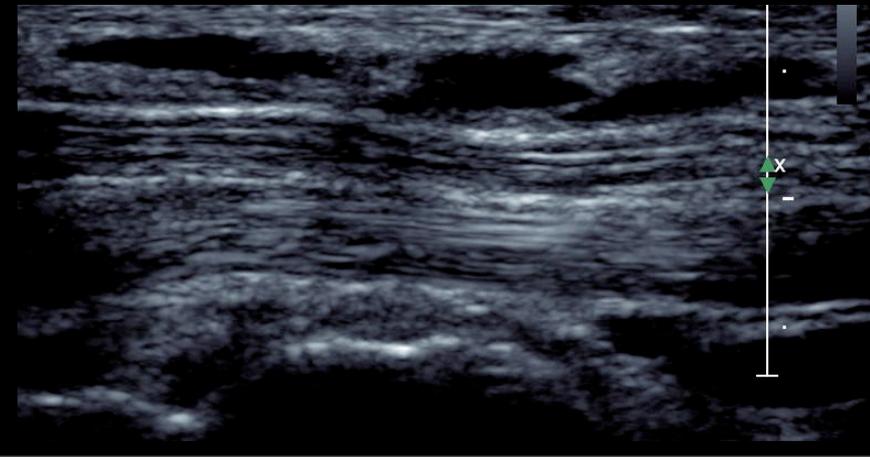
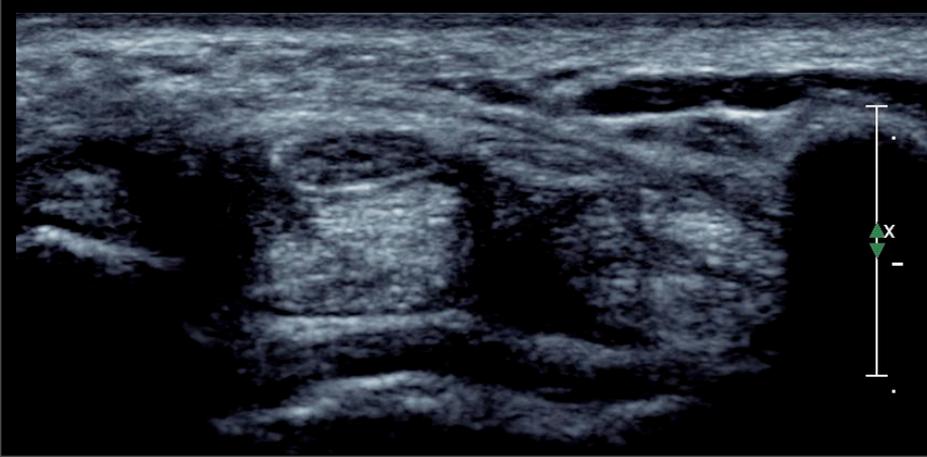


4. PATHOLOGIE NERVEUSE

Nerf Médian

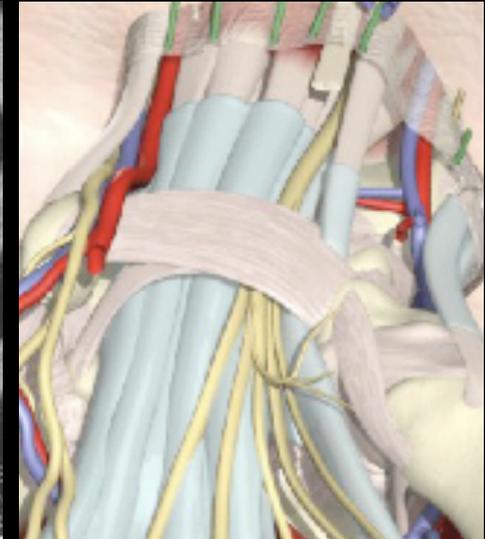
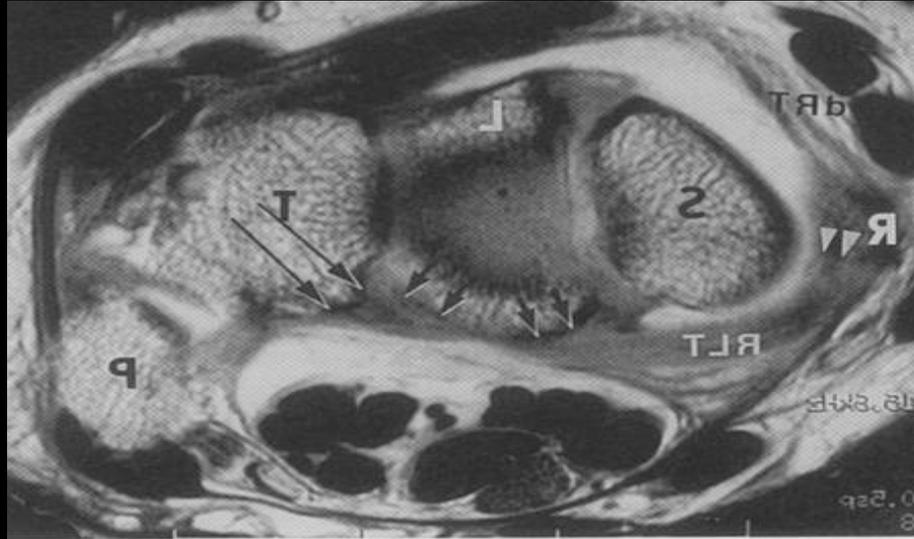


US : pas d'anisotropie, peu mobile à la flexion digitale
Aspect folliculaire (Axial) ou fasciculaire (Longitudinal)

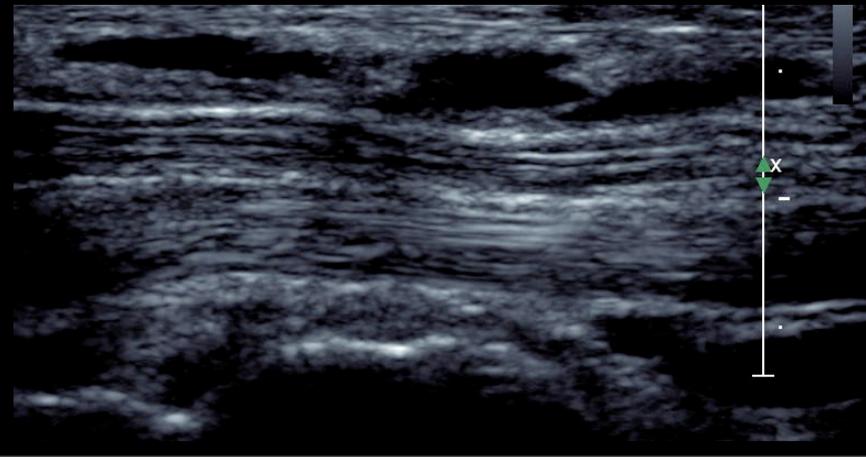


4. PATHOLOGIE NERVEUSE

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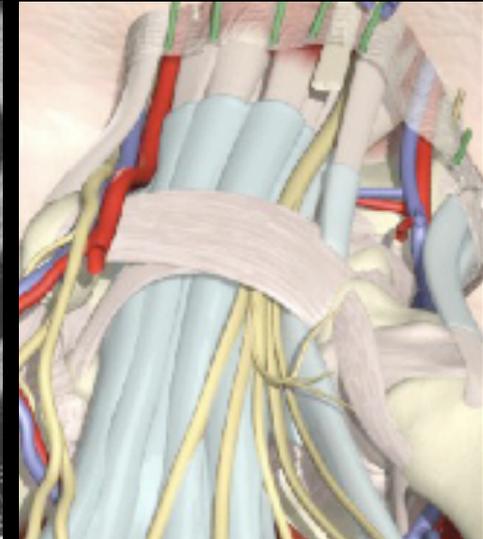
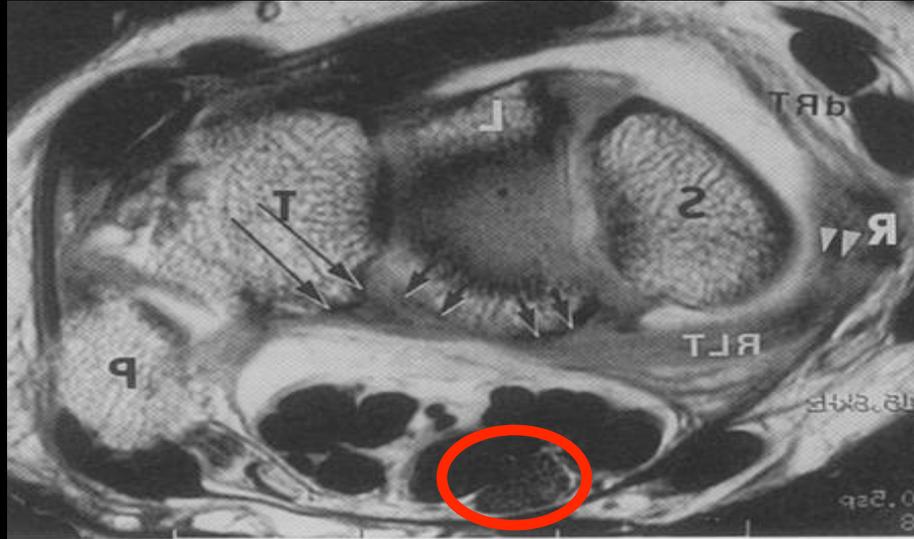


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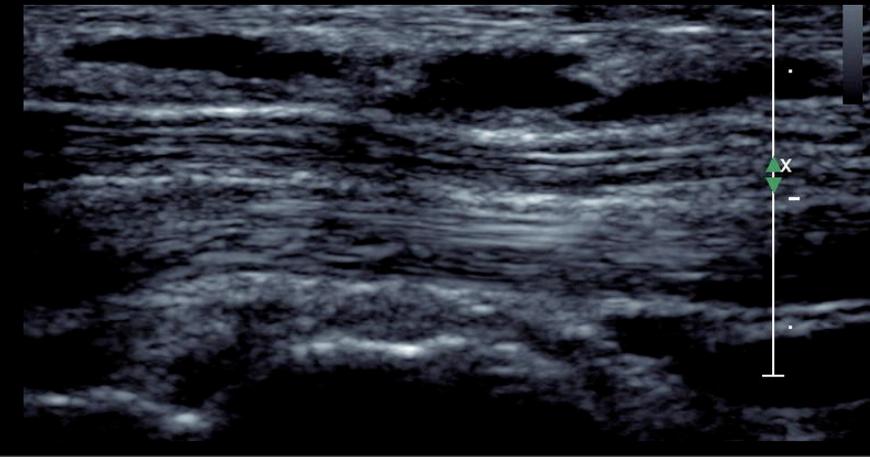


4. PATHOLOGIE NERVEUSE

Nerf Médian

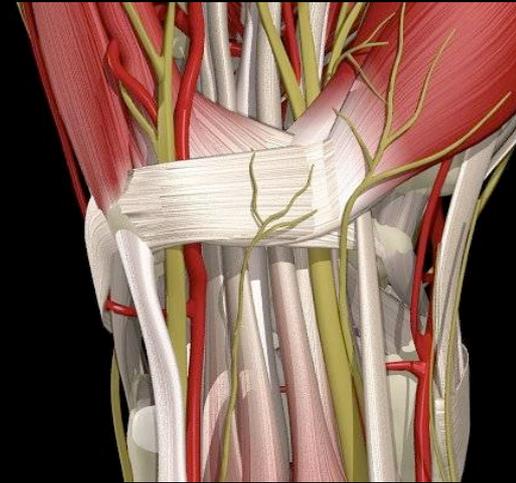


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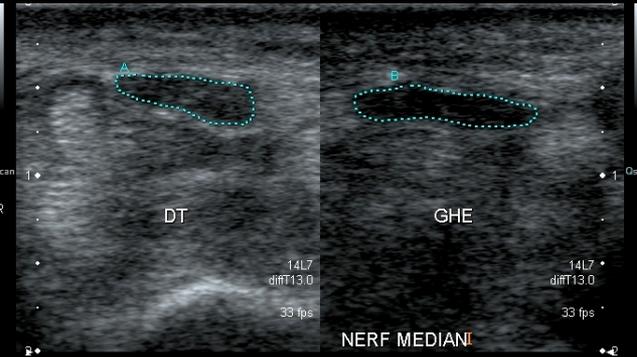


Syndrome du Canal Carpien

FORME IDIOPATHIQUE

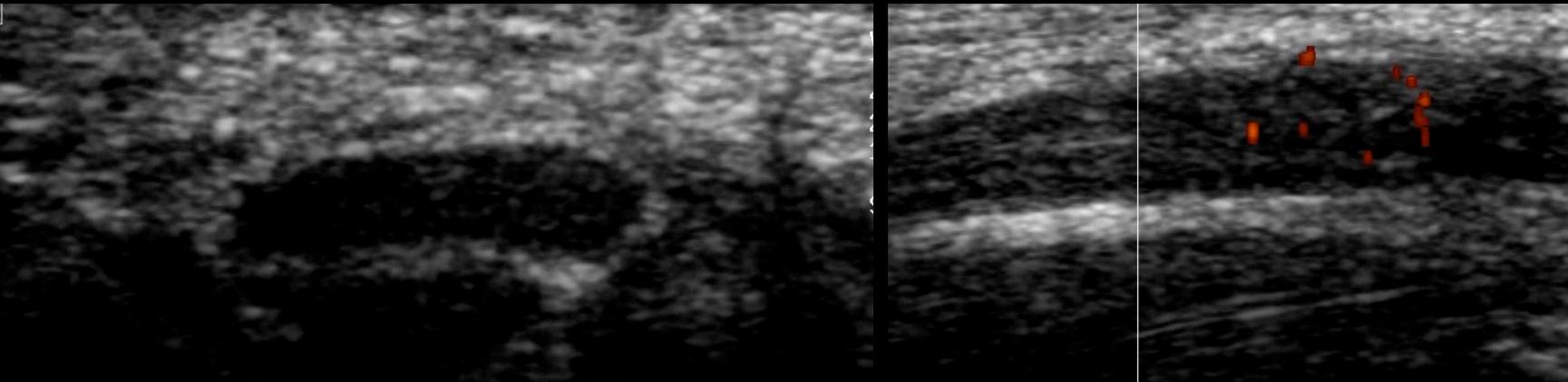


1. Surface du nerf supérieure à 10 mm²



Surface A	0.14 cm ²	Circ A	18.1 mm	Surface B	0.16 cm ²	Circ B	22.2 mm
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2. Hypoéchogénicité du nerf/perte de l'aspect fasciculé



3. Hyperhémie

Syndrome du Canal Carpien

CAUSES SECONDAIRES

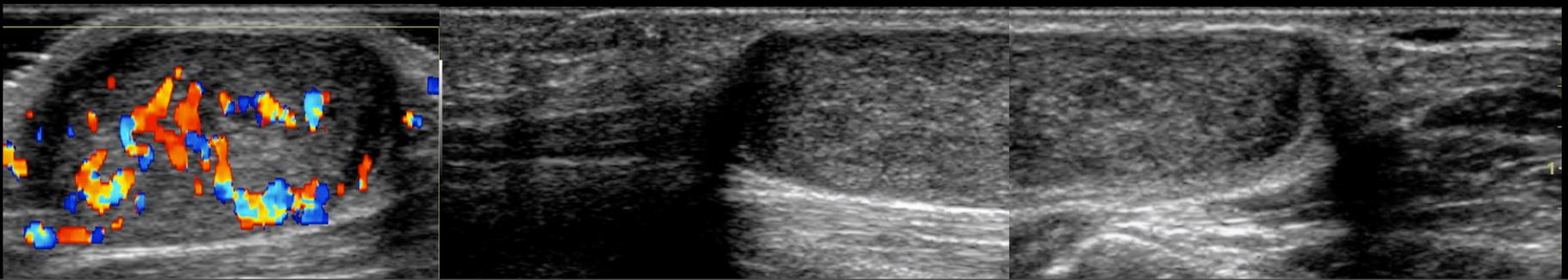
1. Anomalies congénitales

- Insertion proximale des lombricaux
- Jonction myo-tendineuses basses des fléchisseurs
- Anomalies du long palmaire
- Muscle surnuméraire : muscle fléchisseur du II aberrant

Parésthésies diurnes à l'effort du sujet jeune - Tinel + au site de compression

2. Causes acquises : synovites, TS des fléchisseurs, kystes, tumeurs

3. Causes intrinsèques = Tumeurs Bénignes



CONCLUSION

Examen de première intention

Couple RX-US indissociable

En aigü, 3 diagnostics à éliminer:

versant latéral : fractures du scaphoïde

versant dorsal : LSL

versant ulnaire : rétinaculum de l'EUC



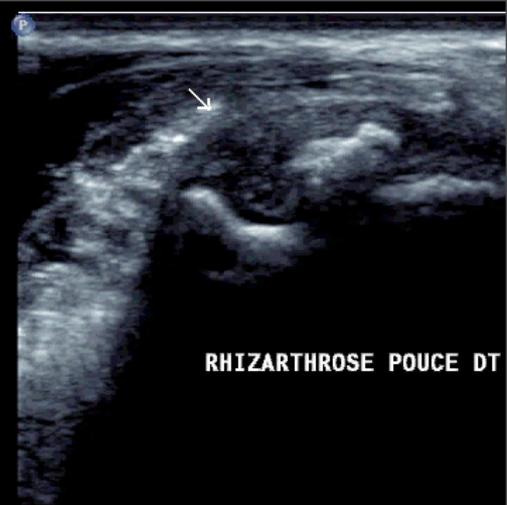
CONCLUSION

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C 55
P Bas
Rés





Centre d'imagerie ostéo-articulaire
Clinique du sport de Mérignac

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