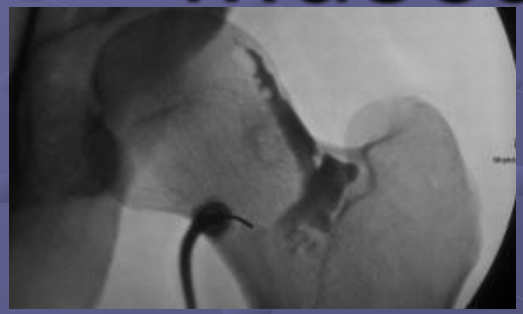
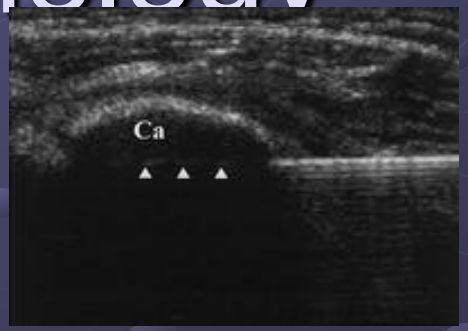
Interventional Musculoskeletal Radiology An Overview





Dr Grant Meikle

Consultant Radiologist

My Background

- Consultant Radiologist
  - MBChB 1994
  - FRANZCR 2001
  - Musculoskeletal Imaging Fellowship 2001/2002 Canberra, Australia.
  - Current Appointments
    - SDHB Consultant Radiologist
    - Consultant Radiologist, Shareholder, Chairperson Otago Radiology Ltd (Part of the Pacific Radiology Group)
    - Honorary Senior Clinical Lecturer University of Otago Department of Medicine.
  - Other commitments.
    - Part 2 examiner FRANZCR
    - External Advisor ACC Treatment Injury Claims Unit.

OTAGO Radiology

Southern District Health Board

The Royal Australian and New Zealand College of Radiologists

Talk Aims and Structure

- Aims
  - To appreciate the range of image guided musculoskeletal interventions available.
  - To appreciate the advantages and disadvantages of an image guided approach.
- Structure
  - General Overview
  - A review of the several common interventions by region.

Overview

- A greater number of Image guided diagnostic and therapeutic procedures are being performed by radiologists.
- Why?
  - ACCURACY?
  - EFFECTIVENESS?
  - SAFETY?
  - AVAILIBILITY?

ACCURACY

- The literature conclusively shows that Image guided therapies are more accurate than a “blind” or surface anatomy approach.
- SA/SD Bursa 70% (1)
- Hip 65%(2)

1. Arthroscopy. 2002 Oct;18(8):887-91.

The targeting accuracy of subacromial injection to the shoulder: an arthrographic evaluation.

Yamakado K.

2. Acta Orthop Belg. 2010 Apr;76(2):205-7.

Do we need radiological guidance for hip joint injections?

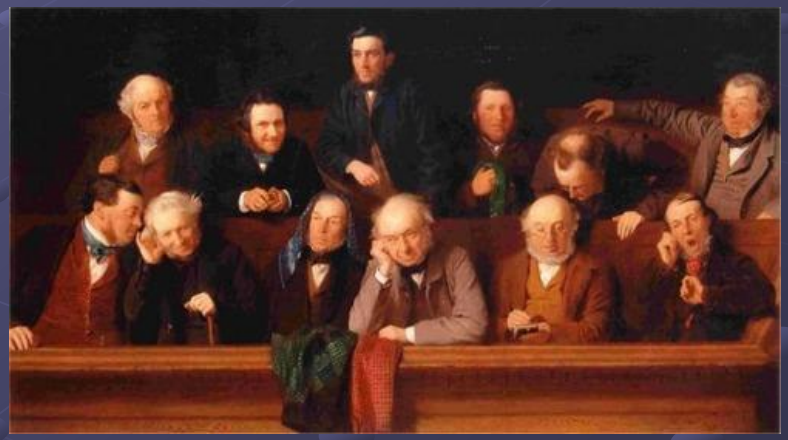
Kurup H, Ward P.

EFFECTIVENESS

- The jury is still out here.
- Is it OK to get the injection “close enough”?

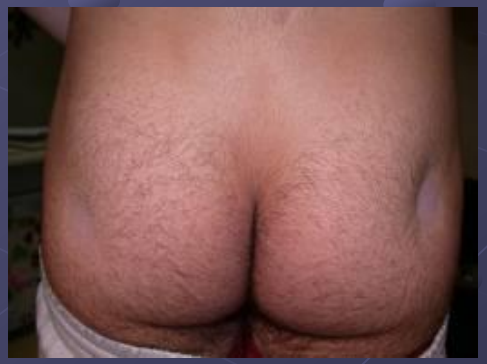
“Image-guided versus blind corticosteroid injections in adults with shoulder pain: A systematic review.”

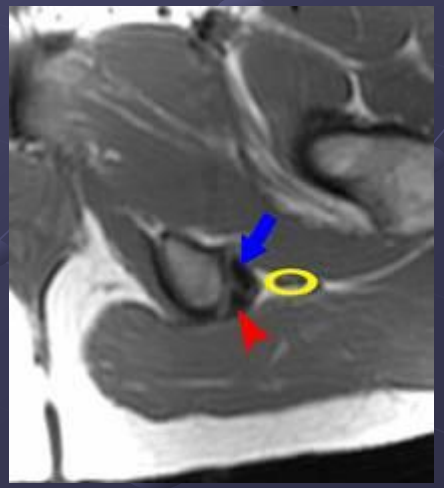
Soh et al. BMC Musculoskeletal Disorders 2011, 12:137
CONCLUSION US better at 6 weeks more research required.



SAFETY

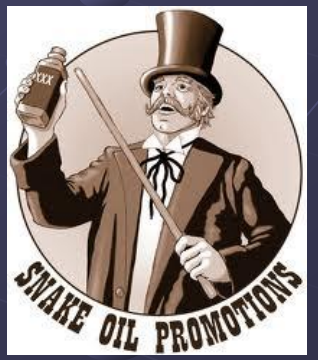
- Image guided procedures are safer in some areas because of the advantage of direct needle visualisation.
  - Neighbouring Structures
  - Depth
- More straight forward procedures are not necessarily safer under imaging
- Other Factors
  - Experience
  - Speed
  - Numbers
  - Gear





AVAILABILITY

- Image guided therapies are now widely available.
- Why?
  - Money ?
  - Technology ?
  - A “market” need?



EVIDENCE BASE

- Often lacking in terms of :-
  - New Therapies
  - Well constructed double blind studies comparing different approaches/techniques and new therapies.
  - PRP Injection
    - 380 Medline hits last week.

How I approach an Image Guided Procedure.

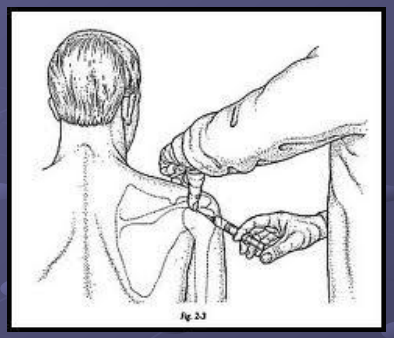
- Screen all referrals and contact referrer if required.
- Review Imaging and decide on the modality to use.
- Pre procedure information to patient.
- History from patient.
- Written and Verbal Consent.
  - Complications (Infection, Allergy, Steroid Flare, Skin/Fat Atrophy)
  - Expected course.
- Strict Aseptic Technique.
- Observe as required.
- Post procedure care instructions, pain chart and follow up plan.

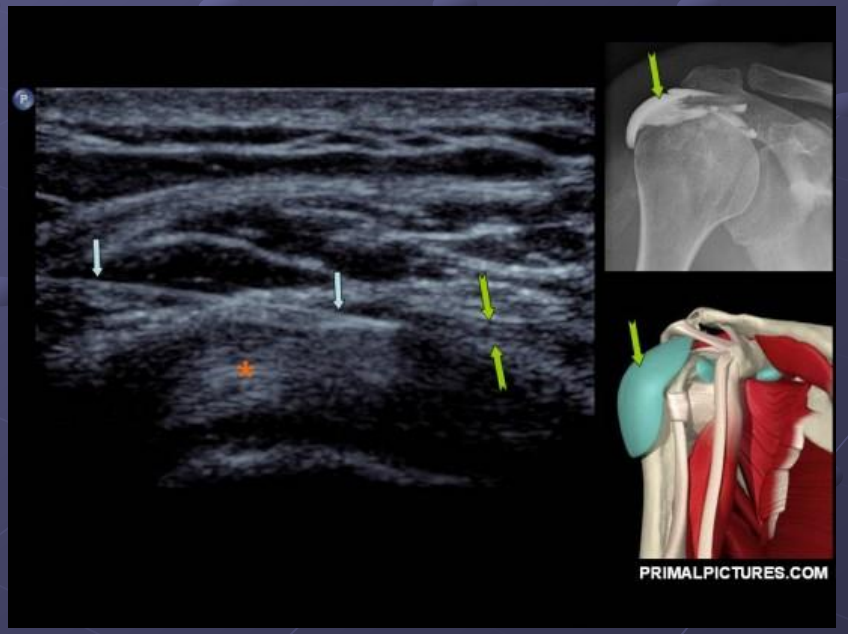
SHOULDER

- Subacromial/Subdeltoid Bursal Injection
- Glenohumeral Joint Injection +/- Hydrodilation
- Barbotage of Calcific Tendonitis
- AC Joint Injection

SA/SD Bursal Injection

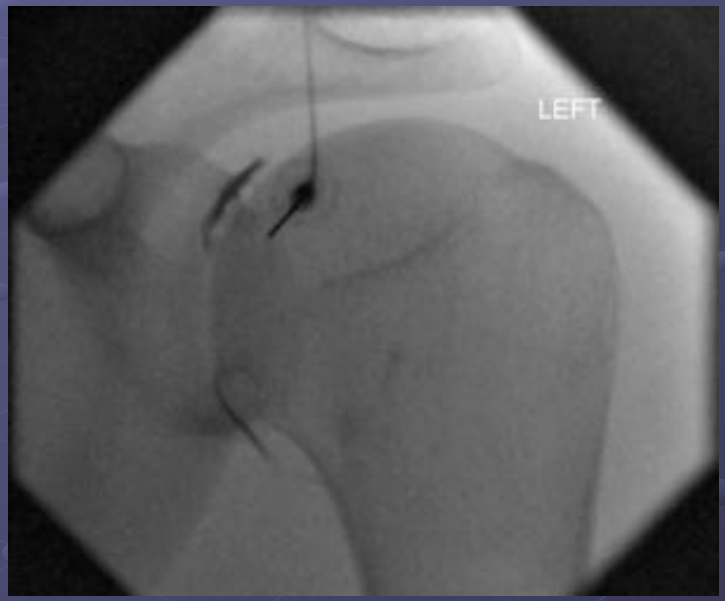
- Ultrasound guided
- Indications
  - Bursitis
  - Impingement
- Posterior Approach
- 24G needle to bursa
- LA +/- Steroid





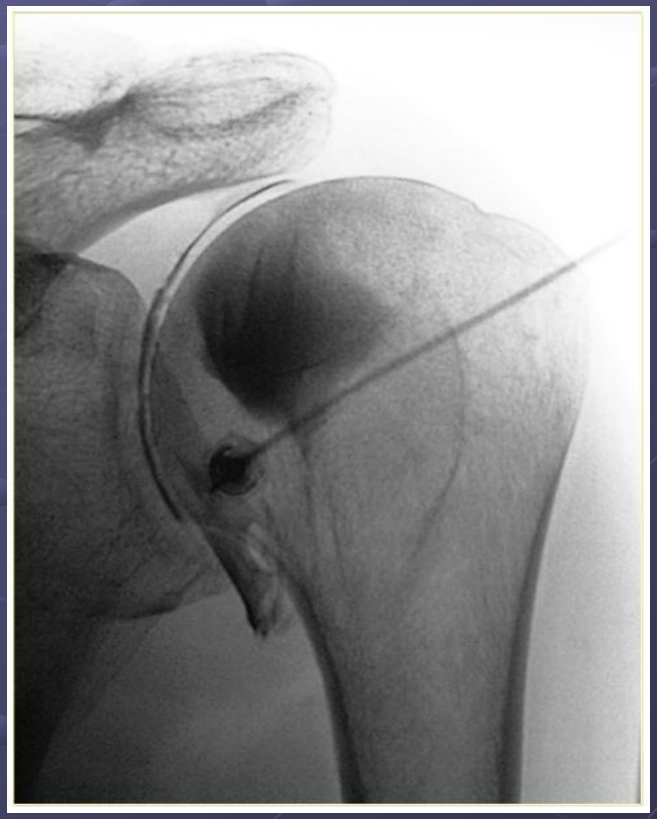
Glenohumeral Joint Injection +/- Hydrodilation

- Flouro or US.
- Indications
  - GHJ Arthritis/Synovitis
  - Adhesive Capsulitis
- Anterior approach
- 22G spinal needle
- Confirm IA location
- LA+/- Steroid



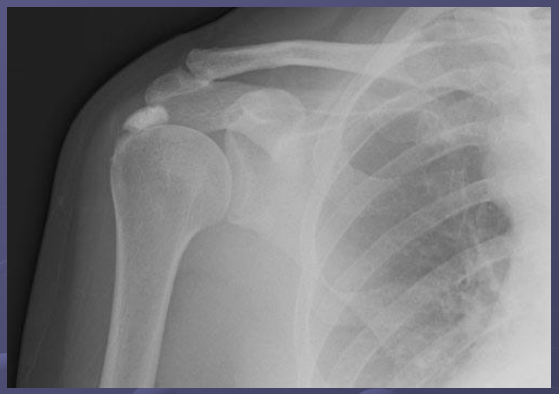
Hydrodilation

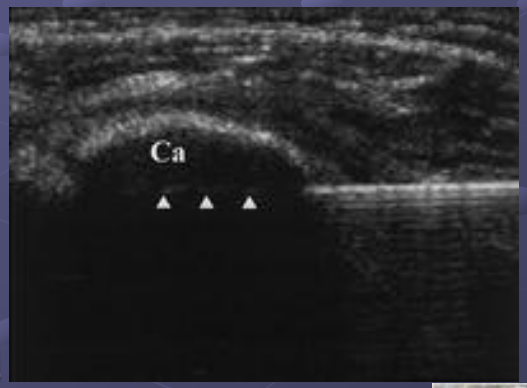
- HYDRODILATION
- Indication
  - Adhesive Capsulitis
- Same as GHJ injection but keep injecting till either pain ++ or capsular rupture.
- “Strip capsule”
- ? more effective than steroid alone.
- Is as effective as MUA



Barbotage of Calcific Tendonitis

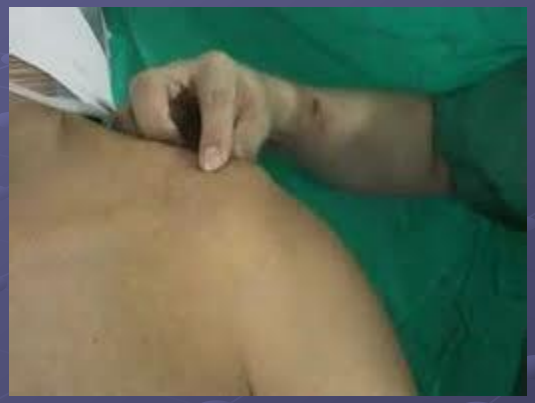
- Indication
  - Calcific Tendinopathy
- US of Fluoro
- LA to soft tissue and bursae.
- 24G then 22G the 18G needles into deposits aspirate and needle.
- Steroid to Bursa.
- Theory - needling trauma triggers resorption of calcium and speeds up natural history.
- Better than Bursal Injection alone?

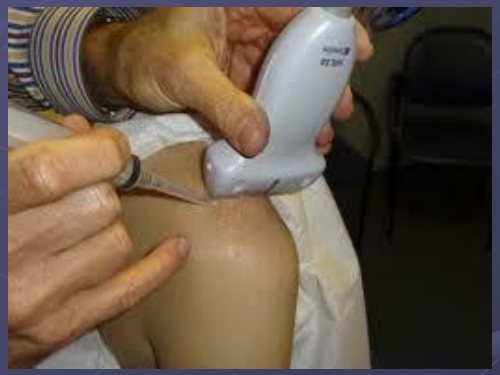


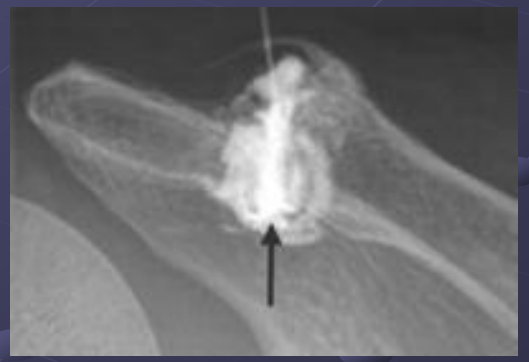


AC Joint Injection

- US or Fluoro
- Surprising where the joint is compared to palpation.
- Skin/Fat Atrophy.
- 1 – 2 mls of LA +\- Steroid.





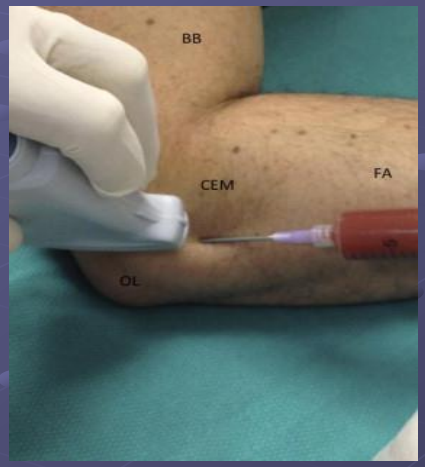


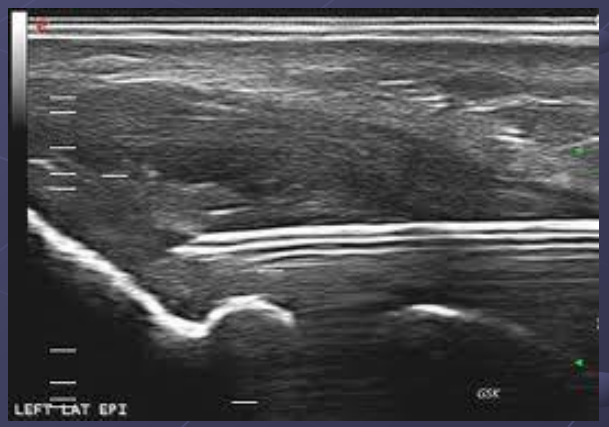
Elbow

- Common Extensor Tendinopathy
- Bicipitoradial Bursitis

Common Extensor Tendinopathy What to Inject?

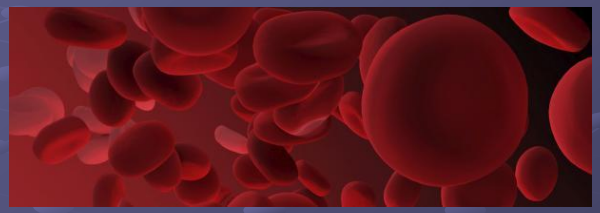
- What to inject is controversial
  - Steroid out of favour
    - Do worse in long run
  - Dry Needling
  - Autologous Blood
  - PRP
  - Prolotherapy
  - Placenta???
  - What Next?

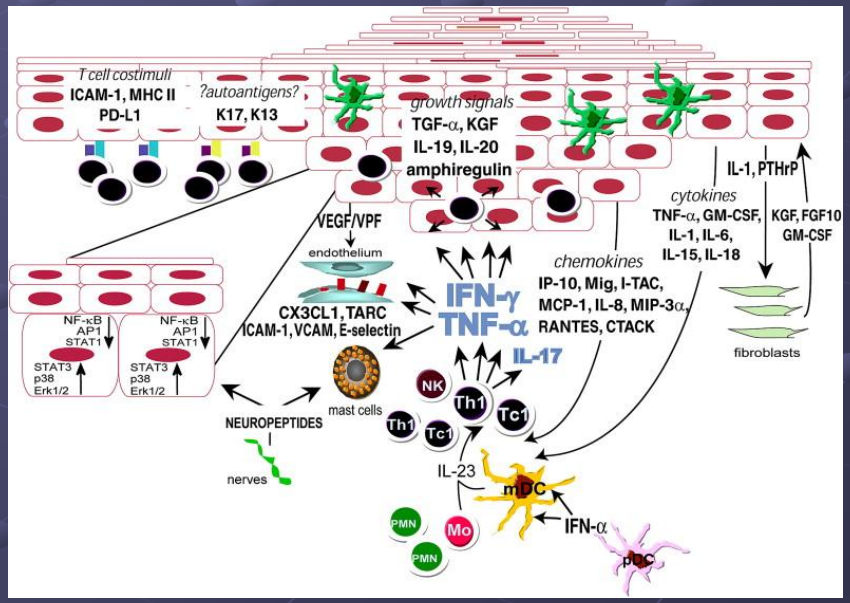




Common Extensor Tendinopathy

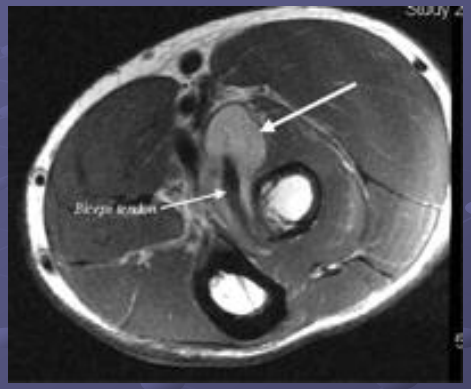
- Dry Needling , AB and PRP all probably use the same mechanism
  - Growth Factors
  - Cytokines
  - Trigger “inflammatory response” which leads to “healing”.

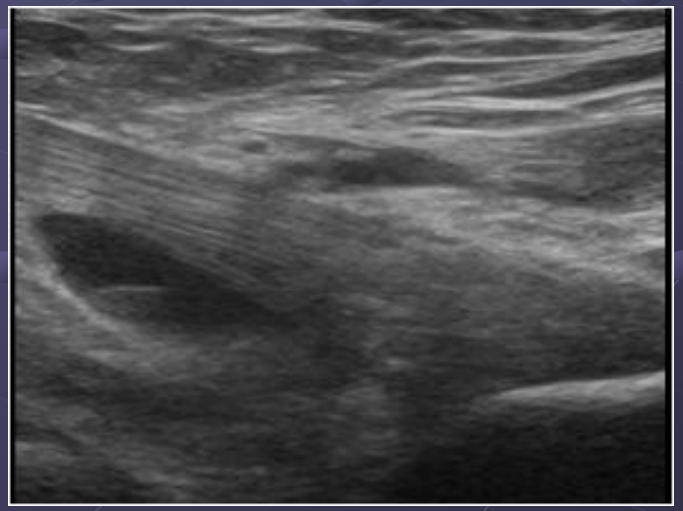




Bicipitoradial Bursitis

- US guided.
- Safe as can avoid nerves (median and radial) and vascular structures.
- Steroid and LA.
- Consent re risk of rupture.



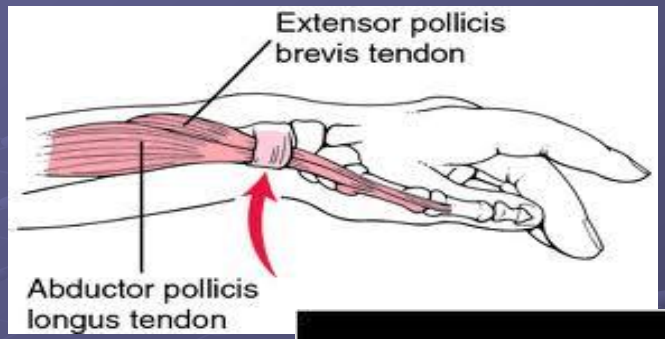


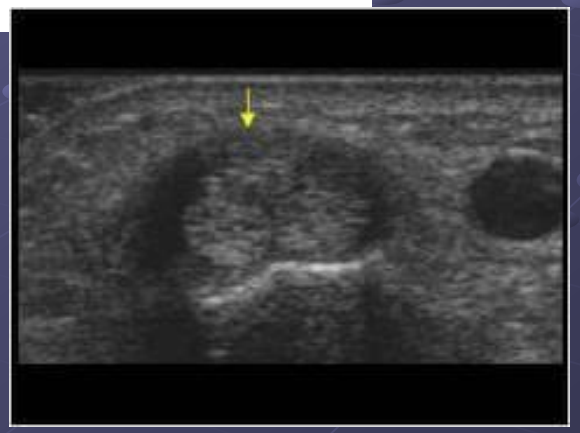
Wrist and Hand

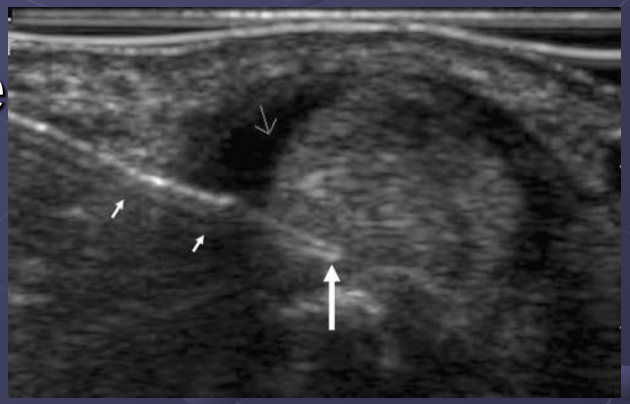
- De Quervains Tenosynovitis
- Carpal Tunnel Injection
- Ganglion Treatment

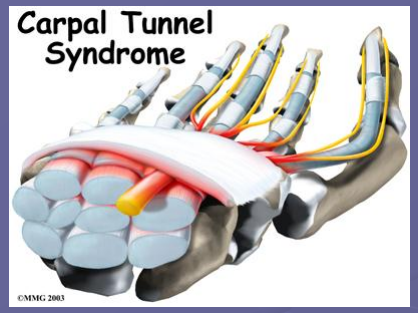
De Quervains Tenosynovitis

- US guided.
- Safe and accurate.
- Other tendon sheaths also easily accessed
  - ECU
  - FCU
  - Trigger Fingers
  - Intersection Syndrome



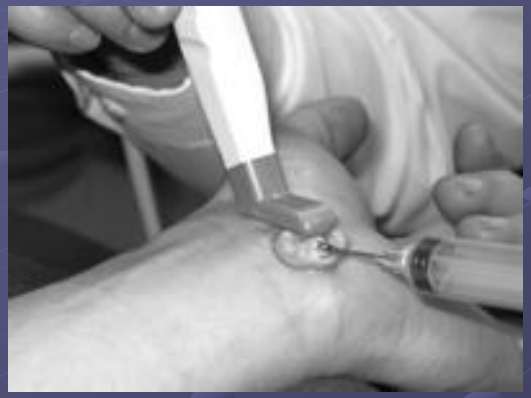


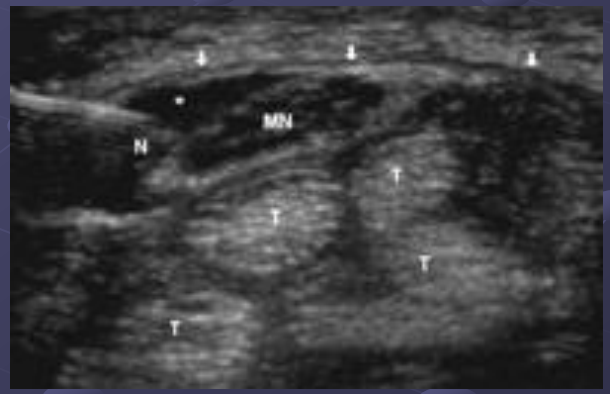




Carpal Tunnel Injection

- Usually post op patients who haven't done so well.
- Steroid and LA
- US guided
- Why does it work
  - Inflammation
  - "Reset" nerve
  - Scar tissue atrophy?





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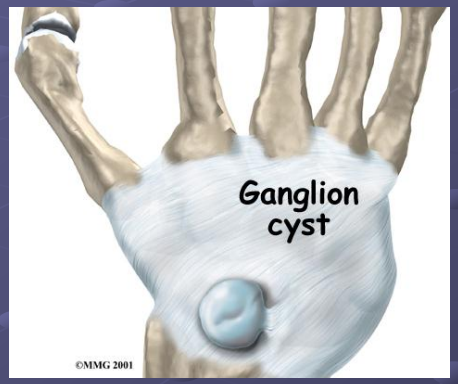
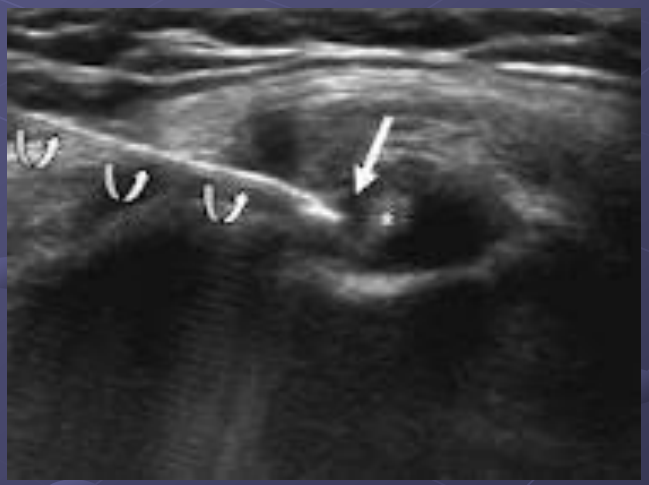
Ganglion Treatment

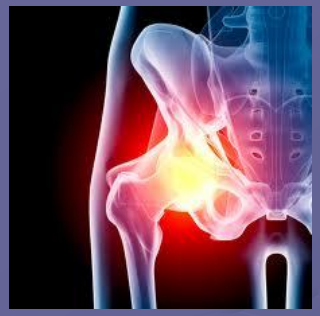
- US guided.
  - Neighbouring structures
- Rule of thirds.
- Options.
  - Needle
  - Aspirate
  - Burst
  - Inject





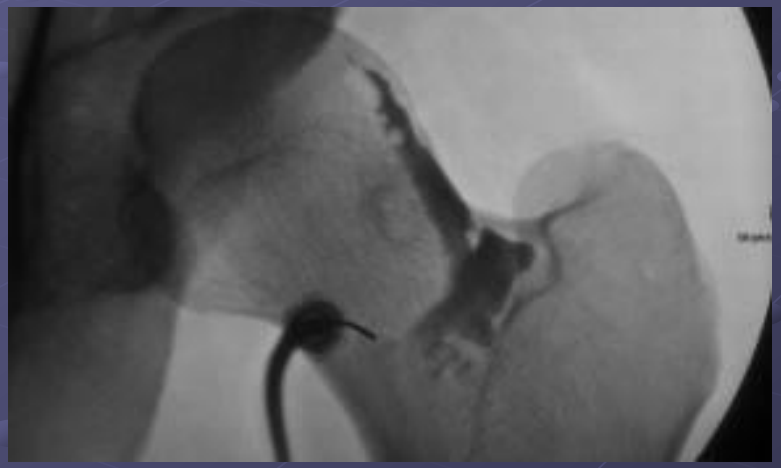
Hip and Pelvis

- Hip Joint Injection
- Lateral Hip Injection
- Psoas Injection
- Hamstring Injection



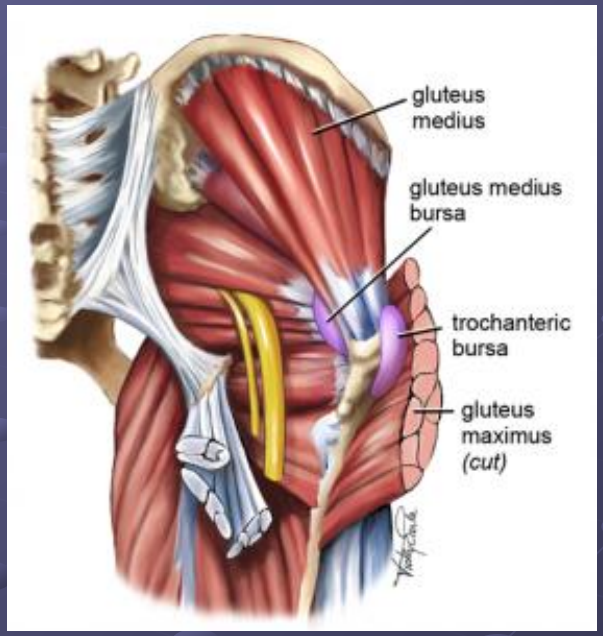
Hip Joint Injection

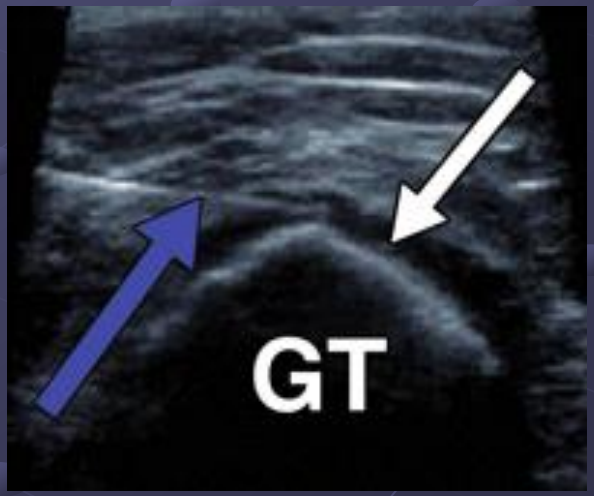
- Fluoro or US
- Indications
  - ?Intraarticular cause of pain.
  - Arthropathy where other treatments have failed.
  - Not ready for THJR
- Timing with THJR important. Check with surgeon



Lateral Hip Injection

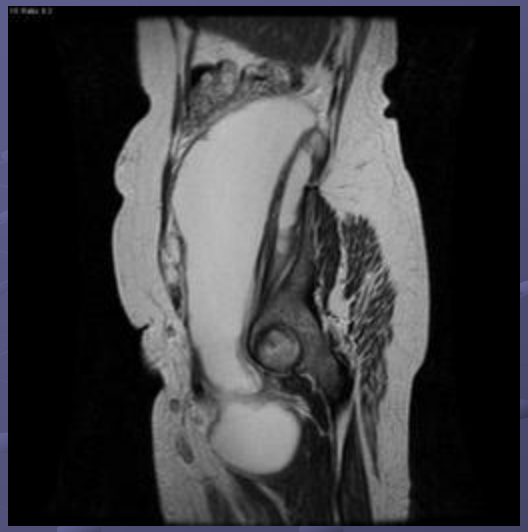
- Spectrum of lateral hip pathology. Not all “trochanteric bursitis”
- US guided
- LA and Steroid
- Aim at bursae and deep to ITB.

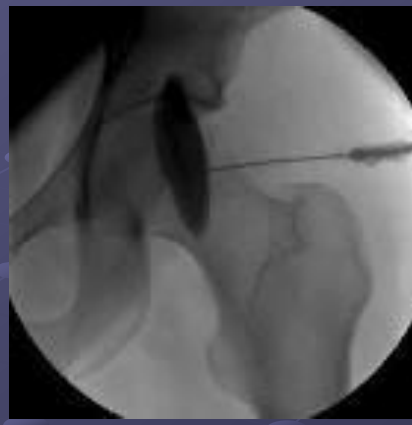


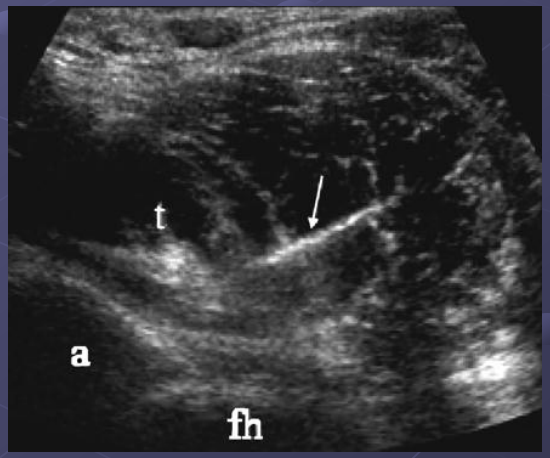


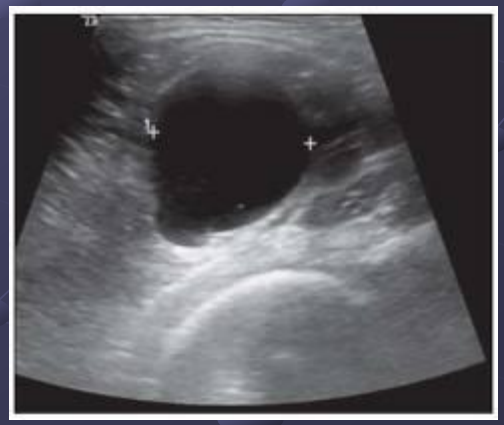
Psoas Tendon Sheath Injection

- US or Fluro guidance.
- 22G spinal LA and Steroid.
- Indications
  - Iliopsoas bursitis
  - Post Op









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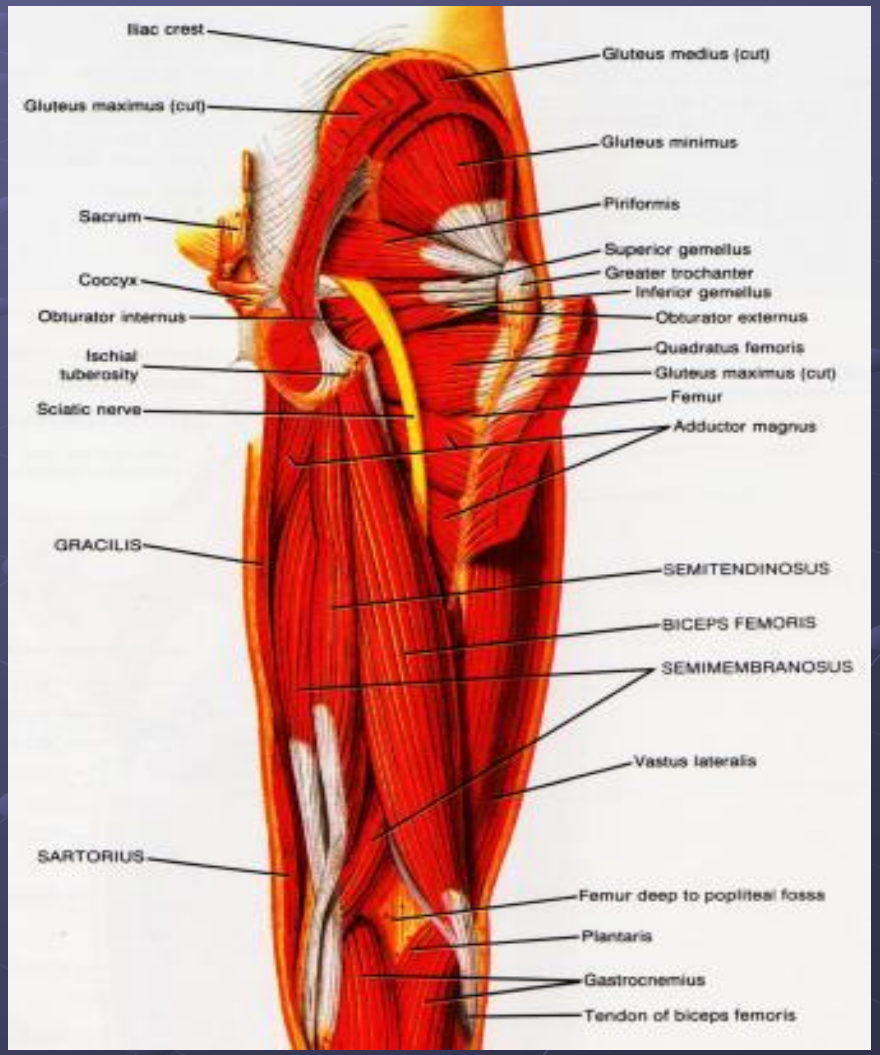
Hamstring Injection

- US or CT guidance
- Beware of the Sciatic Nerve
- LA and Steroid
- Indication common extensor tendinopathy
  - Athletes
  - Elderly

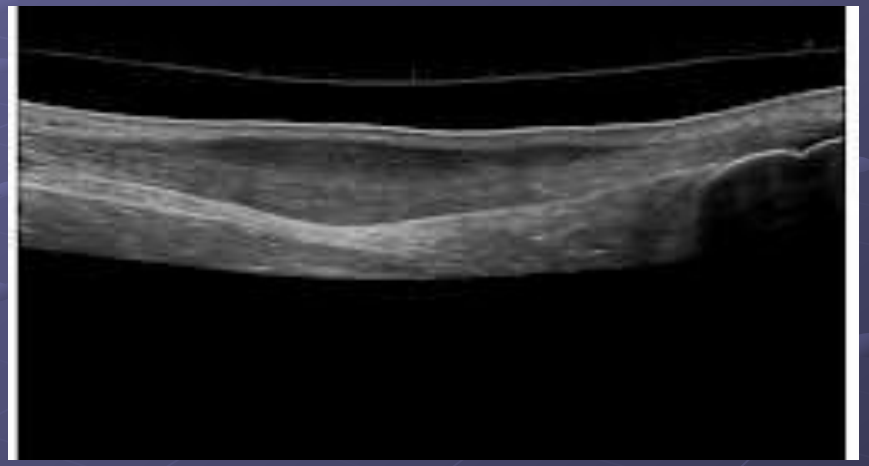


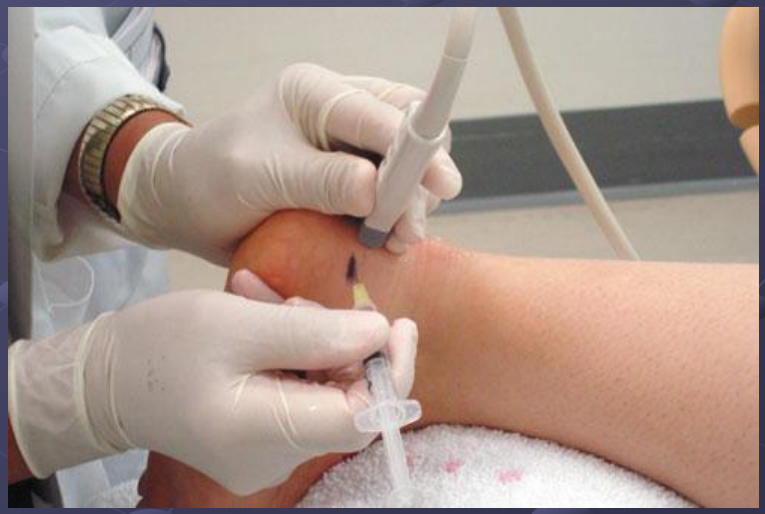
Foot and Ankle

- Achilles
- Planter Fascia
- Mortons Neuroma

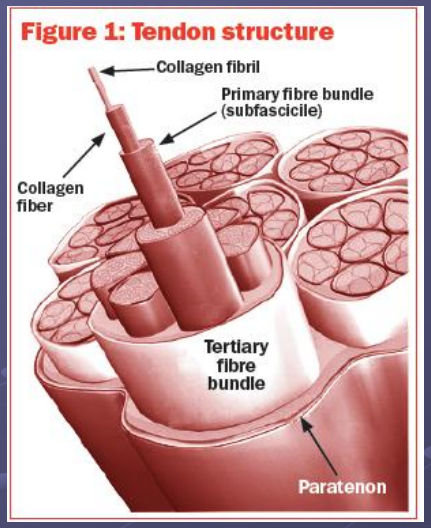
Achilles

- Where to inject depends on the diagnosis.
  - Paratenon
  - Bursa
  - Tendon
- What to inject
  - Volume
  - LA
  - Steroid
  - Polidocanol
  - Blood/PRP/Dry Needle.
- Rehab important
- Multiple sessions?

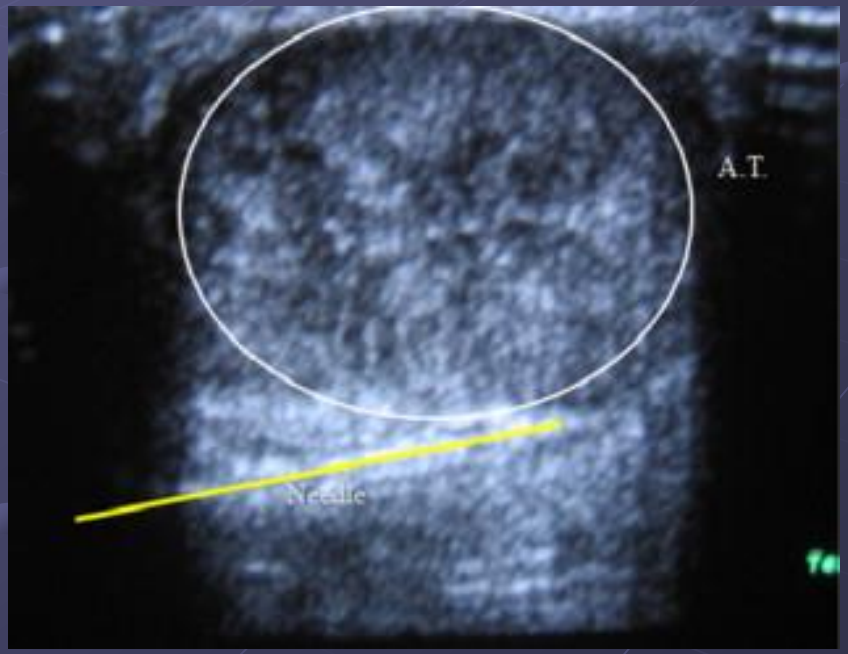




Achilles Paratenon

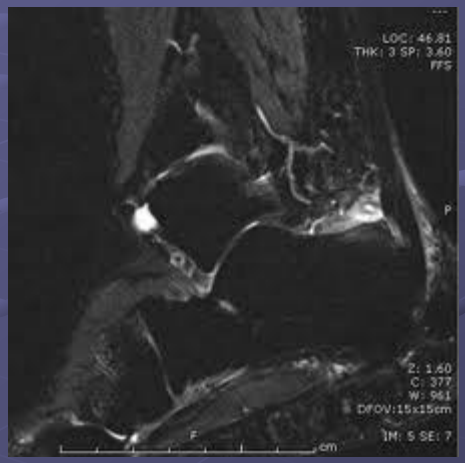


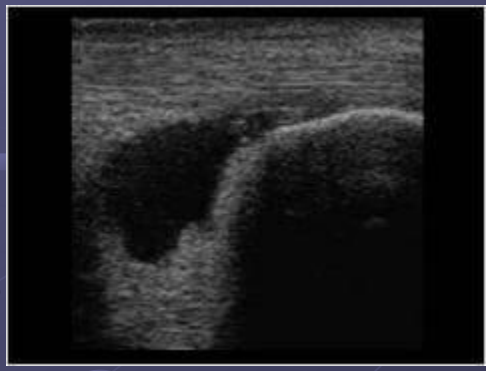
- “Strip” the tendon from the paratenon.
- High Volume
- US guided
  - Medial transverse approach
- LA alone +/- steroid

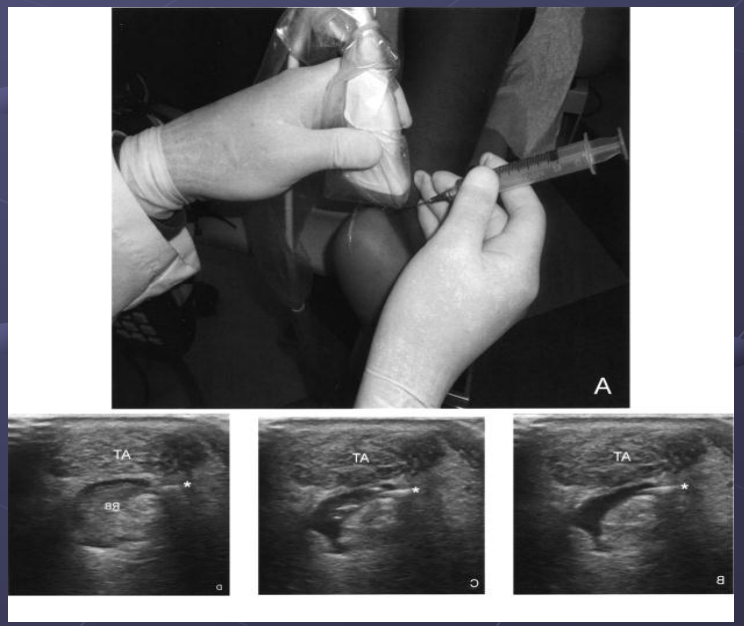


Achilles Retrocalcaneal Burstis

- Indication
  - Primary retrocalcaneal Bursitis
  - Insertional tendinopathy
- US guided medial transverse approach
- LA + Steroid

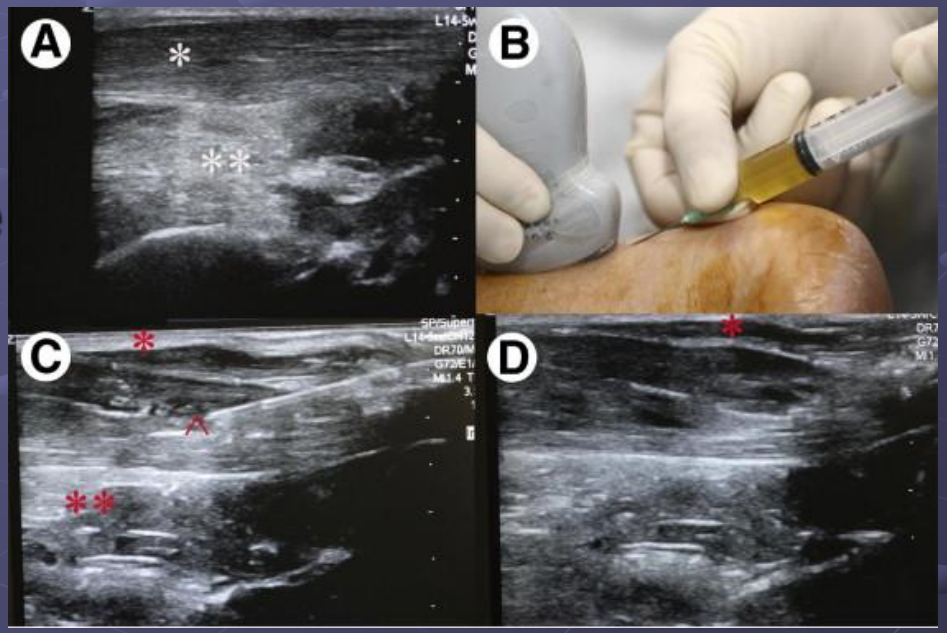






Achilles Tendinosis Injections

- Same range as CET
- Rehab important
- Sore after. Feel worse 2 -3 days.
- Rehab important
- Repeat at 6 weeks?
- Aim for clefts.



Operative Techniques in Orthopaedics
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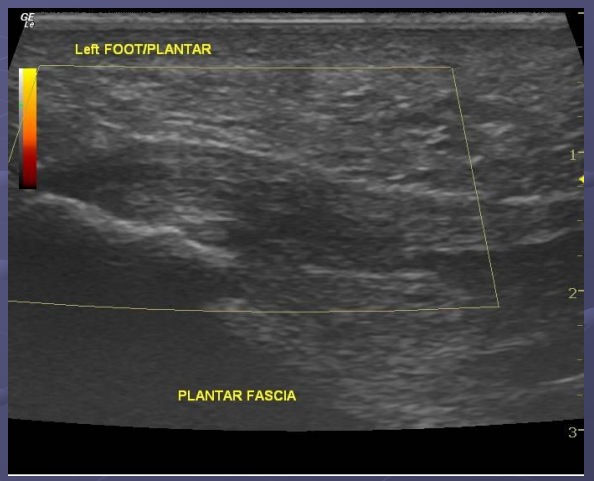
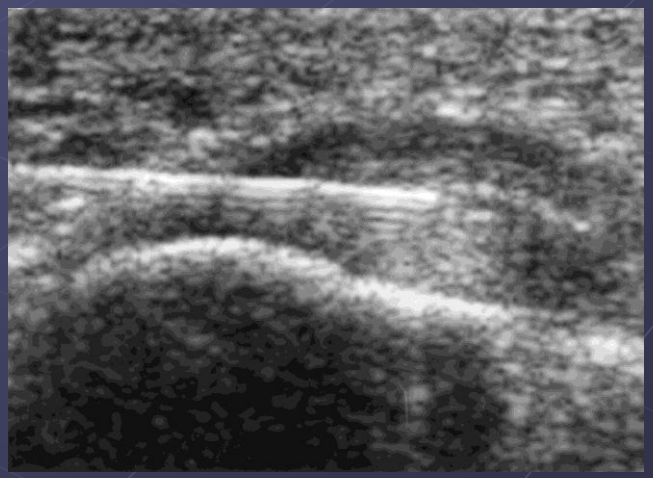
Planter Fascia

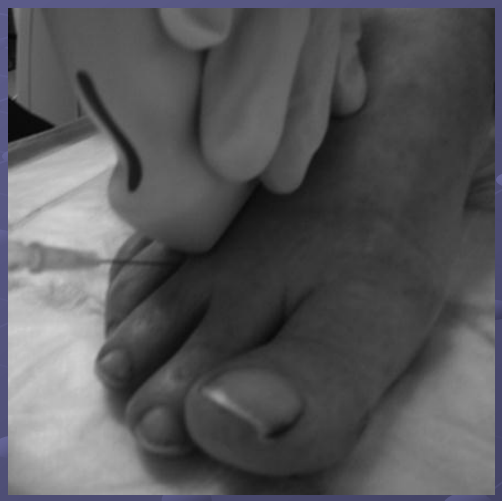
- Indication
  - Planter Fasciitis
- US guided
  - Transverse Medial approach.
  - Deep vs Superficial
- Complications
  - Rupture
  - Fat Pad Atrophy

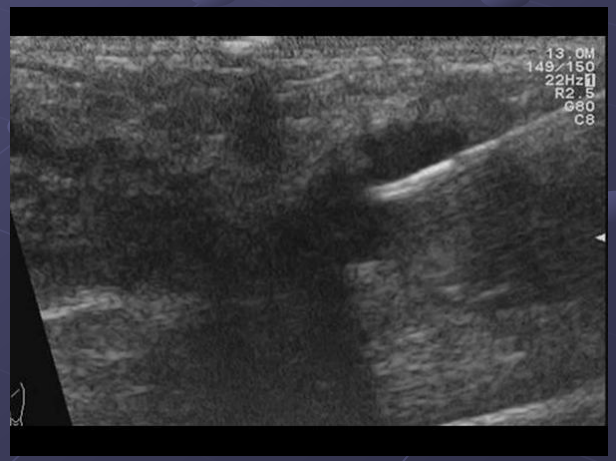




Mortons Neuroma

- Ultrasound guided
- Bursitis vs Neuroma
- Options
  - Steroid/LA
  - Alcohol
  - RFA



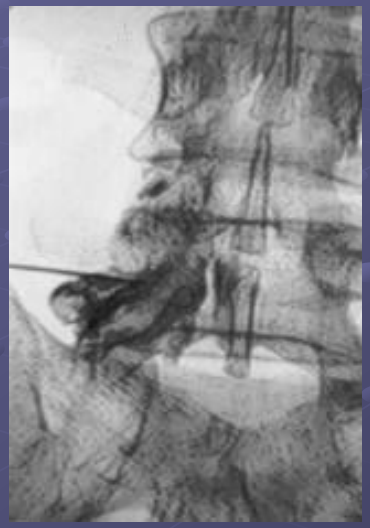


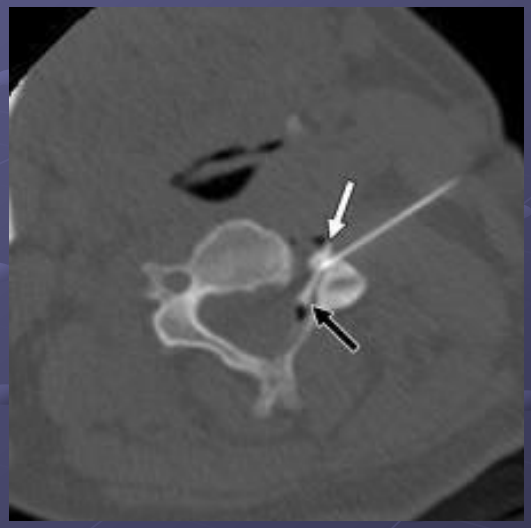
Spine

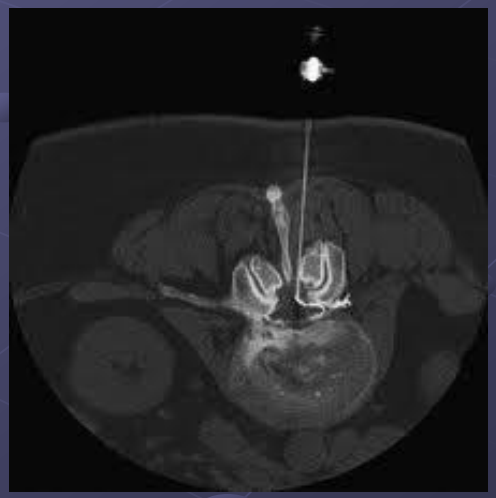
- Nerve Root and Interlaminar Epidural blocks
- Facet Joint Injections
- Others

Nerve Root and Interlaminar Epidural blocks

- Diagnostic and Therapeutic Role
- Indications
  - Radiculopathy
  - Discogenic Pain
- Fluoro or CT Guidance
- LA and Steroid
- Risks small but real
  - Infection
  - Cord infarction
- Mechanism
  - Reset nerve
  - Inflammatory Component

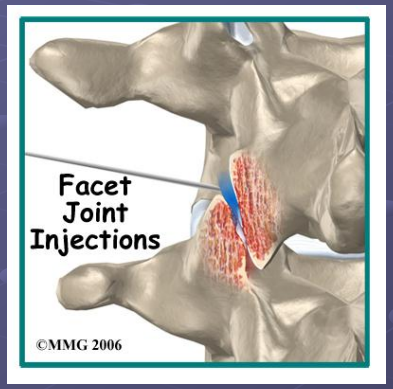


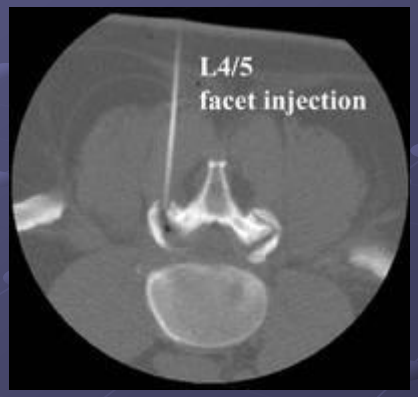


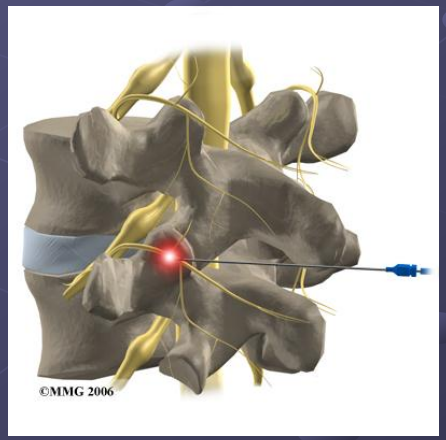


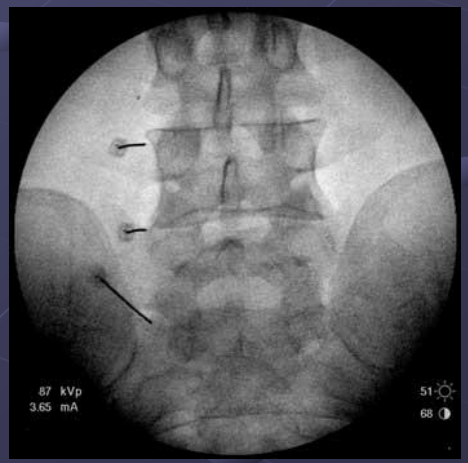
Facet Joint Injections

- Indication
  - ?facet joint source of pain.
  - “Facet Joint Syndrome”
- Two options
  - Target Joint
    - Direct Joint Injection
  - Target nerves
    - Medial Branch Blocks
- 3 -6 months relief



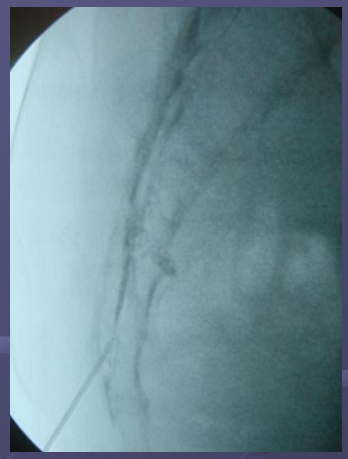


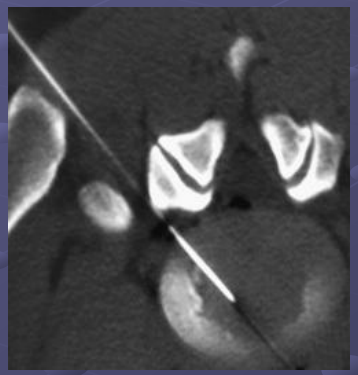


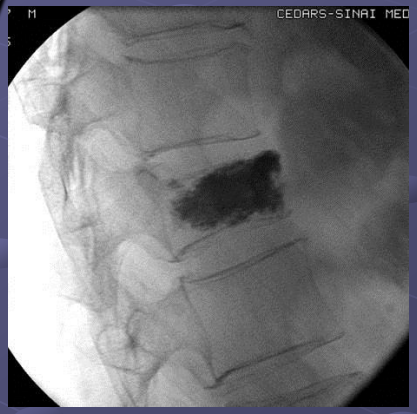


Spine
Other Techniques

- Caudal Epidural
- Disc Therapies
- Vertebroplasty
- Kyphoplasty

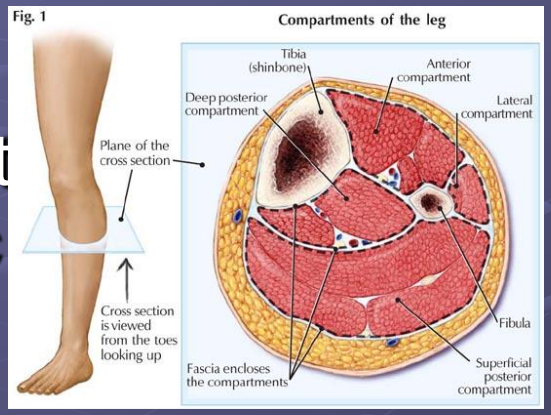


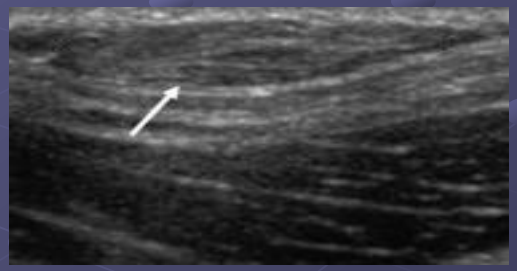


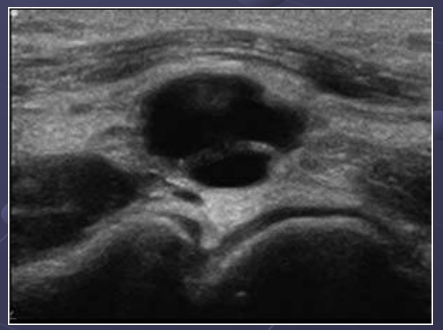


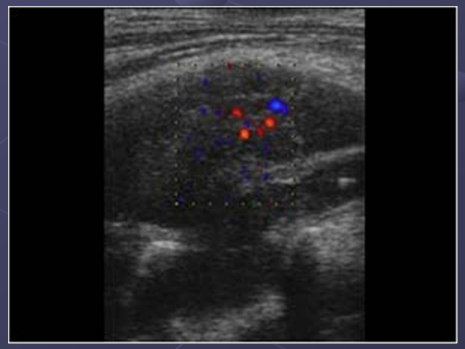
Lumps and Bumps

- DON'T biopsy soft tissue masses without specialist orthopaedic guidance.
- US is limited in assessing a soft tissue mass.
  - Cyst
  - Lipoma?
- Beware of the "chronic haematoma"









CONCLUSIONS

- A number of safe and effective image guided treatments are now available.
- Radiologists can help treat patients.
- More research is required to establish the true place of a number of these treatments and to whether image guidance provides an advantage in terms of outcome.
- A team approach is paramount.

Thank you for you're attention.