



The Weekly Probe

17th June 2016

Volume 13 Issue 19

Message Bank – When you order a test the results need to be “signed off” by you or someone else that the report has been seen +/- acted on. Results can be cut and pasted into documents yet this does not always equate to the content being seen and acted on.

Subsequently the SSs go through all the Radiology reports which pile up (see below) with unseen and unsigned reports from up to a month ago.



When a missed fracture is picked up within days / a week it is easier to “fix” yet when it is noted a month later it does not inspire confidence in the clinician or department with the patients or family. So a plea to check your Message Bank – look at the results and if you are not too sure what to do next , please talk to one of the Staff Specialist / VMOs. If you are not too sure how to negotiate the Message Centre aslo have a chat to one of the SSs or registrars.

HIV testing – Haven’t tired of HETI modules. Well there is a new HETI online training module “**Normalise HIV Testing in your practice**” which aims to help staff to recognise indicators for HIV testing and provide testing. NSW Health staff can access it by logging on to HETI Online and searching for “Normalise HIV Testing”.

THIS WEEK

Ring Removal
Compression Neuropathy
2 minute hand exam
Joke / Quote of the Week
The Week Ahead

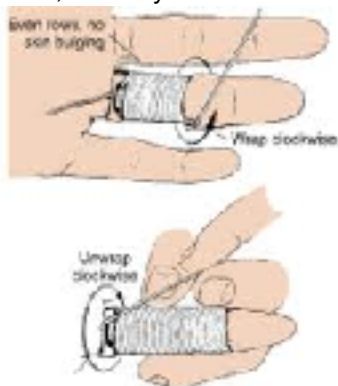
RING REMOVAL

A 30yo lady presents with inability to remove her signet ring for **2 months**. What techniques do you have to remove a ring?



When a patient presents with a hand or arm injury one of our first steps is to remove the rings on the hand. With a bit of lubrication, gentle rotation and gradual traction, the ring slips off. But what if it doesn't and the finger is oedematous?

One technique described in Roberts & Hedges – Clinical procedures in Emergency medicine, the bible of emergency procedures, describes passing string, umbilical tape or a silk suture under the ring from proximal to distal and then circumferentially wrapping it around the digit trying to avoid bulging bits of tissue between the constricting material. The main hurdle is the PIP joint – once you are beyond that, it's easy!



Looking for other material for the Probe we came across this tip on the net from Dr. Patricio Chavez and Dr. Emily Grigsby which you can try alone or prior to the string technique:

1. Wrap with a tourniquet to include the ring- the texts talk about a penrose drain which you could get from OT – down in the ED you could try the green disposable tourniquets from the IV insertion kits, yet this may be too thick . If too wide, then split the tourniquet longitudinally. An alternative to the penrose drain would be to cut a strip from the wrist section of a rubber glove ~ ½ cm wide They don't describe the technique but suspect distal to proximal application sound the most intuitive technique.



2. Wait 5 minutes.
- 3 Unwrap and remove ring.

Up-to-date also comments that you can add an arterial tourniquet to avoid blood flowing into the oedematous region – elevate the arm to drain venous blood- level the manual blood pressure cuff to ~ 30-40mmHg above SBP.

If it doesn't work there's always the ring cutter – cut a piece of Xray film to slide under the ring to protect the underlying skin.
Failing that (eg platinum rings) the next step is the Ambulance or NSW Fire rescue teams with heavy duty cutters.

In this case, skin was growing through the centre piece of the ring where the stone normally sits, and the standard ring cutter only cut through the accumulated serum, hair and dirt. The fire brigade brought in a gas driven saw and combined with some ketamine the ring was removed leaving a non-functional rigid finge. !

COMPRESSION NEUROPATHY

A 35yo man presented last week straight from the airport after being concerned that he'd had a stroke. Long flight – leaning on girlfriend / edge of chair during flight home from Thailand with pressure on the lateral aspect of the humerus. He awoke with wrist drop and hand weakness. On exam he was noted to have 4/5 weakness with wrist and finger extension and reduced sensation over the dorsolateral aspect of the hand. No local pain or swelling. As it was improving over the following ~ 3 hrs he was discharged home with reassurance

A 48yo lady presented with decreased LOC post ingestion of alcohol and methadone. When she awakes she is found to have a foot drop. O/E Weak dorsi and plantar flexion of ankle – with hypoaesthesia on sole of foot c/w sciatic nerve injury. Mild tenderness in buttock. UA large blood – CK 14,000 then 50000 – treated as rhabdomyolysis + splint for foot drop- Cr rises from normal to 600

Both are recent examples of compression neuropathies – these occur when the nerves become compressed. Compression may occur as a result of trauma, inflammation or entrapment. We won't deal much with the entrapments (which normally present with subacute or chronic histories) and largely stick to those conditions that may present acutely .

The key to making a diagnosis is a good history re onset of features and the assessment of the risks (immobilisation or compression). Follow this with a good examination remembering your nerve pathways and the function for that dermatomes/ myotomes + root / branch / peripheral nerve.

Couple of points to remember:

- if you see a nerve compression injury then look for compression of other structures. In particular remember rhabdomyolysis which may also be associated with compartment syndrome. If there is potential muscle injury, check the UA (for blood) & CK – examine the compartment and consider liaising with the orthopods to check the pressures if in doubt. Remember the 5Ps with pain being the most sensitive aspect.
- The compression may result in a motor neuropathy with little or no sensory changes.
- Nerve conduction studies may not become abnormal till a couple of weeks down the track

Couple of compressive neuropathies to be aware of include:

Sciatic neuropathy -leads to weakness, pain, and sensory loss, with footdrop deformity, foot pain and dysaesthesia, **sensory loss of the sole** and dorsum of the foot and lateral leg, and **absent ankle jerk** . Sciatic nerve lesions usually are associated with total hip replacement; hip fracture; dislocation; femur fracture; gluteal injections; and acute compression during overdose, prolonged sitting.

Proximal sciatic neuropathy (piriformis syndrome)- sciatic-type symptoms in the absence of back pain, weakness, sensory loss, or reflex changes. Often with buttock pain and tenderness at the sciatic notch. As the sciatic nerve leaves the pelvis, it runs under or through the piriformis muscle being compressed. It is more common in women than men, especially following minor trauma to the buttock. Some patients report paresthesias in the buttocks radiating down the back or side of the leg into the calf. Weakness of sciatic innervated muscles (gastrocnemius, hamstrings, and tibialis anterior) is uncommon. Symptoms are often worsened during activities that require prolonged sitting, especially on a hard surface, or stooping or bending at the waist. Adduction and internal rotation of the hip may exacerbate symptoms, whereas standing or walking, or holding the leg externally rotated, may relieve symptoms.

Lateral femoral cutaneous neuropathy, (meralgia paresthetica): burning pain and numbness over the anterolateral thigh, without weakness or reflex changes. Symptoms are worsened with standing and walking, and relieved by flexing the hip. Because there is no muscular innervation from this nerve, there is no associated muscle atrophy, weakness, or loss of reflexes. Most cases of meralgia paresthetica are idiopathic, can be from compression from belts or more recently "hipster" jeans.

Femoral nerve is a mixed motor and sensory nerve that provides innervation to hip flexor and knee extensor muscles and sensory innervation to the anterior thigh and distal medial leg along the saphenous nerve; it too may be entrapped in the inguinal region. Can be injured by angiography puncture and haematomas, surgery, angiography puncture, bypass surgery, and hip or knee surgery due to traction.

Peroneal neuropathy at the fibular neck – most common neuropathy of the leg -usually involves both the deep and superficial peroneal nerves (common peroneal neuropathy). This combination of deep and superficial peroneal neuropathy results in weakness of toe and ankle dorsiflexion, ankle **eversion**, and sensory disturbance over the dorsum of the foot and the lateral calf below the knee. There may be pain and a Tinel's sign over the lateral fibular neck. Ankle inversion is notably spared, which is innervated by the tibial nerve. Check ankle inversion in a dorsiflexed position, to avoid the mistaken impression that the tibialis posterior is weak. May have hypoesthesia to touch and pain in the lower two thirds of the lateral leg and **dorsum of the foot**. It may follow trauma; stretch injury, such as when the ankle is forcibly inverted; or compression from prolonged immobilization or compartment syndrome.

Tarsal tunnel syndrome (TTS) - As the distal tibial nerve runs under the flexor retinaculum through the tarsal tunnel at the medial malleolus, it divides into the calcaneal sensory nerves and the medial and lateral plantar nerves. The calcaneal nerves provide sensation to the heel of the sole. The medial and lateral plantar nerves are mixed nerves that innervate the intrinsic foot muscles. The medial plantar nerve supplies sensation to the first three toes and the medial fourth toe, whereas the lateral plantar nerve supplies the little toe and the lateral fourth toe. One or more of the three nerve branches (calcaneal, medial, and lateral plantar) may be involved in TTS. Presents with gradual onset of burning pain in the ankle and sole of the foot, with numbness and tingling in the heel or sole, depending branches involved. Symptoms worse with weight bearing - may be wasting of the intrinsic foot muscles but strength usually normal. Most cases of TTS are idiopathic, with no clear precipitating event. Trauma, however, such as ankle sprain or fracture, also accounts for a large proportion of TTS.

Interdigital neuropathy, also known as Morton's neuroma- local pain in the ball of the foot between the third and fourth toes, worsened with weight bearing, and accompanied by numbness of the third and fourth toes

Suprascapular neuropathy: slow onset of muscle wasting over the scapula with reduced ability to externally rotate or abduct the shoulder, and pain in the posterior shoulder (superior scapula). Esp with weight lifters. No sensory loss. Wasting over inferior scapular.

Radial nerve compression in the axilla - eg as in patients who use crutches incorrectly. Results in weakness of arm extension from involvement of the triceps, the triceps reflex is depressed or absent, and sensory disturbance extends from the lateral dorsal hand up into the posterior forearm and arm, (not seen in radial neuropathy at the spiral groove).

Radial nerve compression in the upper arm - At the spiral groove, the nerve lies next to the humerus, thus prone to compression, especially following prolonged immobilization "Saturday night

syndrome” (fall asleep with one arm draped over a chair compressed against the nerve on the surface of the humerus) or humeral #.

Patients present with the acute onset of a marked wrist and finger drop, accompanied by mild weakness of supination and elbow flexion from involvement of the supinator and brachioradialis muscles, respectively. Elbow extension remains strong, as the branch to the triceps muscle comes off proximal to the spiral groove. Finger abduction should be tested with the hand held passively extended, by placing the hand on a flat surface, or it may seem to be falsely weak. There is altered sensation over the lateral dorsal hand and dorsal aspects of digits one through four, in the distribution of the superficial radial sensory nerve. The triceps reflex remains intact, and the brachioradialis reflex is depressed or absent.

Ulnar neuropathy – presents with elbow pain, weakness of the hand muscles, and numbness and tingling of digits four and five. In contrast to carpal tunnel syn, in which sensory symptoms predominate, patients may experience no sensory symptoms at all, despite sensory loss on examination. Elbow pain is common, in some patients radiating down the medial forearm and wrist. Paresthesias may be provoked by flexing the elbow or applying pressure to the ulnar groove. Weakness of hand grip is common, caused by weakness of the ulnar innervated intrinsic hand muscles. Thumb abduction is OK. Asking the patient to make a fist may reveal their inability to bury digits four and five in the palm, because of weakness of the ulnar innervated flexor digitorum profundus to ring & little fingers. Sensory change, when present, involves the little finger, medial ring, and medial hand. Sensory loss may extend just beyond the wrist crease. If there is altered sensation beyond the wrist crease into the medial forearm, however, a more proximal lesion, such as in the brachial plexus or C8-T1 nerve roots, should be investigated.

Posterior interosseous neuropathy - supplies the extensors of the wrist / fingers with no sensory branch – they have a characteristic response to attempted wrist extension: the wrist deviates radially in extension as extensor carpi radialis is preserved as it comes off proximal to the posterior interosseous nerve, in comparison with the weak extensor carpi ulnaris, which comes off distal to the lesion. Furthermore, there is no reflex loss or cutaneous sensory loss or in posterior interosseous neuropathy, although there may be pain in the forearm from dysfunction of the deep sensory fibres supplying the interosseous membrane and joint capsules.

Ulnar neuropathy at the wrist – Seen often in cyclist or manual workers with repetitive pressure against the hypothenar eminence. Results in progressive weakness and wasting of the ulnar intrinsic hand muscles, sparing the median and proximal ulnar innervated muscles. In most cases, there are no sensory findings, although there may be sensory loss in 4th -5th fingers. If sensory loss is present, it spares the dorsal medial hand, innervated by the dorsal ulnar cutaneous sensory branch, which arises several cm proximal to the wrist. The superficial sensory nerve may be compressed at the wrist as a result of tight handcuffs so watch out for those of you re-enacting Fifty Shades of Grey.

Carpal tunnel Syn - Paresthesias or sensory loss involving median nerve, including the medial thumb, index, middle, and lateral fourth fingers - sparing the thenar eminence, which is supplied by the palmar cutaneous sensory branch of the median nerve that comes off proximal to the carpal tunnel. May have thenar wasting with weakness of thumb abduction and opposition. Tinel's sign (paresthesias radiating into the fingers with tapping over the median nerve at the wrist) is present in over half the cases, although this is a nonspecific sign Phalen's maneuver (holding the wrist in a flexed position) is more sensitive than the Tinel's sign, and more specific to CTS with paresthesias in the middle or index fingers after 1 or 2 minutes of wrist flexion.

TAKE HOME POINT

If you find **COMPRESSION NEUROPATHY**
consider
RHABDO
& consider
COMPARTMENT SYN

The 2 minute hand exam:

Looking at the upper limb injuries noted above, and in the context of the significant number of arm and hand injuries we see, here is something from Emergency Medicine Reports with an additional bit for the assessment of the motor component of each nerve.

Remember a few basics. The back of the hand is the dorsal surface. The palm is the volar or palmar surface. In the “anatomical position” the palm is facing forwards – the little finger is next to the body so the ulnar aspect is the medial side, and the radial side is the lateral aspect.

Abduction (away from midline) /adduction (towards midline) of the fingers is from an imaginary plane bisecting the 3rd (middle finger- just in case some of you have 6 fingers) finger.

For the thumb lay the hand flat with the dorsum on the table:

- Abduction / adduction occurs in the saggital plane
 - Abduction- the thumb goes **up** in the air
 - Adduction- the thumb moves back to the 2nd digit
- Flexion / extension occurs in the coronal plane – moving to and from the 2nd digit
- Opposition – tip of thumb brought to the tip of the 5th digit

General

- *General appearance:* skin breaches, soft tissue swelling, erythema, bruising, loss of normal palmar concavity
- *Deformity:* note the position of the hand eg flexion may indicate extensor tendon disruption

Vascular

- *Capillary refill* < 2 seconds
- *Haemorrhage* control
- Ulnar & radial *pulse*

Neurological

Assess prior to anaesthetic infiltration or blocks

Ulnar:

- sensation – test at the distal, palmar surface of the 5th digit (little finger).
- Motor: (supplies hypothenar mm, interossei, add pollicis, lumbricals to 4-5 digits & deep fl poll brevis) Test with **ab**duction of the interossei, usually the 2nd digit (ask patient to spread the fingers against resistance, palpating the 1st interosseous muscle of the index digit). This tests the dorsal interossei (remember DAB & PAD – Dorsal ABduct and Palmar ADDuct)
Or you could lie the hand flat on the table, palm down and adduct the index finger against an abducting resistance, testing the dorsal interossei.
Also could test the adductor pollicis by lying the hand flat, dorsal side down on table & adducting the thumb (pulling it down onto the palmar side of the base of the 2nd digit (index finger).
Consider abductor digiti minimi (hand & fingers flat, dorsal surface

Median:

- Sensation: - test the distal, palmar surface of the index finger.
- Motor: supplies thenar mm except deep head of flex poll brevis and add pollicis) and lumbricals for 2-3 – Test with abduction of the thumb, palpate the thenar eminence for abductor pollicis brevis. Hand flat, dorsal surface down, Abduct the thumb (lift away from the table) at right angles against resistance.
Could also test opponens pollicis. Hand on side, ulnar border down and ask pt to touch base of little finger with thumb against resistance.

Radial:

- sensation: light touch to dorsal webspace between 2nd-3rd (index & middle) fingers
- Motor: wrist extension (ext carpi radialis longus).

** Remember the long flexors and extensors of the hand arise from the forearm and thus power may be intact for those MM with injuries to the wrist / hand.

Check sensation finger tips.

Musculoskeletal

- Bony palpation of digits & joints
- Active ROM: make fist, extend digits
- Passive ROM: passively move digits & joints
- Resistance: pain on resisted movements suggest partial ligament injuries

Tendons - Ligamentous

- FDS-Flexor Digitorum Profundus: hold PIP in extension, flex DIP against resistance (ie dorsal surface hand down, fix the middle phalanx onto the table, flex distal phalanx against resistance-ant interosseous nerve, from median)
- FDS-: Flexor Digitorum Superficialis: flex PIP against resistance (median nerve) and can flex the MCPs and wrist with further contraction. Again dorsal surface of hand down, hold the other fingers not being examined in extension (inactivating the FDP) fix the prox phalanx and flex at the PIP
- Extensor tendons: hand palm down, extend digit with resistance at the level of each phalanx
- Ulnar collateral ligament of thumb: Gamekeepers thumb or skiers thumb caused by hyper extension of the thumb; tender at UCL with laxity at the MCP joint and inability or reduced ability to oppose the thumb actively; there may be an assoc avulsion # .

JOKE / QUOTE OF THE WEEK

A man in a hot air balloon were realised he was lost. He reduced altitude and spotted a woman below. He descended a bit more and shouted: "excuse me, can you help me? I promised a friend I would meet him an hour ago but I don't know where I am". The woman below replied "you're in a hot air balloon hovering approximately 30 feet above the ground. You'll between 40 and 41° north latitude and between 59 and 60° West longitude".

"You must be a technician." said the balloonist. "I am" replied the woman "how did you know?". "Well," answered the balloonist "everything you have told me is technically correct, but I've no idea what to make of your information and the fact is, I'm still lost. Frankly, you've not been much help at all. If anything, you've delayed my trip with your talk."

The woman below responded, " you must be in management". "I am replied" the balloonist, "but how did you know?". "Well", said the woman "you don't know where you are all where you are going. You have risen to where you are, due to a large quantity of hot air. You made a promise, which you have no idea how to keep, and you expect people beneath you to solve your problems. The fact is you are in exactly the same position you were in before we met, and now, somehow, it's my f#*cking fault!!"

Please forward any funny and litigious quotes you may hear on the floor (happy to publish names if you want)

THE WEEK AHEAD

Tuesdays - 12:00 – 13:45 Intern teaching -Thomas & Rachel Moore

Wednesday 0800-0900 Critical Care Journal Club. ICU Conf Room / 12.00-1.15 Resident MO in Thomas & Rachel Moore

Thursday 0730-0800 Trauma Audit. Education Centre / 0800-0830 MET Review Education centre / 1300-1400 Medical Grand Rounds. Auditorium.