~~FroFDoF~~ - Neuro

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the exam

- based on previous exams
- I have been involved in standard setting this years 5B exam
- single MCQ paper with common content
- 3 part OSCE
- neuro content appears to be focussed on that which is relevant to acute general practice

topic areas

- head injury including GCS
- epilepsy
- stroke
- headache
- collapse
- radiology
- the examination

functional anatomy

- suggest you revise the functional neurological anatomy of UMN/LMN lesions, somatosensory deficits, visual fields
- blackboard, year 4, B&B, lecture notes, “functional neuroanatomy”

head injury

- 700,000 A&E attendances/year; 110,000 admissions; 4,000 neurosurgical interventions; 75% male
- falls, assaults and RTAs
- surprisingly high rate of psychological morbidity (45% all grades)
- roughly 25% mortality for severe head injury
- the principle determinant of long term outcome from polytrauma

concepts

- brain injury is irreversible
- primary brain injury has already happened
- secondary brain injury can be prevented
  - by rapid resuscitation
  - ensure the brain is perfused with well oxygenated blood at adequate pressure (MAP>90mmHg)
  - sometimes by surgical decompression

concepts

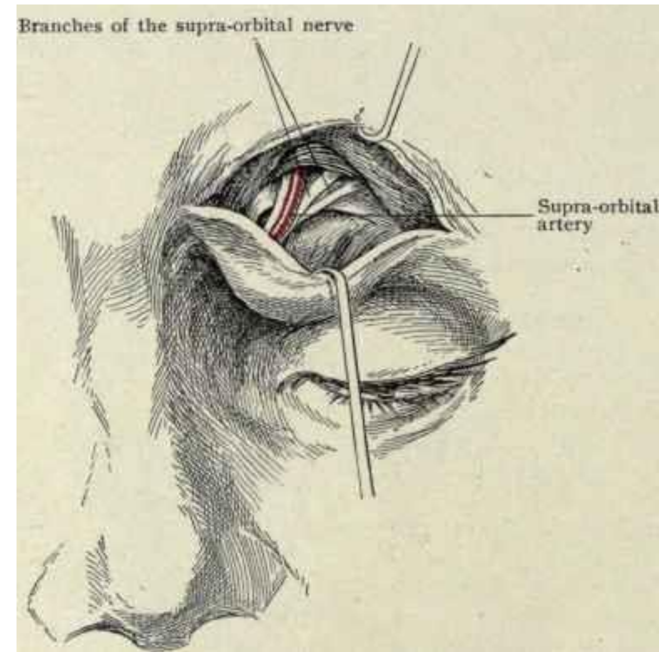
- in order to:-
  - measure the severity of head injury
  - estimate prognosis
  - detect deterioration (or improvement)
- a graded scale of conscious level which is internally and externally consistent and universally understood and applied is required

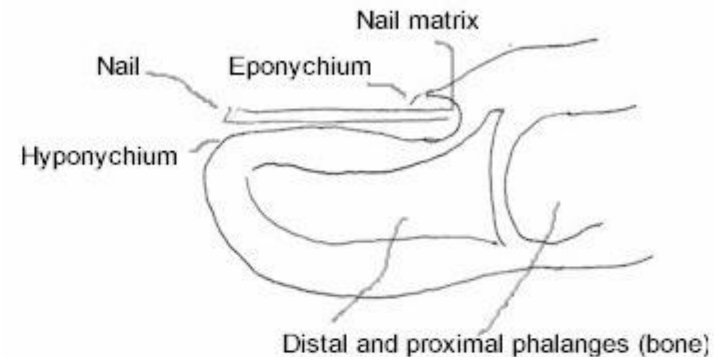
Glasgow Coma Scale

- motor
  - obeying commands (6)
  - localising to pain (5)
  - flexing (of arm to nail bed pressure) (4-3)
  - extension (ditto) (2)
  - no response (1)
- verbal
  - orientated (5)
  - confused (4)
  - words (3)
  - sounds (2)
- eye opening
  - spontaneously (4)
  - to speech (3)
  - to pain (2)

how to examine the GCS

- "squeeze my fingers" bilaterally
- apply supraorbital pressure, each side in turn
- with the elbow at 90°, apply nail bed pressure, each side in turn
- record best response in each domain

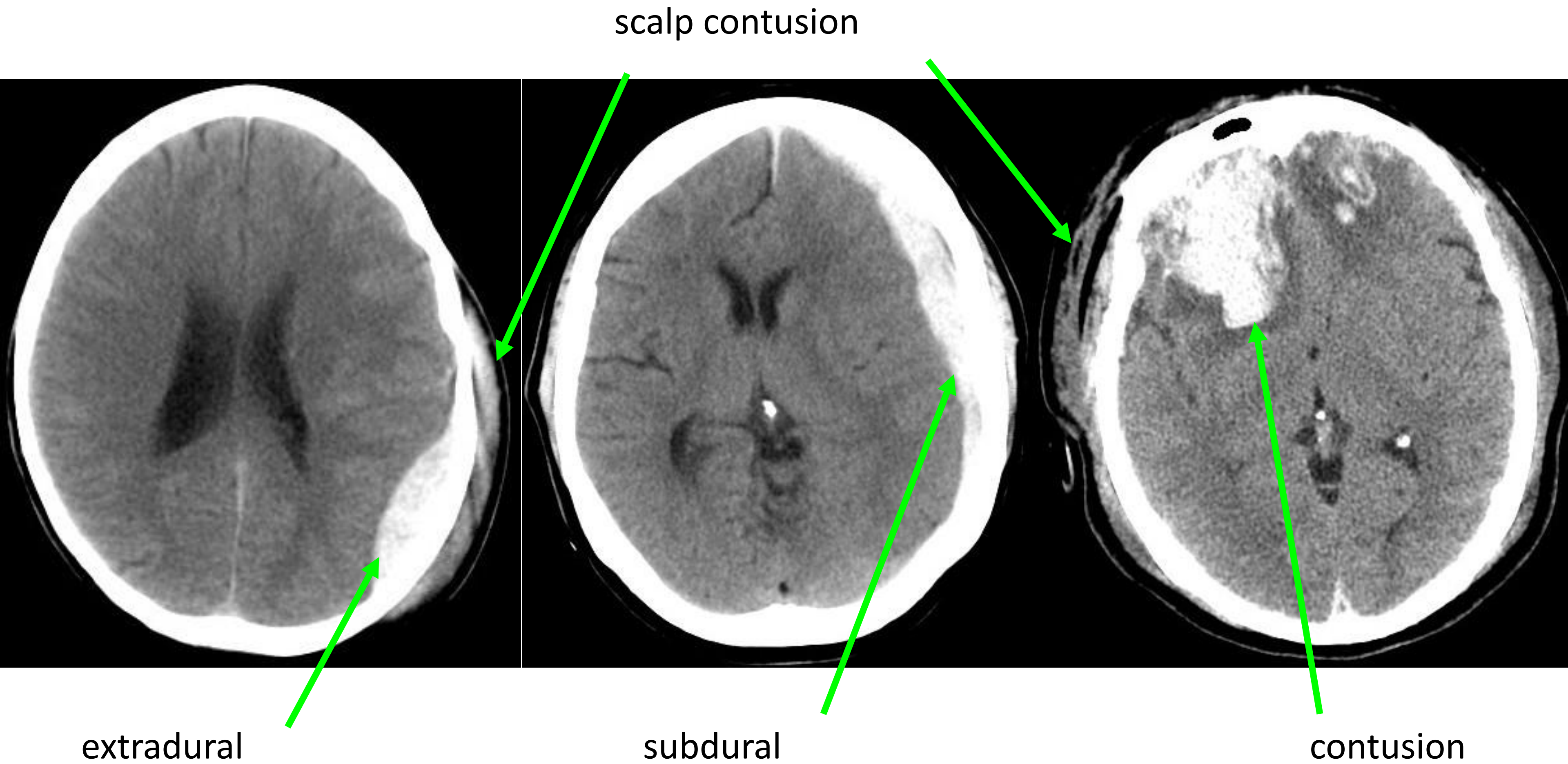




in practice

- good rapid resuscitation
  - Comatose patients may need ventilating
  - remember C-spine
- early accurate application of GCS
- CT just about everyone (current guidelines in NICE CG56)
- refer to neurosurgery if
  - GCS$\leq$8
  - significant CT abnormality
  - CSF leak, compound depressed skull fracture

traumatic haemorrhage



generalised seizures

- resuscitation
  - place of safety e.g. recovery position on floor
  - oxygen, capillary glucose check
  - benzodiazepines e.g. rectal diazepam, iv lorazepam (remember conscious level will fall)
  - load with phenytoin 15mg/kg over 20 minutes
  - 30 minutes, still seizing? time for GA and ITU

first seizure

- investigate for cause
  - CVA in elderly
  - tumour, head injury, infection in adults
  - fever in children
- consider treatment, especially if structural cause found
  - phenytoin can be given rapidly
  - carbamezapine good for focal seizures and fertile women
  - valproate and lamotrigine are alternatives for monotherapy
  - Keppra/Levetiracetam becoming the new standard

established epilepsy

- epilepsy is the disorder of recurrent seizures
- AED maintenance plagued by drug interactions
  - Carb., phen. induce hepatic enzymes
  - so some drugs are metabolised faster
    - OCD, warfarin, etc
  - check BNF
- AED toxicity and levels
- beware drugs that reduce seizure threshold eg SSRI
- compliance
- pseudoseizures - consider video EEG telemetry
- neurology referral

stroke

- the sudden onset of a neurological deficit
- most is ischaemic due to cardiac or carotid emboli
- c. 10% haemorrhagic
- 150,000/year most >65
- 3rd most common cause of death
- commonest neurological disorder
- most common cause of severe disability

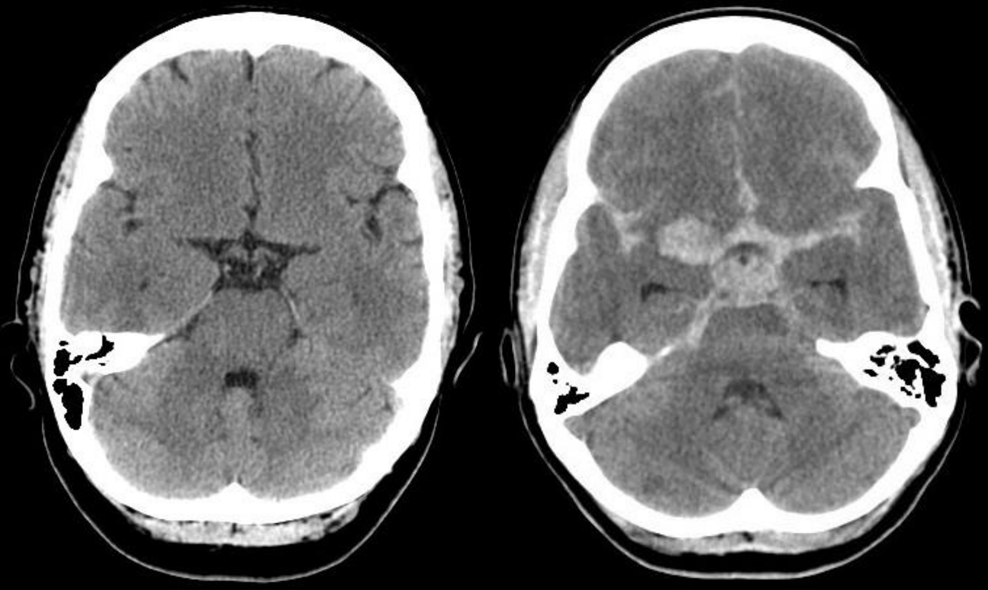
stroke

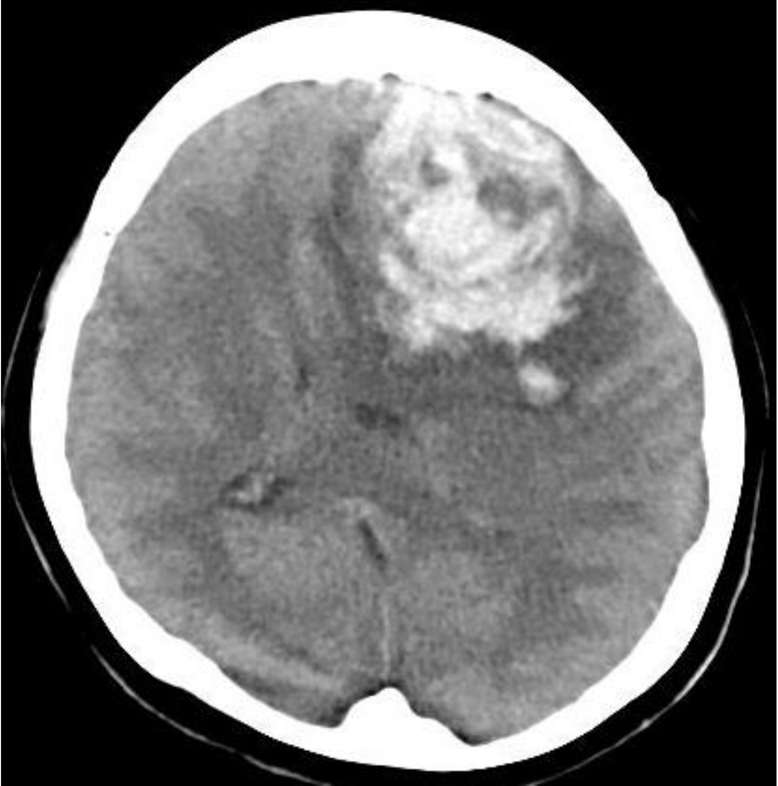
- resuscitation if appropriate
- consider thrombolysis
  - good clinical syndrome
  - normal CT
  - within 3 hours
  - no contraindication
- stroke rehab

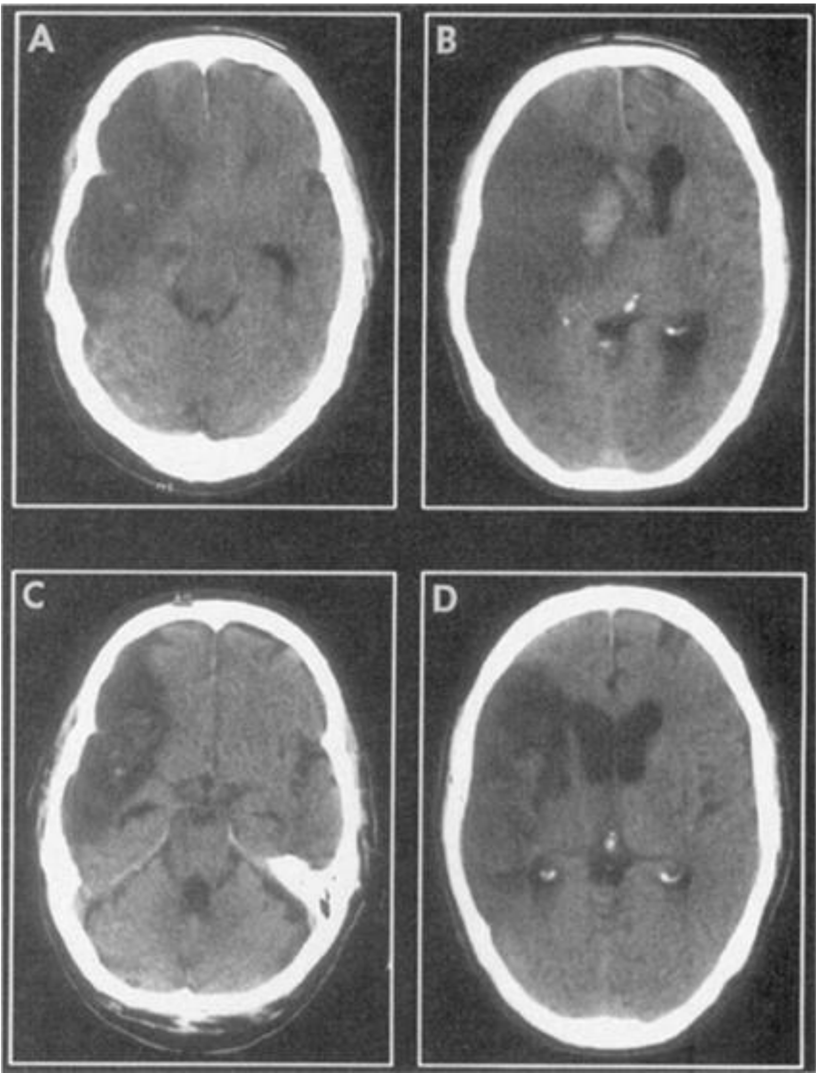
prevention

- TIA - ischaemic event with complete clinical resolution within 24hours
- should prompt search for cause e.g.
  - AF, anticoagulate
  - high grade carotid stenosis, CEA
- stop smoking, treat hypertension & hypercholesterolaemia, optimise diabetic control
- antiplatelets

stroke imaging







headache

- all in the history
  - time course critical - sudden onset, recurrent, diurnal variation, progressive
  - visual disturbance - flashing lights, blurring
  - associated deficit or seizure
  - meningism - stiff neck, vomiting, photophobia
  - fever

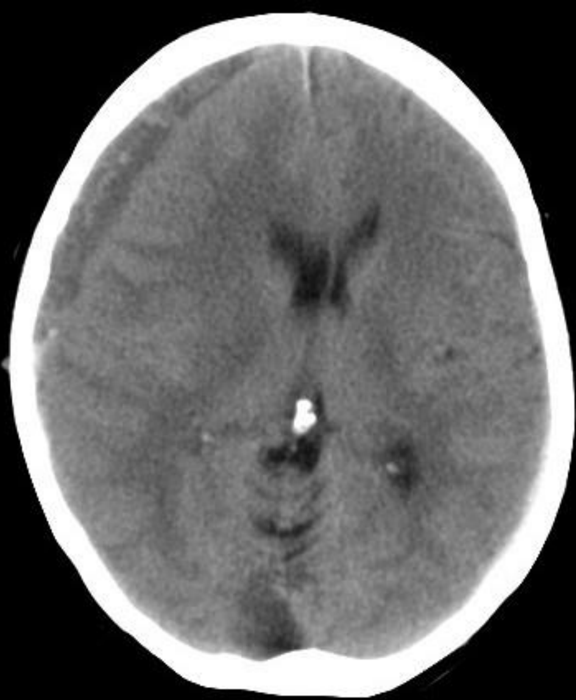
acute headaches

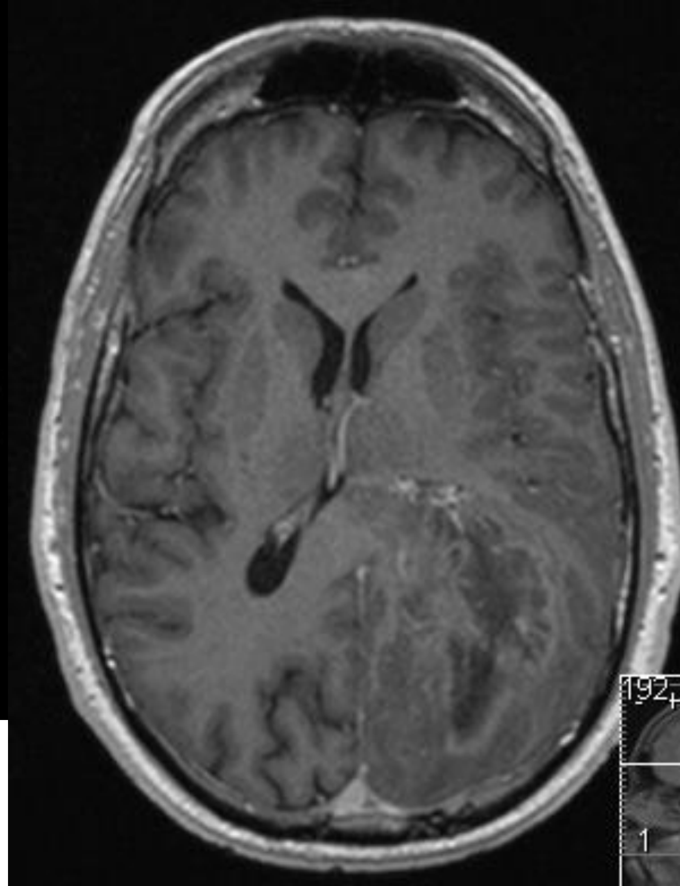
- meningitis - rapid progression, unwell, vomiting and photophobia, fever
  - iv benzyl pen/cephalosporin
  - CT to exclude SOL
  - LP
- SAH - instantaneous onset, vomiting, unwell
  - CT to make diagnosis
  - LP if CT normal for xanthochromia
  - neurosurgical referral

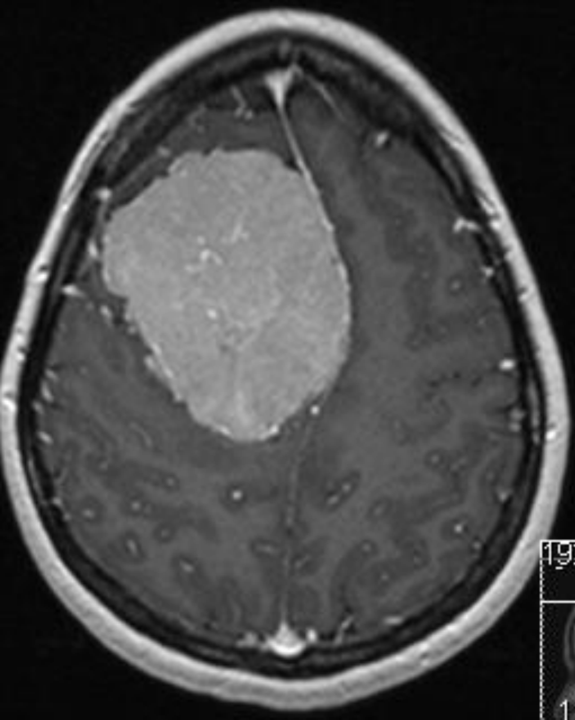
chronic headache

- raised ICP/SOL/intracranial hypertension
  - exacerbated by recumbency and sleep
  - N&V, blurred vision from papilloedema
  - many causes are progressive e.g.
    - brain tumour
    - cSDH
    - hydrocephalus
  - this is the sort of chronic headache that needs imaging

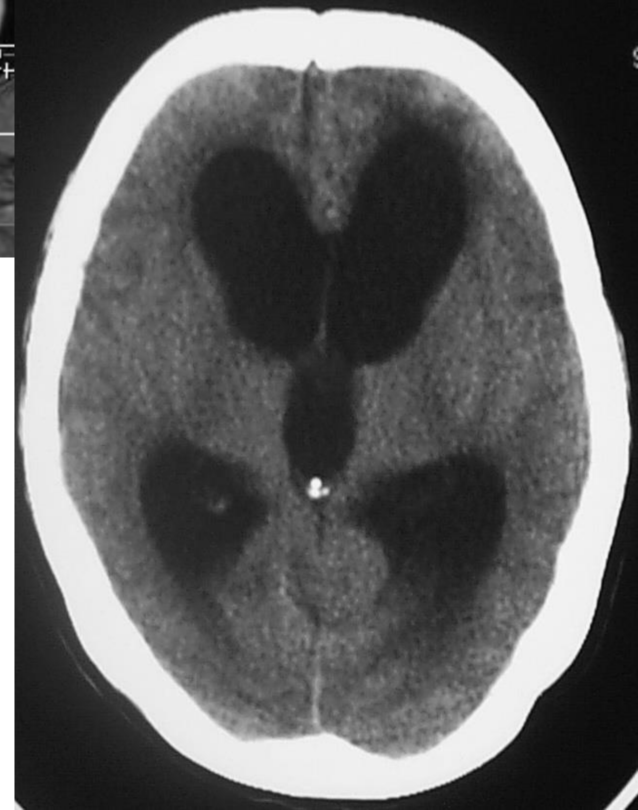
SOLs







- consider dex
- refer to neurosurgery



other headaches

- are very common or even universal
- recurrent one sided h/e with n&V, visual disturbance with zig-zag lines or flashing lights lasting 24 hours - consider migraine
- frequent headache, worse at end of day, often felt behind the eyes - consider tension headache
- see blackboard, year 4, B&B, lecture notes, headache for more

collapse

- a common, non-specific presentation that makes people go to the doctor
- history from the patient and witness are the key
- distinguish between
  - a mechanical fall, and a loss of consciousness
  - first time, recurrent events
- pmh, aura, medication, environment, associated symptoms

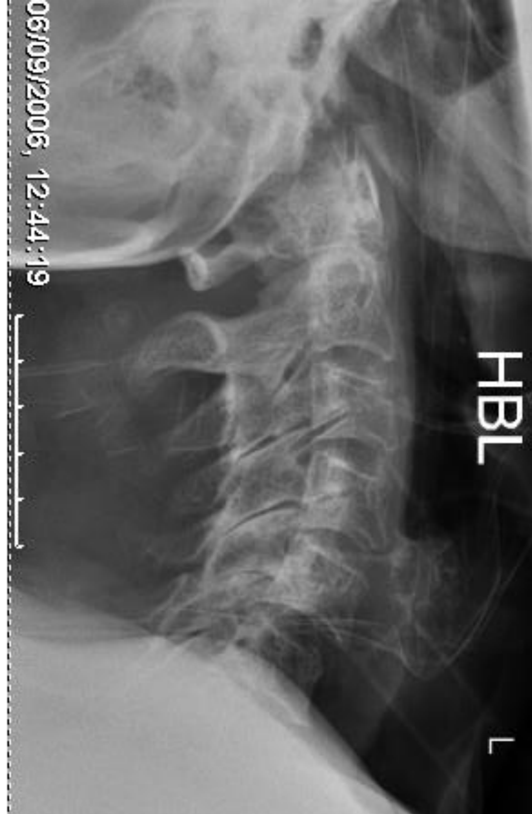
cause of collapse

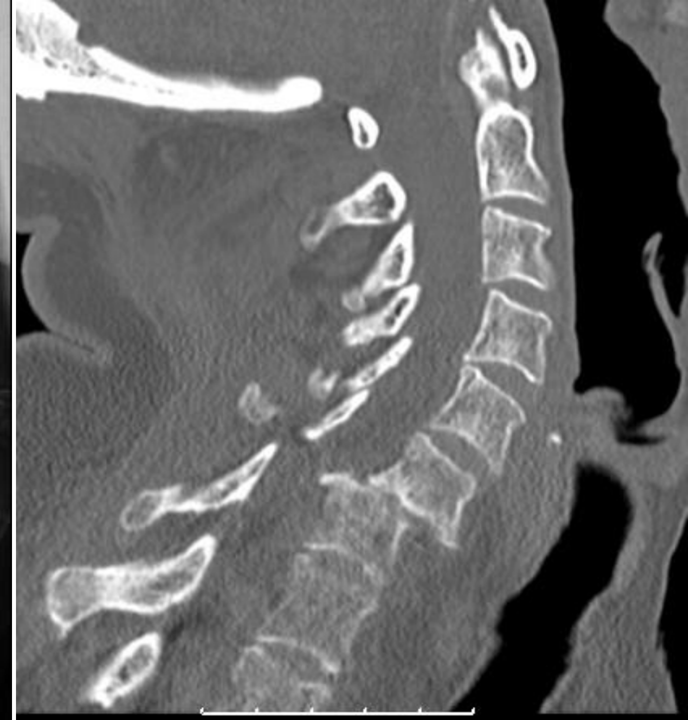
- cardiovascular
  - faint - aura, rapid recovery, upset or micturating at time
  - paroxysmal dysrythmia - palpitations
  - carotid sinus hypersensitivity - while shaving or dressing
- neurological
  - seizure - aura, witnessed convulsions, bit tongue, soiled
  - intracranial event - lasting effects
- metabolic
  - diabetes related - Medicalert, BM
  - postural hypotension - on rapid standing
  - drug related - look at DH, alcohol
- environmental e.g. CO poisoning

collapse

- resuscitate
- full history and exam if possible
- Ix to include
  - BM
  - bloods
  - ECG and tape
  - consider brain imaging
- falls clinic can be a useful resource

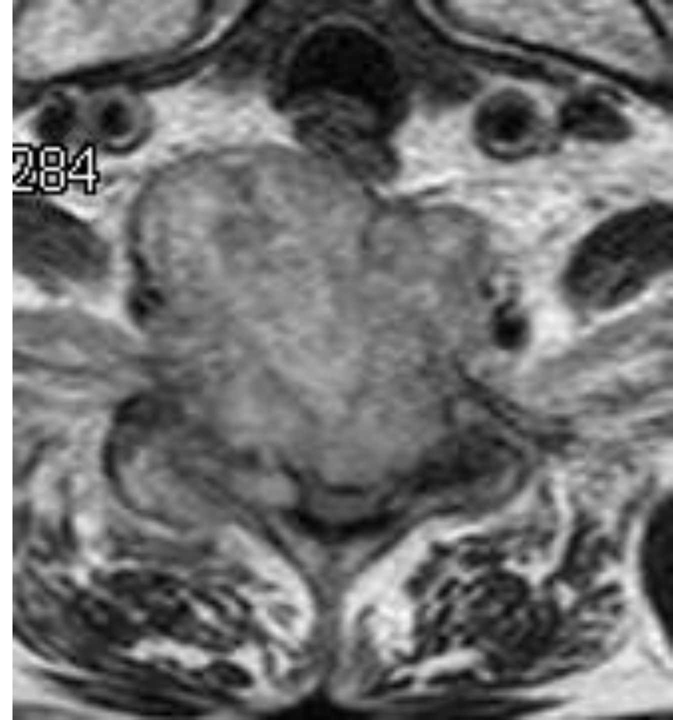
other neuro emergencies





- potential spinal injury
  - remember that after trauma (including falls) a patient with neck pain, or an unconscious patient has a broken neck until proven otherwise
  - so immobilise and image - usually CT occiput to T4

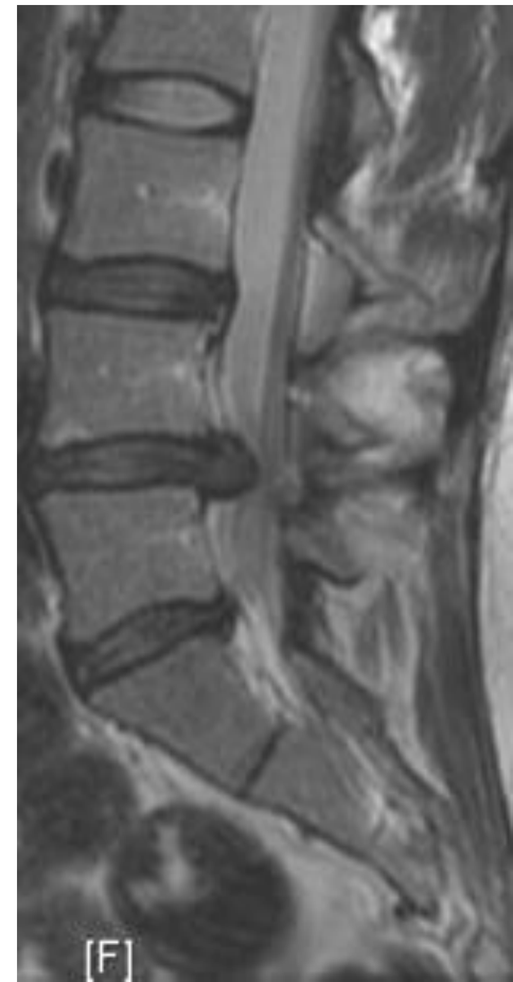
metastatic spinal cord compression



- patients with painful, acute para- or quadra-paresis require MRI, whole spine, within 24hours (stat if deficit progressive)
- rapid introduction of dexamethasone, followed by radiotherapy and or surgical decompression can save ambulation

cauda equina syndrome

- acute urinary retention with new or worsened back and or leg pain should lead to
  - neuro exam ?lumbar root signs, perianal numbness, decreased anal tone
  - catheteristation and measure residual volume
  - emergency MRI L spine if suspicion persists
  - rapid decompression can save continence (and litigation)



neuromuscular respiratory failure

- some severe neurological disorders can affect ventilation
  - Guillain Barre Syndrome
  - MND
  - myasthenia gravis
  - cervical cord injury
- CO_2 rises, lung volumes on spirometry fall
- consider pressure support or intubation

other common stuff

- dementia
- PD, MS
- degenerative spine
  - cervical myelopathy
  - root pain in arm or leg

general stuff

- most points are for general performance aspects
- so behave like your favourite role model clinician - be pleasantly professional
- speak in colloquial English to the patient, and medical English to the examiner
- is that facial piercing, bright green shirt, unusual hair cut etc. important enough to you to risk irritating multiple scorers
- read the instructions (RTFQ)

summarise your findings

- guess what this means
- spend a few minutes practising presenting fairly straight forward cases in one sentence without leaving important stuff out eg
  - this 78 year old woman with hypertension presents with the sudden onset of a left hemiparesis 2 hours ago

Oh, oh, oh…

I. Olfactory
II. Optic
III. Oculomotor
IV. Trochlear
V. Trigeminal
VI. Abducens
VII. Facial
VIII. Auditory (vestibulo-cochlear)
IX. Glossopharyngeal
X. Vagus
XI. Accessory
XII. Hypoglossal

Cranial nerve exam

common questions

- UMN facial palsy spares the face
- hypoglossal weakness results in ipsilateral tongue wasting which deviates towards the weak side when protruded
- bulbar palsy results in the uvula deviating away from the weak side on phonation
- the jaw opens away from the weak side

top tips

- visual field
- the H, not too close, not too far, hand on head
- centre of the face for sensation
- power against resistance
- light before phonation
- trapezius instead of scm
- make sure you know how to turn a pen torch on
- pupils light from the side

Upper limb neuro exam

top tips

- tone, how to hold an arm
- isolate joint to be examined
  - don’t pull Granny off the bed
- adopt a system so as not to leave things out
- still time to practice
  - you don’t want to look like you’ve not done it before
  - especially reflexes
- timing of reinforcement if required
- boosy shots
- biceps on the other side of the bed

Lower limb neuro exam

top tips

- are you a large man or a little lady
  - or perhaps something in between
  - some suggestions for alternative techniques
- some techniques to avoid and why
  - rolling femur and lifting leg
  - finger tips – really
  - sharp end of tendon hammer
  - proprioception

thanks to

- David Loh- round of applause please