Neurological pitfalls in primary care

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This overview will discuss the following presentations:

- Headache
- Bilateral limb weakness
- Episodic alteration of consciousness
- Seizures
- Epilepsy

Headache

- Among the top 10 reasons for consultations to primary care and to neurologists
- Consultation rates highest between 15–24 years (15.8/100 in women, 5.8/100 in men) decreasing with age.
- *UK GPRD (1992-2000) involving 253 practices / 13.2 million patient years (pts >15 yrs)
- Consultation rates overall 6.4/100 patients/year in women and 2.5 in men

*Headache and migraine in primary care. Latinovic, R. et al. JNNP 2006;77:85-87.

Headache Classification

Primary Headache Syndromes

- Migraine
- Cluster Headaches
- Tension type
- Others: ice pick, exertional, coital, thunderclap, cough

Secondary /Symptomatic

- Fever
- Analgesic rebound
- Subarachnoid Haem
- Post-traumatic
- Idiopathic Intracranial Hypertension
- Post-Lumbar Puncture
- Temporal Arteritis
- Sinusitis
- Meningitis

Migraine Headache

- Throbbing, pulsatile, beating...
- Unilateral (but often not)
- Dramatic terms: boring, sharp, terrible,…
- At least moderately severe
- Aggravated by movement
- Any 2 of the above.....

Migraine Headache: associated features

- Nausea
- Vomiting
- Photophobia
- Phonophobia
- Osmophobia
- Any 1 of the above.....

Depictions of migrainous aura with fortification spectra and scintillating scotoma (teichopsia)

Leao AAP. Spreading depression of activity in cerebral cortex. *J Neurophysiol*. 1944;7:359-390

Features of migrainous aura (Classical Migraine)

- Precedes but may coincide with headache
- Gradual onset lasting less than 60 mins
- Visual: fortification spectrum; scintillating scotoma; teichopsia; blurriness; jumbled up, distorted images, blindness
- Sensory: hemi-body numbness
- Speech (dysphasia)
- Typically HA follows but may be absent

Headache in primary care

- Review family history / OCP use
- Full general and neurological examination (including fundoscopy)
- Repeat visual field examination (if abnormal) once migraine attack has settled
- If typical migraine and normal exam: no need for brain imaging
- Arrange brain imaging if history of trauma, suspected subarachnoid haemorrhage (thunderclap headache), intractable daily headache, papilloedema

Major dietary triggers

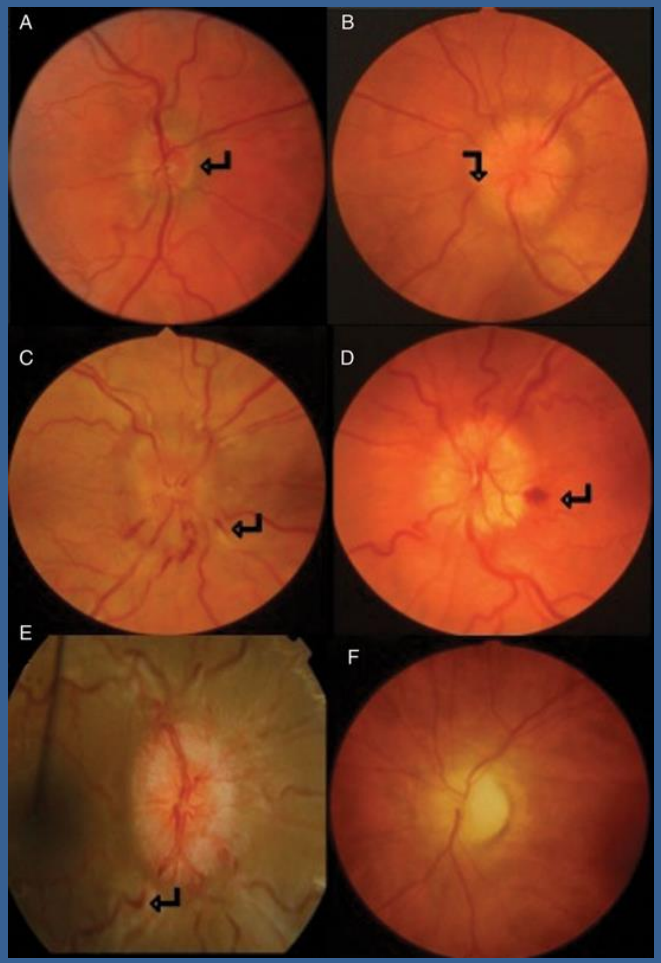
Chocolate (liquid or solid)
Cheese (incl parmesan)
Alcohol
Peanuts, cashew nuts
Hot Dogs / luncheon meat
Pepperoni / pizza
Mono-sodium glutamate
Seasonings
Avocado pear

Diagnostic Features	Cluster Headaches	Migraine
Prevalence	0.1%	16%
Age / Gender M>F	20-40 / M>F 3:1	Young to old / F>M 2:1;
Site	Retro-orbital unilateral	Often unilateral
Onset	Early am	Random
Attitude	Paces up and down	Prefers to be still / in dark room
Autonomic	Ipsilateral ptosis, red eye, lacrimation, rhinorrhea	Prodrome / visual and other aura
Duration	30-180 mins	2-72 hours
Recurrence	Nightly for up to 2 months	Random
Periodicity	Same time next year	Random
Treatment options	Nasal 100% oxygen; triptan; ergotamine; PREDNISOLONE	Paracetamol (+ metoclopramide); triptan; baralgin; NSAIDs

IDIOPATHIC INTRACRANIAL HYPERTENSION (IIH)

Previously known as pseudotumor cerebri or benign intracranial hypertension

Papilloedema seen in IIH



Mollan, SP et al. Pract Neurol 2014;14:380-390

Idiopathic Intracranial Hypertension

Clinical Features	Patients (N=165)
Age (mean)	29 years
Females %	97.6 %
Weight (mean)	107.9 Kg
BMI (mean)	40
Amaurosis fugax	68%
Diplopia	18%
Photophobia	48%
Headache	84%
Pulsatile tinnitus	52%
Papilloedema (gd 1-5)	100%
CSF	34.3 cm H^2O

Effect of acetazolamide on visual function in patients with IIH and mild visual loss. Wall M, et al. JAMA 2014;311:1641–1651

Drugs associated with IIH

- Ciprofloxacin
- Tetracyclines
- Nalidixic Acid
- Vitamin A excess
- Tamoxifen
- NSAIDS
- *?OCP / Depoprovera

*Sodhi M, Sheldon CA, Carleton B, Etminan M. Risk of Pseudotumor Cerebri Syndrome (PTCS) with hormonal contraceptive use. Int J Reprod Contracept Obstet Gynecol 2018;7:77

Management of IIH

- Weight loss: > 6% effective
- Low sodium diet and Acetazolamide (1-4G daily)
- Correct iron deficiency anaemia
- Treatment failure in 4.2% with permanent visual loss
  - high-grade papilloedema
  - high number of transient visual obscuration episodes
  - significant loss of visual acuity at baseline
  - male gender despite the small numbers

Effect of acetazolamide on visual function in patients with IIH and mild visual loss. Wall M, et al. JAMA 2014;311:1641–1651

PARAPARESIS / QUADRIPARESIS

Consultations for subacute bilateral limb weakness

Myelopathy vs neuropathy

Clues from history

- Sudden onset / bilateral or asymmetrical
- Bladder dysfunction
- Leg weakness with associated hand numbness

Clues from exam

- Increased tone (but may be flaccid early)
- Brisk or preserved reflexes
- Babinski signs (or non-flexor)
- Prominent loss of sensation involving lower limbs and above groins

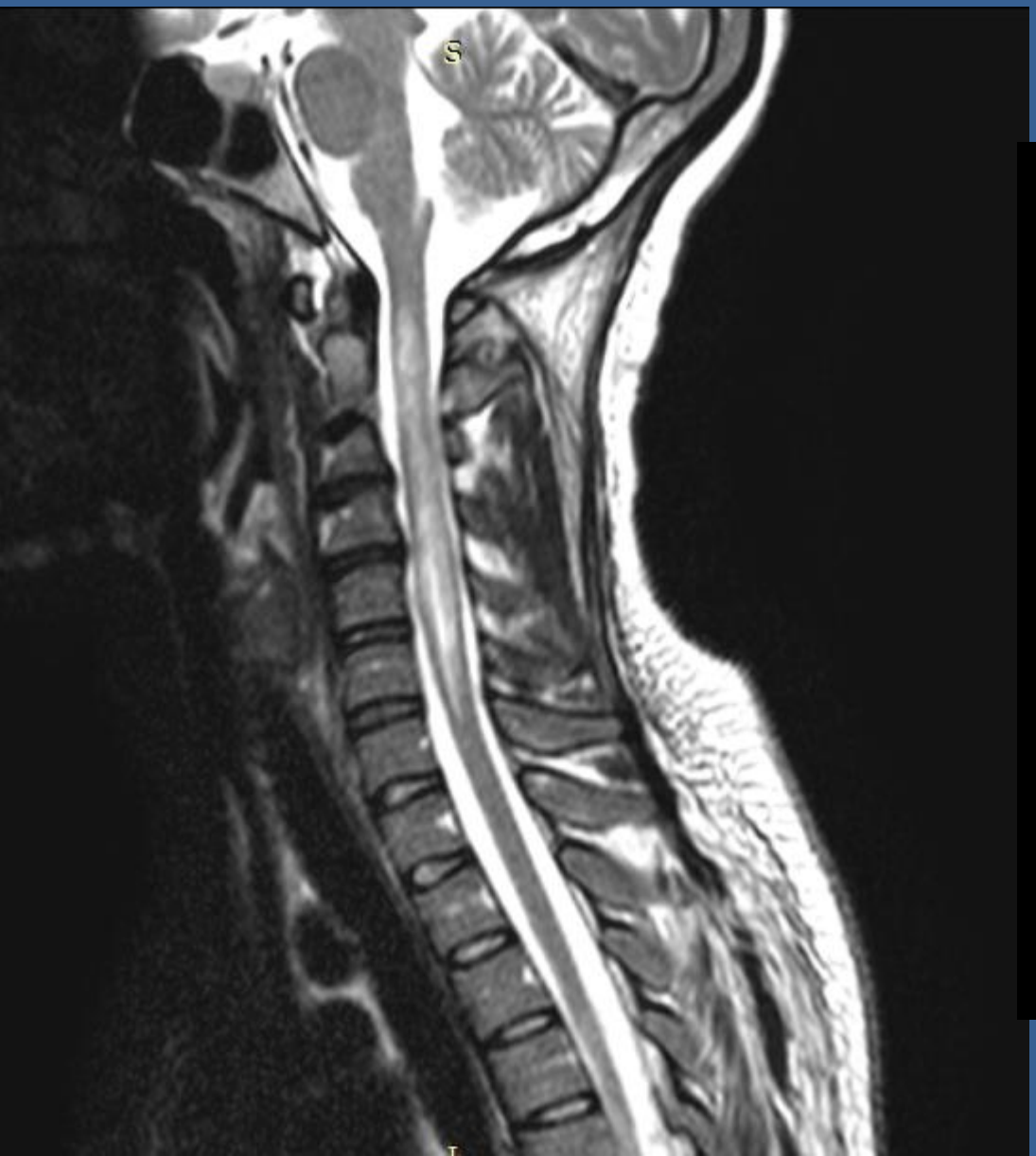
Common errors

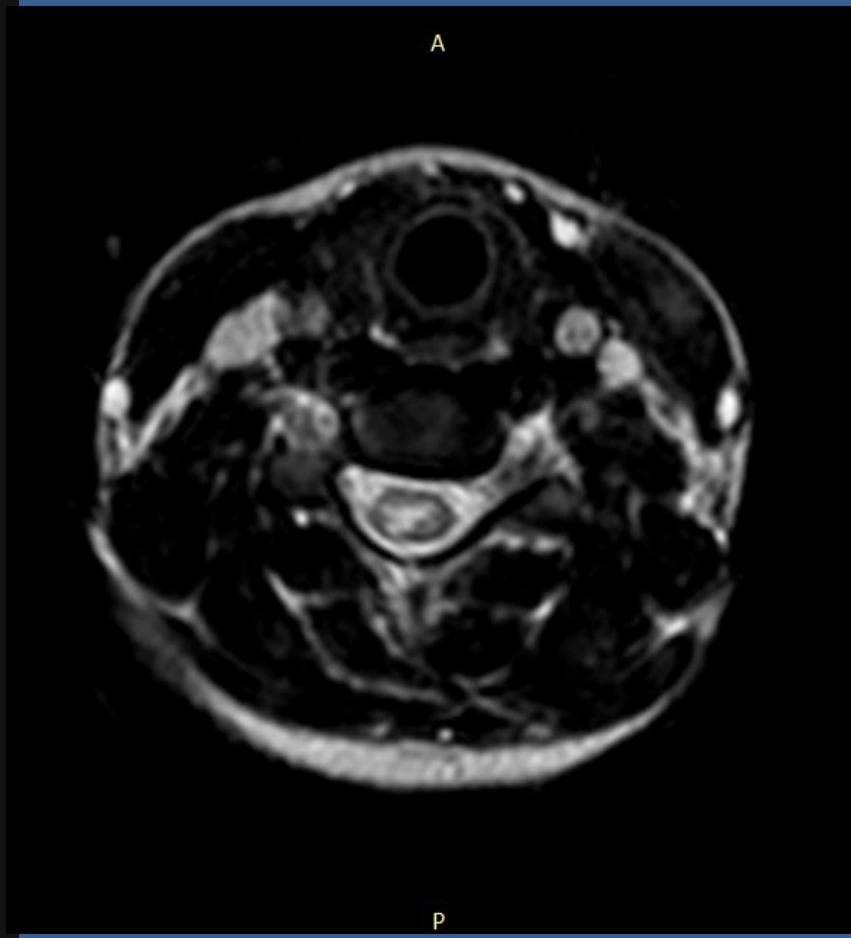
- Arranging Xray / CT lumbar spine for spastic paraparesis (myelopathy)
- Omitting thoracic and cervical spine
- Omitting CXR (esp lateral)

[MRI cervical and thoracic spines preferable for myelopathy]

Quadriparesis in a 32-yr old female with SLE

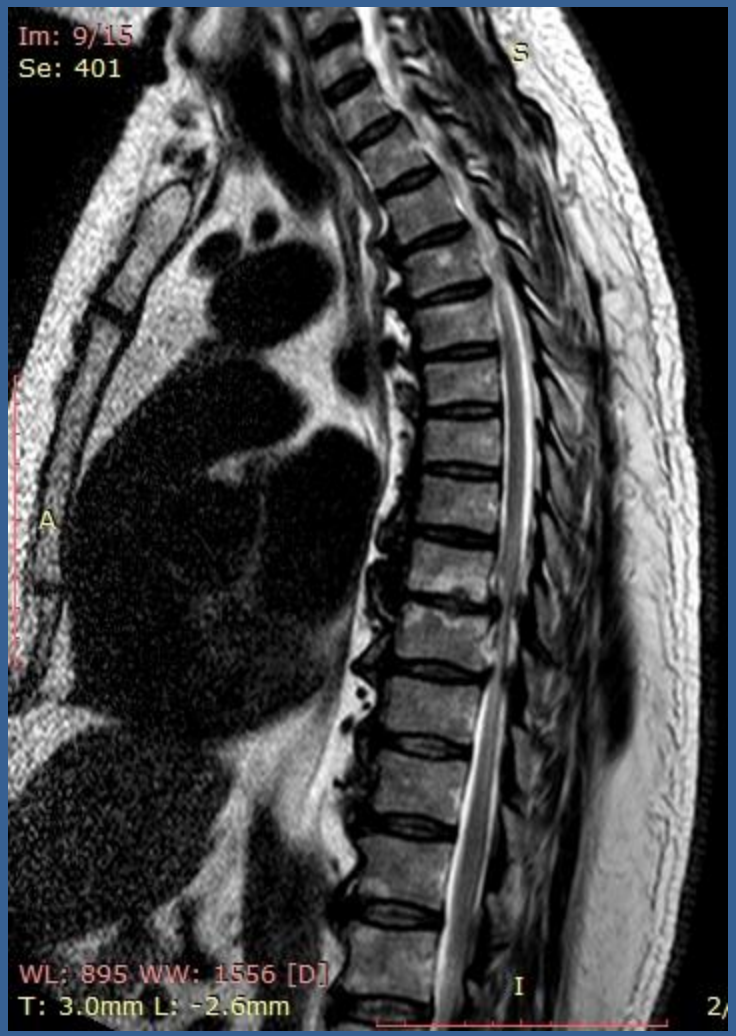
MRI cervical spine: Sagittal and Axial views showing longitudinally extensive inflammatory lesion with high T2 signal





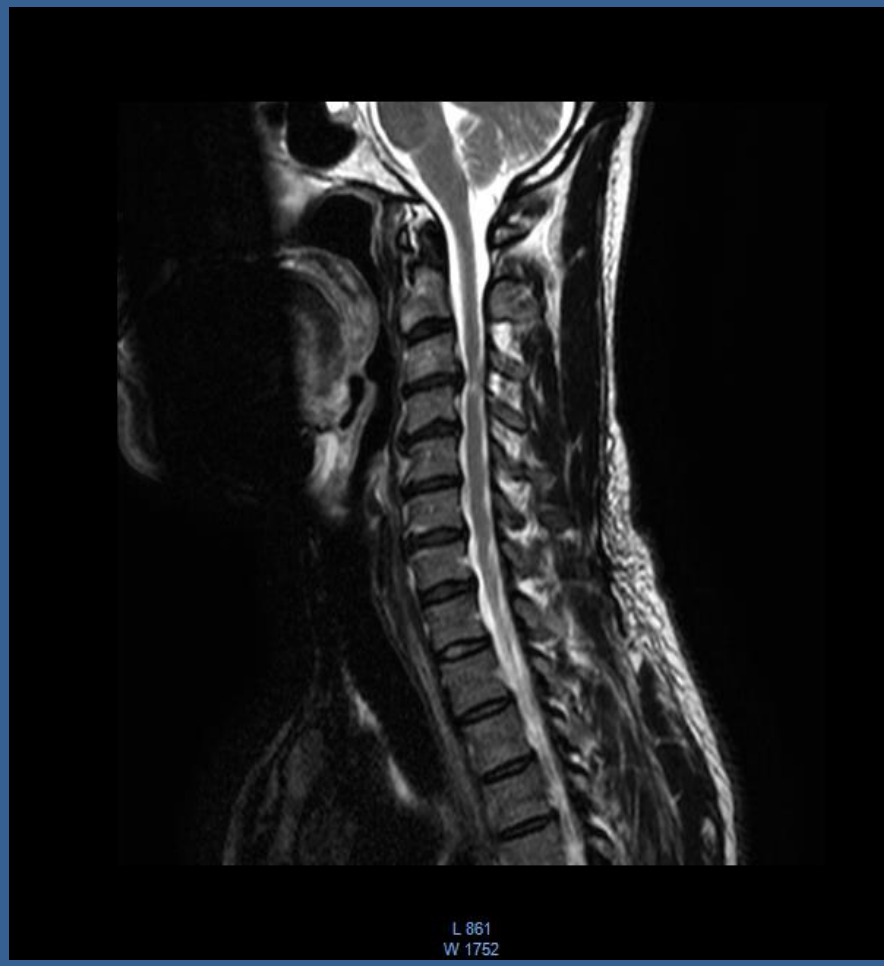
DEGENERATIVE DISEASE

Paraparesis



Prolapse thoracic disc
in a 75 yr-old man

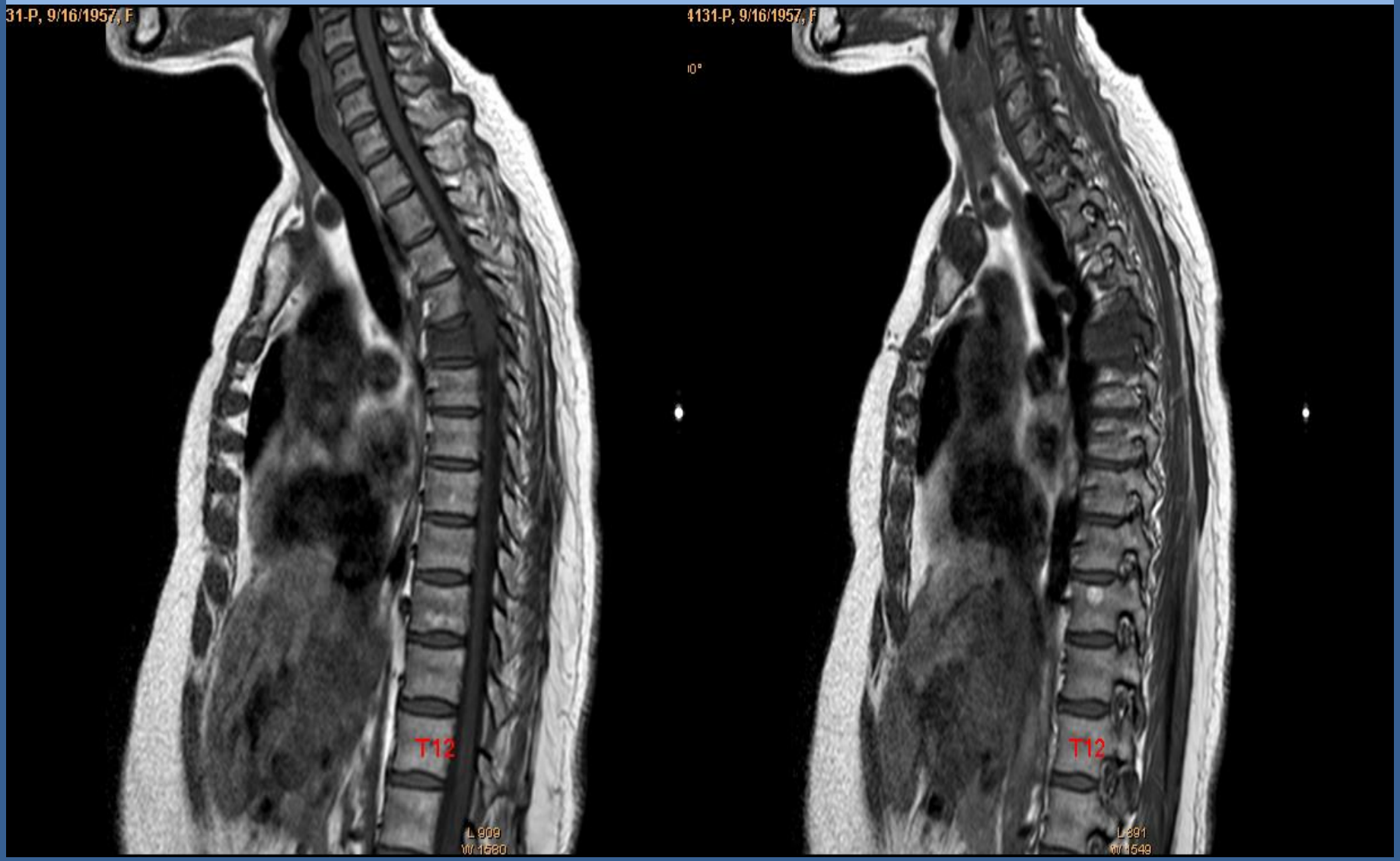
Quadriparesis



Prolapse cervical disc
in a 27 year-old man

MALIGNANT DISEASE

Female 61 / Spastic paraparesis / infiltrated vertebra at T2



Guillain-Barre Syndrome (GBS)

- Flaccid areflexic quadriparesis with little sensory loss
- Proximal or distal weakness or both
- Back and limb pain may be prominent
- Bladder function typically preserved
- Bilateral facial weakness (Bell's phenomenon)
- 30% will require ICU care: mortality <15%

GBS: risk factors

- At least 2/3 GBS cases preceded by an infection (resp or GI) within 4 weeks
  - Campylobacter jejuni
  - Mycoplasma pneumoniae
  - Haemophilus influenzae
  - Cytomegalovirus
  - Dengue, chikungunya, and ZIKA virus
  - HIV
- GBS may also be triggered by non-infectious causes including vaccine (including flu) administration or surgery

PATIENTS PRESENTING WITH EPISODIC ALTERATION OF CONSCIOUSNESS

Episodic AOC in primary care

- Blackouts, funny turns, staring spells, seizures…
- Diagnostic clues may be in the recent medical, drug, social and family history
- Obtain video wherever possible
- Inadequate or lack of control / relapse / recurrence may signal need for further investigation, including video-EEG

Seizure Versus Epilepsy

Seizure: a symptom

- Typically lasts 3 -4 mins (ictal period) vs status
- Paroxysmal change in behavior due to abnormal neuronal activity in the brain
- Many causes, only one of which is epilepsy
- Approx 10% of people worldwide have a single seizure

Epilepsy: a disease

- Two or more unprovoked seizures occurring more than 24 hours apart
- High probability of more seizures after a single unprovoked event

Seizure imitators

- Syncope (50% have jerking, GTC activity)
- Sleep-related: hypnagogic myoclonus, parasomnias, narcolepsy-cataplexy, REM behaviour disorder…
- Tics, paroxysmal kinesigenic dystonia
- Behavioural: day-dreaming, non-epileptic seizures, tantrums, self gratification, panic attacks…

Seizure provocation

- Alcohol
- Acute stroke / encephalitis
- Drugs: cocaine / tricyclics /amphetamines
- Head trauma
- Light flicker (disco lights, old TV's)
- Sleep-deprivation
- *Systemic metabolic derangements:*

Metabolic derangements that may provoke seizures

- Non-ketotic hyperglycaemia (focal)
- Hypoglycaemia
- Uraemia
- Hyponatraemia
- Hypocalcaemia
- Liver failure

Epileptic Seizure Classification

ILAE 2017

Focal Onset

- With or without impaired awareness
- Non-motor
- Motor
- May progress to bilateral tonic / clonic seizure

Generalized Onset

Non-motor

- Absence (typical or atypical)

Motor

- Bilateral tonic / clonic
- Myoclonic
- Atonic

Un-determined

Focal onset seizures

With awareness……

- Motor (?Jacksonian) or other; sensory; visual; bad smell / taste; nausea; memory disturbance (déjà vu)

Loss of awareness…….

- Automatisms: fiddling with hands or clothes, pacing up and down, running away,…
- Ictal or post ictal aphasia lateralizes to the dominant hemisphere

Progression to bilateral tonic-clonic seizure…….

- Post-ictal hemiparesis (Todd's paresis) lateralizes to the contralateral hemisphere

Seizure Classification

ILAE 2017

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Generalized Onset

Non-motor

- Absence (typical or atypical)

Motor

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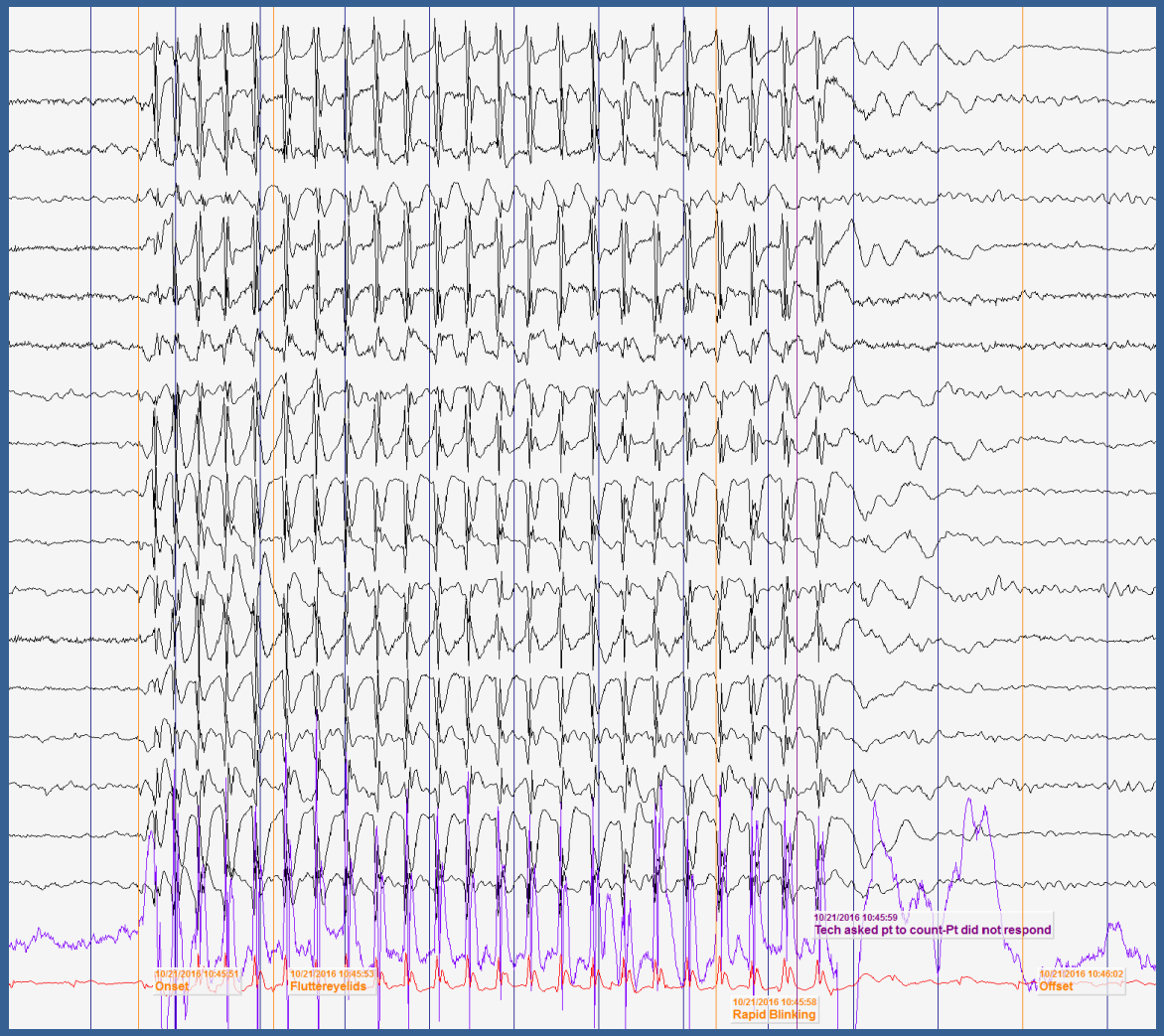
Un-determined

Absence is a generalized onset seizure (petit mal)

Features

- Typically childhood onset (first decade)
- Frequent episodes at onset
- Behaviour arrest for a few seconds
- Blank staring ± eyelid flutter, jaw movements
- No post-ictal confusion

EEG after 1 min of hyperventilation in a 4 year old with typical absence



#Episodic altered consciousness in an adult more likely due to focal onset seizure than absence

- Although both seizure types are associated with loss of awareness it is important to distinguish between absence and focal onset seizures

Focal or absence status epilepticus may present as a confusional state

Definition of status epilepticus

- A single seizure lasting > 5 mins
- A series of 2 or more seizures without full recovery

Presentations

- Convulsive (or tonic-clonic) status
- Non-convulsive (focal or absence) status
- Epilepsia partialis continua (focal motor)

ANTI-EPILEPTIC DRUG (AED) THERAPY

Absence: treatments of choice

- Valproate {beware fetal toxicity}
- Ethosuximide {not active against GTCSz}
- Lamotrigine
- Carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin not effective

Other generalized onset seizures: treatments of choice

- Valproate {beware fetal toxicity}
- Lamotrigine {avoid if associated myoclonus}
- Levetiracetam, topiramate
- Carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin not effective

Focal onset seizures: preferred antiepileptic drugs

- Carbamazepine
- Lamotrigine
- Levetiracetam, topiramate, oxcarbazepine
- Phenytoin (useful IV but beware of awkward pharmocokinetics)
- Add-on: Clobazam, gabapentin, oxcarbazepine

careful to distinguish clobazam from clonazepam

CLOBAZAM

Add-on / focal seizures

Typical adult dose 10-40 mg nocte

CLONAZEPAM

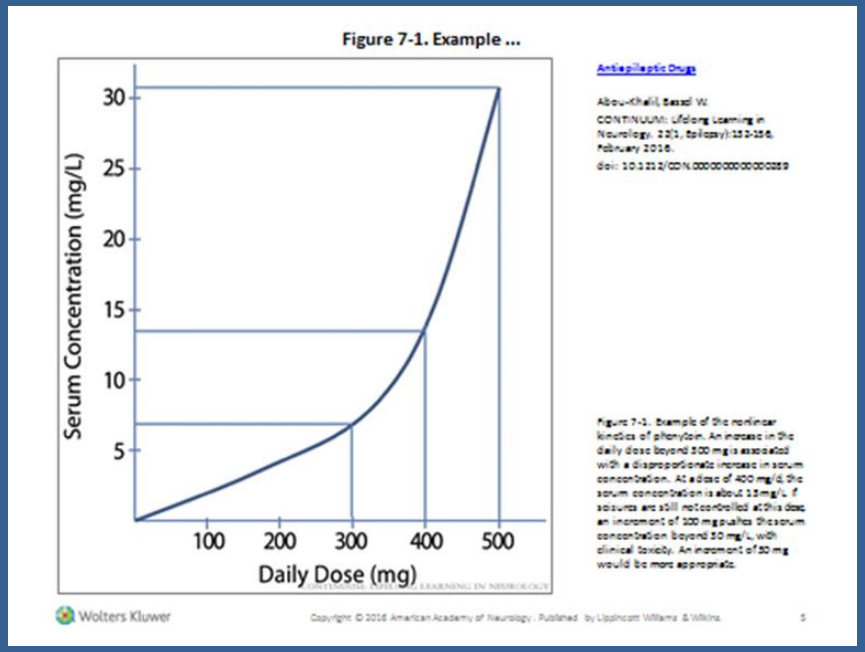
Intractable seizures in paediatric practice

Or myoclonic seizures in adults

Typical Adult dose 0.5-2.0 mg daily

Phenytoin:
non-linear pharmacokinetics

- Therapeutic range 10 – 20 mg/l
- Small increase in dose: massive increase in drug concentration
- Paradoxical increase in seizures documented above 30 mg/l
- Ph conc may remain high for several days after stopping drug in toxic range
- Long half-life means once daily dosing
- Phenytoin loading dose (oral or slow IV) useful for immediate anti-seizure effect ..15-18mg/kg



Impact of Intractable Epilepsy

- 20-30% continue to have unprovoked seizures despite AEDs.
- These patients are at risk of:
  - Cognitive impairment may be due to underlying condition, frequent seizures or AED toxicity
  - Neurotoxicity due to AED (eg. ataxia)
  - Accidental injuries (burns, fractures, head trauma)
  - Psychiatric co-morbidity (depression and psychosis)
  - Increased mortality (2-5 x general population)
  - Sudden Unexplained Death in Epilepsy (SUDEP)

Sudden Unexplained Death in Epilepsy [SUDEP]

- SUDEP ranks second to stroke in years of potential life lost
- Incidence: 1 per 1000 (0.35 -2) person-years (9 per 1000 in epilepsy surgical cases)
- Av age 50.8 years, men > women living alone, <0800 hours , evidence of seizure in 66%

Sveinsson, O. et al. The incidence of SUDEP: a nationwide population-based cohort study. Neurology 2017.

#Death Certification

- Consider SUDEP in patients with epilepsy rather than stroke or MI

Summary points

- Dysautonomia usually signals cluster headache not migraine in a young male patient
- When evaluating the patient with bilateral leg weakness, recall the spinal cord ends at L1
- Distinguish absence from focal seizures
- Recall phenytoin pharmacodynamics
- Consider epilepsy syndrome when prescribing AED
- When writing death certificate for adults with a history of epilepsy, consider SUDEP rather than stroke or MI

THANK YOU