1) A 30 year old woman attends the ED with a 2 month history of feeling weak. She has generalised bone pain and is dyspnoeic. On examination she has a grade 4 generalised weakness and hyporeflexia. She is generally tender.

Blood results:

FBC	normal
Na	137
K	2.8
Ur	4.2
Creat	97
Cl	115
HCO3	15

ABG show metabolic acidosis with respiratory compensation.

What is the anion gap?

(137+2.8)-(115+15) = 9.8

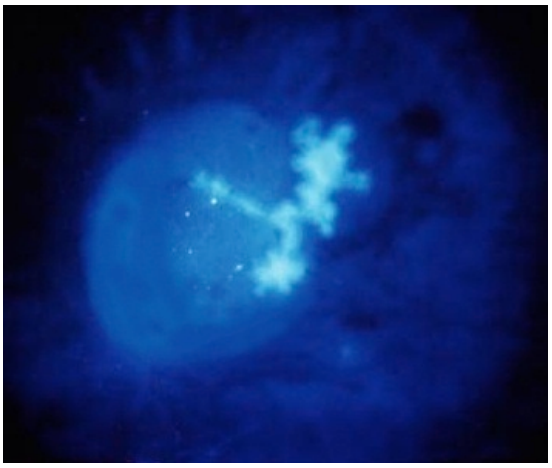
What is the diagnosis?

Hypokalaemic metabolic acidosis with normal anion gap.

Diagnosis is therefore renal tubular acidosis.

Not all cases of metabolic acidosis are caused by increased acid production. In some cases the primary derangement is loss of bicarbonate as occurs with GI losses e.g. profound diarrhoea or vomiting, or renal tubular acidosis. In these cases the serum bicarbonate is low but the body is able to increase the chloride concentration to maintain electroneutrality.

2) This eye has been stained with fluorescein.



What is the diagnosis?

Corneal dendritic ulcer due to herpes keratitis (HSV type 1).

List 4 things to ask for in the history.

i) Pain?
ii) Discharge?
iii) Previous herpes infections?
iv) Systemic disorders ~ ? immunocompromised.

Also contact lens use, reduced visual acuity etc.

Give 3 features of management.

i) Analgesia
ii) Topical acyclovir 3% X5/d
iii) Refer ophthalmology

Topical corticosteroids are contraindicated.

3) A 32 week pregnant lady presents with a headache and BP of 160/100.

List 6 symptoms/signs of pre-eclampsia.

i) Headache
ii) Visual disturbance
iii) Hyperreflexia
iv) Abdominal pain
v) Tremor
vi) Reduced urine output

List 4 risk factors for pre-eclampsia.

i) Primiparity.
ii) Maternal systemic disease – DM, renal disease, hypertension.
iii) Low socioeconomic status.
iv) Maternal age <20 or >35 years.

Give 3 immediate treatments.

i) Hydralazine 5mg IV over 20mins to max. 20mg.
ii) Careful fluid balance; preload of 500ml colloid prior to hydralazine may reduce risk of hypotension and fetal distress.
ii) Magnesium sulphate 4g IV over 5-10 minutes followed by maintenance of 1g/hr for 24hrs.

What are the signs of magnesium toxicity?

Loss of deep tendon reflexes and respiratory depression.

4) A 75 year old man presents with a right hemiparesis and expressive dysphasia. He is fully conscious, has a mild pyrexia of 38.0 and his blood sugar is 10.5mmol/l.

What is the likely diagnosis?

CVA – infarct (80% of strokes).

The definition of stroke is an acute onset of focal neurological deficit of vascular origin which lasts >24hrs.

Which arterial territory is affected?

Left middle cerebral.

Give 4 immediate managements that may reduce morbidity.

i) Aspirin 300mg after an urgent CT scan to exclude haemorrhage.
ii) Correct hypoglycaemia.
iii) Thrombolysis – rtPA 0.9mg/kg (if within 3hrs of symptom onset→10% absolute reduction in death or disability).
iv) Admit to specialised stroke unit.

Also optimise airway/oxygenation, careful fluid balance, antipyretic to reduce fever, correct metabolic disturbances, good nursing care etc.

Give 4 contraindications to thrombolysis.

Absolute:

i) Active internal bleeding (not menstruation).
ii) Known intracranial neoplasm.
iii) Severe uncontrolled hypertension.
iv) Suspected aortic dissection.

5) Give the chronology of ossification at the elbow.

1-2 Capitellum
4 Radial head
6 Internal (medial) epicondyle
8 Trochlea
10 Olecranon
12 Lateral epicondyle

6) A 6 year old boy suffers a laceration over the distal forearm whilst at school and is brought in by a teacher.

What strategies can be used to facilitate suturing of the wound with minimal distress to the child? Give 4.

i) Distraction/ play techniques.
ii) Suitable environment.
iii) Reassurance by good interaction with carers/ parents.
iv) Oral analgesia.

The child becomes very distressed and you are unable to suture the wound safely. You telephone the child's mother to explain that her son will need sedation or GA for suturing. She refuses to come to the ED or give her consent. Give 4 things that have to be done now.

i) Cover wound.
ii) Determine if she is legal guardian.
iii) Establish non-confrontational relationship and explain need for treatment.
iv) Consult with ED senior/ paediatrics team.

7) A 29 year old man presents with sore throat and left ear pain for the past 5 days. On examination he is febrile, with cervical lymphadenopathy and a marked left facial droop. Vesicles are noted in his left ear. The patient has vesicles and blisters on the left side of the tongue. Examination is otherwise unremarkable.

What is the diagnosis?

Ramsay-Hunt syndrome. Facial nerve palsy caused by herpes zoster infection of the geniculate ganglion. There may also be loss of taste on the anterior part of the tongue, tinnitus, hearing loss and vertigo.

Give analgesia and refer to ENT for IV acyclovir and eye care.

8) A 30 year old woman with history of sickle cell disease presents to the ED with severe pleuritic chest pain and breathlessness. She denies haemoptysis or leg swelling. On examination she has a temperature of 38.0, RR 22/min, pulse 98/min, BP 126/65, SaO2 93% on RA. Chest examination is unremarkable apart from a few crackles in the right lower lung field.

Give 3 differential diagnoses.

i) Sickle cell 'acute chest syndrome'
ii) Pneumonia
iii) Pulmonary embolism

Outline your initial treatment.

i) Keep patient warm, rested and give O_2.
ii) Opioid analgesia is usually required for pain.
ii) Careful rehydration with fluids – crystalloid.
iv) Empirical antibiotic therapy e.g. cefuroxime 750mg IV tds.
v) Exchange transfusion may be required; aim for Hb between 7-9g/dl as any higher can increase blood viscosity and precipitate further sickling.

List the most useful investigations

i) FBC
ii) Infection screen – blood culture, CXR, MSU
iii) U&E, ABG, ECG

Patients with sickle cell trait usually have no disability except at times of severe hypoxia. Patients with sickle cell anaemia have chronic anaemia (8-10g/dl) and a small percentage have recurrent crises. Later in life, chronic ill-health supervenes with renal failure, bone necrosis, osteomyelitis (Salmonella), there is an increased susceptibility to infection, leg ulcers.

Sickle cell crises can occur spontaneously or follow infection, cold, dehydration or any situation where tissue hypoxia exists. Acute medical and surgical emergencies may be mimicked.

i) Acute painful crises are the most common presentation; severe pain at one or more sites associated with pyrexia, tenderness and local warmth and swelling. Haemolysis may be increased – there is a fall in Hb and reticulocyte count is increased. There are no reliable markers to indicate severity.

ii) Chest crisis is the most common cause of mortality. There is vaso-occlusion of the pulmonary microvasculature resulting in local infarction. May be precipitated by infection.

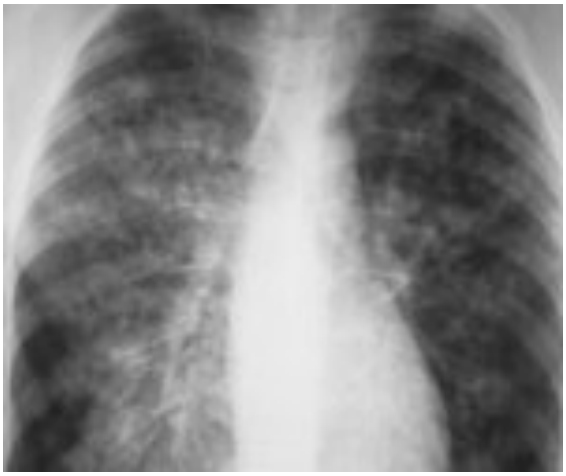
iii) Cerebral infarction: usually children <5yrs, rare in adults. Presents as acute stroke.

iv) Splenic/ hepatic sequestration: usually children <5yrs, RBCs become trapped in spleen and liver, causes severe anaemia and circulatory collapse.

v) Aplastic crisis: usually in children and young adults, mainly caused by parvovirus infection. Reduced reticulocyte count.

vi) Priapism: Local vaso-occlusion causes prolonged, painful erections. Urological emergency.

9) This is the CXR from a 25 year old man who admits to regular use of crack cocaine. He has presented with SOB and pleuritic chest pain. Clinical examination is unremarkable.



Describe the X-ray appearance.

Ill-defined nodular soft tissue shadowing throughout both lungs, predominantly of a perihilar distribution.

What is the diagnosis?

Crack pneumonitis.

Give 3 differential diagnoses.

i) Atypical pneumonia.
ii) Sarcoidosis.
iii) Extrinsic allergic alveolitis.

Respiratory complications of crack use can include pneumonitis, infections, pulmonary oedema, pulmonary fibrosis and ARDS.

10) Question about urethral injury.

Possible signs of urethral injury:

i) Perineal bruising
ii) Blood at external urethral meatus
iii) Abnormally high-riding prostate
iv) Inability to palpate prostate

Remember the parts of the urethra;

Prostatic urethra (3cm, receives prostatic ducts and ejaculatory ducts), membranous urethra (2cm, pierces voluntary sphincter of bladder), anterior urethra (15cm, traverses corpus spongiosum and made up of bulbar and penile sections).

Rupture of the membranous urethra occurs in about 30% of severe pelvic fractures~ the prostatic urethra is fixed so the membranous part gives way. Blunt trauma to the perineal area may result in bulbar trauma.

Investigation may involve retrograde urethrogram or antegrade cystography via an SPC.

The main complication of urethral trauma is recurrent stricture.

11) A 24 year old girl presents one week after a large partial thickness burn to her leg. She has severe diarrhoea and is unwell. On examination she is drowsy, febrile and shocked. No focal neurology. There is a widespread macular rash.

Investigations:

Hb	14.5	WCC	14	Plt	100
Urea	10	Creatinine	158	Potassium	7
CK	400				

Give the most likely diagnosis.

Toxic shock syndrome ~ caused by exotoxins from Staph. aureus (occasionally streptococci). Some cases during menstruation are related to tampons, others occur after burns, surgery or other trauma.

There is high fever, generalized rash, confusion, diarrhoea, muscle pains, hypotension and renal failure. There may be desquamation from hands and feet. Death may occur from MOF.

Treat for shock with circulatory support and IV flucloxacillin. Remove tampons if present. Send urine for urine MC+S. Take vaginal, throat and wound swabs.

12) Question about electrical injury to hand ~ patient has difficulty flexing MCPJ and extending IPJ of ring and little fingers.

Which muscles are responsible for these movements?

3/4th lumbricals.

Remember ~ interossei abduct/ adduct fingers.

Nerve supply to 3/4th lumbricals (and interossei and adductor pollicis) is from the ulnar nerve.

Describe the position of the fascial spaces of the hand.

i) Superficial pulp spaces of fingers
ii) Synovial tendon sheaths of the flexor tendons ~ that of the 2nd, 3rd and 4th fingers are closed off proximally at the metacarpal head but the synovial sheaths of the thumb and little finger extend into the palm (see diagram).
iii) Midpalmar space
iv) Thenar space

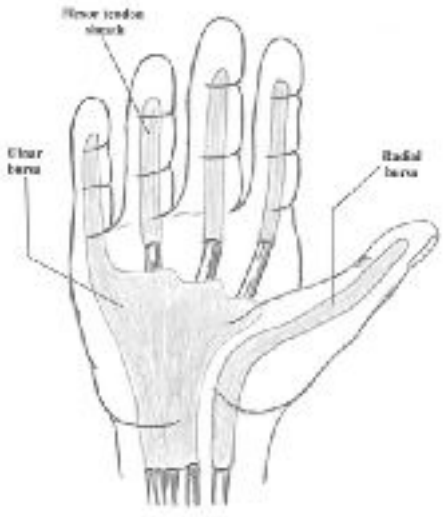


Diagram shows flexor tendon sheaths; midpalmar and thenar spaces lie deep.