RADIOLOGY TEACHING Master copy of questions

1.

Basic CXR: describe the features of this CXR. What information can you glean from it?

- Portable – patient too unwell to be sent to radiology
- Erect – patient not too unwell to sit up
- AVR
- Central line (x2) = IJV and SC
- Sternal wires in figure-of-8 shape
- Pleural drain (note hole)
- Enlarged heart
- Pleural effusion
- Minor atelectasis LU/LM
- Collapse/consolidation LLL
- Right basal atelectasis/pleural effusion
- Small apical right Ptx

Can you guess what this lady came into hospital for?

2.

Please describe the features of this CXR. What information can be gleaned?

- Intubated – ICU patient
- Supine – too unwell to sit up
- Central line
- NGT
- Sternal wires – thoracic surgery
- Monitoring leads – cardiac issues
- Left sided effusion
- Left sided empyema – took 3 days to come up
- Unwell

3.

What abnormality can be seen on this CXR? Clue: compare to previous XRays.

- Sternal disruption due to inappropriate activity post cardiac surgery

4.

Presentation: young male with self-inflicted wound to right anterior chest.
CXR: please describe this chest X ray.

- Large right sided effusion – likely haemothorax given history (*Why is there no level?)*
- Small foreign object (bullet)
- Lung contusion mid zone right lung
- What is your first line of management?
- What are you concerned about in this patient?

The chest drain is inserted, and drains 1.5L of frank blood.
Does this patient need thoracotomy?

- Likely to – borderline of current suggestions, which say drainage of 1000-1500ml immediately, or ongoing bleeding of 200ml/hr for four hours
- In this patient, we held off, as the blood stopped there and there was no HD instability

What else would suggest the need for theatre?

- Ongoing bleeding as above

- Other associated injury requiring operative repair
- Ongoing HD instability with no visible bleeding from chest tube – occult or hidden blood sources

What considerations for theatre would go through your mind? (advanced level)

- How would you intubate him? RSI, which drugs, which size tube, anticipated problems
- Ventilatory settings – normal, or for ALI?
- Fasting status and other factors less important
- Needs lines in every orifice – art line, NGT, IDC, CVC if possible.

5.

Pre
Please describe this CXR
What are the causes of pleural effusion? *Infection, malignancy, heart insufficiency*
What clinical features or signs would suggest a pleural effusion needs draining?

Post
Please describe this CXR

6.

57 yo female with complaint of increasing SOBOE, dry cough, and decreased exercise tolerance.

CXR: please describe this CXR. Can you glean any information about the patient from it?
Unwell on ward but not critically so. Lungs with diffuse bilateral infiltrate - ?fibrosis. Air bronchogram.

Causes of pulmonary fibrosis? *Autoimmune, infection, asbestosis/silica/etc, drugs.*

This lady had BOOP/COP. Given steroids, reasonable recovery.

7.

50 yo male from MINDA presents with sudden onset of abdominal pain, distension, obstipation. History of chronic constipation and frequent use of enemas.

Examination: tachycardia, hypotensive, dehydrated, resonant abdomen, abdo tender but not peritonitic, tinkling BS.

Bloods: mild leucocytosis (WCC 13). What other bloods would you consider doing*? Lactate*

Differential diagnosis?

- Volvulus – Bedford Syndrome.
- Bowel obstruction (unlikely in virgin abdomen)
- Ischaemic gut
- Ileus of other cause

Immediate management? Rigid sigmoidoscopy decompression, direct vision.

Long-term management? Bowel resection.

Bonus question: what are the normal diameters of the adult bowel – SB, LB, Caecum? *3, 5, 7cm.*

8.

62 yo male struck by a car that mounted the curb at low speed. No LOC, did not strike head, mobilised to ambo, mobilised into ED, GCS 15/15.

What does his XR show?

What complications are you concerned about with this injury?

- Massive haemorrhage from iliac vessels – pelvis can't tamponade until ~4L blood lost, so can bleed out easily
- Genitourinary injuries less common, with men more likely than women to have urethral injuries
- Remember that the bladder is intrapelvic in adults, intraabdominal in children.

How would you manage this patient?

- In resuscitation room
- First priority – pelvic binder
- Full non-invasive monitoring
- Bloods including G+X and Coags
- Call for MTP if at all concerned

9.

Elderly male, presented with SOB for investigation. Recent LOW, malaise, fevers at night. Smoking history.

What is the abnormality on this CXR?

- Left sided pleural effusion
- Collapse/consolidation

What are the causes of a pleural effusion?

- Transudate vs exudate
- Infection/malignancy/inflammation/pressure imbalance/fluid imbalance – qualitative or quantitative

What blood tests would you order, and why?

- FBE – anaemia, WCC (elevated a little – infection, a lot – leukaemia)
- EUC – renal impairment, electrolytes, although low yield in this patient
- LFT – albumin. Low oncotic pressure, possible cirrhosis. ALP – bony turnover.
- CRP – possibly, but may be of low yield – low number may not mean anything, very high number (>100) may indicate infection
- Coag panel – unlikely to be haemothorax, but coagulopathy needs excluding, particularly before invasive procedures
- Troponin – unlikely to be helpful, but may show a silent MI that has lead to acute heart failure.

Blood tests showed:
Hb 150
WCC 9.2
CRP 11

What do these blood tests indicate?

10.

78 yo female waving goodbye to friend after a visit when the friend accidentally reversed into her, knocking her over, running her over, and avulsing her eyeball.

What is the abnormality on this CXR?

- Flail chest

What are the complications associated with this injury?

- Lung contusion

- Damage to surrounding structures/mediastinal structures
- Pneumothorax
- Pain – this is the major issue usually, as the pain stops patients from breathing deeply. This then causes atelectasis and predisposes to infection, which can be fatal in elderly patients.

When should a CXR be ordered for low-moderate impact chest injury, and why?

- If a CXR shows no fractures, pt will be diagnosed with contusion, discharged home with analgesia, and advised to take deep breaths and watch for signs of infection
- If a CXR shows fractures, pt will be diagnosed with fractures, discharged home with analgesia, and advised to take deep breaths and watch for signs of infection
- So why order an XR that won't change management?
    - Only to exclude Ptx or other injuries

Management of simple rib fractures/contusions?

- Analgesia +++
- Explain to patient that ribs have nerve bundles above and below the rib, so are exquisitely sensitive
- Explain the risk of chest infection if deep breathing exercises not done
- Ensure patient knows to return if symptoms of chest infection evolve
- Elderly patients with social issues and significant pain may need to be admitted for PCA

11.

Elderly female admitted for elective CABG. Post op CXR shown: what is the main abnormality?

- Left sided pleural effusion – moderate-large
- This is common after heart surgery, and will usually resolve once the heart starts working properly

Repeat CXR in clinics at post op visit 6 weeks later:

- What is the abnormality on this CXR?
    - Right paratracheal mass causing tracheal deviation.
    - Linear atelectasis left side (probably residual from operation)
- What could be the cause? – retrosternal goitre
- Bonus points: why are women more prone to autoimmune diseases? *Constitutively higher levels of interferon gamma expressed by women, key cytokine in the autoimmune process.*

12.

What is the abnormality on this CXR?

- Large right pleural effusion

What would be your differential of causes? What key history are you going to cover?

- Infection/inflammation/CHF/malignancy/etc etc
- Malignancy history – LOW, malaise, smoking history, occupational history, anaemia
- Infection history – fevers, rigors, etc.

13.

74 yo female involved in MVA. Presented with painful left shoulder girdle and dyspnoea. HR 110, BP 160/100, Sats 98% RA.

What is the abnormality on this CXR?

- Large left pneumothorax
- Poor inspiration by patient gives impression of small lungs
- Rotation of film gives impression of widened mediastinum
- Defibrillator evident
- Usual foreign object search – wires, etc.

What is the management for a pneumothorax?

- First define the size and clinical effect of the Ptx
- Simple PTx – may be conservatively managed and followed up closely
- Moderate to large – chest drain insertion with UWSD
- Should you give oxygen if her sats are 98%? And why?

14.

65 yo male presents with the following CXR. What is the abnormality?

- Left pneumothorax
- Multiple introduced lines and objects – name them?

This man had recurrent pneumothorax secondary to lymphoid granulomatosis. The following CXR shows the management of his problem:

- VAT (video assisted thoracoscopy) and pleurodesis
- Pearl: abnormal is not always abnormal. Sometimes we cause it deliberately!

15.

19 yo female presents with ongoing SOB, which has been an intermittent problem for two years. CT chest shown: abnormalities? Causes?

- Lung windows on CT – compared to soft tissue windows.
- Multiple nodules throughout lung
- Obese patient – subcutaneous tissue thick. NB: CT fat on females vs males – distribution.

Amy had metastatic Ewing's sarcoma of her right leg for which she had an AKA. Her SOB was due to recurrent pleural effusions, so she was admitted for an elective VAT pleurodesis.

16.

CXR 1 – 43 yo Aboriginal male presented with SOB on a background of smoking, DM2, HTN, high cholesterol, and AF. Minimal history from patient due to cultural differences. What is abnormal here?

- Bilateral dense alveolar opacities in mid zones
- No effusion
- Likely infection

How does this CXR differ from pleural effusion?

- Costophrenic angles clear
- No Kerley B lines, although you could argue there are a few Kerley A lines??
- No upper lobe diversion of oedema

If this was a patient with history of pneumonia and CHF, what test could you do to differentiate between the two causes?

- BNP – good negative predictive value for CHF if <100, good positive predictive value if >1500 for CHF. Intermediate numbers must be correlated with clinical picture.

Repeat CXR taken 16 days later: clearly pneumonia with consolidation evident.

Pearls: ATSIC patients are physiologically older than their age in years, and more likely to have significant illnesses that are more resistant to treatment.

17.

38 yo female deliberately drove car into tree at 80kph. Complaining of sternal pain and dyspnoea. What is the abnormality on this CXR?

- Moderate-large right sided Ptx

- No obvious rib fracture

18.

50 yo female presents with mucosal injury from chicken bone with impaction for 6/7 in oesophagus. NGT passed. CXR ordered to check position of NGT. Can the NGT be used?

- Nope. It projects over the right costophrenic recess and likely lies in the pleural cavity. Hard to say if it has entered the pleural cavity via the airway or oesophagus.

Later CXR taken after an attempt to reposition the NGT. What is now wrong? Where was the NGT most likely to have been based on this CXR?

- Large right sided pneumothorax
- This suggests the NGT was in the right pleural cavity, causing an internally sourced pneumothorax.

19.

61 yo female presented with headache and syncope after PFO. This is her CT. What is the abnormality?

- Extensive parenchymal haemorrhage in the right temporal lobe
- Loss of grey-white differentiation in this region
- Hypodensity suggestive of ischaemic haemorrhage
- Extensive subarachnoid haemorrhage in same area
- Acute on sub acute subdural haemorrhage in frontotemporal region
- Compression of right lateral ventricle, anterior horn
- Minor midline shift

20.

53 yo male noted to have abnormal coronary artery on elective angiogram. What is the abnormality?

- Massive dilatation of the LCx artery, which is markedly tortuous
- Widest diameter of LCx is 24.5mm (normal 4mm)

21.

90 yo female presented with decreased GCS and right sided flaccid paralysis. What does the CT show?

- Left frontoparietal intraparenchymal acute haemorrhage
- Surrounding oedema
- Haemorrhage has ruptured into left lateral ventricle
- Minimal midline shift
- No hydrocephalus

22.

80 yo male presented with chest pain radiating to left chest and back; history of moderate mitral regurgitation. What is the abnormality shown?

- Large fusiform aneurysm involving descending thoracic aorta
- Mural thrombus present

Patient had endovascular stent inserted after this was found. This subsequently became infected…

23.

66 yo male presented with chest pain. Troponin and ECG normal. D dimer 4.5. Sent for CT for ?PE. What is the abnormality on this CT scan?

- Stanford Type A dissection of the aorta with compression of the true lumen of the aorta.
- No PE found

Learning points: what does D dimer mean? How is it used? What sort of complications could you expect from a Type A dissection?

24.

84 female involved in MVA. No LOC, self-extricated. Ten minutes later, had dense R hemiplegia. Code STROKE called. What does the CT show?

- Acute intra-axial haemorrhage within left frontal lobe posteriorly
- Likely secondary to trauma
- Bleeding has extended into left lateral ventricle

25.

Basilar aneurysmal bleed. Three days later, nil improvement in physical state. Repeat CT taken – what does this show?

- Acute bleeding – large intra-axial haemorrhages within the cerebellar hemispheres
- Pooling of blood in posterior horns of lateral ventricles
- New contusions in both frontal lobes and right temporal lobe
- Loss of grey-white matter differentiation throughout
- Effacement of sulci and ventricles
- Brain death

26.

Cow vs person. Tender over right chest, dyspnoea. What abnormalities can you see on this CXR?

- Right fib # 3-5
- Subcutaneous emphysema right side
- Collapse of right lung base

27.

83 yo female presented with dyspnoea, wheeze, and right sided crackles. What does her CXR show?

- Confluent airspace opacity in RUL and left perihilar region
- Infective consolidation likely
- Left basal atelectasis

28.

91 yo female presents with delirium, hallucinations. GCS 13/15 yesterday, now 9/15. Known atypical meningioma. What does this CT slice show?

- Left posterior parietal meningioma 48x36mm
- Surrounding vasogenic oedema
- Persistent effacement of left sided sulci and lateral ventricle
- No acute bleeding
- NB: cochlear implant on left side

29.

67 yo male presented with decreased conscious state, tachypnoea, and sats of 70% RA. What does the CXR show?

- large left-sided pneumothorax with almost complete collapse of the left lung.
- associated mediastinal shift to the right
- TENSION PTx

What blood tests will you order, and why?

- Only blood test of importance in emergency is blood gas:

  pH 7.06
  pCO2 115
  PO2 36

Patient palliated and passed away soon after.

30.

85 yo female presented after unwitnessed fall. Complaining of pain left lower leg. UTWB. Large laceration over left tibial area. What does XR show?

- oblique fracture involving the junction of middle and distal thirds of the tibia with overlying skin defect, consistent with an open fracture.
- displaced transverse fracture of the proximal shaft of fibular
- Undisplaced fracture of the distal shaft of fibular is also noted.

What are the priorities of management? Analgesia, splint/reduce, ortho input.

31.

91 yo male presented with SOB. Recent # NOF, now complaining of non-pleuritic pain over right ACJ. What are the abnormalities on this xray?

- Extensive sclerotic bony metastases are noted - limiting interpretation of lung fields.
- There is the impression of some patchy consolidative change involving the right middle lobe with obscuration of the right heart border.
- Minor anterior segment RUL consolidation peripherally

Blood tests showed the following: please interpret.

Hb 93
WCC 6.1
Plat 207

EUC normal

LFT:
Bili 12
GGT 106
ALP 495
ALT 30
AST 51