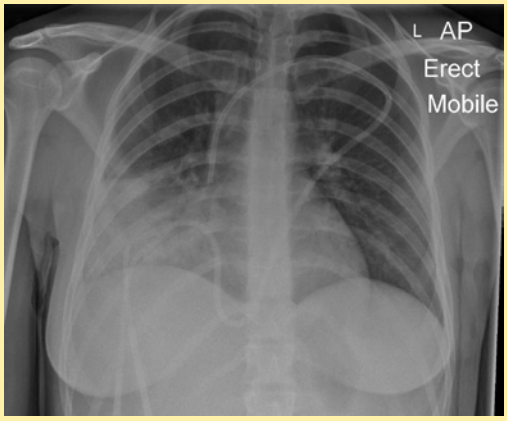
Radiology corner

Case 1

A 34-year-old female with acute lymphoblastic leukaemia presents with a productive cough.

1. What lobe is definitely involved in the pathological process?
   a) Right lower lobe
   b) Right upper lobe
   c) Right middle lobe
   d) No lobar involvement – pleural effusion only
2. Is the tunnelled dual lumen catheter appropriately positioned?
   a) Yes
   b) No



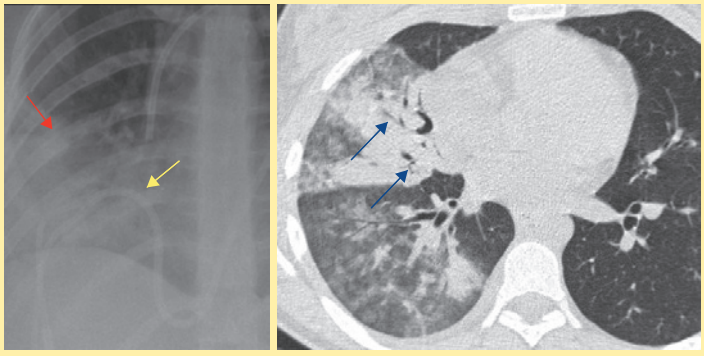
Case 2

A 39-year-old female presents with chest pain.

1. What is the main abnormality?
   a) Normal appearances
   b) Bony abnormality
   c) Soft tissue abnormality
   d) Paravertebral abnormality
   e) Lung parenchymal abnormality

Answers

Case 1



1. c) Right middle lobe. There is consolidation within the right lower zone and given the clinical history an infective aetiology is most likely. The abnormality affects the right middle lobe as it is limited superiorly by the horizontal fissure (red arrow) and there is loss of clarity of the right heart border (yellow arrow). The horizontal fissure as a general rule runs from the lateral aspect of the right sixth rib to the level of the right hilar point and may be visualised on a normal chest radiograph.
   The axial CT correlate confirms the dense consolidation with air bronchograms evident (blue arrows). The axial CT image also identifies ground-glass and dense parenchymal opacification within the right lower lobe.
2. a) Yes. The dual lumen catheter is appropriately positioned with its tip located at the junction of the SVC and right atrium.

Case 2

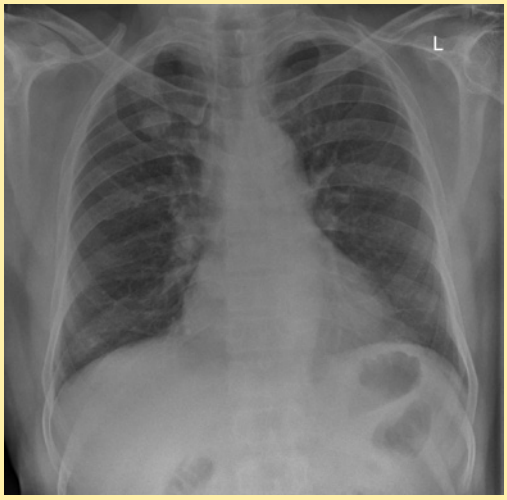
1. b) Bony abnormality. The main abnormality is the presence of inferior rib notching. This patient had aortic coarctation and on the chest radiograph the appearances are suggestive of a high aortic knuckle. It is difficult to assess for the "figure 3" sign of aortic coarctation on this radiograph due to the prominent manubrium. The bilateral inferior rib notching is due to enlarged intercostal arteries due to collateral flow from the internal mammary arteries (these arise from the subclavian vessels bilaterally). This results in pressure erosion on the inferior aspect of ribs 3–9 bilaterally.
   The differential diagnoses for inferior rib notching are listed in the table below.

Enlargement of collateral vessels (arteries, veins)
Coarctation of aorta
Interrupted aortic arch
Subclavian artery obstruction (Takayasu's disease)
Blalock–Taussig shunt (upper two ribs)
Superior vena cava obstruction
Intercostal nerves (neurogenic tumours) (schwannoma, neurofibromatosis type 1)
Hyperparathyroidism

Case 3

A 42-year-old male presents with acute onset of chest pain.

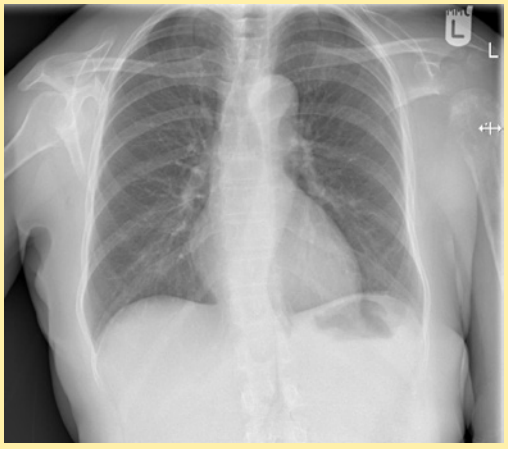
1. What is the main abnormality?
   a) Mediastinal abnormality
   b) Hilar abnormality
   c) Lung parenchymal abnormality
   d) Bony abnormality
   e) Normal appearances



Case 4

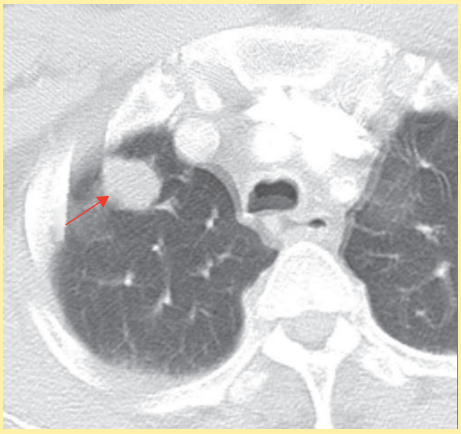
A 53-year-old female presents with loss of appetite and weight loss.

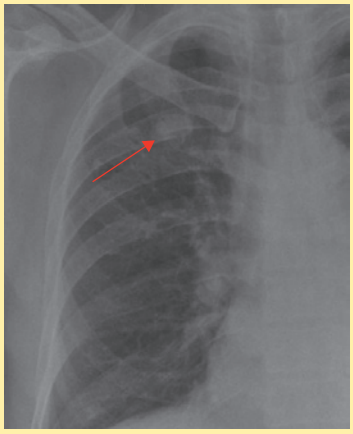
1. What is the main abnormality?
   a) Normal appearances
   b) Lung parenchymal abnormality
   c) Pleural abnormality
   d) Mediastinal abnormality
   e) Bony abnormality



Answers

Case 3





1. c) Lung parenchymal abnormality.
There is a round soft tissue mass projected behind the anterior aspect of the right first rib (red arrow), which was confirmed on subsequent axial computed tomography (CT) imaging. This was confirmed to represent a bronchial adenocarcinoma on tissue biopsy. Remember to assess the "check" areas on a chest radiograph for hidden masses, *i.e.* apices, hilar regions, retrocardiac region, adjacent to the lateral chest walls and below the diaphragm.
The differential diagnoses for a solitary pulmonary nodule are listed in the table below.

Neoplasm	Bronchogenic carcinoma
	Solitary metastasis
	Bronchial carcinoid (most are benign)
Infective	Tuberculosis
Granulomas	Granulomatosis with polyangiitis
	Rheumatoid necrobiotic nodule
Other	Hamartoma
	Pulmonary arteriovenous malformation
	Haematoma

Case 4

1. e) Bony abnormality. There is a destructive lesion of the left humeral head, which is dislocated inferiorly on this single AP view. This is an aggressive process as there is an ill-defined zone of transition with cortical destruction. Given the nature of the film it is difficult to assess for subtle periosteal reaction.
Given the age of the patient metastases and multiple myeloma are the most likely causes of these findings. The primary cancers to particularly consider are breast, bronchus, thyroid and renal.