



## Final Examination for the Fellowship in Clinical Radiology (Part A)

### Specimen Questions

- 1 A 56 year old woman with breast cancer is treated with radiotherapy and chemotherapy. Twenty years later, she presents with increased difficulty in walking over three months. Plain pelvic radiograph is normal. MRI of the lumbar spine shows two foci of low signal in the sacral ala on T1-weighted imaging. Bone scintigraphy shows focal tracer uptake in the sacrum and pubic rami.

What is the most likely diagnosis?

- (a) leukaemic infiltration
  - (b) multiple myeloma
  - (c) insufficiency fractures
  - (d) metastatic breast carcinoma
  - (e) sacral chordoma
- 2 An athletic 13 year old boy presents to the emergency department with a painful right hip. Pelvic x-ray demonstrates an irregular shaped bone adjacent to the anterior inferior iliac spine.

The avulsion of which muscle is most likely to have caused this injury?

- (a) iliopsoas
  - (b) rectus femoris
  - (c) sartorius
  - (d) biceps femoris
  - (e) vastus medialis
- 3 A 30 year old man presents with a three month history of right wrist pain and swelling. A radiograph demonstrates a well defined lytic abnormality in the distal radius extending to just below the articular surface.

What is the most likely diagnosis?

- (a) aneurysmal bone cyst
- (b) giant cell tumour
- (c) fibrous dysplasia
- (d) chondromyxoid fibroma
- (e) osteoid osteoma

- 4 A 35 year old primigravida presents for antenatal ultrasound at 35 weeks' gestation. The sonographer identifies a focal hyperechoic 3 cm lesion in the right lobe of the mother's liver. Hepatitis serology is negative and liver function tests are normal. Post-partum MR scanning shows a central area of high signal intensity on T2-weighted pre-contrast sequences, intense enhancement with IV gadolinium on T1-weighted at 25 seconds post-injection and isodensity with normal liver on T1-weighted at 75 seconds after IV gadolinium.

What is the most likely diagnosis?

- (a) focal nodular hyperplasia
  - (b) adenoma
  - (c) haemangioma
  - (d) hepatocellular carcinoma
  - (e) metastatic colonic carcinoma
- 5 A 40 year old man presents with bright red rectal bleeding, hypotension and tachycardia. He is initially resuscitated. The colonoscopist is unable to negotiate the sigmoid colon and active bleeding is seen from proximal bowel. Endoscopy to the third part of the duodenum is normal. A  $^{99m}\text{Tc}$  RBC scan demonstrates accumulation across the upper abdomen, interpreted to be the proximal transverse colon. An angiogram is performed.

Which vessel should be catheterised to maximise the chance of demonstrating the bleeding point and what would be the most likely cause of this?

- (a) coeliac axis and villous adenoma
  - (b) coeliac axis and angiodysplasia
  - (c) superior mesenteric artery and villous adenoma
  - (d) superior mesenteric artery and angiodysplasia
  - (e) inferior mesenteric artery and villous adenoma
- 6 A 72 year old man, with a past history of coronary bypass surgery and transient ischaemic attack, comes to the clinic with a nine month history of weight loss and unwillingness to eat due to abdominal pain associated with meals. Investigation shows an iron deficiency anaemia and reduced serum albumin.

What is most likely to be found on abdominal imaging?

- (a) caecal pole mass on double contrast barium enema
  - (b) multiple polyps on small bowel enema
  - (c) severe atheromatous disease of the aorta with small bowel wall thickening on abdominal CT
  - (d) cavernous transformation of the portal vein on superior mesenteric angiography
  - (e) increased uptake in the region of the terminal ileum on labelled white cell scan
- 7 A 50 year old woman develops a non-tender nodule within the left submandibular gland. Ultrasound reveals a hypoechoic mildly lobulated lesion 1 cm in diameter.

What is the least likely diagnosis?

- (a) Warthin's tumour
- (b) adenoid cystic tumour
- (c) intraglandular lymph node
- (d) pleomorphic adenoma
- (e) post-inflammatory sialectatic cavity

- 8 A 50 year old man presents with sudden onset of occipital headache. Cranial CT demonstrates hydrocephalus, subarachnoid haemorrhage and a frontal lobe (gyrus rectus) haematoma.

What is the most likely site for the responsible aneurysm?

- (a) anterior communicating artery
- (b) anterior choroidal artery
- (c) basilar artery
- (d) middle cerebral artery
- (e) pericallosal artery

- 9 A 40 year old Caucasian labourer presents with altered consciousness. A non-enhanced CT scan reveals a small high attenuation intra-axial lesion with considerable surrounding low attenuation in the adjacent white matter. Clinical improvement occurs with steroid treatment and MRI is performed. On T1-weighted imaging, the lesion returns high signal with surrounding low signal intensity.

What is the most likely diagnosis?

- (a) lymphoma
- (b) meningioma
- (c) melanoma metastasis
- (d) intracranial lipoma
- (e) non-small cell lung cancer metastasis

- 10 A 52 year old woman has an L5/S1 discectomy. Ten years later, she presents with sudden onset of left foot drop. A gadolinium enhanced MRI scan of the lumbar spine is performed.

On T1-weighted images, by what is a recurrent L5/S1 disc prolapse indicated?

- (a) a non-enhancing extradural mass at L5/S1
- (b) an enhancing extradural mass at L5/S1
- (c) an enhancing intradural mass at L5/S1
- (d) a non-enhancing intradural mass at L5/S1
- (e) an enhancing intradural mass at L4/L5

- 11 A 56 year old man presents with ataxia and cough headaches. His symptoms increase in severity over three weeks. He stopped smoking five years ago and uses alcohol in moderation. On examination, he has left sided cerebellar signs. Routine biochemical and haematological examinations are normal. A CT scan of the brain shows a solitary 3 cm intra-axial rim enhancing mass in the left cerebellar hemisphere.

What is the most likely diagnosis?

- (a) glioblastoma multiforme
- (b) cerebellar haemangioblastoma
- (c) ependymoma
- (d) medulloblastoma
- (e) metastatic carcinoma

**ANSWERS**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>
C	B	B	A	D	C	C	A	C	A	E