Multiple Choice Questions

Pain after thoracotomy

1. A 62-year-old man complains of shoulder pain on the same side as surgery while on the high-dependency unit after lobectomy. A thoracic epidural was inserted preoperatively. It might be anticipated that the pain would be successfully treated if:
   (a). A suprascapular block is performed.
   (b). The thoracic epidural is bolused with bupivacaine 50 mg.
   (c). He is given ibuprofen 400 mg.
   (d). An interscalene block is performed.
   (e). His chest drain is withdrawn by 3 cm at the skin.

2. Regarding the pathophysiology of post-thoracotomy pain:
   (a). The phrenic and vagus nerves convey nociceptive signals from the parietal pleura as opposed to the visceral pleura.
   (b). An intercostal nerve block will stop somatic pain arising from the skin of the back, muscles and ribs after posterolateral thoracotomy.
   (c). The development of a neuroma at the site of intercostal nerve injury can lead to central sensitization.
   (d). Muscle-sparing thoracotomies are associated with less pain than posterolateral thoracotomies as they span fewer dermatomes.
   (e). Continued nociception leads to hyperexcitability of the dorsal horn neurones and higher pain centres, leading to primary sensitization.

3. Paravertebral analgesia:
   (a). Is a suitable alternative to thoracic epidural analgesia in a 24-year-old patient undergoing pleurectomy for recurrent pneumothoraces.
   (b). Would be contraindicated in a patient with an international normalized ratio (INR) of 1.5.
   (c). Provides superior pain relief when a local anaesthetic and opioid mixture is used as opposed to local anaesthetic alone for the block.
   (d). Is a suitable alternative to thoracic epidural analgesia in a patient undergoing lobectomy under open posterolateral thoracotomy.
   (e). Is a suitable alternative to thoracic epidural analgesia in a patient undergoing lobectomy under open posterolateral thoracotomy who has already received intrathecal morphine.

4. Chronic post-thoracotomy pain (CPTP):
   (a). Is unlikely to develop in a 45-year-old woman undergoing open thoracotomy for lobectomy who is administered non-steroidal anti-inflammatory drugs (NSAIDs) and morphine before skin incision.
   (b). Is unlikely to develop in a 68-year-old man reporting a pain score of 8 out of 10 in the recovery room after open thoracotomy.
   (c). Is less likely to develop in patients undergoing video-assisted thoracoscopic surgery (VATS) as opposed to open thoracotomy.
   (d). Is unlikely to develop if the patient is premedicated with gabapentin.
   (e). May be accompanied by persistent cough and weight loss.

Developments in the management of diabetic ketoacidosis in adults: implications for anaesthetists

1. Causes of diabetic ketoacidosis (DKA) include:
   (a). Glucocorticosteroid use.
   (b). Excess alcohol intake.
   (c). Hospital admission.
   (d). Myocardial infarction.
   (e). Underlying infection.

2. A 23-year-old lady with type 1 diabetes mellitus was admitted to the day ward before an elective colectomy for ulcerative colitis. The lady was told to stop all her insulins whilst in hospital as her diabetes would be managed with a variable-rate intravenous infusion; however the surgical team was unable to gain venous access. On the day of surgery she was assessed by the anaesthetist and was found to be drowsy and unwell. Appropriate investigations would include
   (a). Assessment of capillary ketone levels at the bedside using a hand-held ketone meter.
   (b). Measurement of glycosylated haemoglobin (HbA1c) >8.5% or 69 mmol mol$^{-1}$ (levels in an individual without diabetes: 4–6% or 20–40 mmol mol$^{-1}$).
Multiple Choice Questions

(c). Measurement of capillary blood glucose at the bedside using a hand-held glucometer.
(d). Measurement of venous pH and/or venous bicarbonate levels.
(e). Measurement of serum C peptide levels.

3. An 18-year-old man with a 10-year history of type 1 diabetes mellitus on holiday with friends is brought into casualty. He is unwell. Appropriate statements regarding the treatment of DKA include:

(a). The most important initial therapeutic invention in DKA is fluid replacement followed by insulin administration.
(b). DKA is optimally treated with a sliding scale/variable-rate intravenous insulin infusion (VRIII).
(c). DKA should not be treated with a fixed-rate intravenous insulin infusion (FRIII).
(d). DKA can be treated with a continuous subcutaneous insulin infusion (CSII).
(e). Continuation of the long-acting insulin analogues, including Levemir®, Lantus® and Tresiba®, is recommended.

4. A 45-year-old man with type 1 diabetes mellitus presents with DKA secondary to Fournier’s gangrene. A multidisciplinary discussion agrees that the patient requires immediate surgery and resuscitation in theatre. Perioperative management of the patient includes:

(a). Preoperative resuscitation using colloids.
(b). Perioperative resuscitation with Hartmann’s solution with additional potassium chloride.
(c). Use of 0.9% saline with premixed potassium chloride as the preferred DKA resuscitation fluid in theatre and the accident and emergency department.
(d). Stopping the intravenous insulin pump when the patient arrives in theatre because of the risk of hypoglycaemia.
(e). Administration of 20% glucose when blood glucose falls below 14 mmol litre⁻¹.

Computed tomography of the chest—II: clinical applications

1. Concerning pulmonary embolus (PE):

(a). Computed tomography pulmonary angiography (CTPA) is the investigation of choice for pulmonary embolus.
(b). The position of the interventricular septum can be used to assess the haemodynamic effects of a pulmonary embolus.
(c). Dilation of the right ventricle generally occurs with small pulmonary emboli and is diagnostic.
(d). Thrombus may be seen in the right side of the heart.
(e). A saddle PE is one that lodges in the distal pulmonary vasculature.

2. The differential diagnosis for a cavitating lung lesion detected on thoracic computed tomography (CT) scan includes:

(a). Mycobacterial infection.
(b). Infective endocarditis.
(c). Aspergillus.
(d). Malignancy.
(e). H1N1 pneumonitis.

3. Concerning pathology identified on CT of the chest:

(a). CT has a similar sensitivity for diagnosing small anterior pneumothoraces compared with chest radiographs.
(b). CT of the chest may be used for preoperative airway assessment in patients with goitre.
(c). Ground-glass opacification is pathognomonic for pulmonary oedema.
(d). Air bronchograms may be seen within consolidated lung tissue.
(e). CT of the chest is the modality of choice for assessment of complex bony chest injury.

4. With regard to interpretation of chest CT:

(a). CT can be used to diagnose coronary artery disease.
(b). Empyema is associated with the ‘split pleura’ sign.
(c). Lung contusions appear as radiolucent areas in the lung parenchyma.
(d). CT can be used to diagnose misplacement of indwelling devices.
(e). CT of the chest is the method of choice for diagnosis of pleural effusion.

Anaesthetic implications for liver disease in pregnancy

1. When differentiating the presenting features of HELLP (haemolysis, elevated liver enzymes, low platelet count) syndrome and Acute Fatty Liver of Pregnancy (AFLP), the following features are more likely to occur with AFLP:

(a). Hypoglycaemia.
(b). Singleton pregnancy.
(c). Thrombocytopenia.
(d). Low body mass index (BMI).
(e). Hypertension.

2. A pregnant woman is admitted to your obstetric HDU at 32 weeks of gestation with right upper quadrant pain. The following statements regarding her management are true:

(a). Immediate delivery should be planned.
(b). Serial measurements of biochemical markers, including liver function, should be performed.
(c). The presence of pruritis confirms a diagnosis of obstetric cholestasis.
(d). If the woman is confirmed to have HELLP syndrome, imaging should be performed to exclude a diagnosis of hepatic haematoma.
(e). Hepatic rupture is usually indicated by the presence of cardiovascular shock.

3. The following statements regarding liver disease incidental to pregnancy are true:

(a). Drug-induced liver injury is the commonest cause of liver dysfunction incidental to pregnancy.
(b). There is a higher incidence of hepatic encephalopathy and hepatorenal syndrome caused by viral hepatitis in pregnancy.
(c). Autoimmune hepatitis tends to worsen during pregnancy.
(d). Most immunosuppressants should be stopped during pregnancy because of the risk of teratogenicity.
(e). Pregnancy is a risk factor for Budd–Chiari syndrome.

4. A woman presents at 28 weeks of gestation with malaise, nausea, vomiting, jaundice and absent fetal movements. She is somnolent but easily arousable. The following statements regarding her management are true:

(a). The absence of confusion is reassuring.
(b). She should be carefully monitored locally for signs of deterioration.
(c). Deteriorating liver function may be predicted by a lactate concentration of >2.8 mmol litre⁻¹ (normal range 0.3–1.3 mmol litre⁻¹).
(d). The use of N-acetylcysteine should be considered.
(e). Regional anaesthesia is preferred for severe disease, in which patients may be more susceptible to encephalopathy after a general anaesthetic.

Rib fracture management

1. Appropriate statements regarding a patient who is admitted to the emergency department with isolated multiple rib fractures are:

(a). The number of fractured ribs alone is the single most important determinant of morbidity.
(b). The rib fracture score takes age into account.
(c). Respiratory complications often only become evident after 48 h.
(d). The rib fracture score is a valid predictor of morbidity and mortality.
(e). Effective analgesia should be instituted promptly.

2. Regarding analgesia for patients with fractured ribs:

(a). Opioids are the mainstay of analgesic management.
(b). Non-steroidal anti-inflammatory drugs may be used in the analgesic regime.
(c). A thoracic epidural is indicated in a patient with bilateral rib fractures.
(d). Fracture of a lumbar vertebral transverse process is an absolute contraindication to a thoracic epidural.
(e). A paravertebral block is a suitable alternative to a thoracic epidural in unilateral rib fractures.

3. Regarding the serratus plane block:

(a). A serratus plane block provides paraesthesia from T4 to T8.
(b). There is a greater spread of local anaesthetic if it is injected superficially to the serratus anterior muscle.
(c). The block can be performed with the patient supine.
(d). The block is contraindicated in patients on antiplatelet therapy.
(e). A catheter can be placed to prolong its effects.

4. Operative fixation of rib fractures:

(a). Should be considered for most rib fractures.
(b). Should be preceded by a three-dimensional computed tomography (3D CT) reconstruction of the chest wall.
(c). Reduces the number of days patients require their lungs to be ventilated.
(d). Usually requires minimal analgesia after surgery.
(e). Will require a chest X-ray after operation.
Hypertension in pregnancy

1. A 26-year-old primigravida presents to the antenatal clinic at 30 weeks of gestation complaining of headache and blurred vision. Her body mass index before pregnancy was 37 kg m\(^{-2}\). Urine dip analysis reveals 3+ protein and blood pressure is 165/100 mm Hg. Regarding the management of this patient:
   (a). The placental growth factor level should be checked to confirm the diagnosis of pre-eclampsia.
   (b). A spot urinary protein:creatinine ratio or 24-h urine collection should be obtained to confirm the diagnosis of pre-eclampsia.
   (c). She should be admitted to hospital and commenced on intravenous hydralazine.
   (d). She should be tested for proteinuria daily to monitor her response to treatment.
   (e). Her body mass index is a risk factor for developing pre-eclampsia.

2. A 40-year-old primigravida attends the delivery ward in spontaneous labour at 36 weeks of gestation requesting epidural analgesia. Before pregnancy she was taking ramipril for hypertension. She was commenced on labetalol before conceiving and her blood pressure control has been adequate throughout pregnancy. Urine dip testing reveals 1+ protein and her blood pressure today is 155/90 mm Hg. Appropriate statements regarding chronic hypertension in pregnancy include:
   (a). There is an increased incidence of superimposed pre-eclampsia.
   (b). Labetalol, nifedipine and losartan are all appropriate antihypertensives for pregnant patients.
   (c). Patients with chronic hypertension should take aspirin from 12 weeks of gestation until birth.
   (d). Patients with chronic hypertension should take calcium supplements from 12 weeks of gestation until birth.
   (e). Antihypertensive therapy should be titrated until blood pressure is <150/100 mm Hg in pregnant women with chronic hypertension and evidence of end-organ involvement.

3. A 34-year-old patient pregnant with twins presents at 32 weeks of gestation complaining of sudden-onset shortness of breath. On clinical examination she has bibasal crackles, a respiratory rate of 30 bpm, blood pressure of 170/110 mm Hg and oxygen saturation of 92% on air. As part of her management an urgent echocardiogram is requested. Common echocardiographic findings in severe pre-eclampsia include:
   (a). Left ventricular hypertrophy.
   (b). Grossly increased left ventricular end-diastolic volume.
   (c). A pericardial effusion.
   (d). Right ventricular dilatation.
   (e). Increased stroke volume.

4. A 28-year-old primigravida is diagnosed with pre-eclampsia at 26 weeks of gestation and started on oral labetalol. At 30 weeks of gestation she is admitted to the labour ward because of difficulty controlling her blood pressure. She is started on intravenous labetalol and hydralazine. Two days after admission she has a generalized tonic–clonic seizure. She is given an intravenous bolus of magnesium sulphate and it is decided to perform an urgent Caesarean section. Appropriate statements regarding her management include:
   (a). The initial intravenous bolus of magnesium sulphate should be 5 g over 30 min.
   (b). Intravenous labetalol is the drug of choice to obtund the hypertensive response to laryngoscopy if general anaesthesia is required.
   (c). The dose of succinylcholine should be halved after magnesium sulphate administration as its action is prolonged.
   (d). A tracheal tube smaller than predicted may be required for general anaesthesia.
   (e). Carboprost should be avoided in the case of postpartum haemorrhage.