

Final FRCA Vascular Anaesthesia Questions (2008-2023)

Carotid endarterectomy

CEA

A 56-year-old man is listed for carotid endarterectomy 10 days after suffering a cerebrovascular accident.

- What are the advantages (4 marks) and disadvantages (4 marks) of performing the procedure under regional anaesthesia?
- What local or regional anaesthetic techniques may be used? (3 marks)
- How can his risk of perioperative cerebrovascular accident be minimised? (6 marks)
- Following this procedure what other specific postoperative complications may occur? (3 marks)

(also written as)

- Why is cardiovascular instability common during CEA? (3 marks)
- Following this procedure what specific postoperative complications may occur? (6 marks)

Carotid endarterectomy and deep cervical plexus block

- Briefly describe your technique for performing deep cervical plexus block for carotid endarterectomy under LA. (35%)
- List the complications associated with deep cervical plexus block. (30%)
- List the advantages and disadvantages of carotid endarterectomy under regional anaesthesia (35%)

Carotid endarterectomy and superficial cervical plexus block

- Describe the anatomy of the cervical plexus. (40%)
- How would you perform a superficial cervical plexus block? (25%)
- A carotid endarterectomy is being performed using a superficial cervical plexus block. A few minutes after clamping the carotid artery the patient becomes unresponsive to verbal command. Describe your management of this situation. (35%)

Lower limb amputation

You have been asked to anaesthetise a 65 year old man for a below knee amputation (BKA).

- What are the potential risk reduction strategies that can be tagged during a pre-operative assessment?
- What are the advantages and disadvantages of a regional technique for anaesthesia in this group of patients?
- What were the key findings with regard to perioperative care of patients undergoing lower limb amputation in the recent NCEPOD report on lower limb amputation?

BKA

You are called to see a patient who has had a below knee amputation 24 hours ago. Despite using a patient controlled analgesia (PCA) pump with intravenous morphine he is still in pain.

- a) Why might his pain control have become inadequate? (6 marks)
- b) How would you re-establish optimal pain control? (6 marks)
- c) What features could indicate that this patient is suffering from post-amputation pain syndrome

(phantom limb pain)? (3 marks)

- d) What further pharmacological options are available for managing post-amputation pain syndrome? (5 marks)

AAA

Aortic cross clamping

You are providing emergency anaesthesia for a 69 year old man who has a ruptured aortic aneurysm. The surgeon has cross-clamped the aorta.

- a) Briefly describe the anatomy of the abdominal aorta and how it gives rise to the renal circulation (4 marks)
- b) What are the potential sites for aortic cross clamping? (2 marks)
- c) Describe the (i) haemodynamic (ii) metabolic changes that occur with aortic cross clamping. (5 marks)
- d) What changes may occur with aortic unclamping? How may these be attenuated? (6 marks)
- e) What measures may reduce the likelihood of acute renal failure? (3 marks)

Endovascular aneurysm repair

A 79-year-old patient presents with a leaking abdominal aortic aneurysm. The vascular surgery/radiology team decide to undertake an endovascular aneurysm repair (EVAR) procedure.

What are the main preoperative anaesthetic considerations for this procedure? (55%)
Describe options for providing anaesthesia for this case and give the advantages /disadvantages of each. (45%)

A 79-year-old man with a 6cm infra-renal abdominal aortic aneurysm is to undergo an endovascular aneurysm repair (EVAR). He is known to have chronic obstructive pulmonary disease.

- a) What are the advantages of an EVAR compared to an open repair of the aneurysm for this patient? (8 marks)
- b) List the risk factors for acute kidney injury (AKI) during any EVAR procedure. (6 marks)

c) Describe perioperative measures to prevent AKI following EVAR. (6 marks)

Emergency ruptured aortic aneurysm repair

A patient presents to the Emergency Department with a suspected ruptured abdominal aortic aneurysm.

What are the priorities in your preoperative management? (40%)

The consultant vascular surgeon would like to repair the ruptured aortic aneurysm. Describe your anaesthetic management in the operating theatre. (50%)

TEVAR

You are called to see a 62 year old male on the High Dependency Unit. He underwent elective stenting of a thoracic aortic aneurysm (Thoracic EndoVascular Aortic Repair TEVAR) 6 hours ago. The procedure was performed under combined spinal epidural anaesthesia. The nursing staff are concerned that, although the epidural infusion was discontinued two hours ago, the patient cannot move his legs and is showing no evidence of recovery of his sensory or motor block.

Why may he still be unable to move his legs?

How would you tell between these possible causes?

What further investigation may be necessary?

How would you manage this patient?

What are the problems associated with anaesthesia for planned placement of endovascular stents for Abdominal Aortic Aneurysms?

Aortic dissection

- a) What are the main types of aortic dissection - pick a popular classification. How does this affect management?
- b) What are the risk factors for aortic dissection?
- c) What are the clinical features?
- d) What are the radiological features?
- e) What are the main principles of anaesthesia for emergency surgery for an aortic dissection?

You have been pre-alerted to the Emergency Department where Iwan, a 58 year old gentleman has presented with a suspected aortic dissection.

- a) List 3 clinical features gathered from the history or examination that may suggest an aortic dissection (3 marks)
- b) List 5 risk factors for aortic dissection (5 marks)

- c) List 3 investigations you would request? (3 marks)

A subsequent CT scan has shown that Iwan has an ascending aortic aneurysm.

- a) What 2 anatomical classifications exist for aortic dissection? (2 marks)
- b) Dissection in what area of the aorta requires urgent surgical intervention (1 mark)
- c) When you review Iwan you notice his blood pressure is 190/95mmHg. Name 2 drugs you could use to manage this situation (2 marks)
- d) List 2 reasons why Iwan might develop coagulopathy following surgical repair of his dissection? (2 marks)
- e) Other than coagulopathy, list 2 other potential complications that may arise postoperatively (2 marks)

References

- 1) Hebballi R, Swanevelder J. Diagnosis and management of aortic dissection. CEACCP (2009) 9(1)14-18 [https://bjaed.org/article/S1743-1816\(17\)30327-X/pdf](https://bjaed.org/article/S1743-1816(17)30327-X/pdf)

Thoracic outlet syndrome

You have been asked to anaesthetise a 48 year old woman for the excision of her first rib to treat thoracic outlet syndrome.

- a) What is thoracic outlet syndrome (TOS)?
- b) What are the risk factors for the development of TOS?
- c) Describe the (i) intraoperative and (ii) postoperative anaesthetic factors in the care of this patient.

Upper limb ischaemia and subclavian steal

You are covering the vascular list. The first patient on the list is a 48 year old woman for a subclavian transposition.

- a) Describe the anatomy of the arterial supply to the upper limb.
- b) What are the causes of upper limb ischaemia?
- c) What is subclavian steal syndrome?
- d) What are the anaesthetic considerations in anaesthetising for a subclavian transposition for subclavian steal syndrome?

Prehabilitation

- a) What is prehabilitation in perioperative medicine? (1 mark)
- b) What are the outcome benefits of a prehabilitation programme? (3 marks)
- c) Which specific issues are addressed as part of medical optimisation in a prehabilitation programme? (6 marks)
- d) How will a prehabilitation exercise programme improve a patient's cardiorespiratory physiology? (4 marks)
- e) What are the benefits of carbohydrate preloading and nutritional optimisation? (4 marks)
- f) What psychologically supportive interventions may be used in prehabilitation? (2 marks)

CPET

- a) List the main measures of fitness that are obtained by a cardio-pulmonary exercise test (CPET) (4 marks)
 - b) What abnormalities seen at the time of testing in a CPET may suggest cardio-respiratory disease? (4 marks)
 - c) When might CPET, using a bike, be impractical (3 marks) and how else can patients' functional capacity be assessed? (3 marks)
 - d) What scoring systems can help predict perioperative risk before major (non-cardiac) surgery? (6 marks)
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1. List 3 main measures of fitness that are obtained by a cardiopulmonary exercise test (CPET) (3 marks)
 2. List 3 indications for the use of CPET (3 marks)
 3. List 5 absolute contraindications for CPET. (5 marks)
 4. List 3 situations where CPET may be impractical? (3 marks)
 5. How else can a patient's functional capacity be assessed? (3 marks)
 6. List 3 other scoring systems are commonly used to assess perioperative risk before major non-cardiac surgery? (3 marks)

References

- 1) Agnew N. Preoperative cardiopulmonary exercise testing. CEACCP (2010) 10(2)33–37, <https://academic.oup.com/bjaed/article/10/2/33/310040>
- 2) Chambers D, Wisely N. Cardiopulmonary exercise testing - a beginner's guide to the ninepanel plot. BJA Education (2019) 19(5)158-164 [https://bjaed.org/article/S2058-5349\(19\)30021-6/fulltext](https://bjaed.org/article/S2058-5349(19)30021-6/fulltext)

SBA

1. A 75 year-old man is admitted to HDU following an episode of severe chest pain and collapse with transient loss of consciousness. On admission he is conscious but complaining of chest pain radiating into his back. Blood pressure measured in the right arm is 210/110. The left radial pulse is absent and there are signs of a left hemiparesis. Which one of the following is the most likely diagnosis?
 - a) Acute pulmonary embolism
 - b) Acute myocardial infarction with systemic embolization
 - c) Dissecting aneurysm of the thoracic aorta
 - d) Acute rupture of the aortic valve
 - e) Rupture of a mycotic aneurysm of the aortic arch

ANSWER = C

Intra-arterial injection & extravasation injury

- a) Give 3 risk factors that can lead to an extravasation injury (3 marks)
- b) List 3 pathophysiological mechanisms for tissue damage in extravasation injury (3 marks)
- c) Name 3 steps involved in the initial management of an extravasation injury (3 marks)

- d) Give 1 specific secondary management / specific antidote used to minimize the risk of permanent injury (1 mark)
- e) List 3 pathophysiological mechanisms thought to be involved in intravascular injury (3 marks)
- f) Give 3 acute clinical features of inadvertent intra-arterial (IA) drug injection (3 marks)
- g) Give 2 patient factors that can predispose to inadvertent intra-arterial (IA) drug injection (2 marks)
- h) After the initial management of an intra-arterial (IA) drug injection, list 2 further steps that can be considered in the management of the problem (2 marks)

References

- 1) Lake C, Beecroft CL. Extravasation injury and accidental intra-arterial injection. CEACCP (2010) 10(4)109-113 <https://academic.oup.com/bjaed/article/10/4/109/381097>
- 2) Combeer E. The final FRCA short answer questions – a practical study guide. Inadvertent intra-arterial injection. Masterpass (2013)

Descending thoracic aortic aneurysms

1. List 3 factors that increase the risk of aneurysm rupture (3 marks)
2. Describe 5 physiological changes associated with the application of an aortic cross-clamp (5 marks)
3. Describe 4 steps you would take to prepare and manage for the physiological changes associated with removal of an aortic cross-clamp (4 marks)
4. List 2 advantages and 2 disadvantages for the use of distal perfusion technique (4 marks)
5. List 2 risk factors for developing renal failure postoperatively (2 marks)
6. List 2 other post operative complications following thoracic aneurysm repair (2 marks)

References

- 1) Puchakayala MR, Lau WC. Descending thoracic aortic aneurysms. CEACCP (2006) 6(2)54-59 [https://bjaed.org/article/S1743-1816\(17\)30392-X/pdf](https://bjaed.org/article/S1743-1816(17)30392-X/pdf)

Cell salvage

1. List 9 key stages and / or components of cell salvage (9 marks)
2. List 5 indications for considering cell salvage (5 marks)
3. List 4 contraindications to using cell salvaged blood (4 marks)
4. When should leucodepletion filters be considered for reinfusion of salvaged blood? (2 marks)

References

- 1) Association of anaesthetists. Cell salvage for peri-operative blood conservation 2018. <https://anaesthetists.org/Home/Resources-publications/Guidelines/Cell-salvage-for-perioperative-blood-conservation-2018>

SOE

1. Short Case - Carotid Endarterectomy

You review a 45 year old male for a carotid endarterectomy, who presented with a TIA 10 days ago

A Carotid Doppler USS shows a 90% stenosis on the left side

He has a PMHx

Hypertension, taking Ramipril

T2DM, Taking Glicazide

Increased BMI

What are the criteria for a Carotid Endarterectomy?

What is the time frame the operation should be performed in?

The patient has a BMI of 45, how will this impact upon your anaesthetic management?

How would you optimise this patient pre-operatively?

What are the complications associated with a CEA?

What is the risk of this patient having a perioperative cardiac event?

What is cerebral hyperperfusion syndrome?

What are the risk factors for cerebral hyperperfusion syndrome?

What is the treatment?

2. Long Case – Elective AAA Surgery

History:

67 year old man incidental finding of AAA on screening

Reports past medical history of angina

Admitted to hospital last month with chest pain at rest

BP 180/105, HR 78

Examination: bilateral pitting oedema to knees, bilateral fine crackles to bases of chest, slightly breathless at rest

Bloods: Hb 130, Na 133, K 3.4, Urea 11, Creat 200

ECG: LAD & LVH

ECHO: evidence of LVH, LV diastolic dysfunction, biatrial enlargement

Questions:

Summarise the case

Talk me through the investigations

What are your main concerns?

What are the issues with poorly controlled hypertension?

What would you like the BP to be?

How will you achieve this pre-operatively?

He recently has an admission with chest pain, what are your concerns regarding this?

If this episode was unstable angina, what are the options with regards to his elective surgery?

If he needs both PCI and urgent surgery, what are the options?

There is evidence of heart failure on his examination and investigations, how are you going to

manage this?

Can you classify his renal impairment?

Why are you worried about his renal impairment?

How can we stratify risk in this patient? What tools could we use?

Can you describe the revised cardiac risk index?

Is there anything we can do to optimize this patient?

The patient has now arrived for surgery, what pertinent things will you discuss during your pre-op assessment?

How would you anaesthetise this patient?

Can you describe the physiological response to aortic cross clamp?

How can you mitigate the effects of cross clamp?

What complications can occur after this surgery?