THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH

Royal College of Surgeons of England
ADVANCING SURGICAL CARE

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF GLASGOW

RCSI

Joint Committee on Intercollegiate Examinations

JCIE Vascular Surgery

50 Sample Questions

These sample questions and answers are purposed to clarify the nature and format of the FRCS part 1 exam.

Importantly single “best answer” is different to a multiple-choice format with often multiple answers being reasonable but arguably one being the best choice. In devising these sample questions, the JCIE have endeavoured to provide an accurate reflection of the exam and the reasoning behind the choice of “best answer”. However, these sample questions have not been subjected to the standard setting process, which is a vital part of each exam, and allows for questions to be challenged by an expert panel in the light of current evidence. As such it is expected that aspects of these sample questions may be challenged.

The sample questions are here to help explain the nature of the exam and should not be considered definitive answers.

QUESTION ONE REFER TO THE FOLLOWING INFORMATION

1. You are called to ITU by the consultant who is concerned that in placing a right jugular dialysis multi-lumen catheter he is not sure where the catheter is. You decide to perform a contrast linogram, the results of which are shown in the exhibit.

What management does this patient need?

A. Place a wire down the catheter and exchange the catheter
B. Reassure ITU team that they can continue to use the catheter
C. Remove catheter and perform manual neck compression
D. Surgically explore the neck and remove the catheter
E. Surgically open the chest and remove the catheter

QUESTION ONE ANSWER

D. Surgically explore the neck and remove the catheter

Reasoning: The multi lumen catheter tip lies in the aorta and not in the venous system: it descends to the level of the carina, is in the region of the aortic arch and contrast demonstrates the aortic knuckle. Therefore the access was sited into the right Common carotid artery rather than internal jugular vein. A multilumen catheter typically uses a 14French introducer (approx. 5mm diameter). An intimal injury causing a carotid artery dissection that may be exacerbated and occlusive on blind removal is possible. The essence of the question is therefore how is such a common carotid injury best managed.

A. Exchanging the catheter will be of no benefit and may risk a new/ further intimal injury.

B. Using the catheter for intravascular infusion may not cause arterial irritation. However, infusion may exacerbate intimal injury and the in dwelling catheter may precipitate thrombus causing a distal arterial embolism (eg: stroke, bowel infarction).

C. Manual compression of an artery post sheath removal can be attempted with, for example, upto 8Fr devices in the CFA. Removing the multi-lumen catheter without surgical repair risks: (1) pseudoaneurysm formation and/ or catastrophic bleeding, (2) exacerbation of any intimal injury once the “pinning down” effect provided by the catheter is removed, (3) no opportunity to remove or flush out thrombus at the site of insertion.

D. **This is the best answer.** The typical insertion point into the jugular is at a corresponding arterial level that will lend itself to proximal and distal control from the neck. The arteriotomy is explored, the intimal injury at the insertion point is addressed and either a primary repair or patch repair will be conducted depending on the findings.

E. The conventional open surgical approach to the aortic arch and branches is a midline sternotomy. While this will provide maximal exposure, it is very unlikely to be necessary for proximal control purposes. Such an approach may be needed if a Type A aortic dissection has been caused. This is unlikely to have been caused by the catheter insertion and would need a definitive diagnosis with CT angiogram before consider

QUESTION TWO REFER TO THE FOLLOWING INFORMATION

2. A 55 year old fit and well male presents with an asymptomatic swelling on the right hand side of the neck of several months duration. It is otherwise asymptomatic. A CT scan is performed (see exhibit). There is no evidence of lymphadenopathy and no other abnormal blood tests.
How would you treat this pathology?

A. Radiotherapy to the lesion and referral to a genetics clinic
B. Referral to a genetics clinic alone
C. Regular surveillance scanning
D. Resection of the lesion and level IV lymph node clearance
E. Resection of the lesion and referral to a genetics clinic

QUESTION TWO ANSWER

E. Resection of the lesion and referral to a genetics clinic

Reasoning: This is most likely a para-ganglioglioma of the carotid body, also known as a carotid body tumor. There are typical radiologically findings of a rounded, several cm mass, at the carotid bifurcation, splaying apart the ICA and ECA (Lyre sign). Vagal schwannomas or paragangilomas generally occur more superiorly. The tumor is not encasing the ICA and therefore ICA reconstruction is very unlikely required on tumor resection. He does not have the typical epidemiology ($4^{th}/5^{th}$ decade female), however, clearly that does not rule out a carotid body tumor. There is no lymphademopathy to suggest lymphoma or metastatic spread which may suggest (1) an alternative diagnosis or (2) malignant transformation (approximately 5% risk) with the need for locally invasive or metastatic cancer treatment. He is otherwise asymptomatic suggesting (1) CNs 9,10 and 12 are not symptomatically overtly compressed or involved and (2) this tumor is not secreting catecholamines in a symptomatic fashion. There is no anemia, biochemically obvious chronic disease and plasma metanephrine levels are normal. The patient physiologically, based on past medical history and nil identified biochemical chronic disease, is fit for a tumor removal operation. A genetics clinic referral features in several of the answer stems. This is helpful as 10% are familial (family members can be counselled for genetic screening and if positive, subsequent appropriate tumor screening investigations). Also familial carotid body tumors are associated with conditions that may exhibit other site tumors, for example Multiple Endocrine Neoplasia IIa and IIb, neurofibromatosis type 1, von Hippel-Lindau disease, tuberous sclerosis complex, Carney triad and SDHx mutation. Appropriate patient screening investigations can be offered if the genetics indicates one of these conditions. Active treatment is recommended for those that demonstrate growth, secretory features, CN function loss, or aggressive behavior (malignant transformation or local invasion of structures).

A. Radiotherapy to the lesion and referral to a genetics clinic – Radiotherapy does control carotid body tumor growth at a similar rate to surgery (95%). However, with low risks of stroke and malignancy in the longterm, this is not viewed as first line treatment for a relatively young and fit patient such as the question describes. Genetics clinic referral is correct -see above for rationale.

B. Referral to a genetics clinic alone - Genetics clinic referral is correct -see above for rationale. However, this lesion has demonstrated growth from an asymptomatic size to a noticeable size a few months ago, treatment is therefore indicated. Treatment is therefore indicated.

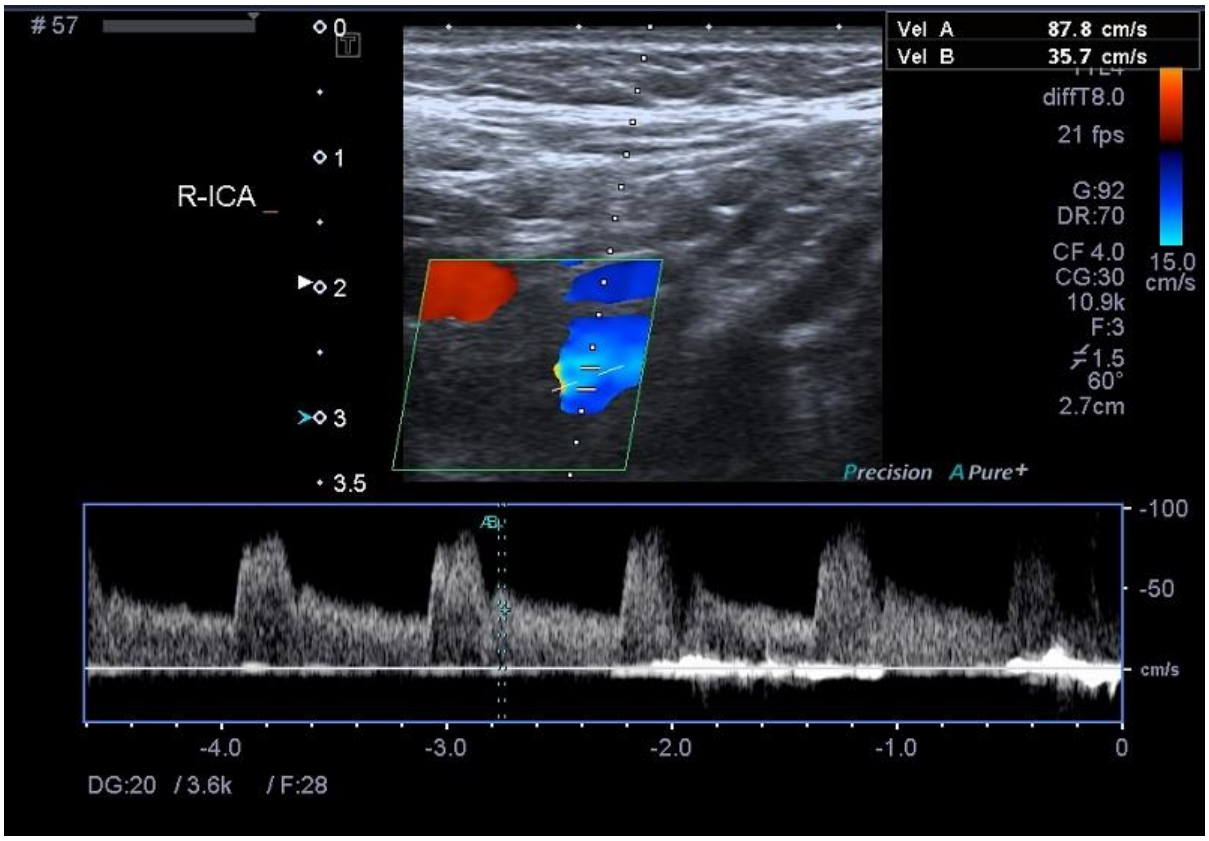
C. Regular surveillance scanning - This lesion has demonstrated growth from an asymptomatic size to a noticeable size a few months ago, treatment is therefore indicated. Genetics clinic referral should also be made.

D. Resection of the lesion and level IV lymph node clearance – Resecting the lesion is first line treatment, however, there is no indication of lymphatic spread, and there is evidence

that routine lymph node removal for carotid body tumors is of no benefit. Genetics clinic referral should also be made.

E. This answer is best option. Resection of the lesion and referral to a genetics clinic - This lesion has demonstrated growth from an asymptomatic size to a noticeable size a few months ago, treatment is therefore indicated. Genetics clinic referral should also be made. .

QUESTION THREE REFER TO THE FOLLOWING INFORMATION



3. A 59 year old diabetic man with hypertension presents two days following a right ocular TIA. He has a BMI of 35 kg/m^2, but is otherwise well. He smokes 10 cigarettes per day. He is in sinus rhythm. His MRI demonstrates multiple ischaemic lesions in the right hemisphere and no evidence of haemorrhage. Review his carotid duplex (see exhibit). What is your definitive management plan?

A. Clopidogrel 75 mg, Atorvastatin 80 mg, tight blood pressure and glucose control
B. Right carotid endarterectomy under general anaesthetic within 5 days
C. Right carotid endarterectomy under local anaesthetic within 5 days
D. Right internal carotid artery stent within 5 days
E. Rivaroxaban 5 mg bd, Aspirin 100 mg, Atorvastatin 80 mg, tight blood pressure and glucose control

QUESTION THREE ANSWER

A. Clopidogrel 75 mg, Atorvastatin 80 mg, tight blood pressure and glucose control

Reasoning: This patient has had a TIA and therefore the essence of the question is: does any present right carotid plaque potentially justify endarterectomy/stent or is it best managed medically? He has class 2 obesity (unlikely to justify stent use as a sole factor), diabetes, hypertension, no pulse evidence of AF and smokes. He has no evidence of haemorrhage that would initially contraindicate antiplatelets. The duplex is labelled right ICA with an appropriately positioned gate generating a pulse wave profile that appears normal for the ICA. PSV is measured as 87.8cm/s (velocity A on top right corner of display) and EDV as 35.7cm/s. There is no obvious dampening of the wave form to suggest a high resistance distal lesion. There is no obvious plaque demonstrated with the colour mode on this single image, however, this is insufficient to rule out visible plaque without other views. In accordance with the Society of Radiologists in Ultrasound Consensus, given the PSV<125cm/s and EDV <40cm/s this carotid is either normal or has <50% stenosis. There is no information on the ICA:CCA ratio. There is no major guideline in Europe or America that recommends operating on a symptomatic patient with <50% stenosis (NASCET criteria). With the information available there is insufficient evidence to justify the risks of surgical or endovascular intervention. Therefore:

A. This is the best answer. Clopidogrel 75 mg, Atorvastatin 80 mg, tight blood pressure and glucose control – This represent best medical therapy in accordance with NICE and RCP guidelines. The CHANCE study demonstrated similar effects of clopidogrel and aspirin in stroke reduction post TIA. UK and American guidelines recommend appropriate blood pressure control (less than 130/80mmHg should be targeted given he is diabetic) and glycemic control. Given that only medical intervention is indicated this is the correct answer.

B. Right carotid endarterectomy under general anaesthetic within 5 days – Intervention not indicated as per rationale above.

C. Right carotid endarterectomy under local anaesthetic within 5 days - Intervention not indicated as per rationale above.

D. Right internal carotid artery stent within 5 days - Intervention not indicated as per rationale above.

E. Rivaroxaban 5 mg bd, Aspirin 100 mg, Atorvastatin 80 mg, tight blood pressure and glucose control – there is evidence that anti Xa agents are non inferior to warfarin in the risk reduction of stroke in non valvular AF (ARISTOTLE). Warfarin reduces the risk of stroke in NVAF by about 37% compared to antiplatelets alone. However,

given the patient has no AF anti Xa agents are not indicated. This regimen (5mg Rivoxaban bd and 100Mg) was the higher dose treatment arm in the COMPASS study – not only did this arm show no additional benefit from the lower dose, but also the COMPASS study is not specifically relevant here as it did not recruit post TIA patients.

4. You are planning to perform a carotid endarterectomy and discover the disease extends very high in the internal carotid artery on preoperative imaging. Your consultant asks you to describe your technique for dissecting out the distal internal carotid artery using an antero-jugular approach under general anaesthesia.
Which of the following is **not** a recognised technique to aid the exposure of the internal carotid artery at the skull base?

A. Division of the posterior belly of the digastric muscle
B. Fracturing the styloid process
C. Ligation and division of the facial vein
D. Naso-endotracheal intubation
E. Splitting the confluence of the hypoglossal and vagus nerves

QUESTION FOUR ANSWER

E. Splitting the confluence of the hypoglossal and vagus nerves

Reasoning: Access to the extra-cranial ICA at the skull base, while it should not be underestimated, is often possible without esoteric manoeuvres. However, they may be need and include in order of performance: division of the common facial vein (standard carotid approach), division of the occipital artery, division of the posterior belly of the digastric muscle, reduction (bone nibblers) of styloid process, TMJ subluxation, mandibular body division. If under general anesthetic naso endotracheal intubation and chin up position is likely to produce better exposure than oro tracheal intubation and chin up position.

The best answer is E. Splitting the confluence of the hypoglossal and vagus nerves is unlikely to be of any benefit – they diverge to a degree almost immediately after exiting the skull base. Such a manoeurve will carry a risk of nerve injury. This is clearly not a recognized technique.

5. A 62 year old fit man is undergoing urgent open juxtarenal abdominal aortic aneurysm repair for a tender aneurysm which has increased by 0.9cm in the last 6 months. Whilst dividing adhesions overlying an inflammatory aneurysm sac, the duodenum is perforated and bowel contents contaminate the abdomen.

What would be the most appropriate management?

A. Abandon open repair and proceed to best fit, oversized infrarenal stent graft
B. Ligate the aorta and perform an axillobifemoral bypass graft with prosthetic graft
C. Repair the bowel, Complete AAA repair using dacron graft, washout the abdomen
D. Repair the bowel, complete AAA repair using SFV, washout the abdomen
E. Repair the bowel, washout the abdomen and close

QUESTION FIVE ANSWER

D. Repair the bowel, complete AAA repair using SFV, washout the abdomen

Reasoning: This has contaminated the operative field with commensal bacteria and viruses. Bowel repair and washout will reduce this load but not eliminate it. Duodenal repair is also notorious for high risk of subsequent leakage. Translocation of these microrganisms via the inflammatory sac or peritoneal vasculature to the circulation may occur. Prosthetic graft insertion, therefore, has a significant risk of infection either through residual bacteria in the peritoneal cavity. His aneurysm has a high risk of rupture given it's tenderness and rapid expansion.

A. Abandon open repair and proceed to best fit, oversized infrarenal stent graft: A fenestrated graft generally takes 6 weeks to manufacture/ acquire in the UK, given his symptomatic aneurysm this is likely to be a high risk delay. An off the shelf solution accounting for the "no neck"/ juxtarenal antomy carries risk of being ineffective. An oversized infra renal stent graft (as suggested) is unlikely to create a proximal seal and the risk of aneurysm rupture therefore unlikely mitigated. Immediate stent solutions use prosthetic solution will carry risk of haematological seeding as described above.

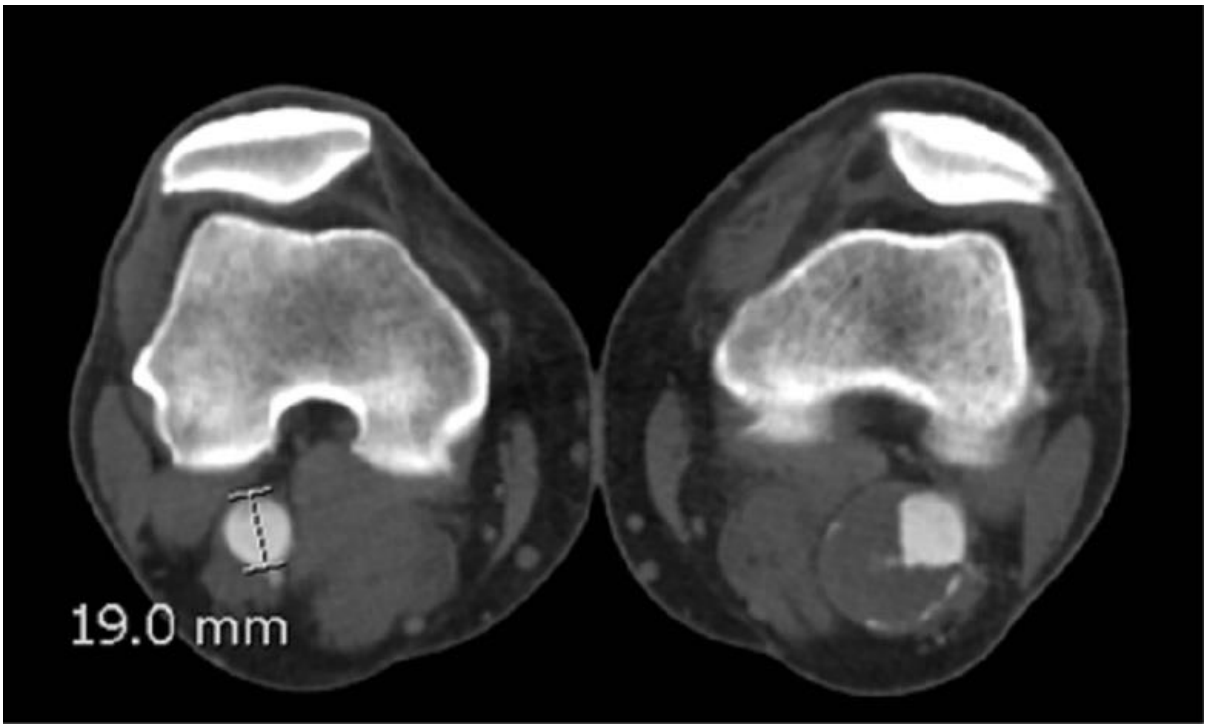
B. Ligate the aorta and perform an axillobifemoral bypass graft with prosthetic graft. Ligating the aorta below the renal arteries (on aneurysmal wall) is likely to "fall apart" with a predictable outcome. Ligating immediately above the renal arteries, below the SMA, even if feasible, will need life long dialysis and is very likely to shorten life expectancy. Haemotological bacterial seeding as described above to the extra anatomical graft is possible.

C. Repair the bowel, Complete AAA repair using dacron graft, washout the abdomen. Dacron graft may become infected for reasons described above. An infected dacron graft is life-threatening and the curative solution for this is SFV grafting. The patient is likely to be significantly more deconditioned at such a second operation from chronic infection. Bowel adhesions are also likely to be significant.

D. This is the best answer. Repair the bowel, complete AAA repair using SFV, washout the abdomen. SFV is the gold standard aortic repair technique where contamination is present. This is likely to give the most durable solution for the patient who otherwise has reasonable chances of living at least 20 years based on the information above. Calling in extra surgical help into the operating theater will mitigate the additional harvest (+/- splicing) time required.

E. Repair the bowel, washout the abdomen and close. This does not address the high risk aortic pathology and is likely to significantly shorten life expectancy.

QUESTION SIX REFER TO THE FOLLOWING INFORMATION



6. An 82 year old man presents to clinic with gross left lower leg swelling. On clinical examination the left leg is grossly swollen with pitting oedema, and a pulsatile swelling is felt in the left popliteal fossa.
What is the most appropriate management for his left leg arterial pathology (see exhibit)?

A. Anticoagulation with warfarin
B. Endovascular stent graft
C. Exclusion bypass with a medial approach
D. Interposition bypass with a posterior approach
E. Surveillance

QUESTION SIX ANSWER

D. Interposition bypass with a posterior approach

Reasoning: This is a case of a popliteal aneurysm presenting with leg swelling secondary to popliteal vein compression. The imaging suggests a popliteal aneurysm above threshold for treatment based on diameter.

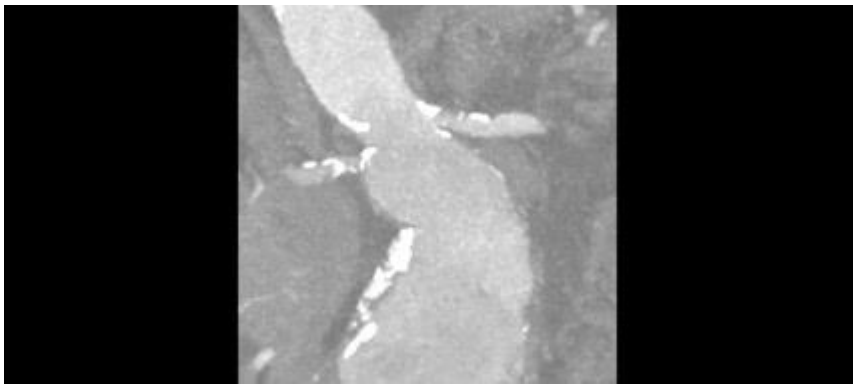
Answer A does not manage the arterial pathology.

Answers B and C are reasonable answers, but they will not decompress the aneurysm and relieve external compression on the vein.

Answer E will not address the patients symptoms and at the implied diameter would be inappropriate

Answer D is the single best answer as it both repairs the aneurysm and decompresses the sac relieving compression on the vein.

QUESTION SEVEN REFER TO THE FOLLOWING INFORMATION



7. A 79 year old man was recently admitted with a perforated sigmoid diverticulum and underwent a Hartmann's procedure, during which a 7.7cm AAA was identified (see exhibit). His post-operative recovery was complicated by an abscess surrounding his rectal stump and he was treated with a course of antibiotics. He is otherwise in reasonably good health with a normal echocardiogram and good exercise tolerance.

How would you proceed regarding repair of his AAA?

A. EVAR
B. EVAR with endoanchors
C. Fenestrated aneurysm repair (if deemed anatomically suitable)
D. Open surgical repair
E. Surveillance and open repair at 8cm

QUESTION SEVEN ANSWER

C. Fenestrated aneurysm repair (if deemed anatomically suitable)

Reasoning: This is a case of a 79-year-old otherwise fit man who has a hostile surgical abdomen, who presents with a threshold AAA. The coronal image demonstrates a juxta renal aneurysm with a conical neck.

Answer “A” is a poor choice in a conical neck

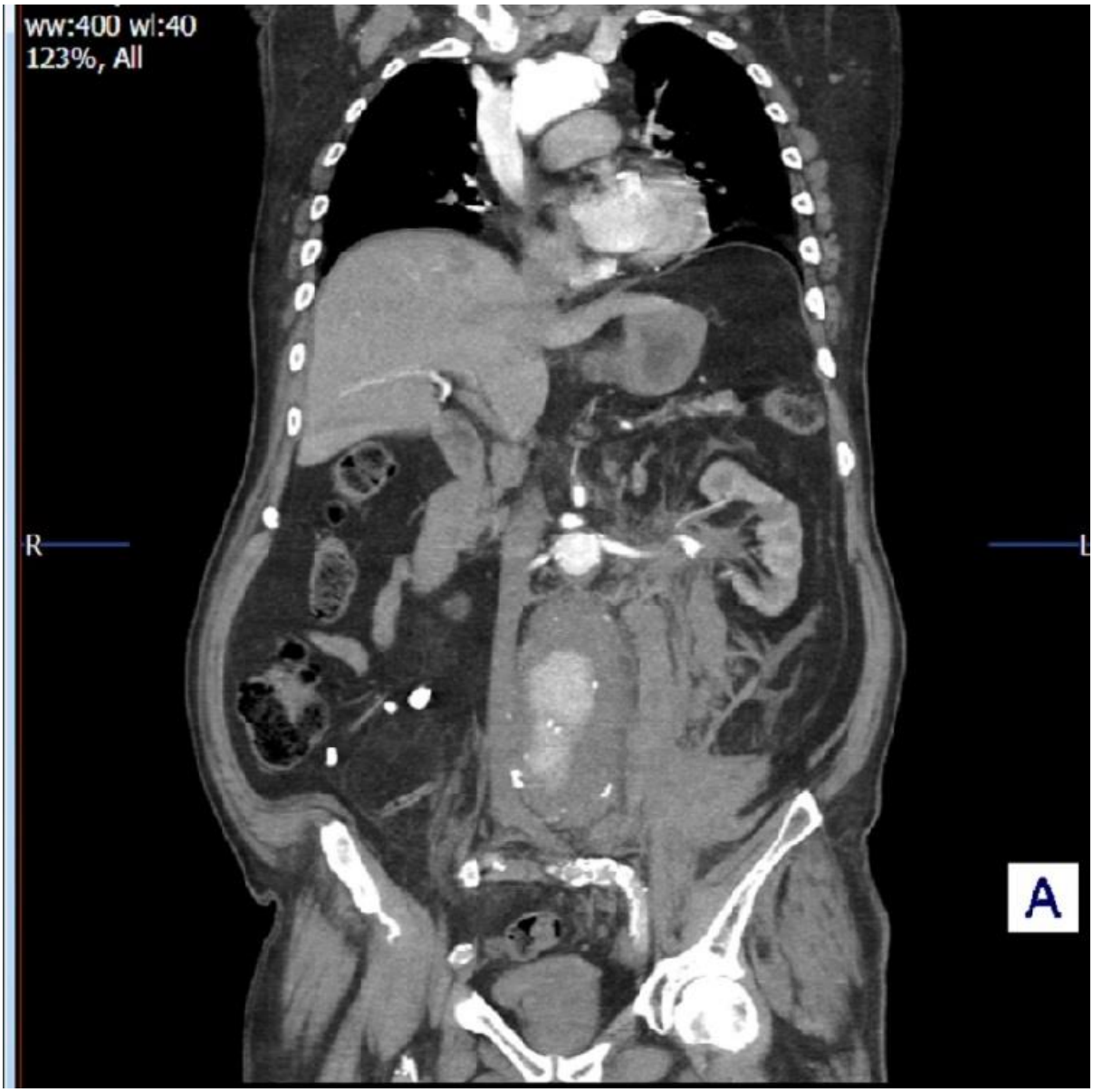
Answer “B”. The IFU for endoanchors includes the treatment of endovascular aortic stent grafts have exhibited migration or endoleak or are at risk of such complications. Endoanchors do not permit the treatment of aortic anatomy with standard EVAR devices off IFU.

Answer “D” is not eh preferred choice in a hostile surgical abdomen with a end colostomy.

Answer “E” may confer some advantage in terms of the hostile surgical abdomen but will expose a fit patient to an unacceptable risk of rupture.

Answer “C” is the single best answer to treat the anatomy and clinical scenario.

QUESTION EIGHT REFER TO THE FOLLOWING INFORMATION



8. An 87 year old man, who is awaiting outpatient review for recent change in bowel habit and weight loss, presents to the ED with acute onset abdominal pain, vomiting and collapse. After adequate resuscitation a contrast CT of the abdomen and pelvis is performed (see exhibit). In addition to the findings shown, both lobes of the liver show multiple hypodense lesions highly suggestive of metastatic disease.
What is the most appropriate management for this patient?

A. Emergency EVAR for AAA
B. Emergency liver biopsy
C. Open repair of AAA
D. Palliation only
E. Urgent OGD and colonoscopy

QUESTION EIGHT ANSWER

D. Palliation only

Reasoning: This CT demonstrates a large infra renal AAA with a large left retroperitoneal haematoma. \Taken together with the presentation the diagnosis is a ruptured AAA.

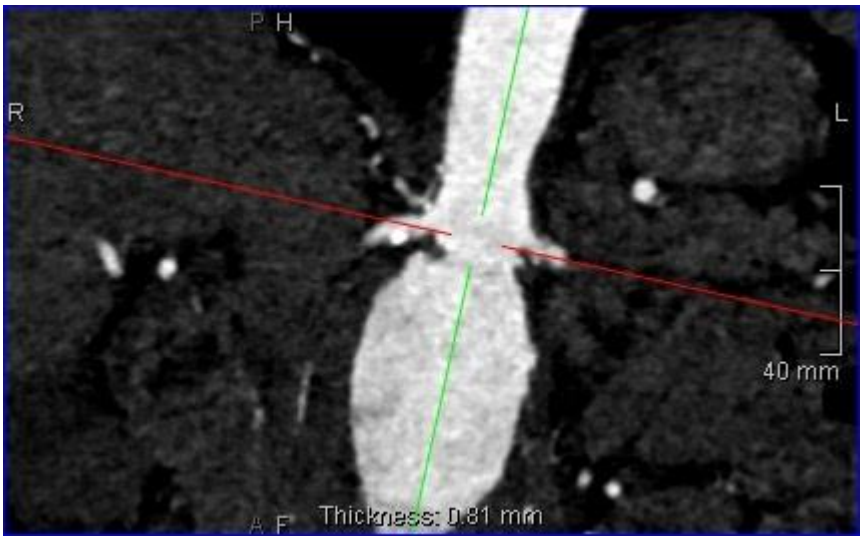
Answer “B” and “E” have no place in the presence of life-threatening ruptured AAA.

Answer “C”. Open repair would not be preferred over emergency EVAR (“A”) in an 87 year old man with a ruptured AAA.

Answer “A”. Although emergency should be considered in an 87 year old man with a ruptured AAA who has responded to resuscitation, this patient has multiple diffuse liver mets and it would not be in his interest to offer AAA repair.

The patient is best managed with palliation. Answer “D” is the single best answer

QUESTION NINE REFER TO THE FOLLOWING INFORMATION



9. A 65 year old farmer is found to have an 8.3 cm aortic aneurysm at his first screening appointment and is referred to your clinic. He had a left inguinal hernia repair in the past and takes amlodipine for hypertension. His CPEX shows a VO2 max of 16 l/min and an AT of 12.2 ml/kg/min. His CT scan is shown (see exhibits).
What is the most appropriate management?

A. ChEVAR
B. EVAS
C. FEVAR
D. Open aneurysm repair with infrarenal clamp
E. Open aneurysm repair with suprarenal clamp.This is a case of a fit 65 year old man with minimal PMHx who presents with an AAA well above threshold for treatment.

QUESTION NINE ANSWER

E. Open aneurysm repair with suprarenal clampThis is a case of a fit 65 year old man with minimal PMHx who presents with an AAA well above threshold for treatment.

Reasoning: E is the best answer

Answer “A” is not the preferred option in an elective situation when FEVAR and open repair are being considered.

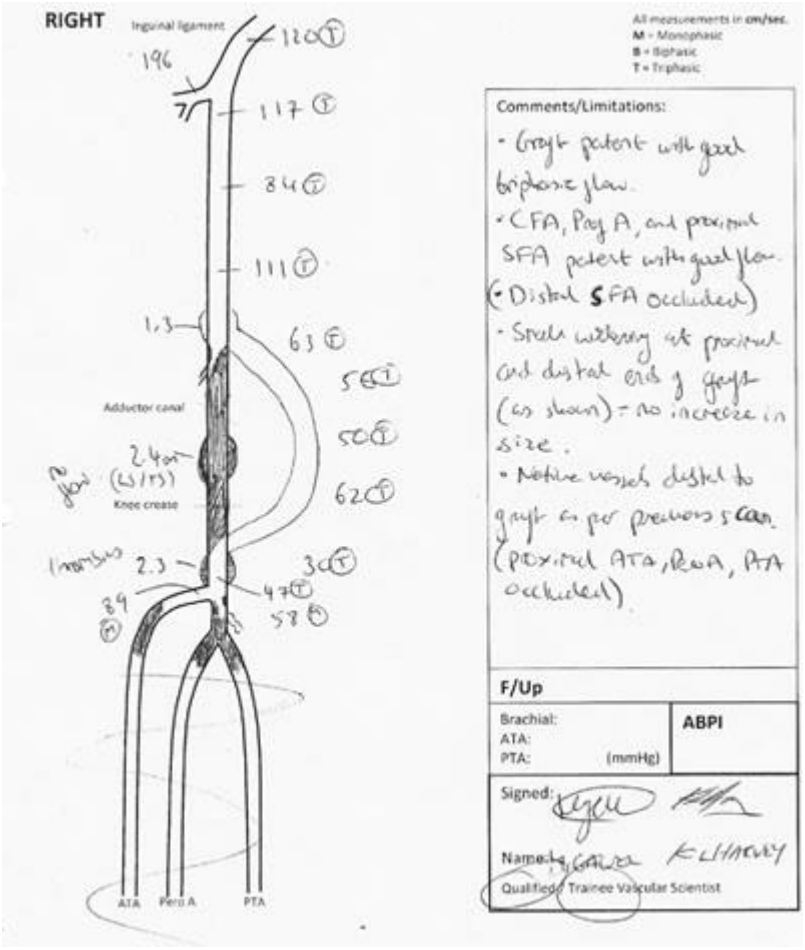
Answer “B”. EVAS technology is prone to high rates of device failure.

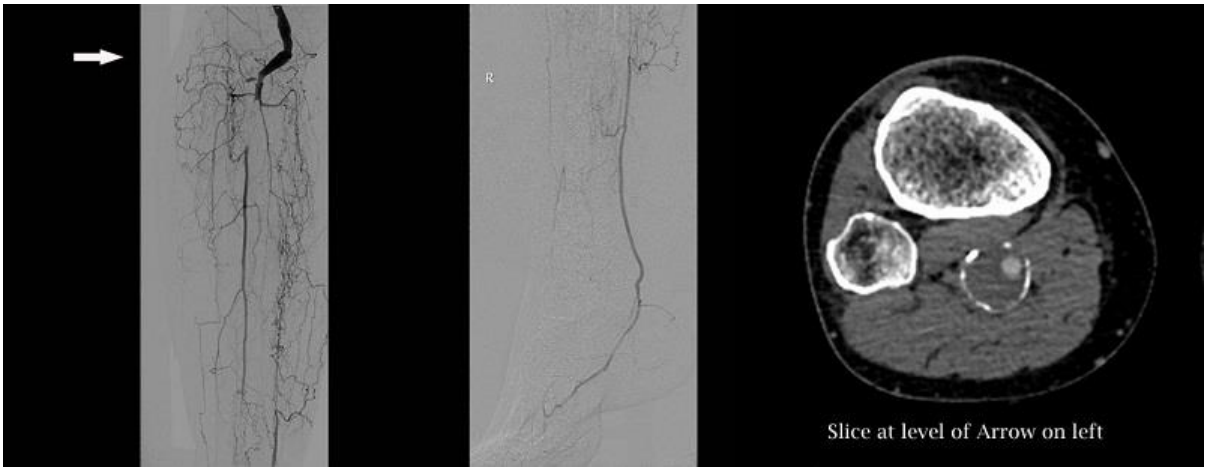
Answer “C” may be a feasible treatment for this aneurysm but in an otherwise fit individual with this CPET result open repair is cheaper with better long term outcomes.

Answer “D” is likely to result in suturing the diseased aneurysm sac into the proximal anastomosis of the repair. This would risk perioperative bleeding and recurrence.

The single best answer is “E”. Open repair provides the best long-term outcome for this patient and a supra renal clamp is the safest approach for this anatomy.*Reasoning in E*

QUESTION TEN REFER TO THE FOLLOWING INFORMATION





10. An otherwise fit and active 71 year old male represents to the Vascular Service 8 years after a successful exclusion bypass to treat an asymptomatic 3.7 cm right popliteal aneurysm using ipsilateral reversed long saphenous vein. They were discharged from routine graft surveillance at one year with normal scans. The patient reports new (2 months) onset of short distance claudication and pain in the right foot at night with a small patch of dry gangrene over the tip of the right hallux. Duplex and angiography of the runoff are shown (see exhibit). A CT scan from just below the anastamosis is shown (see exhibit).
How would you manage this patient?

A. Angioplasty of the TPT and peroneal artery
B. Jump graft to peroneal artery
C. Jump graft to posterior tibial artery
D. Therapeutic anticoagulation and careful observation
E. Thrombolysis followed by anticoagulation

QUESTION TEN ANSWER

C. Jump graft to posterior tibial artery

Reasoning: This is a case of a recurrent popliteal aneurysm distal to the previously excluded popliteal aneurysm and distal to the previous bucket handle bypass. The runoff has occluded secondary to trashing from the aneurysm that contains mural thrombus.

Answer “A” would treat the occluded run off without treating the underlying cause of the aneurysm.

Answer “B” would treat the aneurysm and revascularise the leg but would not provide inline flow to the foot, which has tissue loss.

Answer “D” may prevent further trashing but would not revascularise the foot and therefore not address the presentation of tissue loss.

Answer “E” would leave the aneurysm untreated and is unlikely to work given the two month duration of symptoms.

The best answer is “C” as a jump bypass to the PT will both exclude the aneurysm and restore inline flow to the foot addressing the presentation of tissue loss.

QUESTION ELEVEN REFER TO THE FOLLOWING INFORMATION

11. A six year old boy is admitted with a Gartland type 3 supracondylar fracture having fallen from a trampoline (see exhibit). Preoperatively the limb is pale and pulseless. Wrist and thumb extension are intact. However, he is unable to flex the interphalangeal joint of the thumb and distal interphalangeal joint of the index finger and is therefore unable to make the "OK" sign. He undergoes closed reduction and percutaneous fixation of the fracture. Postoperatively the limb is pink but remains pulseless. There is a monophasic Doppler signal at the radial artery at the wrist.

What is the most appropriate next step?

A. Catheter angiography
B. CT angiography
C. Discharge and nerve conduction studies
D. Inpatient neurovascular monitoring
E. Surgical exploration and proceed

QUESTION ELEVEN ANSWER

E. Surgical exploration and proceed

Reasoning: the best answer is E

In this scenario, the child has a Gartland type 3 supracondylar humeral fracture with initial signs of limb ischemia (pale, pulseless limb) and signs of nerve injury (inability to flex the interphalangeal joint of the thumb and index finger). Although the limb has become pink postoperatively, the pulse remains absent and there is a monophasic Doppler signal at the radial artery.

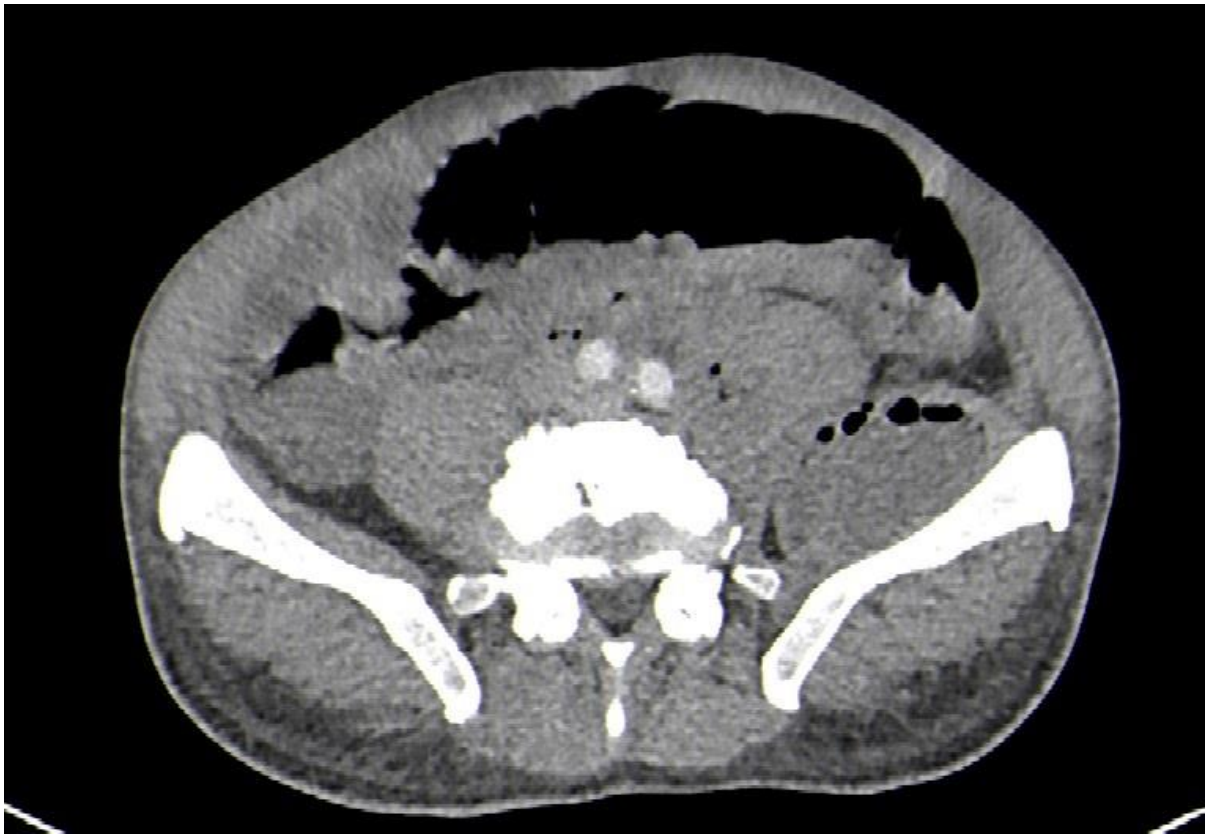
The key concerns are the possible presence of vascular injury (such as an arterial injury that may not be immediately obvious) and the potential for ongoing or evolving nerve injury. Given these findings, it is critical to ensure that there is adequate blood flow to the hand and to evaluate for any potential arterial injury that may have been missed.

Surgical exploration (Option E) is the most appropriate next step. This is because:

1. **Persistent Absence of Pulse**: Even though the limb color has improved, the persistent absence of a radial pulse and the abnormal Doppler signal indicate potential arterial compromise.
2. **Potential for Vascular Injury**: Gartland type 3 fractures are known to be associated with a high risk of vascular injury. The absence of a pulse and an abnormal Doppler signal suggest that there might be an injury to the radial or brachial artery.
3. **Nerve Injury Evaluation**: While nerve conduction studies and neurovascular monitoring are important, they do not address the immediate concern of possible arterial injury which could lead to limb loss if not corrected.

Thus, to evaluate and potentially correct any vascular injury, **surgical exploration** is warranted. This will allow direct assessment of the vascular structures and any necessary repair or intervention to ensure proper blood flow to the extremity and avoid serious complications.

QUESTION TWELVE REFER TO THE FOLLOWING INFORMATION



12. A 65 year old woman presents with lumbar pain and difficulty straightening her leg. She is tachycardic and has a WCC of 18 x 10^9/L. She undergoes a CTA (see exhibit).

What is the most likely causative organism of the pathology shown?

A. Escheria coli
B. Haemophilus aphrophilus
C. Mycobacterium tuberculosis
D. Pseudomonas aeruginosa
E. Staphylococcus aureus

QUESTION TWELVE ANSWER

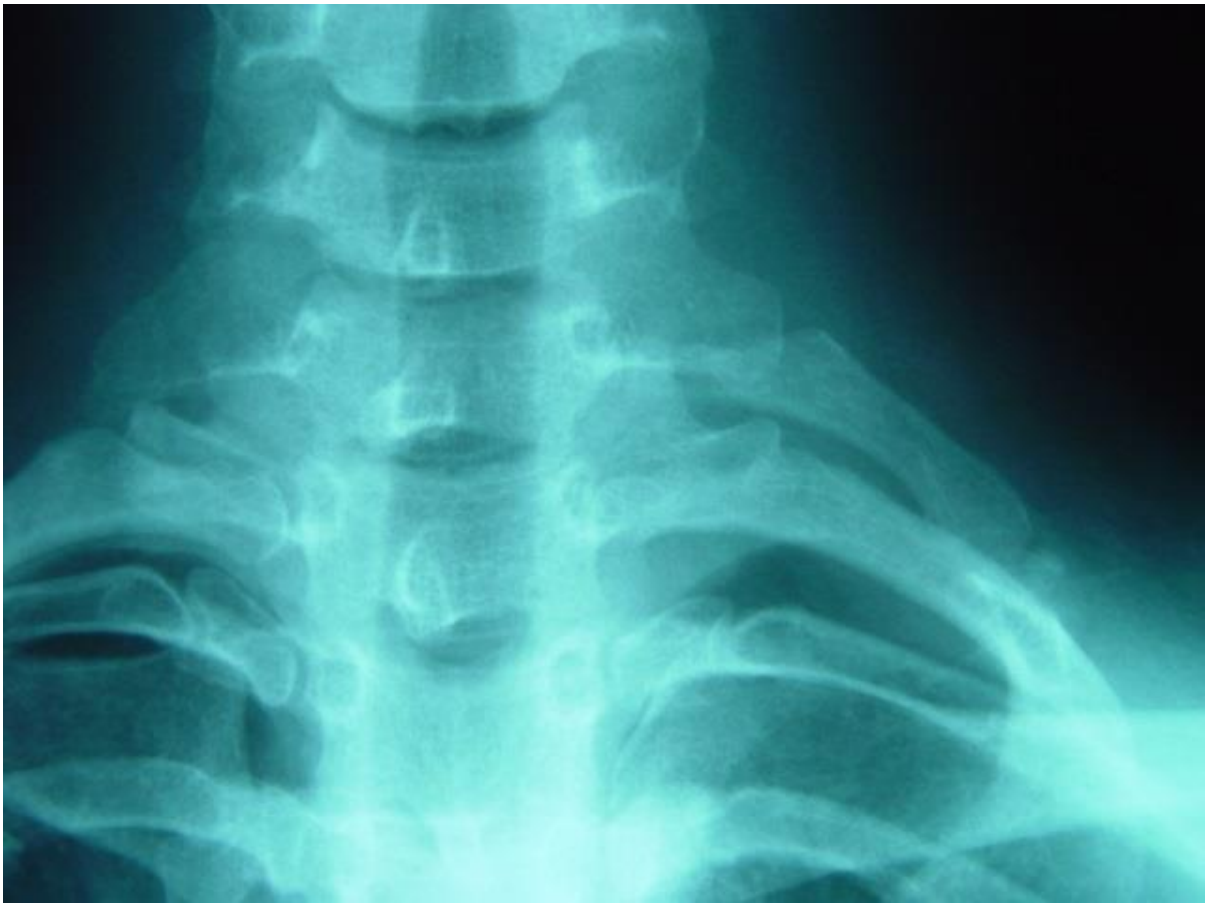
E. Staphylococcus aureus

Reasoning: The best answer is E

This is a clinical picture of a mycotic aneurysm. The most common causative organisms include:

1. **Staphylococcus aureus**: This pathogen is often involved, especially in cases associated with intravenous drug use or post-surgical infections.
2. **Streptococcus species**: Particularly Streptococcus viridans, which is associated with endocarditis.
3. **Salmonella species**: These bacteria are known to cause mycotic aneurysms in patients with predisposing conditions like chronic infections or immunocompromised states.
4. **Pseudomonas aeruginosa**: This is less common but can be a causative agent, particularly in immunocompromised patients.

QUESTION THIRTEEN REFER TO THE FOLLOWING INFORMATION



13. The finding demonstrated on this x-ray (see exhibit) of the neck and upper thoracic region is most likely to be associated with:

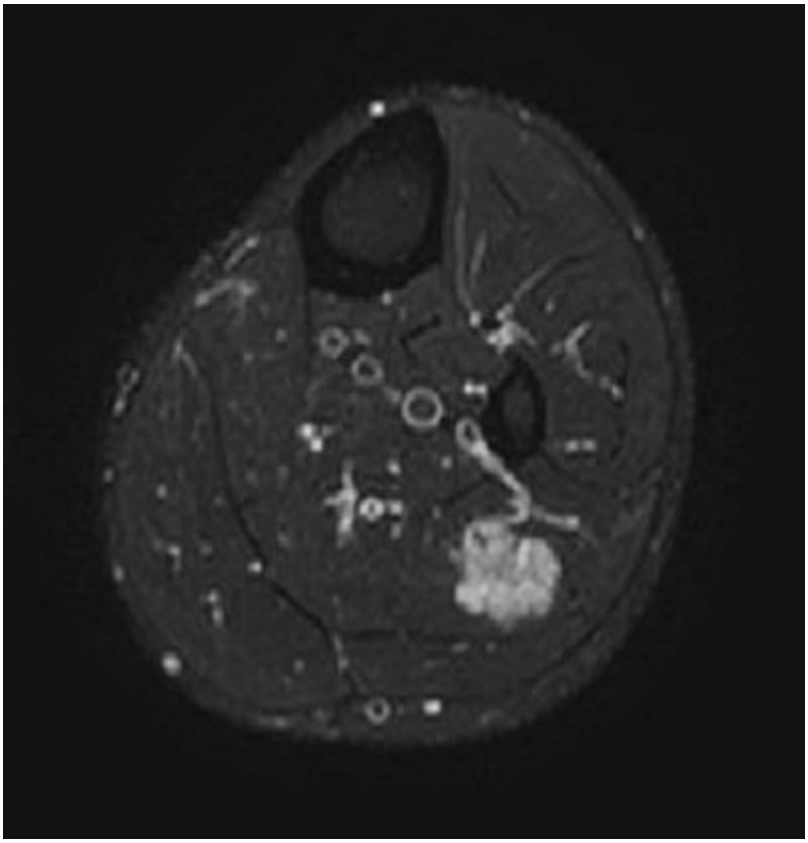
A. Atrophy of the thenar eminence in the left hand
B. Carotid artery dissection
C. Horner’s syndrome
D. Left subclavian artery aneurysm
E. Pneumothorax
A. A is the best answer

QUESTION THIRTEEN ANSWER

A. Atrophy of the thenar eminence in the left hand

Reasoning; The X-ray image provided shows a cervical rib. Given the compression effects of a cervical rib. Atrophy of the thenar eminence in the left hand could occur due to compression of the brachial plexus, specifically the lower trunk, leading to neurogenic thoracic outlet syndrome (TOS). Carotid artery dissection is not typically associated with cervical ribs. Horner's syndrome could be associated if the cervical rib causes compression of the sympathetic chain, but less common. Left subclavian artery aneurysm can result from cervical ribs but this is less common than neurological symptoms. Pneumothorax is unrelated to the presence of a cervical rib.

QUESTION FOURTEEN REFER TO THE FOLLOWING INFORMATION



14. A 23 year old lorry driver presents to clinic with a focal lump in his left calf which is intermittently painful and causes him difficulty driving. He has a past medical history of asthma and diabetes. On examination the lump measures about 3cm and is compressible and non-pulsatile. He undergoes an USS which identifies a focal low flow malformation within the posterior compartment muscles of his leg. His MRI scan is shown (see exhibit).

How would treat this lesion?

A. Angiogram and embolisation
B. Covered stent across the feeding vessel
C. Open ligation of the feeding vessel
D. Open surgical excision
E. Percutaneous direct puncture and sclerotherapy

QUESTION FOURTEEN ANSWER

E. Percutaneous direct puncture and sclerotherapy

Reasoning: E is the best answer

This is a focal low-flow malformation within the posterior compartment muscles. Angiogram and Embolisation is typically used for high-flow arteriovenous malformations, not appropriate for low-flow lesions. Covered Stent Across the Feeding Vessel is used for arterial issues, inappropriate for low-flow venous malformations. Open Ligation of the Feeding Vessel involves tying off the vessel supplying the malformation, usually considered for high-flow or large venous malformations with significant feeding vessels. Open Surgical Excision involves complete removal of the malformation, which may be appropriate if it is localized and accessible without significant risk to surrounding structures but give the deep nature of the lesion this would be an unacceptable risk. Percutaneous Direct Puncture and Sclerotherapy is a common and effective treatment for low-flow venous malformations.

15. A 25 year old woman presents in the third trimester of pregnancy with a uterine rupture. She has always bruised easily and suffers with gross varicose veins.

What is the most likely genetic mutation?

A. ACTA2 mutation
B. COL3A1 mutation
C. Fibrillin-1 mutation
D. Fibrillin-2 mutation
E. TGF-1 or 2 receptor mutation

QUESTION FIFTEEN ANSWER

B. COL3A1 mutation

Reasoning: The best answer is B

The clinical presentation is consistent with a connective tissue disorder. **ACTA2 mutation is a**ssociated with familial thoracic aortic aneurysms and dissections, but less commonly with uterine rupture, easy bruising, and varicose veins. **COL3A1 mutation** is the m**ost likely** answer. This mutation is associated with Vascular Ehlers-Danlos Syndrome. **Fibrillin-1 mutation** is associated with Marfan syndrome. While Marfan syndrome can involve connective tissue weakness, it more commonly affects the cardiovascular system (aortic aneurysms) and skeletal system, not typically presenting with the combination of symptoms described. **Fibrillin-2 mutation** is associated with congenital contractural arachnodactyly, which involves long limbs, joint contractures, and other features but not typically uterine rupture or easy bruising. **TGF-1 or 2 receptor mutation** is associated with Loeys-Dietz syndrome, which involves arterial aneurysms and dissections, craniofacial features, and skeletal manifestations. While it can involve fragile tissues, it is less likely to present primarily with easy bruising and varicose veins in the context of the described symptoms.

16. Which of the following conditions may result in a serious metabolic acidosis?

A. Biliary obstruction
B. Helicobacter pylori infection
C. Jejunal diverticulosis
D. Mesenteric ischaemia
E. Pyloric stenosis

QUESTION SIXTEEN ANSWER

D. Mesenteric ischaemia

Reasoning: Among the options provided, the condition that may result in a serious metabolic acidosis is D. Mesenteric ischaemia. Mesenteric ischemia can lead to reduced blood flow to the intestines, causing tissue damage and the buildup of lactic acid, leading to metabolic acidosis.

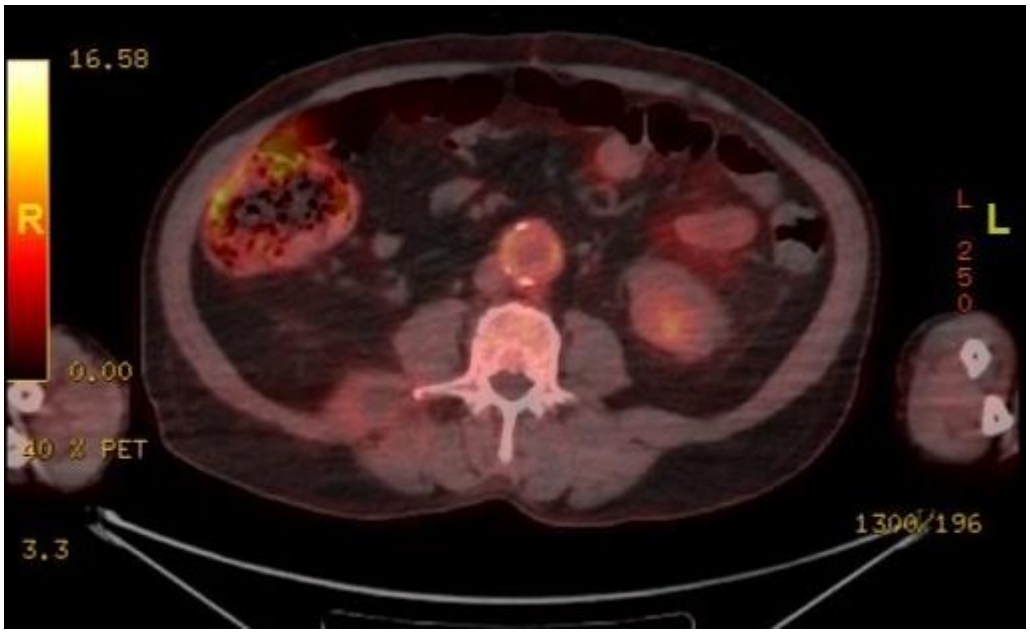
A. Biliary obstruction: Biliary obstruction can lead to the accumulation of bile acids and bilirubin in the bloodstream, which can result in jaundice. However, it is not typically associated with metabolic acidosis.

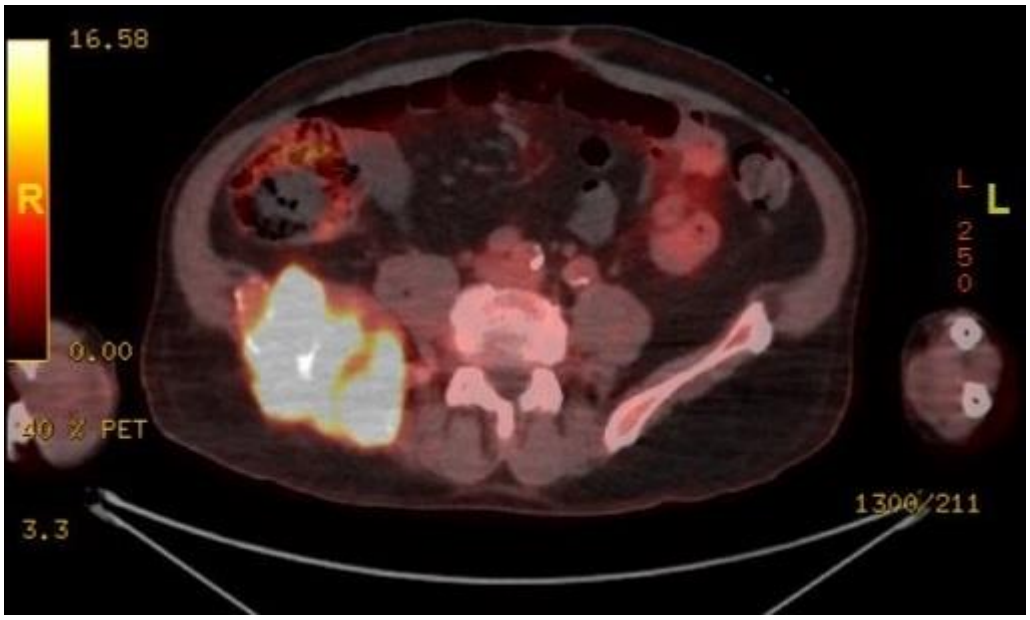
B. Helicobacter pylori infection: Helicobacter pylori infection is a bacterial infection that commonly affects the stomach lining and can lead to conditions like gastritis and peptic ulcers. While it can result in stomach-related issues, it is not typically associated with metabolic acidosis.

C. Jejunal diverticulosis: Jejunal diverticulosis refers to the presence of pouches in the wall of the small intestine. This condition is not typically known to cause metabolic acidosis.

E. Pyloric stenosis: Pyloric stenosis is a narrowing of the opening from the stomach to the small intestine. While it can cause fluid and electrolyte imbalances, it is directly associated with hypokalaemia, hypochloraemia and metabolic alkalosis.

QUESTION SEVENTEEN REFER TO THE FOLLOWING INFORMATION





17. A 67 year old farmer who underwent an open repair of a ruptured juxtarenal AAA one year ago presents to the infectious diseases department with a 4 month history of general malaise and persistent low grade pyrexia. He has well-controlled hypertension and no other medical problems. After some initial investigations, he undergoes a PET scan. (see exhibits).

How would you proceed?

A. Insertion of PICC line and long term antibiotics
B. Re-laparotomy and washout
C. Re-laparotomy, excision of graft and replacement with homograft
D. Re-laparotomy, excision of graft, ligation of aorta and axillo-bifemoral bypass
E. Referral to loco-regional sarcoma team

QUESTION SEVENTEEN ANSWER

E. Referral to loco-regional sarcoma team

Reasoning: The answer is E

This question is asking you to interpret a CTPET image in the context of a clinical scenario. Although the clinical scenario may be consistent with aortic graft infection the CTPET shows a discrete area uptake in the right iliac crest consistent with a new sarcoma. Whilst answers A-D are acceptable treatments for an infected aortic graft E is the only answer consistent with eh imaging.

QUESTION EIGHTEEN REFER TO THE FOLLOWING INFORMATION

18. A 76 year old previously fit woman is admitted with a history of sudden onset lower abdominal pain exacerbated by movement and alleviated by applying a hot water bottle. On examination she is peritonitic in the lower abdomen. There is a scar from a previous appendicectomy in the right iliac fossa and erythema ab igne across the lower abdomen. Observations show a pulse rate of 121 bpm with sinus rhythm and a BP of 103/64 mmHg. Her haemoglobin and WCC are normal. Amylase is 194 U/L. Blood gase analysis shows a pH of 7.184, pO_2 of 8.6 kPa, pCO_2 of 5.45 kPa and a base excess -11.9mmol/L. FiO_2 is 21%. An abdominal x-ray is shown (see exhibit).

What is the most likely diagnosis?

A. Adhesional obstruction with infarcted small bowel
B. Diverticular perforation
C. Ischaemic colitis
D. Pancreatitis
E. Ruptured aortic aneurysm

QUESTION EIGHTEEN ANSWER

C. Ischaemic colitis

Reasoning: The Best answer is C

The clinical scenario is an acute peritonitic abdomen with severe metabolic acidosis. Answers A B C are most consistent with this finding as D and E are retroperitoneal pathologies less likely to cause peritonitis. The AXR shows a dilated oedematous colon most consistent with colitis. Therefore the best answer is C.

19. A 52 year old man presents with tiredness and lethargy. He has no GI symptoms except for a reduction in appetite. Bloods show an Hb of 7 g/dL, microcytic indices and a low serum ferritin. Liver function tests are normal.

What is the most appropriate management protocol?

A. Colonoscopy then OGD if negative
B. Contrast enhanced CT scan
C. CT colonography
D. OGD and colonoscopy
E. OGD then colonoscopy if negative

QUESTION NINETEEN ANSWER

D. OGD and colonoscopy

Reasoning: The best answer is D. Standard investigation of microcytic iron deficiency anaemia is a top and tail. B and C are not as sensitive and are reserved for frail patients. A and E risk missing synchronous lesions.

20. A 75 year old man is admitted with a 24 hour history of initially lower then generalised abdominal pain. He is normally fit and well and has no history of previous hospital admissions. On examination, he is peripherally shut down. His heart rate is 100 bpm and blood pressure 150/90 mmHg. On abdominal examination, there is generalised tenderness and guarding. His Hb is 147 g/L, WCC 14.5 x 10^9/L, Na 135 mmol/L, K 3.2 mmol/L, Urea 8.7 mmol/L and creatinine 120 µmol/L.

What would be the most likely diagnosis?

A. Pancreatitis

B. Perforated appendicitis

C. Perforated diverticular disease

D. Perforated duodenal ulcer

E. Ruptured aortic aneurysm

QUESTION TWENTY ANSWER

C. Perforated diverticular disease

Reasoning: The best answer is C. This is a presentation of acute abdomen with generalized peritonitis. Answers A and E are not likely to present with generalised peritonitis as they are retroperitoneal structures. Only answer C is a hindgut structure and consistent with the history of initial lower abdominal pain.

QUESTION TWENTY-ONE REFER TO THE FOLLOWING INFORMATION

21. A 60 year old man presents with a 48 hour history of feeling unwell and unable to walk using his right leg. He has had increasing pain in the right leg for the past 2 weeks. He has Type 2 diabetes mellitus. The appearances of the foot and ankle are shown in the picture (see exhibit). He has a temperature of 38.6ºC. Foot pulses are barely palpable and there is crepitus to mid-calf level.
Which of the following is the most appropriate next step?

A. Arterial digital subtraction angiography
B. Intravenous antibiotics and overnight observation
C. Urgent above knee amputation
D. Urgent debridement of the dorsum of the foot
E. Urgent debridement of the lateral malleolus and foot

QUESTION TWENTY-ONE ANSWER

C. Urgent above knee amputation

Reasoning: This patient has sepsis and whilst antibiotic therapy should be commenced immediately, this patient requires urgent source control. Answer B is therefore incorrect. The infection appears to track from the dorsum of the foot to the medial malleolus, and therefore debridement of either area in isolation is insufficient. Answers C and D are therefore also incorrect. The crepitus to the mid-calf suggests that major amputation above the knee for source control is required and therefore angioplasty is futile. Answer A is therefore incorrect and Answer C is the correct.

22. A 54 year old woman has had a laparoscopic ultra-low anterior resection of a T3N2M0 adenocarcinoma that took up the duration of an all-day elective operating list and was very challenging. In recovery the patient is complaining of a tender left lower limb despite IV morphine.

Which of the following would be the most appropriate management?

A. Anticoagulation
B. Arterial duplex ultrasonography
C. Epidural analgesia
D. Fasciotomy
E. Venous duplex ultrasonography

QUESTION TWENTY-TWO ANSWER

D. Fasciotomy

Reasoning: The question asks about management and therefore answers B and E are incorrect. Epidural analgesia may treat the symptoms of pain but not the underling pathology and therefore answer C is incorrect. The patient has been in a lithotomy position for a prolonged position and is in significant pain. The most likely diagnosis is compartment syndrome and therefore anticoagulation (answer A) is incorrect as the most appropriate management step and answer D is the correct answer.

23. A 55 year old woman with chronic atrial fibrillation presents with acute abdominal pain and bleeding per-rectum. She has generalised abdominal tenderness. At laparotomy, the small bowel is viable but ischaemic and the mesentery is pulseless.
What would be the appropriate management?

A. Exploration of SMA and thromboembolectomy
B. No procedure, close abdomen and second laparotomy at 48 hours
C. Resection of all the bowel involved with end to end anastomosis
D. Resection of all the bowel involved with proximal and distal stoma creation
E. Thrombolysis through SMA catheter

QUESTION TWENTY-THREE ANSWER

A. Exploration of SMA and thromboembolectomy

Reasoning: The small bowel is ischaemic and viable and therefore salvage of the bowel should be attempted and bowel resection is not indicated in the first instance. Answers C and D are therefore incorrect. Leaving the bowel ischaemic by not attempting any intervention is not appropriate and therefore answer B is also incorrect. Since a laparotomy has been performed, thrombolysis is contraindicated and therefore answer E is correct. The patient requires SMA thromboembolectomy to restore perfusion to the small bowel and so, answer A is correct.

24. A 35 year old female motorcyclist suffers a closed fracture of the distal tibia and fibula. At the time of the accident there was also some concerns over a crush injury; there is no neurovascular compromise on arrival to A & E.
Which serum blood markers can be used to predict the development of compartment syndrome?

A. Elevated Creatinine Kinase
B. Elevated Serum Lactate
C. Elevated Serum Potassium
D. Elevated Troponin levels
E. None of the above

QUESTION TWENTY-FOUR ANSWER

E. None of the above

Reasoning: Whilst creatinine kinase, troponin, serum potassium and troponin may all be elevated following a crush injury, there is no evidence that they can accurately predict the development of compartment syndrome. The correct answer is therefore E.

25. A 76 year old female with a background of mitral valve replacement for which she takes warfarin, and a small 3.6 cm abdominal aortic aneurysm (AAA) is admitted for hysterectomy. Peri-operatively her warfarin is discontinued. On day 4 post-operatively, she complains of bilateral foot pain and has patchy fixed discolouration/appearances of trash to her feet.

Full blood count results are:

Day 1: HB 132 g/L, Platelets 287 x 10^9/L, WCC 7 x 10^9/L

Day 3: HB 130 g/L, Platelets 100 x 10^9/L, WCC 9 x 10^9/L

What is the most appropriate treatment strategy?

A. Commence IV danaparoid (direct thrombin inhibitor)

B. Commence IV heparin and perform cross-sectional imaging

C. Commence IV heparin and plan for early repair of AAA

D. Commence IV iloprost (PGI_2)

E. Commence therapeutic low molecular weight heparin

QUESTION TWENTY-FIVE ANSWER

A. Commence IV danaparoid (direct thrombin inhibitor)

Reasoning: Whilst the abdominal aortic aneurysm may have been a cause of the trash repair of AAA at its current size is not indicated unless there is ongoing trashing whilst the patient is adequately anticoagulated, and therefore answer C is incorrect. Iloprost is not of proven benefit for the management of trash and so, answer D is incorrect. The drop in platelet count suggests that the patient has HITS and therefore LMWH and iv heparin should not be used to treat the patient and therefore answers B, C and E are incorrect. The correct answer is A. Danaparoid is a non-heparin anticoagulant used tin the context of HIT.

26. A randomised controlled trial compares standard dual antiplatelet treatment with a novel antiplatelet agent following TIA. The risk of recurrent events with standard therapy is 4% compared to 1% with the new treatment.
Which of the following is true?

A. Approximately 30 patients need to be treated with the new treatment to prevent 1 recurrent event
B. The absolute risk benefit is 75%
C. The new treatment is 4 times more effective than standard treatment
D. The new treatment is more cost effective
E. The number needed to harm with the new treatment is 5

QUESTION TWENTY-SIX ANSWER

B. The absolute risk benefit is 75%

Reasoning: The best answer is B. The analysis hinges on understanding the Absolute Risk Reduction (ARR) and interpreting the provided data correctly. The absolute risk reduction of 3% from 4% to 1% translates to a 75% reduction relative to the initial risk. Calculations for NNT and an understanding of cost and harm require additional data not provided in the question. ARR=Risk with standard therapy−Risk with new treatment.
ARR=4%−1%=3%=0.03. To express this as a percentage of the initial risk (the absolute risk benefit):

ARR percentage = (ARR/Risk with standard therapy) ×100

ARR percentage = (3%/4%)×100 = 75%

Please note that answer A is reasonable but not as good as answer B. The NNT is calculated using the absolute risk reduction:

NNT = 1/ARR

NNT = 1/0.03 = 33.33

This means that approximately 33 patients need to be treated with the new treatment to prevent one recurrent event, not 30.

27. A 65 year old patient with diabetes is admitted with chronic limb threatening ischaemia. A duplex doppler ultrasound is performed showing patent femoral and popliteal arteries. The posterior tibial, anterior tibial and peroneal artery are occluded with reconstitution of his dorsalis pedis and plantar artery in the foot.
Which of the following statements is most accurate?

A. Basil-1 trial advises crural angioplasty first
B. Basil-1 trial advises crural bypass surgery first
C. Basil-2 trial will clarify if angioplasty or bypass first is best
D. Basil-3 trial will clarify if angioplasty or bypass first is best
E. Prevent trial advises crural bypass surgery first

QUESTION TWENTY-SEVEN

C. Basil-2 trial will clarify if angioplasty or bypass first is best

Reasoning: The best answer is C. This question was written before the results of Basil-2 were known and has now been removed from the question bank, however, as a sample question for Part A process practice it is valid to consider. To determine the most accurate statement, we need to understand the context of the trials mentioned (BASIL-1, BASIL-2, BASIL-3, and PREVENT) and their recommendations regarding the treatment of chronic limb-threatening ischemia (CLTI).

BASIL-1 Trial: The Bypass versus Angioplasty in Severe Ischaemia of the Leg (BASIL) trial was designed to compare bypass surgery and angioplasty in patients with severe limb ischemia.The BASIL-1 trial found that for patients expected to live longer than 2 years, bypass surgery might be more beneficial. However, it didn't specifically recommend bypass or angioplasty first for crural vessels (below the knee).

BASIL-2 Trial: The BASIL-2 trial aimed to provide more clarity on whether bypass surgery or angioplasty should be performed first in patients with severe limb ischemia, particularly involving infrapopliteal (below the knee) disease. This trial was reported in the Lancet in 2023 and demonstrated an endovascular first strategy should be considered first line in selected patients.

BASIL-3 Trial: The BASIL-3 trial is designed to compare drug-coated balloon angioplasty with plain balloon angioplasty and drug-eluting stents in the treatment of below-the-knee (crural) artery disease. It focuses on refining endovascular treatment rather than choosing between endovascular and surgical options.

PREVENT Trial: The PREVENT trial primarily focuses on preventing restenosis and graft failure after lower extremity bypass surgery. It does not specifically address whether to choose angioplasty or bypass surgery first for crural vessels.

28. A randomised trial of EVAR vs open repair of ruptured AAA demonstrated an odds ratio of 0.92 (95% Confidence interval 0.67 – 1.33) for 30 day mortality.
Which of the following statements is supported by this data?

A. EVAR is 8% better than open repair
B. EVAR is safer than open repair
C. The odds of death after ruptured AAA is 92%
D. This is a statistically significant result
E. This is not a statistically significant result

QUESTION TWENTY-EIGHT ANSWER

E. This is not a statistically significant result

Reasoning: A. Although the point estimate of the OR suggests an 8% lower odds of mortality with EVAR, the confidence interval indicates that this result is not statistically significant.

B. The data does not provide sufficient evidence to support that EVAR is definitively safer since the confidence interval includes 1.

C. This misinterprets the OR. An OR of 0.92 means the odds of death with EVAR are 92% of those with open repair, not that the overall odds of death are 92%.

D. Because the 95% CI includes 1, the result is not statistically significant.

E. **This is the best answer**. Since the 95% CI for the OR includes 1, we cannot reject the null hypothesis that there is no difference between EVAR and open repair for 30-day mortality.

29. A randomised trial is designed to study a new drug (Preventaleak) which aims to stabilise the aortic aneurysm sac following endovascular repair with adverse anatomy to reduce the risk of the development of endoleaks. Group A (100 patients) had an EVAR and standard postop management and surveillance, Group B (100 patients) had an EVAR with standard management plus the new drug. At the end of 5 years there were 10 endoleaks in Group A and 5 in group B. The cost of the drug is £2000 per year. Which of the following is true?

A. It will be cost effective at a willingness to pay threshold of £20,000
B. The absolute risk reduction of an endoleak in group B is 0.50
C. The number needed to treat with the drug is 20
D. The odds ratio for an endoleak in group B is 0.50
E. The relative risk of an endoleak in group B is 0.45

QUESTION TWENTY-NINE ANSWER

C. The number needed to treat with the drug is 20

The best answer is C. The premise of this question is to know how to calculate the Absolute Risk Reduction (ARR), Number Needed to treat (NNT), Relative Risk (RR) and Odds Ratio (OR) and cost effectiveness:

ARR

Risk of endoleak in Group A = 10/100 = 0.10.

Risk of endoleak in Group B = 5/100 = 0.05

ARR = Risk in Group A – Risk in Group B

ARR = 0.10−0.05 = 0.05

The absolute risk reduction of an endoleak in group B is 0.05 (or 5%).

NNT

The NNT is the reciprocal of the ARR =1/0.05=20 (the number needed to treat with the drug to prevent one endoleak is 20).

RR

RR in Group B =Risk in Group B/ Risk in Group A

RR=0.05/0.10=0.50

The relative risk of an endoleak in Group B compared to Group A is 0.50.

OR

Odds of endoleak in Group A: Odds A = Risk A / (1− Risk A) = 0.10/0.90=0.111

Odds of endoleak in Group B: Odds B = Risk B / (1−Risk B) =0.05/0.95=0.053

OR = Odds B / Odds A

OR=0.053/0.111 = 0.477

The odds ratio for an endoleak in Group B is approximately 0.48, not 0.50.

Cost-Effectiveness:

The cost of the drug per patient is £2000 per year. Give 20 patients need to be treated to prevent one endoleak over 5 years, £2000 x 20 x 5= £200000 needs to be spent to prevent one endoleak. This is above the threshold of £20000 and therefore will not be cost effective

30. A 67 year old male has a 6.1cm descending thoracic aneurysm arising distal to the left subclavian artery origin. During pre-operative planning for TEVAR, coverage of the left subclavian artery is required to achieve an adequate seal zone. Under which circumstances would revascularization be mandatory?

A. Coverage of > 20 cm of aorta

B. Dominant left vertebral artery

C. Left arm arteriovenous fistula

D. Left internal mammary coronary graft

E. Previous infra-renal aortic replacement

QUESTION THIRTY ANSWER

D. Left internal mammary coronary graft

When planning Thoracic Endovascular Aortic Repair (TEVAR) that involves covering the left subclavian artery (LSA) to achieve an adequate seal zone, revascularization of the LSA is often considered to maintain adequate blood flow and avoid complications. Let's consider the provided options:

- **A. Coverage of > 20 cm of aorta**: Coverage of a large segment of the aorta is significant with risk of spinal cord ischaemia, but does not specifically mandate revascularization of the LSA.
- **B. Dominant left vertebral artery**: If the left vertebral artery is dominant, covering the LSA without revascularization can compromise blood flow to the brain, increasing the risk of posterior circulation stroke. In the presence of intact circle of willis, this may not result in a stroke.
- **C. Left arm arteriovenous fistula**: In patients with an arteriovenous fistula for dialysis, maintaining adequate blood flow to the arm is crucial, this may be correct, but collateral flow may be sufficient to maintain the fistula.
- **D. Left internal mammary coronary graft**: If the patient has a coronary artery bypass graft using the left internal mammary artery, covering the LSA could compromise the blood supply to the grafted coronary artery, necessitating revascularisation
- **E. Previous infra-renal aortic replacement**: Previous infra-renal aortic replacement is important but does not directly mandate revascularization of the LSA.

Considering these options, the most critical circumstance where revascularization of the LSA would be mandatory is:

D. Left internal mammary coronary graft

This is because the left internal mammary artery is often used as a graft in coronary artery bypass surgery, and its blood supply is crucial for the heart. Covering the LSA without revascularisation would compromise the graft, leading to potential myocardial ischemia or infarction, or sudden death.

31. A 75 year old man with tortuous access arteries and occluded internal iliac arteries undergoes a difficult 4 vessel fenestrated endovascular aneurysm repair. On completion imaging there is no flow in either limb of the graft despite aspirating the sheaths.

What is the best way to proceed?

A. Abciximab bolus and heparin infusion

B. Axillo-bifemoral bypass graft

C. Embolectomy over the wire

D. Embolectomy with a Fogarty catheter

E. Thrombolysis

QUESTION THIRTY-ONE

C. Embolectomy over the wire

Reasoning: The correct answer is…. "C. Embolectomy over the wire" would be the best approach for managing the acute occlusion in both limbs of the graft in this scenario:

1. **Immediate Restoration of Flow**: The primary goal in this situation is to quickly restore blood flow through the graft limbs. Given the context of a recent complex endovascular procedure with no flow detected, immediate mechanical intervention is necessary.
2. **Endovascular Approach**: Considering the patient has just undergone a fenestrated endovascular aneurysm repair (FEVAR), maintaining a minimally invasive endovascular approach is ideal. This avoids the risks associated with open surgical procedures, which is particularly important in a high-risk patient population.
3. **Use of Wire Guidance**:
    - **Wire Navigation**: Performing an embolectomy over the wire allows for precise navigation through the graft limbs. This technique involves using a guidewire to facilitate the passage of embolectomy devices directly to the site of occlusion.
    - **Less Invasive**: This method minimizes additional trauma to the already manipulated vessels and graft, reducing the risk of further complications.
4. **Practical Considerations**:
    - **Feasibility**: Using the guidewire that is already in place from the initial procedure, an embolectomy catheter can be advanced directly to the thrombus. This is both practical and efficient.
    - **Success Rate**: Embolectomy over the wire is often successful in resolving acute occlusions, particularly in the controlled environment of the operating room where the patient is still under anaesthesia and the vascular access is fresh.
5. **Comparison to Other Options**:
    - **Abciximab and Heparin Infusion (A)**: While useful for thrombus prevention and dissolution, it may not act quickly enough for an acute occlusion and does not physically remove the thrombus.
    - **Axillo-bifemoral Bypass (B)**: This is a more invasive surgical option that is generally reserved for cases where endovascular techniques have failed.
    - **Embolectomy with a Fogarty Catheter (D)**: Though effective, this typically requires withdrawal of the guidewire and re-introduction of the catheter, which can be more cumbersome and less precise.
    - **Thrombolysis (E)**: This is less immediate and carries a risk of bleeding complications, especially shortly after a major endovascular procedure.

Given the urgency to re-establish blood flow and the benefits of leveraging the existing endovascular setup, "C. Embolectomy over the wire" is the best approach in this specific context. It combines immediate mechanical resolution with the precision of wire guidance, making it an optimal choice for this scenario.

32. During endovascular aneurysm repair, the patient radiation dose is increased by:

A. Insertion of a copper filter

B. Insertion of an anti-scatter grid

C. Reducing frames per second rate

D. Use of fluoroscopy rather than digital subtraction angiography

E. Use of last image hold technique

QUESTION THIRTY-TWO

B. Insertion of an anti-scatter grid

Reasoning: During endovascular aneurysm repair (EVAR), the patient radiation dose can be influenced by several factors related to the imaging techniques used.

- **A. Insertion of a copper filter**: Inserting a copper filter typically reduces the radiation dose. Copper filters absorb low-energy X-rays, which do not contribute to image quality
- **B. Insertion of an anti-scatter grid**: Anti-scatter grids are used to improve image quality by reducing scatter radiation that reaches the detector. However, using an anti-scatter grid generally increases the patient radiation dose because higher radiation doses are required to penetrate the grid and achieve the same image quality.
- **C. Reducing frames per second rate**: Reducing the frames per second (FPS) rate decreases the radiation dose because fewer images are captured over time, reducing the overall exposure.
- **D. Use of fluoroscopy rather than digital subtraction angiography**: Fluoroscopy generally results in a lower radiation dose compared to digital subtraction angiography (DSA), which requires multiple images to be taken and subtracted from each other to produce a clear view of the blood vessels.
- **E. Use of last image hold technique**: The last image hold technique reduces the radiation dose by allowing the operator to use the last captured image for reference instead of continuously using fluoroscopy.

Given these explanations, the correct answer is:

B. Insertion of an anti-scatter grid

Insertion of an anti-scatter grid increases the patient radiation dose during endovascular aneurysm repair because it requires a higher radiation dose to maintain image quality due to the attenuation of the grid.

33. Surveillance ultrasound of an abdominal aortic aneurysm is being undertaken in an average weight 72 year old man. In order to improve axial resolution, the following applies:

A. Use of harmonic imaging reduces axial resolution

B. Use of higher frequencies will improve axial resolution, however beam attenuation will be reduced

C. Use of higher frequencies will improve axial resolution, however beam attenuation will be increased

D. Use of lower frequencies will improve axial resolution, however beam attenuation will be reduced

E. Use of lower frequencies will improve resolution, however beam attenuation will be increased

QUESTION THIRTY-THREE ANSWER

C. Use of higher frequencies will improve axial resolution, however beam attenuation will be increased

Reasoning: To understand how to improve axial resolution during an ultrasound, it's essential to know that axial resolution is primarily determined by the frequency of the ultrasound waves. Higher frequencies provide better axial resolution because they have shorter wavelengths, which can distinguish between closely spaced structures. However, higher frequencies also result in greater beam attenuation, meaning the ultrasound waves are absorbed and scattered more quickly, limiting their penetration depth.

-
- **A. Use of harmonic imaging reduces axial resolution**: Harmonic imaging can improve image quality by reducing artifacts and noise, but it doesn't necessarily reduce axial resolution. Therefore, this statement is not correct in the context of axial resolution specifically.
- **B. Use of higher frequencies will improve axial resolution, however beam attenuation will be reduced**: This statement is incorrect because higher frequencies actually increase beam attenuation, not reduce it.
- **C. Use of higher frequencies will improve axial resolution, however beam attenuation will be increased**: This is correct. Higher frequencies improve axial resolution due to shorter wavelengths, but they also increase beam attenuation, limiting the depth of penetration.
- **D. Use of lower frequencies will improve axial resolution, however beam attenuation will be reduced**: This statement is incorrect because lower frequencies decrease axial resolution but increase penetration depth due to reduced beam attenuation.
- **E. Use of lower frequencies will improve resolution, however beam attenuation will be increased**: This statement is also incorrect because lower frequencies decrease resolution and reduce attenuation.

Therefore, the best answer is:

C. Use of higher frequencies will improve axial resolution, however beam attenuation will be increased

34. Strategies to optimise detection of low flow velocities during duplex ultrasound examination include:

A. decreasing the colour velocity scale

B. increasing the high pass/wall filter setting

C. maintaining a Doppler angle >60° during spectral Doppler analysis

D. reduction in pulsed Doppler gain

E. reduction in sample volume gate on spectral Doppler analysis

QUESTION THIRTY-FOUR ANSWER

A. decreasing the colour velocity scale

Reasoning: To optimize the detection of low flow velocities during a duplex ultrasound examination, the following strategies are most effective:

A. Decreasing the colour velocity scale
Lowering the colour velocity scale increases the sensitivity to slow-flowing blood by allowing the machine to detect smaller velocity changes. This is essential for accurately visualizing low flow velocities. **This is the correct answer**

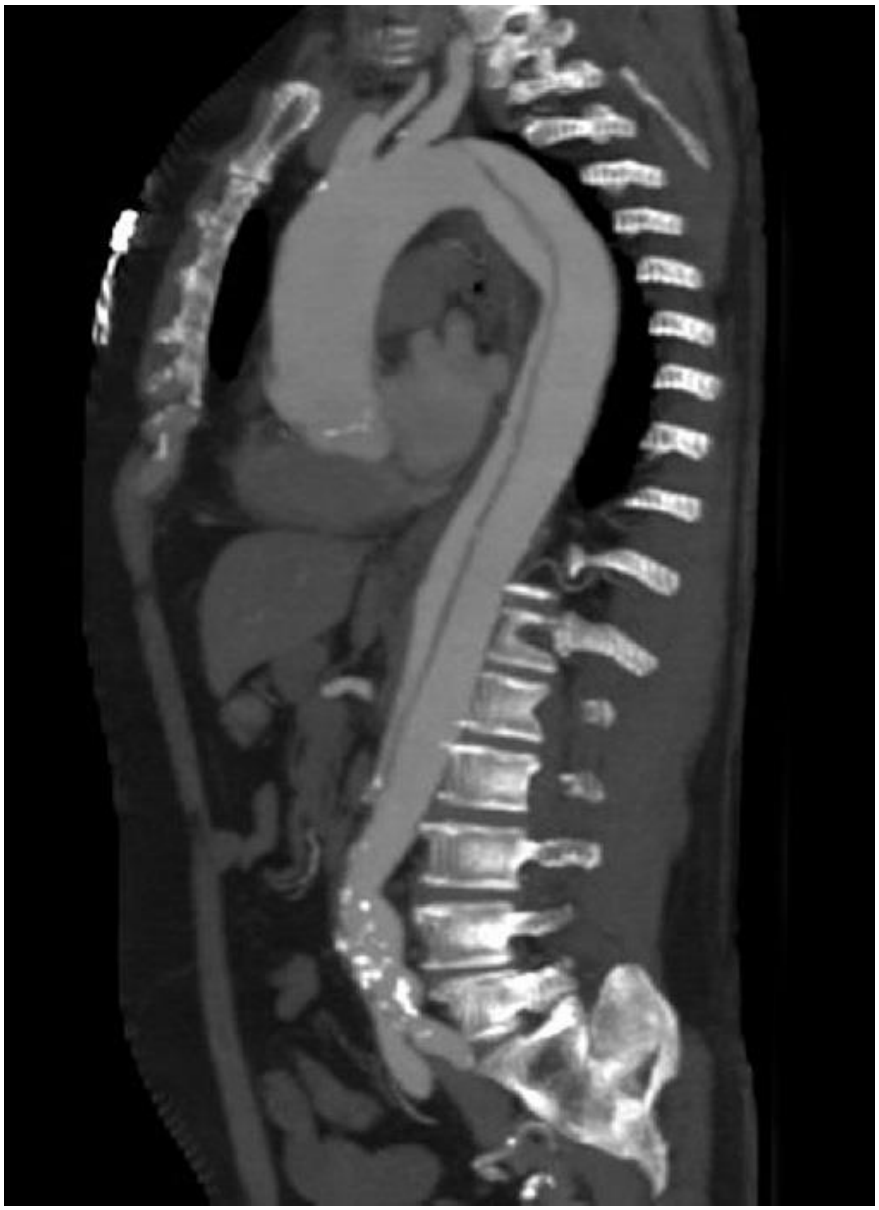
B. Increasing the high pass/wall filter setting
Increasing the high pass/wall filter setting actually reduces the sensitivity to low flow velocities because it filters out lower frequency signals, which could include slow flow. Therefore, this is not a recommended strategy for detecting low flow velocities.

C. Maintaining a Doppler angle >60° during spectral Doppler analysis
A Doppler angle greater than 60° is less ideal for spectral Doppler analysis because it reduces the accuracy of velocity measurement and makes it more difficult to detect low flow velocities. A Doppler angle closer to 0° (ideally <60°) is preferred to obtain more accurate measurements and better detect low flow velocities.

D. Reduction in pulsed Doppler gain
Reducing the pulsed Doppler gain can decrease the sensitivity to low flow velocities, as it might reduce the overall signal strength. Thus, lowering the gain is not beneficial for detecting low flow velocities.

E. Reduction in sample volume gate on spectral Doppler analysis
Reducing the sample volume gate can improve the sensitivity to low flow velocities by focusing on a smaller volume of blood and reducing the effects of noise or artifacts from surrounding tissues. This can help to better identify slow-moving blood, but is not as effective as decreasing the colour flow scale.

QUESTION THIRTY-FIVE REFER TO THE FOLLOWING INFORMATION



QUESTION THIRTY-FIVE REFER TO THE FOLLOWING INFORMATION

35. A 69 year old man presents with a 6 hour history of acute, severe, interscapular back, chest and left-sided abdominal pain. He is a smoker but has no other relevant history and is not on any regular medication. His blood pressure is 193/100mmHg, and he has palpable femoral pulses bilaterally. His eGFR is 60ml/min/1.73m2, and white cell count is 19x109/L. His arterial blood pH is 7.27, base excess -9.0mEq/L. Two reference images from his CT angiogram are shown (see exhibits).
What is the most appropriate management plan?

A. Aortic root replacement
B. Blood pressure control and observation
C. Endovascular thoracic stent insertion
D. Open septal fenestration
E. Open thoracoabdominal aortic replacement

QUESTION THIRTY-FIVE

C. Endovascular thoracic stent insertion

Reasoning: The best answer is C. TEVAR is indicated for complicated type B aortic dissections, particularly those with visceral involvement, as it stabilises the dissection and restores blood flow to the visceral organs. TEVAR is a less invasive procedure compared to open surgery and can effectively manage complications such as organ ischemia and pain. Blood pressure control and observation are appropriate for uncomplicated type B dissections. Open septal fenestration is not typically the first-line treatment for acute type B dissections. Aortic root replacement is not appropriate in this case.

36. A 67 year old man presents with flank pain and shock. He is otherwise fit and underwent an endovascular procedure for AAA 3 years ago, but has been lost to follow-up. There appears to have been caudal migration of the stent and no aortic stents in the aortic neck (see exhibit).
What is the best option?

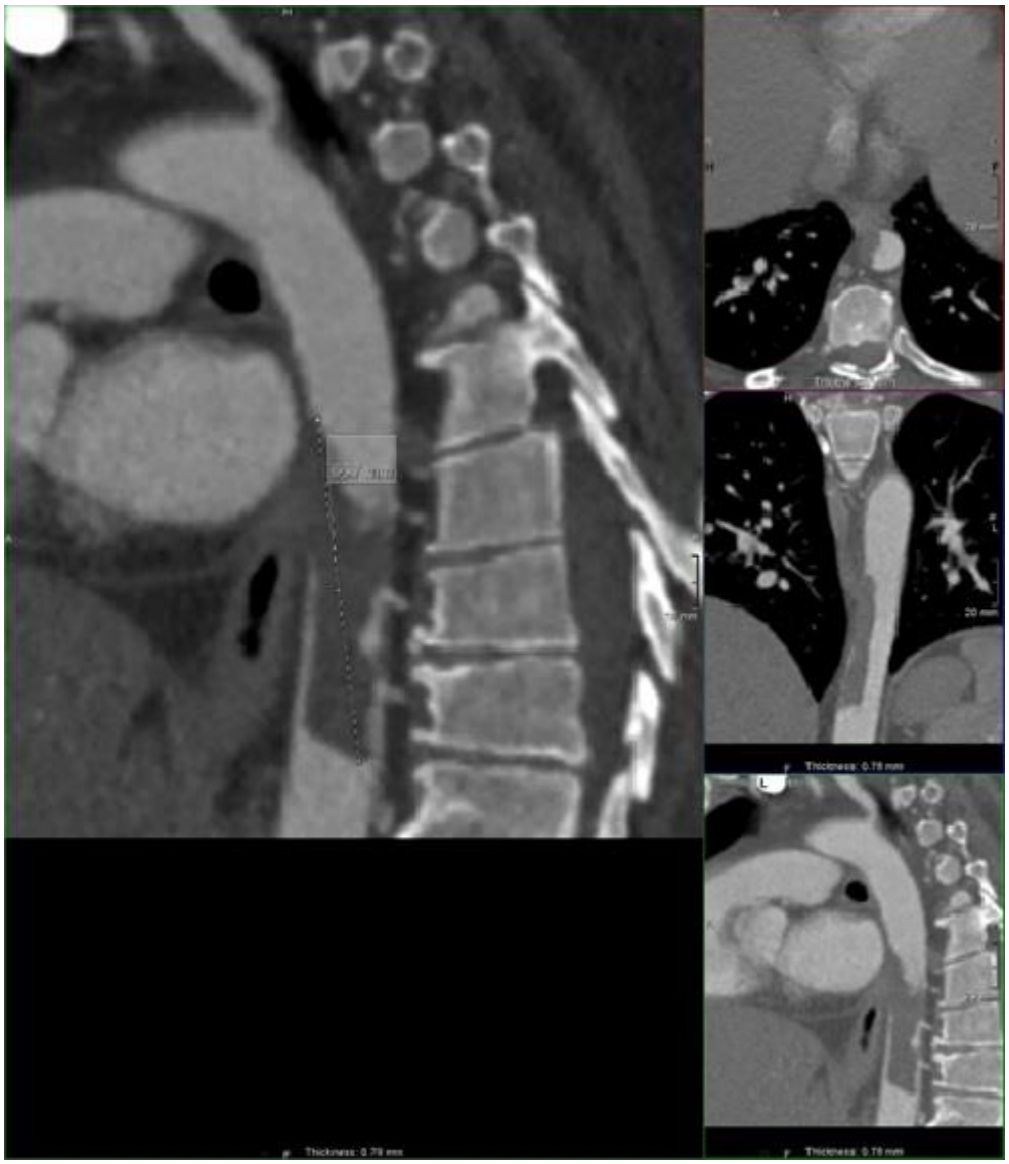
A. Coil embolisation
B. Open surgical repair
C. Palliation
D. Proximal aortic cuff
E. Proximal stents +/- parallel stents in the renal arteries

QUESTION THIRTY-SIX ANSWER

B. Open surgical repair

Reasoning: The answer is B. Open surgical repair is indicated in this scenario because the patient presents with stent graft failure with signs of haemodynamic instability. In addition, given his age and fitness, an open repair is more favourable. Coil embolisation would not be sufficient to address the underlying problem of stent migration. D and E may not be appropriate in this case given the significant caudal migration and the patient's hemodynamic instability. Palliation is not appropriate given the patient is normally fit.

QUESTION THIRTY-SEVEN REFER TO THE FOLLOWING INFORMATION



37. Whilst being worked up for an infra-renal aortic aneurysm repair, an incidental finding is demonstrated in the exhibits shown.
What is the most appropriate management for this finding?

A. Anti-coagulate and observe
B. Catheter directed thrombolysi
C. Fogarty Thrombectomy
D. Open replacement of descending Thoracic aorta
E. Thoracic endovascular stent graft

QUESTION THIRTY-SEVEN ANSWER

A. Anti-coagulate and observe

Reasoning: The answer is A. The occlusion in the thoracic aorta was found incidentally, and the patient is asymptomatic. Anticoagulation can prevent thrombus propagation and embolisation, while observation ensures that any changes in the patient's condition can be detected early. Given the above, a conservative approach with anticoagulation and observation is most appropriate.

QUESTION THIRTY-EIGHT REFER TO THE FOLLOWING INFORMATION

QUESTION THIRTY-EIGHT REFER TO THE FOLLOWING INFORMATION

38. A 79 year old female patient is reviewed in clinic two months after she is discharged home from hospital, where she has spent four weeks in ITU with severe pneumonia on a background of COPD. She is now on home oxygen and has carers three times a day. She has failed to gain weight and has a BMI of 19 kg/m^2. She complains of a constant boring pain in the mid left chest and pain in her left hand. On examination, she has ischaemic petechiae on the fingers of her left hand and the ulnar pulse is absent at the wrist. Her Hb is 96 g/L, WCC 17 x 10^9/L and CRP 57 mg/L. A CTA is performed (see exhibits).

What is the most appropriate management for this patient?

A. Endovascular embolization of the proximal left subclavian artery and carotid-subclavian bypass
B. Long term antibiotics at home and anticoagulation
C. Subclavian artery stent graft insertion
D. TEVAR and embolization of the proximal left subclavian artery and carotid-subclavian bypass
E. Thoracotomy, ligation and excision of the proximal left subclavian artery

QUESTION THIRTY-EIGHT ANSWER

B. Long term antibiotics at home and anticoagulation

Reasoning: The answer is B. The patient presents with symptoms and signs suggestive of mycotic aneurysm of the left subclavian artery. Long-term antibiotics are crucial to treat the underlying infection, while anticoagulation can help manage the thromboembolic complications from the aneurysm. Given her frailty, extensive recent ICU stay, and current dependency on home oxygen, a less invasive approach focused on medical management is the most appropriate first step.

QUESTION THIRTY-NINE REFER TO THE FOLLOWING INFORMATION

39. An 89 year old male with severe COPD presents with an acutely swollen, painful, bruised right leg. He has previously undergone endovascular stenting for a ruptured popliteal artery aneurysm. A DUS is suboptimal but suggests the aneurysm sac is a little larger with flow. A scanogram is shown (see exhibit).
How would you manage this patient?

A. Above knee amputation
B. Coil embolisation
C. Exclusion bypass using autologous vein
D. Exclusion bypass using prosthetic
E. Further stent graft implantation

QUESTION THIRTY-NINE ANSWER

E. Further stent graft implantation

Reasoning: The answer is E because it addresses the immediate problem of the misaligned stents and the persistent aneurysm flow. By placing another stent graft, you can realign the stents to ensure exclusion of the aneurysm sac, thus preventing further expansion and potential rupture. Given the patient's severe COPD and advanced age, a less invasive endovascular approach is preferable to open surgery. Coil embolisation and above knee amputation are not appropriate in the first instance as the stents could be realigned again.

40. Which of the following is correct regarding medical statistics?

A. A wide confidence interval indicates a high power of a study
B. P values indicate the power of a study
C. Sample size affects the power of the study
D. Sensitivity of a study is the proportion of negatives which are correctly identified
E. Specificity is the proportion of positives which are correctly identified

QUESTION FORTY ANSWER

C. Sample size affects the power of the study

Reasoning: A. A wide confidence interval actually indicates greater uncertainty about the estimate of effect size. High power in a study usually results in narrower confidence intervals, reflecting more precision in the estimate.

B. P values indicate the probability of obtaining the observed results, or more extreme results, if the null hypothesis is true. They do not directly provide information about the power of the study, which is the probability of correctly rejecting the null hypothesis when it is false.

C. **This is the best answer.** The power of a study is influenced by several factors, including the sample size. Larger sample sizes generally increase the power of a study because they reduce the standard error, making it easier to detect a true effect if one exists.

D. Sensitivity is the proportion of true positives that are correctly identified by the test. It measures the test's ability to correctly identify those with the condition (true positive rate).

E. Specificity is the proportion of true negatives that are correctly identified by the test. It measures the test's ability to correctly identify those without the condition (true negative rate).

41. A 76 year old female with a background of mitral valve replacement for which she takes warfarin, and a small 3.6 cm abdominal aortic aneurysm (AAA) is admitted for hysterectomy. Peri-operatively her warfarin is discontinued. On day 4 post-operatively, she complains of bilateral foot pain and has patchy fixed discolouration/appearances of trash to her feet.

Full blood count results are:

Day 1: HB 132 g/L, Platelets 287 x 10^9/L, WCC 7 x 10^9/L

Day 3: HB 130 g/L, Platelets 100 x 10^9/L, WCC 9 x 10^9/L

What is the most appropriate treatment strategy?

A. Commence IV danaparoid (direct thrombin inhibitor)

B. Commence IV heparin and perform cross-sectional imaging

C. Commence IV heparin and plan for early repair of AAA

D. Commence IV iloprost (PGI_2)

E. Commence therapeutic low molecular weight heparin

QUESTION FORTY-ONE ANSWER

A. Commence IV danaparoid (direct thrombin inhibitor)

Reasoning**:** Whilst the abdominal aortic aneurysm may have been a cause of the trash repair of AAA at its current size is not indicated unless there is ongoing trashing whilst the patient is adequately anticoagulated, and therefore answer C is incorrect. Iloprost is not of proven benefit for the management of trash and so, answer D is incorrect. The drop in platelet count suggests that the patient has HITS and therefore LMWH and iv heparin should not be used to treat the patient and therefore answers B, C and E are incorrect. The correct answer is A. Danaparoid is a non-heparin anticoagulant used tin the context of HIT.

QUESTION FORTY-TWO REFER TO THE FOLLOWING INFORMATION

VASCULAR LABORATORY, CLINICAL PHYSICS DEPARTMENT
UNIVERSITY HOSPITAL

DUPLEX ULTRASOUND
Lower Limb Scan

III - NOT SEEN
~ - NOT SCANNED

Date of test __/__/__ **Time since op** _____

Scan No. __/__/__

Name
Address

DOB __/__/__ **H.N.** _____

Resting ankle pressures (mm Hg)

	DP	PT	Per	BP	Index
Right					
Left					

Post-exercise pressures

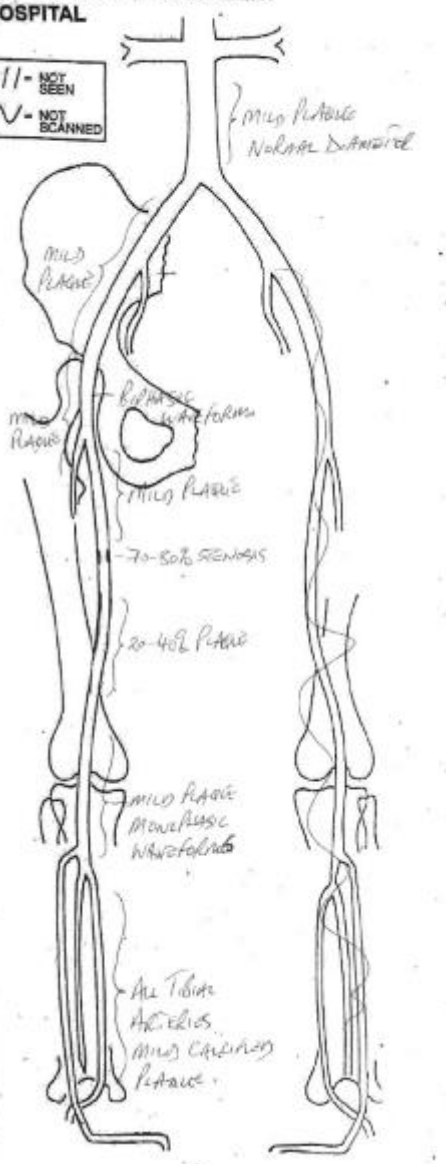
	DP	PT	Per	BP	Index
Right					
Left					

____ mph Time walked _____

Comment:

Scan comment:

Signed _____



42. A 66 year old patient with intermittent claudication of his right leg at 150 m is reviewed in your clinic. He has hypertension, hypercholesterolaemia and is an ex smoker of 5 years. His ABPI is 0.7. Duplex scan is performed (see exhibit).

    What is the best treatment option?

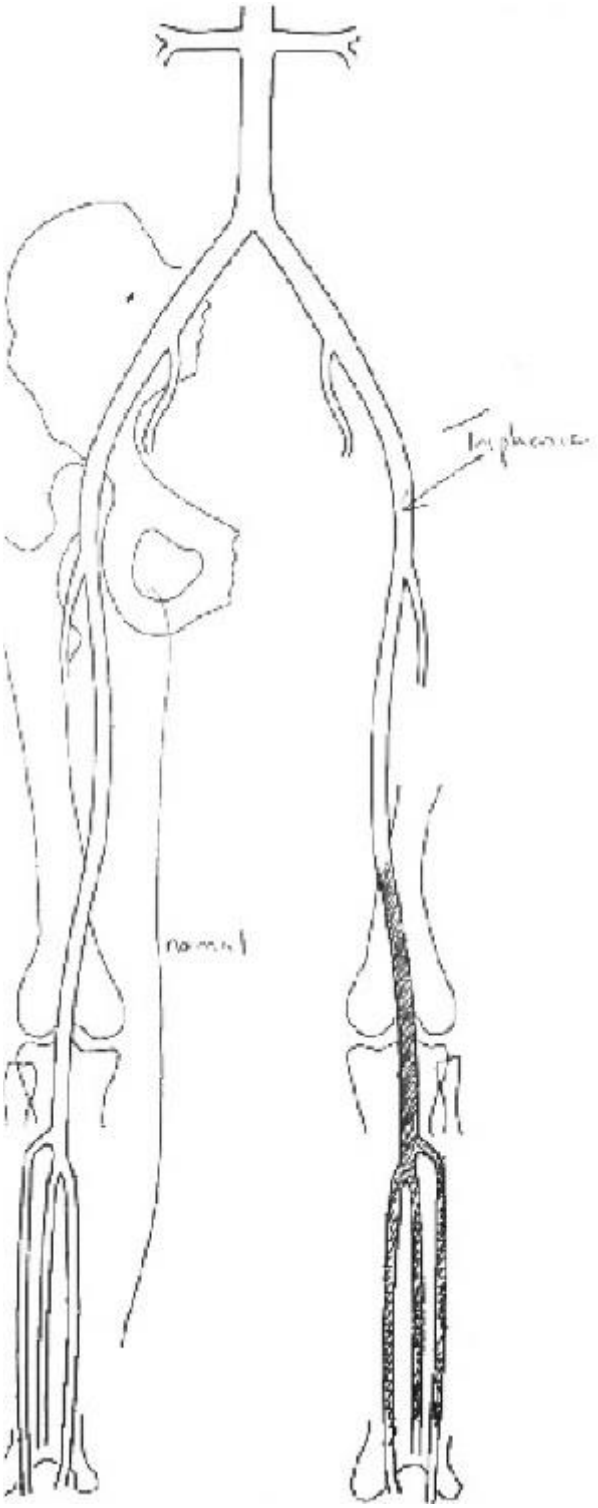
    A. Femoro popliteal bypass
    B. Naftidrofuryl oxalate and best medical treatment
    C. SFA angioplasty
    D. SFA stent
    E. Supervised exercise therapy and best medical treatment

QUESTION FORTY-TWO ANSER

E. Supervised exercise therapy and best medical treatment

Reasoning: The answer is E. The best initial treatment option for a patient with intermittent claudication who has not had best medical therapy should be managed conservatively at first. Supervised exercise therapy in intermittent claudication has been shown to improve walking distance and overall cardiovascular health. Optimal medical treatment including antiplatelet therapy, statins, and strict control of hypertension should be commenced first.

QUESTION FORTY-THREE REFER TO THE FOLLOWING INFORMATION



43. You review a 39 year old triathlete in A & E who presents with a 10 hour history of left leg pain. On examination, he has a palpable left femoral pulse only. He has reduced sensation and power in his left foot and leg and non-fixed mottling. He undergoes an emergency arterial duplex scan (see exhibit).

    What would be the most appropriate treatment?

    A. Catheter directed thrombolysis
    B. Four compartment calf fasciotomies
    C. Popliteal/tibial vessel embolectomy and on table angiogram
    D. SFA to PT_3 bypass using non-reversed LSV, anatomically tunne
    E. SFA to PT_3 bypass using non-reversed LSV, superficial tunnel

QUESTION FORTY-THREE ANSWER

C. Popliteal/tibial vessel embolectomy and on table angiogram

Reasoning: The answer is C. This patient presented with acute limb ischaemia. While he is a candidate for catheter-directed thrombolysis, given the 10-hour history and the presence of neurological deficits, immediate revascularisation is preferable over thrombolysis, which may take 24-48 hours to be effective. On-table angiogram would help to visualise and guide further treatment options. Given the acute nature of the ischemia and the presence of neurological symptoms, this approach allows for prompt restoration of blood flow, reducing the risk of permanent neurological deficit and major limb loss.

QUESTION FIRTY-FOUR REFER TO THE FOLLOWING INFORMATION

44. A 67 year old man presents with a four months history of lifestyle limiting claudication. He undergoes an angiogram (see exhibit).

    How would you treat the lesion demonstrated?

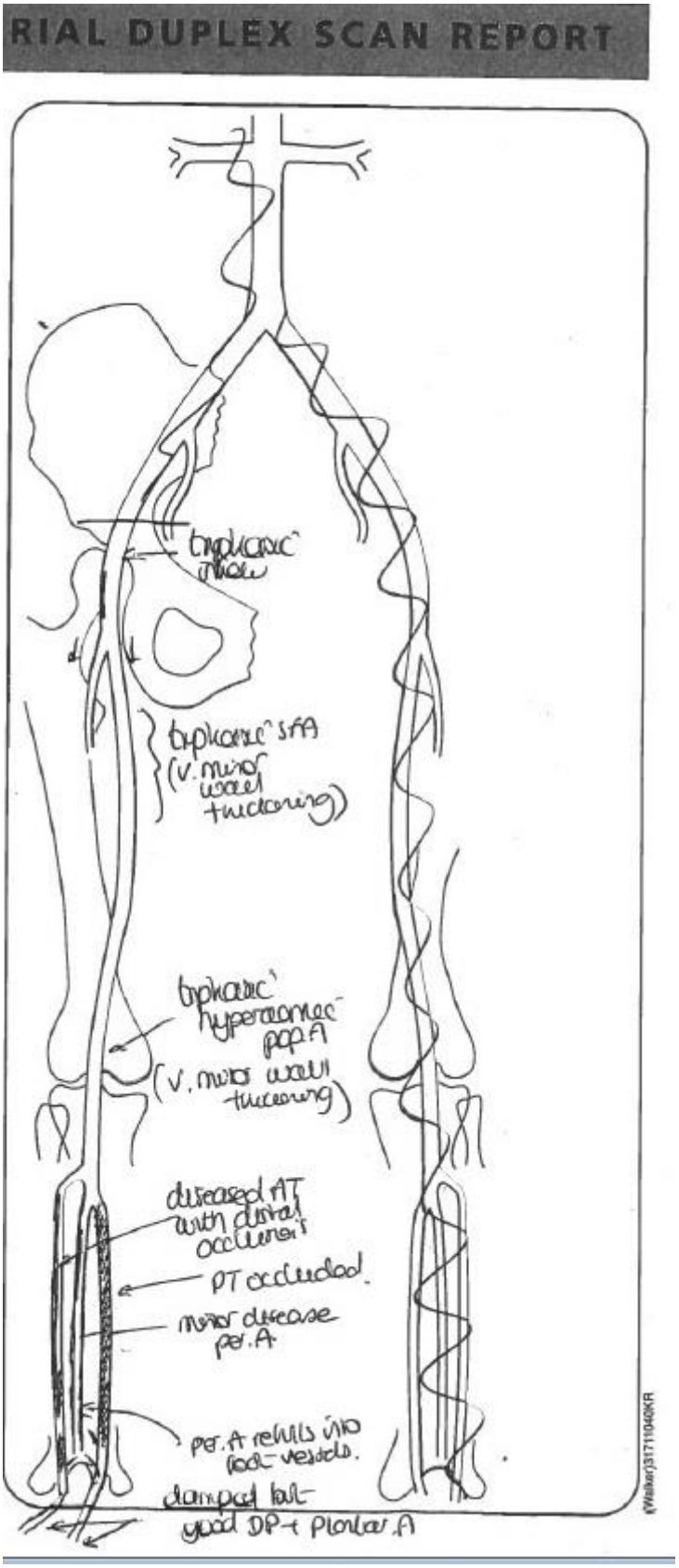
    A. Angioplasty of P0 segment of popliteal artery
    B. Angioplasty of P1 segment of popliteal artery
    C. Angioplasty of P2 segment of popliteal artery
    D. Angioplasty of P3 segment of popliteal artery
    E. Angioplasty of P4 segment of popliteal artery

QUESTION FORTY-FOUR ANSWER

C. Angioplasty of P2 segment of popliteal artery

Reasoning: The answer is C. There is a short segment occlusion in the popliteal artery just above the tibial plateau. This is within the P2 segment of the popliteal artery.

QUESTION FORTY-FIVE REFER TO THE FOLLOWING INFORMATION



QUESTION FORTY-FIVE REFER TO THE FOLLOWING INFORMATION

45. A 78 year old man presents to A & E with a temperature of 38.7°C, heart rate of 105 bpm and a BP of 100/85 mmHg. He has Type 2 diabetes, treated with metformin, hypertension and has previously had a laparotomy for small bowel obstruction. He is completely pain free but does not have any palpable pedal pulses. You diagnose diabetic foot sepsis. Images of his foot and his arterial duplex scan are shown (see exhibits).

    How would you proceed?

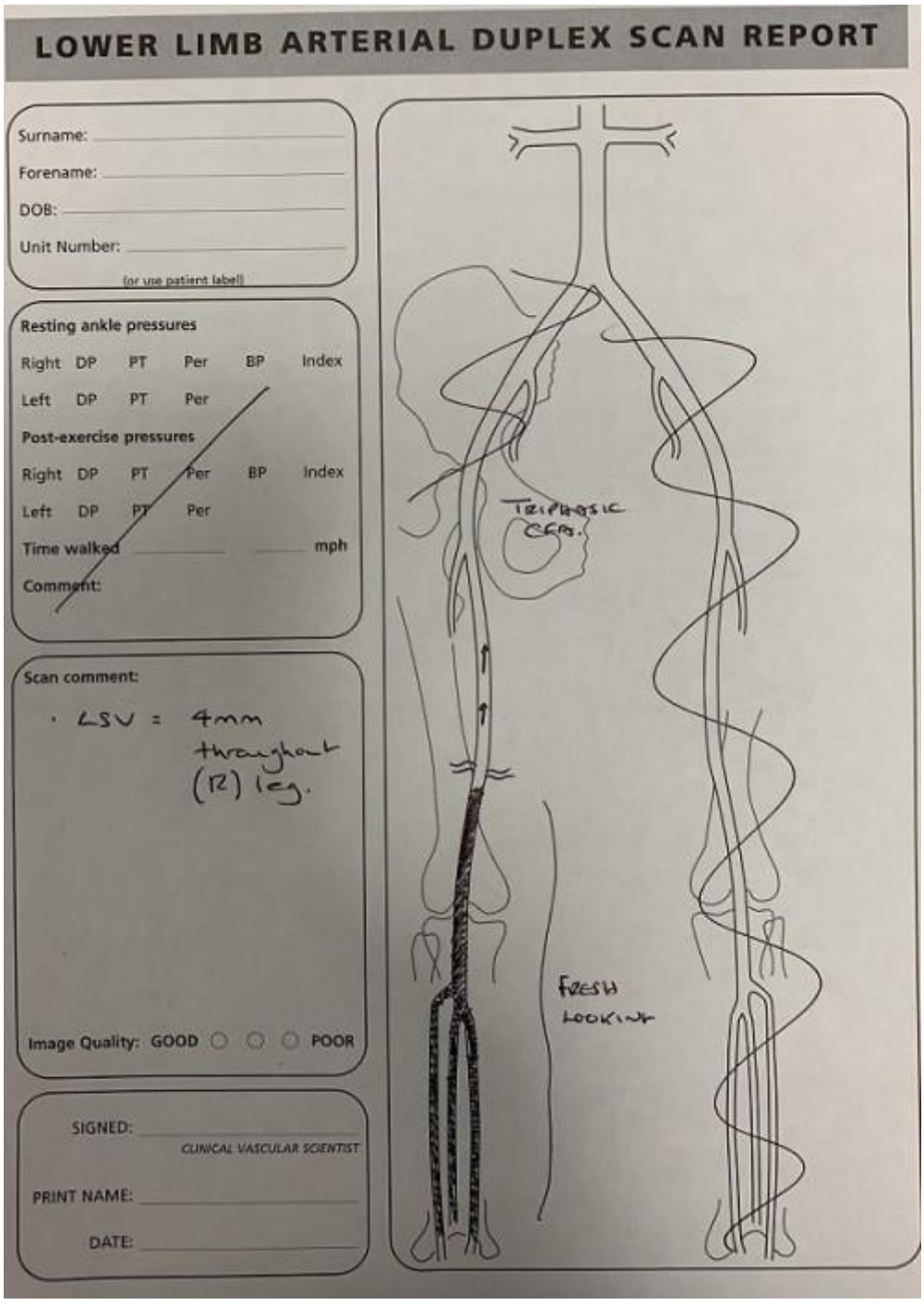
    A. Intravenous antibiotics and observation
    B. Urgent angioplasty followed by hallux amputation
    C. Urgent de-roofing of the hallux abscess followed by angioplasty
    D. Urgent hallux amputation followed by angioplasty
    E. Urgent pop-pedal bypass with synchronous hallux amputation

QUESTION FORTY-FIVE ANSWER

D. Urgent hallux amputation followed by angioplasty

Reasoning: The answer is D. Given the patient's presentation with wet gangrene, diabetic foot sepsis, and systemic signs of infection (pyrexia, tachycardia, hypotension), immediate debridement and drainage is necessary to manage the source of infection first. Following this, angioplasty can be performed to improve blood flow to facilitate wound healing and preventing further ischemic events.

QUESTION FORTY-SIX REFER TO THE FOLLOWING INFORMATION



LOWER LIMB ARTERIAL DUPLEX SCAN REPORT

Surname: _____

Forename: _____

DOB: _____

Unit Number: _____

(or use patient label)

Resting ankle pressures

Right DP PT Per BP Index

Left DP PT Per

Post-exercise pressures

Right DP PT Per BP Index

Left DP PT Per

Time walked _____ _____ mph

Comment:

Scan comment:

· LSV = 4mm throughout (R) leg.

Image Quality: GOOD ○ ○ ○ POOR

SIGNED: _____

CLINICAL VASCULAR SCIENTIST

PRINT NAME: _____

DATE: _____

TRIPHASIC CFA.

FRESH LOOKING

46. A 93 year old lady with diabetes is admitted through A & E with a four day history of right foot and leg pain. She lives with her son and requires help with her day to day living activities. On examination, she is frail with a heart rate of 100 bpm which is irregularly irregular and a BP = 100/50 mmHg. Her right foot and lower calf are insensate with fixed mottling of the skin. She has a palpable right femoral pulse; but popliteal, DP and PT are absent. She has a full complement of pulses in her left leg. She undergoes an arterial duplex scan (see exhibit).

    What would you recommend to the patient?

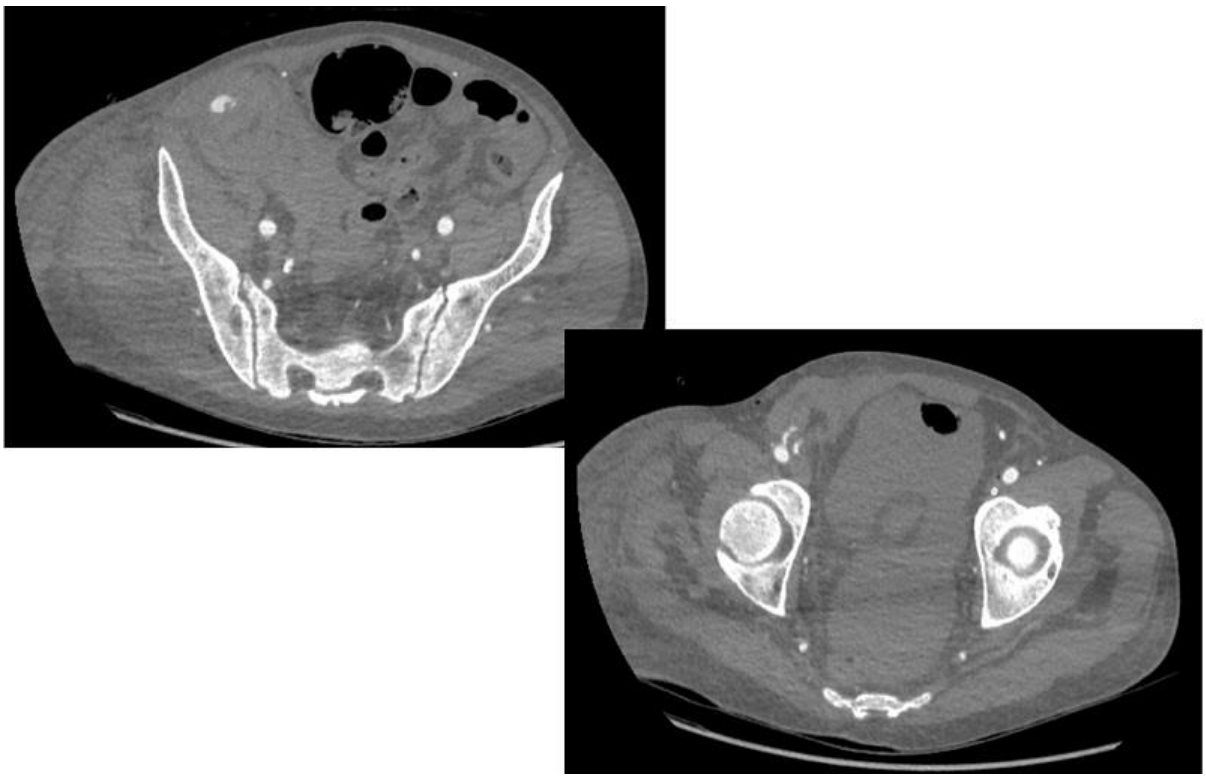
    A. Above knee amputation
    B. Catheter direct thrombolysis
    C. Intravenous heparinisation and observation
    D. Palliative care pathway
    E. Thromboembolectomy under local anaesthetic

QUESTION FORTY-SIX

D. Palliative care pathway

Reasoning: The answer is D. The patient presents with signs of profound ischemia in her right leg. The insensate foot and lower calf with fixed mottling suggest that the limb is non-viable. Given her frailty, age, and significant comorbidities, the focus should be on keeping her comfortable and dying with dignity.

QUESTION FORTY-SEVEN REFER TO THE FOLLOWING INFORMATION



47. You are asked to see a 69 year old man on the cardiology ward who is four hours post PTCA. Percutaneous access was achieved using a right femoral approach and 6F sheath. An Angio-seal was used for haemostasis. He is dialysis dependent, has biventricular failure (EF 20-25%), diabetes, CKD, AF and he is a smoker. On examination, he has a systolic blood pressure of 70 and heart rate of 120. His abdomen is tender and he has a large right groin swelling. A CTA is performed (see exhibit).
How would you proceed with his management?

A. Advise to insert a further Angio-Seal™
B. Conservative management (fluid resuscitation, correction of clotting, blood transfusion)
C. Emergency endovascular repair of the CFA
D. Emergency open repair with proximal control of EIA
E. Ultrasound guided thrombin injection

QUESTION FORTY-SEVEN ANSWER

D. Emergency open repair with proximal control of EIA

Reasoning: This patient has developed a large femoral pseudoaneurysm following femoral arterial access for PTCA, likely related to Angio-Seal closure failure or arterial wall injury at the puncture site.

Several features indicate active haemorrhage and haemodynamic instability. These findings indicate ongoing arterial bleeding with haemorrhagic shock, requiring immediate definitive haemorrhage control.

Open surgical repair allows:

- Rapid proximal vascular control, typically at the external iliac artery
- Evacuation of the haematoma
- Identification and repair of the arterial defect
- Prevention of ongoing blood loss

Therefore, emergency open repair with proximal control of the EIA is the most appropriate management.

A. This is inappropriate as the closure device has likely failed and the patient has active bleeding. Reinsertion would not control haemorrhage.

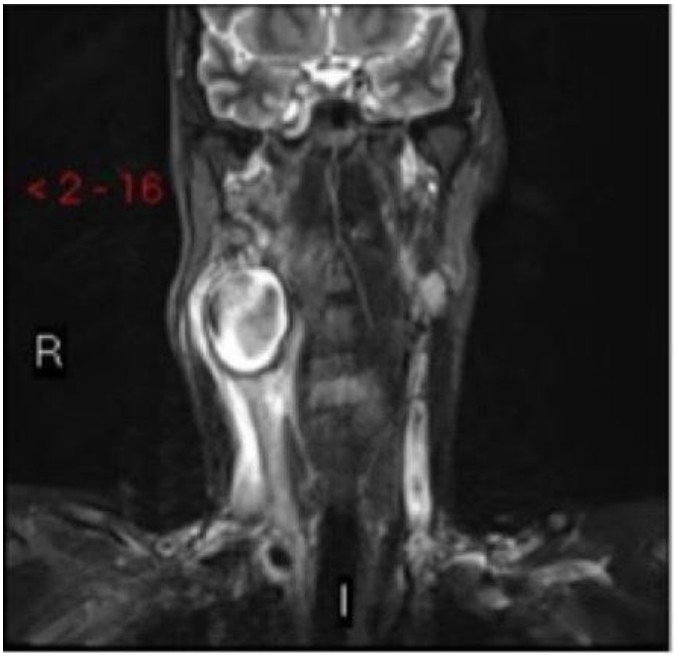
B. Conservative treatment is only suitable for stable pseudoaneurysms. This patient is haemodynamically unstable, indicating active arterial bleeding requiring surgical intervention.

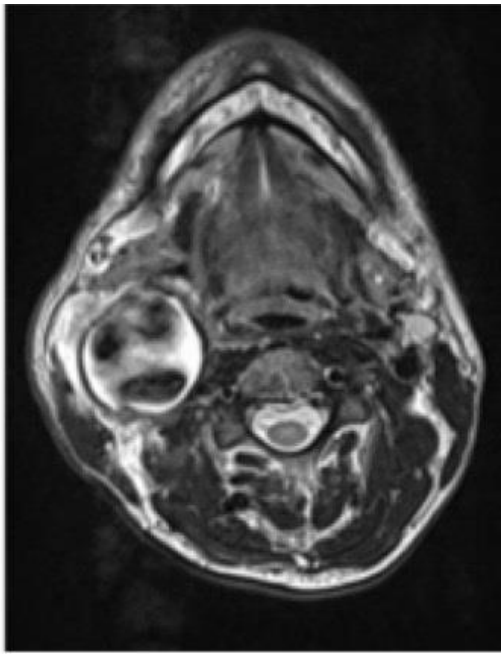
C. Although endovascular techniques may be used in select cases, they are not ideal in unstable patients with large groin haematomas and may compromise flow to the profunda femoris artery. Immediate open repair provides faster and more reliable haemorrhage control.

E. Thrombin injection is the first-line treatment for stable femoral pseudoaneurysms, but it is contraindicated in unstable patients or when rupture is suspected.

SBA D. In a patient with a large femoral pseudoaneurysm causing haemodynamic instability after femoral arterial access, the correct management is emergency open surgical repair with proximal control of the external iliac artery.

QUESTION FORTY-EIGHT REFER TO THE FOLLOWING INFORMATION





48. A 37 year old man presents with a tender, pulsatile right neck lump in the anterior triangle. He has recently had a course of anti-microbial mouth wash for a dental infection. An MRA is performed and demonstrates the following pathology (see exhibit).
In addition to blood cultures, what is the most appropriate management strategy?

A. 6 weeks of antibiotics
B. Covered endovascular carotid stent and 6 weeks of antibiotics
C. Open debridement, allograft interposition reconstruction and 6 weeks of antibiotics
D. Open debridement, ligation and 6 weeks of antibiotics
E. Open debridement, vein graft interposition reconstruction and 6 weeks of antibiotics

QUESTION FORTY-EIGHT ANSWER

E. Open debridement, vein graft interposition reconstruction and 6 weeks of antibiotics

Reasoning: This clinical scenario is highly suggestive of a mycotic (infected) carotid artery aneurysm or pseudoaneurysm, most likely involving the internal carotid artery.

Management requires both infection control and definitive surgical treatment.

Standard treatment involves:

1. Blood cultures
2. Prolonged intravenous antibiotics (approximately 6 weeks)
3. Surgical excision and debridement of infected tissue
4. Arterial reconstruction to maintain cerebral perfusion

A cryopreserved arterial allograft is often preferred because:

- It has greater resistance to infection than prosthetic grafts
- It avoids introducing prosthetic material into an infected surgical field
- It provides appropriate arterial wall characteristics for carotid reconstruction

A. 6 weeks of antibiotics
Antibiotics alone are insufficient because infected aneurysms have a high risk of rupture, embolisation, and progression. Surgical management is required.

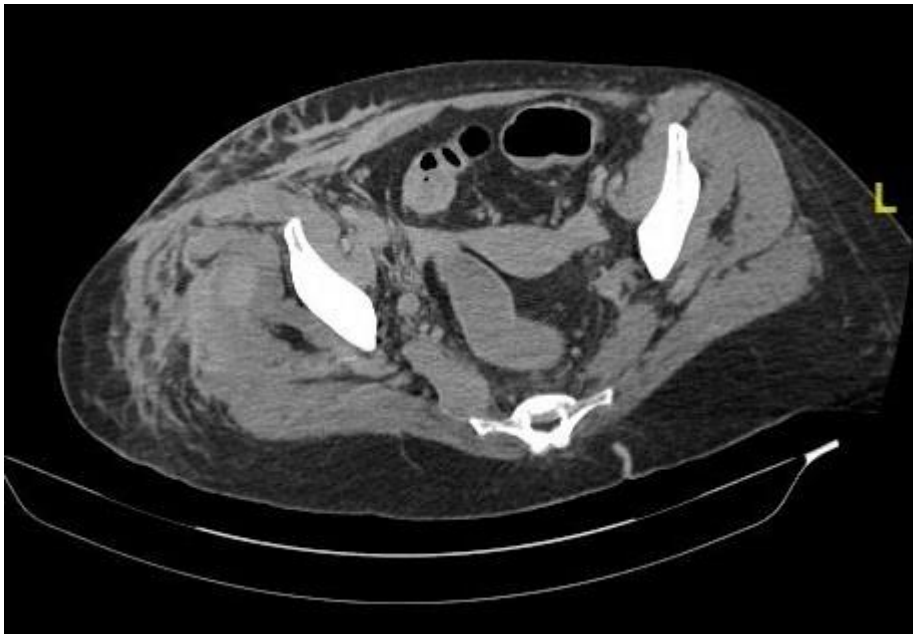
B. Covered endovascular carotid stent and antibiotics
Endovascular stenting introduces prosthetic material into an infected field, which risks persistent infection and stent sepsis. It is generally avoided except as a temporary bridge in unstable patients.

D. Open debridement with ligation
Carotid ligation carries a significant risk of stroke and is reserved for situations where reconstruction is not possible.

E. Open debridement with vein graft reconstruction
Although autologous vein grafts can be used, arterial allografts are generally preferred in infected arterial reconstructions because of their lower infection risk and better structural properties.

SBA: C. Open debridement, allograft interposition reconstruction and 6 weeks of antibiotics

QUESTION FORTY-NINE REFER TO THE FOLLOWING INFORMATION



49. A 49 year old woman presents acutely with swelling and pain over her right buttock and flank. The pain developed suddenly with no obvious cause identified. She has previously had left common iliac vein stenting for treatment of an iliac vein DVT one year ago. She currently takes apixaban. On examination, the right gluteal region, upper thigh and flank are swollen and oedematous. Her observations are stable and her CT scan is shown (see exhibit).
How would you proceed?

A. Compression dressing
B. Intravenous antibiotics
C. Open exploration and drainage
D. Open exploration and ligation
E. Percutaneous embolisation

QUESTION FORTY-NINE ANSWER

E. Percutaneous embolisation

Reasoning: This presentation is most consistent with a spontaneous gluteal artery haemorrhage or pseudoaneurysm. Haemodynamically stable patient. Spontaneous arterial bleeding in the gluteal region is recognised in patients on anticoagulation and typically arises from branches of the internal iliac artery, particularly the superior gluteal artery.

The first-line treatment for gluteal artery bleeding or pseudoaneurysm is endovascular management, specifically, Percutaneous transcatheter embolisation

A. Compression dressing
External compression is ineffective for deep arterial bleeding within the gluteal musculature.

B. Intravenous antibiotics
There is no evidence of infection; the presentation suggests arterial bleeding or pseudoaneurysm.

C. Open exploration and drainage
Drainage alone would not control the arterial source of bleeding and may worsen haemorrhage.

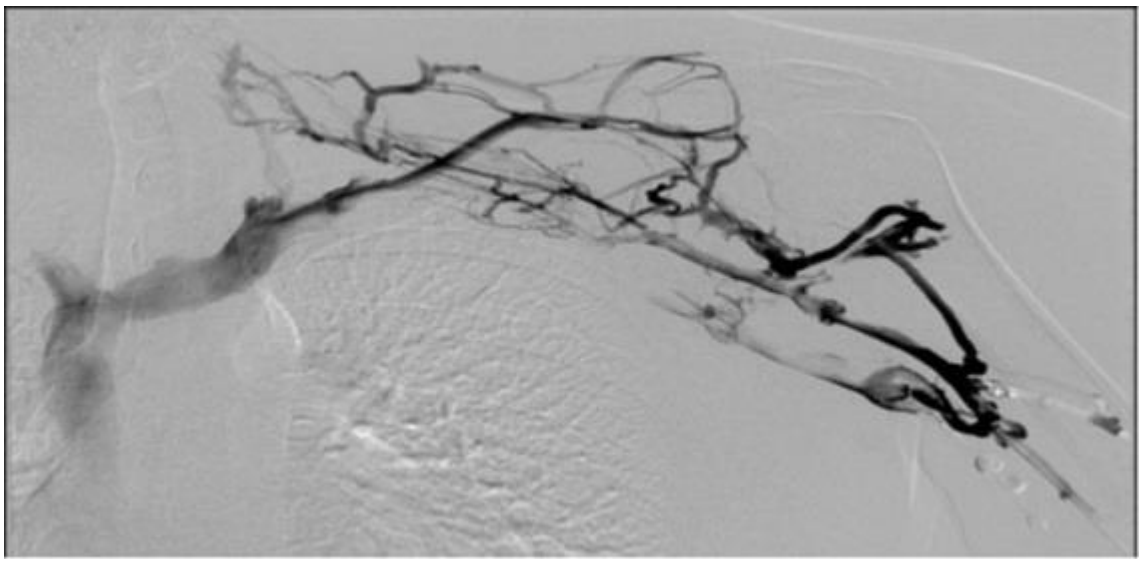
D. Open exploration and ligation
Surgical exposure of gluteal arteries deep within the pelvis is technically challenging and associated with higher morbidity. Endovascular treatment is preferred when the patient is stable.

Conclusion

In a haemodynamically stable patient with suspected gluteal arterial bleeding or pseudoaneurysm, the optimal management is percutaneous endovascular embolisation.

SBA: E. Percutaneous embolisation.

QUESTION FIFTY REFER TO THE FOLLOWING INFORMATION



50. A 32 year old left handed tree surgeon presents with a 6 day history of left arm pain and swelling. He undergoes an upper limb venogram. What is the most appropriate next step in the management of this patient (see exhibit)?

A. Catheter-directed thrombolysis
B. Conservative management with oral naticoagulation
C. Primary stenting
D. Transaxillary excision of the first rib
E. Venous reconstruction

QUESTION FIFTY ANSWER

A. Catheter-directed thrombolysis

Reasoning: This presentation is typical of effort thrombosis (Paget–Schroetter syndrome), a type of venous thoracic outlet syndrome that occurs in young, active individuals performing repetitive overhead arm activity.

Management usually occurs in stages:

1. Initial treatment:
   Catheter-directed thrombolysis (CDT) or mechanical percutaneous thrombectomy to restore venous patency.

2. Definitive treatment:
   Thoracic outlet decompression, usually first rib resection.

3. Post-procedure management:
   Anticoagulation therapy.

B. Conservative management with oral anticoagulation. Not preferred in young active patients with effort thrombosis.

C. Primary stenting. Not recommended before thoracic outlet decompression due to persistent external compression.

D. Transaxillary excision of the first rib. Performed after thrombolysis, not as the initial treatment.

E. Venous reconstruction. Reserved for chronic cases or residual obstruction.

SBA A. Catheter-directed thrombolysis. First-line treatment when symptoms are present for less than 14 days