Vascular Anaesthesia Society of Great Britain and Ireland

Annual Scientific Meeting

Abstracts for the Belfast Meeting

26th & 27th September 2022

ICC, Belfast
2 Lanyon Place
Belfast
BT1 3WH

VASCULAR ANAESTHESIA SOCIETY

Monday 26th September 2022

Session 1: Fresh off the Press

11.05am **New Clinical Trials Relevant to Vascular Anaesthesia**
Dr Ronelle Mouton, Bristol

11.25am **COVID 19 and the challenges for Vascular Surgery in the UK**
Mr Arun Pherwani, Stoke on Trent

11.55am **Addressing the waiting list Crisis: Day Case Toe Surgery**
Dr Nilay Mankad, Belfast

11.55am **Addressing the Waiting List Crisis: Day Case EVAR**
Mr Greg McMahon, Leicester

12:35pm **Annual General Meeting**
Dr Ronelle Mouton, Bristol

Session 2: Cardiology for Vascular Anaesthetists - When to worry and what to do

2.00pm **HOCM**
Dr Alison Muir, Belfast

2.20pm **Perioperative Management of Pacemakers and ICDs**
Dr Rebecca Noad, Belfast

2.40pm **Aortic Stenosis**
Dr Colum Owens, Belfast

3.00pm **Coronary Artery Disease**
Dr Andrew McNeice, Belfast

Session 3: Case Base Discussion - Virtual MDT

4.00pm **Panel Discussion**
Dr Anton Collins, Belfast
Mr Louis Lau, Belfast
Dr Dominic McAtamney, Belfast

New Clinical Trials Relevant to Vascular Anaesthesia

Dr Ronelle Mouton
Consultant Anaesthetist, North Bristol NHS Trust;
Honorary Associate Professor of Anaesthesia, University of Bristol

Randomised controlled trials (RCTs) remain the gold standard for providing clinical evidence through research. However, they are very expensive and perioperative researchers compete with other specialties for limited available national funding. Furthermore, RCTs require collaboration with clinical trials units, methodologists, health economists, statisticians and other clinical specialties. Until recently, clinical trials in anaesthesia were rare in the UK and worldwide. The National Institute of Academic Anaesthesia (NIAA) was established to facilitate high profile, influential research through training, support and funding. Following this, the Perioperative Medicine Clinical Trials Network (POMCTN) was created in 2015 with the aim to promote & support multicentre, collaborative randomised, controlled trials in perioperative medicine, anaesthesia and pain. https://pomctn.org.uk - This inspired a new era for perioperative research and cross-specialty collaboration.

In this lecture I shall briefly discus some contemporary trials that were funded by the National Institute for Health Research (NIHR) and the important research questions they address; their relevance to vascular anaesthesia and how vascular anaesthetists could get involved:

- VITAL is a clinical trial to test whether total intravenous anaesthesia (TIVA) is superior to volatile anaesthesia for patients undergoing major non-cardiac surgery. VITAL aims to recruit 2500 patients aged ≥ 50 years, over a three year period and the study is aligned with the PQIP database. VITAL is a modern registry-based trial using routinely collected data to collect baseline characteristics and outcomes and are therefore less labour intensive, less expensive and more efficient.
- The CAMELOT trial will find out whether rectus sheath catheters, when added to standard patient-controlled analgesia, provides better pain relief, fewer side effects and complications, and greater satisfaction for patients undergoing emergency laparotomy surgery. The trial will also determine whether rectus sheath catheters are safe and cost-effective. The study aims to recruit 750 patients over a period of three years, from October 2022.
- OSIRIS - Optimising Shared decision-makIng for high-RIsk major Surgery. The final stage of the OSIRIS programme will evaluate the clinical effectiveness of a decision support intervention in a cluster randomised trial to improve shared decision making for high-risk surgical patients and their doctors: 44 hospitals will be recruiting 24 patients each. Patients ≥ 60 years undergoing elective AAA-repair are included as one of the three patient populations.
- The PLACEMENT trial will find out if a perineural catheter placed adjacent to the sciatic or tibial nerve at the time of surgery and infused with continuous local anaesthesia will improve postoperative pain in patients undergoing major lower limb amputation. The study aims to recruit 650 patients, starting early in 2023.
- ACCESS is a surgically-led clinical trial that will test whether regional anaesthesia is superior to local anaesthesia in patients undergoing arteriovenous fistulae (AVF) creation. Although AVF is the gold standard for haemodialysis, their use is hindered by the very high early failure rate. The primary outcome is unassisted patency at 1 year and the trial aims to recruit 566 patients.

It is an exhilarating time for perioperative research and the vascular anaesthesia community. It is known that research activity and participation improve education and patient outcomes. There are further studies in the perioperative care of vascular surgery patients that are being developed or where commissioned funding calls are under consideration. Our specialty benefits from close collaboration with the surgical Vascular Society and the National Vascular Registry (NVR), capturing important anaesthesia-related data. We anticipate more registry-based trials that in the future will answer important research questions relevant to vascular patients and health care professionals.

COVID-19 and the Challenges for Vascular Surgery in the UK

Dr Arun Pherwani, Consultant Vascular Surgeon, Stoke on Trent

In response to the COVID-19 pandemic the national vascular registry (NVR) team were fleet of foot to collect data on the impact of COVID-19 on vascular patients in the UK with the data sets amended in May 2020. Data items included COVID-19 infection symptomatic or test proven, the impact on the type of procedure and timing and whether patients suffered respiratory complications or COVID infections in the postoperative period. Further updates added vaccination status and the impact of previous COVID infection to the existing variables.

The first COVID-19 short report was published in November 2020 with further updates in May and November 2021. A further update will be produced to coincide with the annual scientific meeting of the Vascular Society of Great Britain and Ireland in November 2022.

Approximately 5% of patients treated during the pandemic were diagnosed with COVID-19 and the death rate was high among those infected. COVID-19 infection was identified independently as the single most important cause of mortality in patients admitted as emergency with chronic limb threatening ischaemia to NHS hospitals during the pandemic. There was a 35% reduction in elective aortic activity and 28% reduction in carotid surgery for stroke prevention during the pandemic. The NVR recommended that patients waiting for elective repair of aneurysms who had their procedures postponed during the pandemic are prioritised along with other time critical and life threatening conditions on NHS waiting lists.

Addressing the Waiting List Crisis: Day Case EVAR

Mr Greg McMahon
Consultant Vascular Surgeon
Clinical Director Leicester, Leicestershire & Rutland National Abdominal Aortic Aneurysm Screening Programme (NAAASP)
Leicester Vascular Institute at Glenfield Hospital

Introduction

Despite subsequent controversies over durability and cost-effectiveness, the widespread adoption of endovascular aneurysm repair (EVAR) at the turn of the century heralded a revolution in the management of abdominal aortic aneurysms (AAA).

There is less upfront physiological impact with EVAR when compared to conventional open surgery, albeit at the expense of long-term surveillance for endoleaks and other stent-related complications, as well as the potential need for reintervention. Nonetheless, the reduced perioperative mortality and morbidity associated with EVAR inevitably results in a comparatively reduced length of stay, with several retrospective studies having described experience with short stay and day case EVAR[1].

Methods and results

Initiatives targeting the components of the patient journey were serially introduced to EVAR practice in Leicester, aiming to reduce length of stay.

First, day of surgery admission became routine practice. Pre-operative delays on the day of surgery were reduced by ensuring all necessary investigations were performed prior to admission. In particular, we showed that the in-hospital transfusion requirement for patients undergoing planned EVAR was 1%, and therefore surgery need not be delayed while a repeat group and save sample was processed on the morning of the procedure.

Secondly, the conduct of EVAR was addressed. The development of vessel closure devices revolutionised the operation, facilitating the percutaneous deployment of the stent components from the common femoral arteries, and obviating open groin access. This meant that EVAR could feasibly be performed without either general or regional anaesthesia, with acceptable tolerance achieved with local anaesthetic infiltration and sedation as necessary. Regardless of mode of anaesthesia, percutaneous access significantly reduced length of stay, groin wound complications and procedure duration. Furthermore, without general or regional anaesthesia there is no need for urethral catheterisation, and for men the placement of a convene sheath instead reduces the risks of post-catheter urinary retention which would otherwise delay discharge.

Finally, the significant improvements in intra-operative imaging in a modern hybrid operating theatre meant that the detection of endoleaks on completion angiogram became much more accurate than was possible with the mobile C-arm. This rendered redundant the need for postoperative, inpatient check imaging. A retrospective review demonstrated that pre-discharge duplex ultrasound scan did not identify any post-EVAR complications requiring immediate intervention that had not already been seen on the intra-operative completion angiogram. We therefore concluded that there was no compulsion for patients to remain in hospital for post-operative imaging, which could be safely deferred to clinic follow up at 2 weeks.

Discussion

Despite the combined advances in the EVAR process, effecting a reduction in length of stay, its move to a truly day case procedure has not become universal. The reasons are multifactorial, with the practicalities of many patients' home care circumstances ultimately precluding safe discharge on the evening of surgery.

There is also likely to be system inertia in the embedded culture of AAA management that continues to perceive this as major surgery incompatible with a day case approach.

For day case EVAR to succeed there must be collective engagement, perhaps most importantly from the patient and their post-operative carer. The approach must be embedded from the outset of the patient journey and certainly in the first discussion at the vascular clinic so that there is a consistent management of expectation.

In Leicester, having identified that an individual will have the appropriate support available upon discharge, they are admitted at 07:00 on the morning of surgery. Their EVAR is first on the morning list, with the aim to begin operating by 09:30. Men have a convene sheath applied for urinary collection, with women being catheterised. An initial dose of co-amoxiclav is given intravenously in theatre. Anaesthesia is primarily achieved with local infiltration, using a combination of 1% lignocaine and 0.25% bupivacaine in a 50:50 mix. There is support from an anaesthetist, and often a low dose infusion of remifentanil is titrated. The femoral arteries are accessed bilaterally percutaneously under ultrasound guidance, using Proglide vessel closure devices in a pre-close technique. On completion, a prolonged angiogram is performed primarily to check for endoleaks. A 4-hour period of rest post-procedure is advised, but providing there are no immediate complications and the patient has satisfactory support at home, they can be discharged the same evening. Two further doses of co-amoxiclav are given at 8 hourly intervals, either intravenously if the patient is still in hospital or as oral alternatives if they have been discharged. A card is issued with the contact (vascular ward) telephone numbers should there be any concerns. All patients are then seen in the stent clinic for a baseline abdominal X-ray and duplex ultrasound scan at 2 weeks.

The pressures in part wrought by the COVID-19 pandemic on healthcare services have galvanised innovation to maximise the efficient use of resources and may ultimately drive the transformation to a day case model for EVAR as standard.

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Cardiology for Vascular Anaesthetists: When to worry and what to do : Hypertrophic Cardiomyopathy (HCM)

Dr Alison Muir
Consultant Cardiologist in Inherited Cardiac Conditions
NI ICC Service, BHSCT, Belfast, Northern Ireland

Hypertrophic cardiomyopathy (HCM) is one of the commonest inherited cardiac conditions. It is characterised by left ventricular hypertrophy of any pattern (most commonly in an asymmetric pattern) in the absence of any abnormal loading conditions. It is complicated by left ventricular outflow tract obstruction in up to one third of cases and is predominantly due to gene mutations of the sarcomeric protein complex.

Most patients with HCM can anticipate a normal life expectancy without limiting symptoms or need for treatment. Approximately one third will experience disease related complications which can include left ventricular outflow tract obstruction (LOVOT), sudden cardiac death (SCD) due to malignant ventricular arrhythmias, atrial fibrillation and the thromboembolic consequences thereof and heart failure due to advanced diastolic dysfunction with or without systolic dysfunction.

The diagnosis of HCM is a clinical one and is based on imaging criteria. Nearly any pattern of left ventricular hypertrophy can be observed but the commonest is of basal anteroseptal hypertrophy. Common additional findings on cardiac imaging, that are not essential to the diagnosis of HCM include, hypertrophied papillary muscles, abnormal papillary muscle attachments, myocardial crypts and abnormalities of the mitral valve.

The aetiology of HCM was first proven as an inherited condition in the 1990s when mutations in the sarcomeric proteins were discovered. Approximately 40-60% of patients will be found to have a mutation in one of the sarcomeric genes, the vast majority being within the two most common genes, beta myosin heavy chain (MYH7) and the myosin binding protein complex (MYBPC3). A significant proportion of patients will have what can be termed “non familial disease” and others will have systemic disorders, which include abrnormalities of the RAS/MAPkinase pathway (eg Noonan syndrome), mitochondrial disorders, glycogen or lysosomal storage disorders (eg Fabry disease), sarcoidosis, amyloidosis or other rare diseases.
All patients should undergo clinical assessment with a detailed personal and family history, cardiovascular examination and a range of imaging and functional assessments which can include, but are not limited to, ECG, echocardiogram, exercise testing, Holter monitoring, cardiac MRI etc. Most patients with HCM will remain well but the natural pathophysiology can included dynamic, provokable LVOTO, mitral regurgitation, diastolic dysfunction, myocardial ischaemia, arrhythmias and autonomic dysfunction. Most patients attending for ansaesthetic should have had these issues addressed through their cardiology service, but the specific issues to consider perioperatively include:

- Risk of sudden cardiac death
- Left ventricular outflow tract obstruction
- Atrila fibrillation and consequent thromboembolic disease
- Heart failure/ impaired LV function.

Studies have reported varying perioperative mortality rates in patients with HCM undergoing non cardiac surgery, ranging from 3-6.7%. The anaesthetic management of HCM patients is based upon maintenance of sinus rhythm, adequate rate control, avoiding unnecessary tachy or bradycardia, and avoidance of systemic hypotension (worsening preload and/or afterload).

This presentation seeks to address the best management of the patient with HCM to avoid these pitfalls and then addresses the specific situations of the HCM patient at risk of SCD, atrial arrhythmias, LVOTO and heart failure.

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Vives & Roscoe, Min Anest 2014;80 (12): 1310-139Wilde et al, Europace 2022;00: 1-61

Perioperative Management of Pacemakers and ICDs

Dr Rebecca Noad
Consultant Cardiologist, Belfast Health and Social Care Trust

With advances in technology, increasing numbers of cardiac implantable devices procedures (including pacemakers, defibrillators and resynchronisation systems) are being performed, and therefore becoming more common in the population of patients undergoing surgery. This adds a layer of difficulty for anaesthetists and surgeons. This lecture aims to discuss the device problems that can arise and how they present, in addition to how to assess a cardiac device patient pre-operatively, and manage any issues intraoperatively. A helpful summary document on this is the updated British Heart Rhythm Society "Guidelines for the management of patients with Cardiac Implantable Electronic Devices around the time of surgery".

VASCULAR ANAESTHESIA SOCIETY

Tuesday 27th September 2022

Session 4: Coagulation Controversies

9.00am **Platelet Analysis & Clopidogrel**
Dr Vanessa Fludder, Brighton

9.25am **Heparin Dosing**
Dr Rebecca Thorne, Frimley

9.50am **Bloody Tap - what would you do?**
Dr Tim Wood, Derby
Dr Maria Safar, Liverpool

Session 5: Research and Audit

11.00am **Free Paper Session**

Session 6: Endovascular

12.00pm **The Evolution and Complications of Complex EVAR Surgery**
Ms Zenia Martin, Dublin

12.25pm **Anaesthesia for Complex EVAR**
Dr Adam Pichel, Manchester

12.50pm **Considerations for Working in the Hybrid Theatre: The Dream versus The Reality**
Ms Gemma McKevitt, Belfast
Dr Sheena Gormley, Belfast

Session 7: How to do it (CPD Topics)

2.30pm **Perioperative Management of Diabetes 2022**
Dr Anthony Lewis, Belfast

2.50pm **COPD: Current Management and Anaesthesia**
Dr Paul McKeagney, Belfast

3.10pm **Point of Care Management of Haemorrhage**
Dr Anita Sugavanam, Brighton

3.30pm **Consent and Capacity in Lower Limb Amputations**
Dr Dearbhail Lewis, Belfast

4.00pm **Prize Presentations**
Dr Beth Perritt, Chester
Dr Dan Taylor, London

Platelet Function and Vascular Anaesthesia

Dr Vanessa Fludder
Consultant Anaesthetist, University Hospitals Sussex (East)

The majority of Vascular Surgical Patients are taking at least one prescribed anti-platelet to reduce thrombotic complications of their various co-morbidities. These often include coronary artery disease, cerebro-vascular disease and peripheral arterial disease for which antiplatelet regimens are prescribed for secondary prevention of further events.

Anti-platelet therapy may increase peri-operative blood loss leading to blood transfusion, potentially exposing the patient to the inherent risks associated with blood product administration. The rare, but potentially devastating, complication of spinal haematoma is also a real concern for anaesthetists when weighing up the pros and cons of performing neuraxial anaesthetic techniques for patients who are at higher risk of complications from general anaesthesia.

There are published guidelines which suggest anaesthesia and/or surgery should be delayed in patients who have taken Thienopyridines and Glycoprotein IIb/IIIa Inhibitors for various time periods dependent upon pharmacokinetic properties of the anti-platelets.

However, there is considerable inter-patient variability in the recovery of platelet function after cessation of some anti-platelet medications. For example, the pro-drug clopidogrel is metabolised to its active form by cytochrome P450 enzymes (mainly CYP2C19), and genetic polymorphisms of this enzyme contribute to considerable variation in the efficacy of clopidogrel between individuals. Approximately 30% of individuals retain high on therapy platelet reactivity despite taking regular clopidogrel. These patients may be at higher risk of thrombotic complications and a lower risk of peri-operative bleeding related complications.

In the last 10 years point of care (or near patient) platelet function analysers have become more widely available and used to assess a patient's response to anti-platelet therapy, with the aim of reducing thrombotic complications, particularly in-stent thrombosis. These analysers have also been used to assess residual anti-platelet effects of medications stopped prior to surgery, most commonly cardiac surgery in patients who have recently taken clopidogrel.

There is a growing body of evidence that using point of care testing to assess the degree of platelet inhibition in the pre-operative period can predict peri-operative blood loss and enable clinicians to schedule surgery as soon as platelet function has recovered sufficiently to minimise risk of bleeding complications. This may enable urgent surgery to be scheduled before the standard minimum discontinuation times (3-5 days for Ticagrelor, 5-7 days for Clopidogrel and 7-10 days for Prasugrel).

Point of care platelet function analysers may be useful to risk stratify patients who have been taking antiplatelet medication who require urgent vascular surgery. Results may facilitate decision making with regard to timing of surgery (earlier than 5 days) and mode of anaesthesia (spinal when GA carries significant risk). More research in this area is required and national registries may be the best way of collecting data to support change a change in practice when serious complications such as neuraxial haematoma are so rare.

Heparin Dosing in Vascular Surgery

Dr Rebecca Thorne, Consultant Anaesthetist
Frimley Park Hospital
Rebecca.thorne10@nhs.net

The key topics we will cover in my presentation will include:

1. The role of peri-procedural heparin in vascular surgery.
2. The pharmacodynamic and pharmacokinetic properties of heparin and how they contribute to its unpredictable effects.
3. Causes and treatment of heparin resistance.
4. The rationale for ACT monitoring in vascular surgery.
5. The current evidence for heparin dosing and ACT targets in vascular surgery.

Bloody Tap - What would you do?

Dr Maria Safar, Consultant Anaesthetist Liverpool
Dr Tim Wood, Consultant Anaesthetist University Hospital of Derby and Burton Trust

Summary of the evidence regarding risk and management of an epidural bloody tap / vertebral canal haematoma with specific reference to high-risk vascular patients. Summary of survey of the VASGBI membership into management and interactive with audience around some of the subtleties in the management dilemma of a bloody tap in the vascular patient group. Aiming to draw together the results of above for a possible suggested management pathway?

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Anaesthesia for complex EVAR

Dr Adam Pichel, Manchester

Complex endovascular techniques have developed to allow healthcare providers to offer people “minimally invasive” treatments which are considered to have lower rates of perioperative mortality and morbidity compared with conventional open surgery. It continues to provide treatments to people who would not have been considered candidates for open complex aortic surgery. This has brought challenges to anaesthetic services, specifically with respect to staffing, facilities, organisational, administrative, educational, and not least clinical.

Intuitively it is likely that some individuals and cohorts of patients (yet to be defined) will benefit from such procedures, but careful patient selection is essential in ensuring a sustainable and effective service and in maintaining a minimal rate of adverse outcomes. Careful selection must consider both the aortic anatomy and current physiological state of an individual whilst also trying to balance that with the individual’s life expectancy, risk of rupture and effects that treatment may have on the individual’s survival and quality of life. This is the holy grail of AAA surgery in general and not confined to complex aortic pathology. Re-intervention rates appear similar to those reported in the UK EVAR trials but is based solely on observational data. As far as cost-effectiveness of these treatments is concerned, I will refer you to the NICE (NG 156) clinical guideline!

Adoption of these techniques has grown in a similar fashion to EVAR for infra-renal abdominal aortic aneurysm. Whether this approach is non-inferior in terms of short-term and long-term survival after intervention is debatable without randomised trials. A great difficulty in assimilating the evidence is the heterogeneity of the case-mix within published datasets; therefore, it cannot be easily risk adjusted and is based almost entirely on single case series, registry, and observational data.

My presentation summarises the main issues that we as anaesthetists need to be aware of when developing and when providing perioperative care to this cohort of patients. Manchester’s complex EVAR service began life in 2007 with the appointment of a new breed of (endo)vascular surgeon and I have had the privilege of being responsible for providing the anaesthesia support ever since. Much of my talk is based upon my own experience of setting up and delivering the service over the previous 15 years. I will outline the perioperative pathway and perioperative anaesthetic considerations which I believe to be important, and I will focus on certain aspects of spinal cord protection - if time permits!

Transfusion Talk: Point Of Care Management In Haemorrhage

Dr Anita Sugavanam BSc (Hons) MBBS MRCP FRCA Sen Hon Clin Lecturer
Consultant Anaesthetist
University Hospital Sussex-East

Our understanding of clotting and bleeding and the tests that can assess them have evolved hugely over the last 10-15 years. The "intrinsic" and "extrinsic" systems of coagulation have been replaced by more cell-based global models involving initiation amplification, propagation and dissolution. Key players that are cell-based are tissue factor-bearing cells and platelets whereas key coagulation proteins are thrombin and fibrinogen[1]. There are also very complex interactions with the cytokine/inflammatory system. Tests such as International Normalised ratio (INR), activated partial thromboplastin time (aPTT) and prothrombin time (PT) look at isolated pathways in plasma only, terminate very early in clot formation, use supranormal levels of activator (like tissue factor), take time in the laboratory, and unsurprisingly do not predict bleeding in the perioperative setting: A cirrhotic patient with an INR of 3 may actually not be at increased risk of bleeding, yet a trauma patient may bleed excessively with normal conventional test results[2]. Indeed, bleeding from post-partum haemorrhage (PPH), cirrhosis, septic laparotomy, ruptured abdominal aortic aneurysm and arterial bypass surgery all have different starting points and trajectories within the cell-based model of haemostasis[1-3]. Viscoelastography tests provide a more global picture of haemostasis using whole blood and rapid point-of-care technology. In addition, the modern devices use cartridge technologies minimizing human error and rendering the machines more stable, portable and robust. They also have add-on features such as platelet-mapping and rapid measurements/parameters. These devices have become standard in major haemorrhage management[4]. These assays along with current understanding about the cell-based model of hemostasis have influenced changes in transfusion practice in major haemorrhage such as early fibrinogen replacement which will be reviewed here[1,6]. A brief description of and comparison between available devices such as TEG6S, ROTEM Sigma and Quantra Hemostasis will be given[5]. There is a growing body of evidence that these tests reduce the use of transfusion products in trauma and PPH with no extra harm but it is challenging to show a direct reduction in mortality [4, 7-10] . In addition, the use of cell salvage has also dramatically reduced the number of transfused blood products. One challenge remains: what to give during a major haemorrhage before the first point-of-care results are back. Anaesthetists also face the dilemma of correcting intravascular volume depletion alongside any coagulopathy. Empirical fixed ratio transfusions may help here: Much of the evidence surrounding fixed ratio of blood products in major haemorrhage comes from military studies in young and fit combat soldiers. This cannot be automatically extrapolated to an octogenarian unexpectedly bleeding during an invasive procedure[1]. In this presentation I will run through the practicalities of how to set up a point-of-care system and protocol that best suits your department. Lastly, consideration to vascular surgical patients will be given. Due to poorly-controlled diabetes, renal disease, smoking and chronic soft tissue/bone infections, these patients are often extremely prothrombotic[11] (and often anaemic) and taking heparin/anti-platelet medication. Viscoelastography and platelet-mapping can be very useful this setting[12]. Correcting coagulopathy may be a priority during a major haemorrhage but low viscosity-high flow blood is desirable post-operatively for these patients and so full correction may not be in their best interests. Balancing the need for optimal blood flow characteristics with the risk of haemorrhage often requires the vascular anaesthetist to have different transfusion thresholds to other clinical settings.

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VASCULAR ANAESTHESIA SOCIETY

POSTER PRESENTATIONS

An Audit Investigating Fasting Times for the Multi-disciplinary Diabetic Foot Team Patients in the Royal Victoria Hospital
Dr Kathryn Chang, Royal Victoria Hospital
Dr Leeona Gallagher, Royal Victoria Hospital
Dr Anthony Lewis, Royal Victoria Hospital

Acute Aortic Occlusion: A Rare yet Fatal Complication Associated with COVID-19
Dr Shreela Ghosh, Bedford Hospital
Dr Prisly Fernando, Bedford Hospital
Dr Pallab Rudra, Bedford Hospital
Dr Jose Soriano, Bedford Hospital

A Case Report of General Anaesthesia in Patient with Rare Genetic Dysautonomia due to Dopamine Beta Hydroxylase Deficiency
Dr Nicola Johnson, Leeds Teaching Hospital
Dr Paul Warman, Leeds Teaching Hospital

Major Lower Limb Amputation during the Pandemic. A re-look at Anaesthetic Technique and Outcomes in a Regional Centre
Dr Simon Smith, Royal Victoria Hospital
Dr Caroline Curry, Royal Victoria Hospital
Mr Louis Lau, Royal Victoria Hospital

Cerebrospinal Fluid Drains in Aortic Surgery: a case series and improvement programme
Dr Leonie Murphy, University Hospitals Sussex
Nilo Sadeh, Brighton & Sussex Medical School
Dr Ruth De Las Casas, Norfolk & Norwich University Hospitals
Dr Thomas Clewley, University Hospitals Sussex
Dr Richard Stoddart, University Hospitals Sussex
Dr Abhijoy Chakladar, University Hospitals Sussex
Dr Vanessa Fludder, University Hospitals Sussex

Development of a Spinal Drain Protocol for Postoperative Spinal Cord Injury in Patients Undergoing Abdominal Aortic Surgery at Derriford Hospital
Dr Adam Green, Derriford Hospital
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Development of a Guide to the Perioperative Management of Cardiac Implantable Electronic Devices (CIEDs)
Dr Michael McCann, Royal Victoria Hospital
Dr Kerry Featherstone, Royal Victoria Hospital
Dr Rebecca Noad, Royal Victoria Hospital
Mr John Dowd, Royal Victoria Hospital

The Use of Rectus Sheath Catheters in Open Aortic Vascular Surgery
Dr Katherine Saunders, Musgrove Park Hospital
Dr Isabelle Ferarrio, Musgrove Park Hospital

An Audit Investigating Fasting Times for the Multi-disciplinary Diabetic Foot Team Patients in the Royal Victoria Hospital

Dr Kathryn Chang, Royal Victoria Hospital, Dr Leeona Gallagher, Royal Victoria Hospital
Dr Anthony Lewis, Royal Victoria Hospital

Background

The relatively new multi-disciplinary diabetic foot team (MDFT) in the Royal Victoria Hospital serves as a regional centre for diabetic foot infections and interventions. Despite growing clinical demand, and impacted by the COVID-19 pandemic, there are infrequent separate operating list reserved for patients admitted under the multidisciplinary diabetic foot team. The service often utilises vascular operating lists and the emergency theatre list. As a result, diabetic patients who are intended to be prioritised to minimise fasting times to prevent peri and post operative complications (as per Centre for Perioperative Care guidelines (CPOC), are often not prioritised, cancelled or undergo prolonged fasting periods. This audit was a first of its kind in our unit and investigated the fasting times of patients undergoing procedures within the MDFT team at RVH.

Design and Methods

Retrospective data was collected for patients undergoing procedures between 29/09/21 -23/11/21. Duration of fast, list operated on, current diabetes management and procedures delays and cancellations were captured using patient notes, prescriptions charts, theatre lists and nursing notes. Median length of time was used for comparison

Results

Data was collected for 16 patients and a total of 39 procedures/operations. Of the 16 there were 4 female and 12 male. Two patients had T1DM and 14 T2DM. Nine of the 16 patients managed their diabetes with insulin and required the variable rate insulin infusion as per trust guidelines while fasting. Median length of fast was 13 hours 42 minutes, with a longest fast of 25 hours and 40 minutes. There was a 31% cancellation/postponement rate with 9/16 patients being affected by this. The median length of fasting time for patient who had procedures cancelled was 3 hours and 35 minutes. 59% of procedures were completed on the emergency list and 41% completed on a planned list. Those on the emergency list had a longer mean fast time (14hours and 29 minutes) compared with those on a planned list (12 hours 54 minutes).

Conclusions

Patients with diabetic foot infections requiring surgical intervention were often on an emergency list and therefore unable to be prioritised for theatre. They often experienced prolonged fasting and there was a high rate of cancellation or postponement of procedure. Dedicated regular planned operating lists for patients in the MDFT service would ensure less cancellations, shorter fasting times and improved efficiency across the service.

Acute Aortic Occlusion: A Rare yet Fatal Complication Associated with COVID-19

Dr Shreela Ghosh, Bedford Hospital, Dr Prisly Fernando, Bedford Hospital
Dr Pallab Rudra, Bedford Hospital, Dr Jose Soriano, Bedford Hospital

Acute aortic thrombosis is associated with high mortality and morbidity. Multiple definitive risk factors and few potential risk factors have been identified for aortic thrombosis. Even though Corona Virus Disease-2019 (COVID-19) was initially identified as an acute respiratory illness, its multi systemic effects including venous and arterial thrombosis were noted early in the pandemic. COVID-19 related aortic thrombosis is recognised as a rare fatal complication. Embolic and thrombotic events were also related to (ChAdOx1-S [recombinant]) – COVID-19 Vaccine AstraZeneca, for which roll out of the vaccine had been affected after the notable hypercoagulable complications. We present here two cases of acute total aortic occlusion secondary to hypercoagulable state related to COVID infection or its vaccine. They had presented to our tertiary vascular hospital within a span of 7 weeks during the pandemic. Both had emergency surgical interventions- one with axillo-bifemoral bypass and the other with aorto-bi-iliac femoral thrombectomy, both with systemic anticoagulation and bilateral four-compartment fasciotomies. Each resulted in severe metabolic acidosis secondary to ischemic reperfusion syndrome and death thereafter despite maximal resuscitation. In these two patients, apart from the hypercoagulable state of COVID-19 infection or its vaccine, the co-morbidities of obesity, previous thrombotic episodes, Type 2 diabetes mellitus and smoking aggravated these acute events, and led to this poor outcome.

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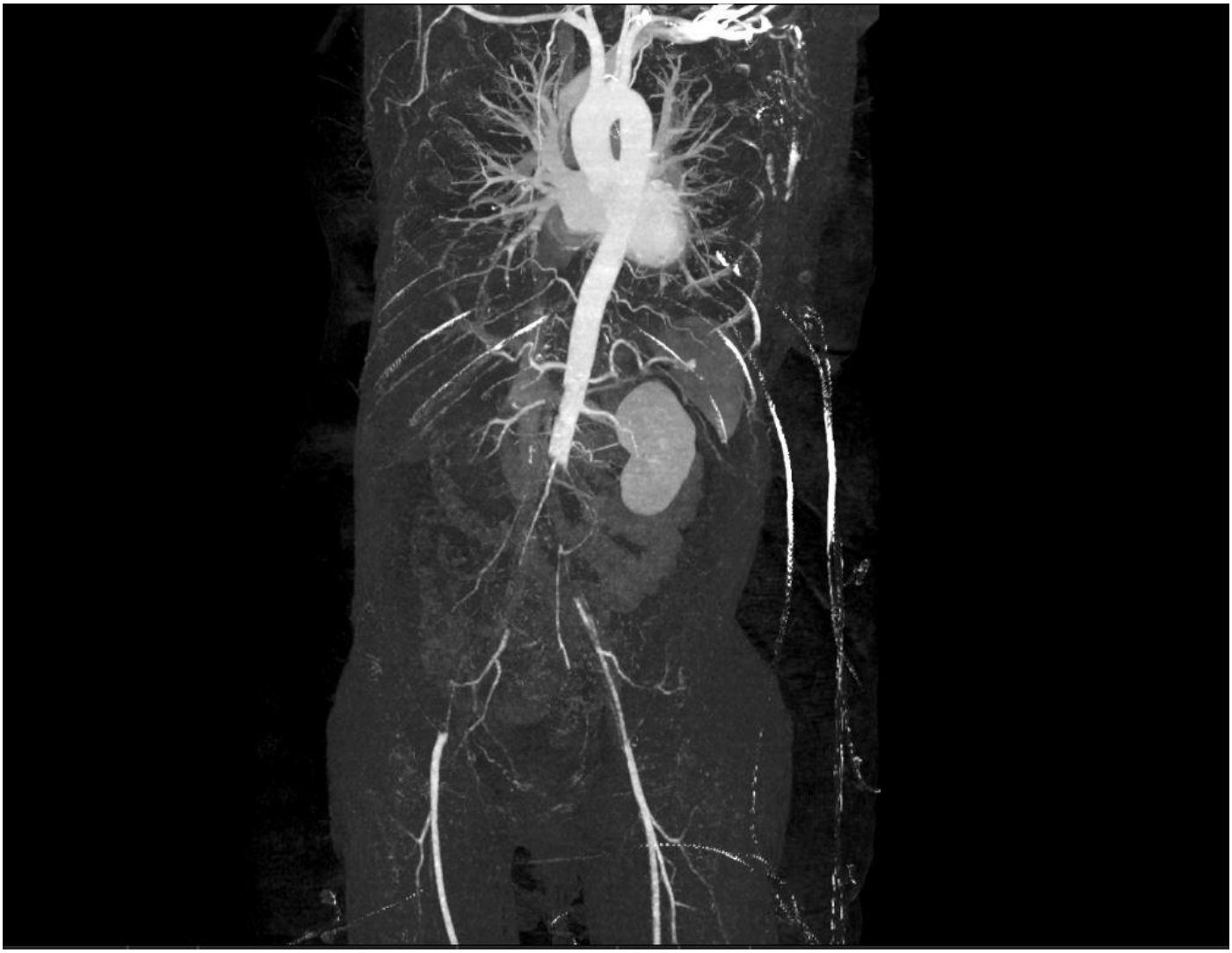
2. Strom T, McIntosh M. A Patient Presenting with Lower Extremity Paralysis due to Acute Aortic Occlusion. Case Reports in Emergency Medicine. 2022 Mar 14;2022.

3. Yang X, Li X, Yin M et al. Percutaneous Mechanical Thrombectomy for Acute Limb Ischemia With Aorto-iliac Occlusion. Frontiers in Surgery. 2022 Apr 9: https://doi.org/10.3389/fsurg.2022.831922.

4. Eliason JL, Wakefield TW. Metabolic consequences of acute limb ischemia and their clinical implications. Semin Vasc Surg. (2009) 22:29–33. doi: 10.1053/j.semvascsurg.2009.01.001.5. Wang X, Jie Yuan W. Timing of initiation of renal replacement therapy in acute kidney injury: a systematic review and meta-analysis. Ren Fail. (2012) 34:396–402. doi: 10.3109/0886022X.2011.647371.

Computed Tomography Angiogram post-contrast showing complete occlusion of abdominal aorta at the level of L2-L3 with non-visualisation of right kidney and renal artery.



A Case Report of General Anaesthesia in Patient with Rare Genetic Dysautonomia due to Dopamine Beta Hydroxylase Deficiency

Dr Nicola Johnson, Leeds Teaching Hospital, Dr Paul Warman, Leeds Teaching Hospital

A 59 year old female presented for insertion of a peritoneal dialysis (PD) catheter for management of her end stage renal failure secondary to nephrosclerosis on the background of hypertension, renal dysplasia with ureteric reflux, anaemia of chronic disease and congenital dopamine beta-hydroxylase deficiency (DBHD). To the best of the authors knowledge, there are no previously reported cases of general anaesthesia undertaken in DBHD patients. There is one case report of a Caesarean Section performed under neuroaxial anaesthesia1.

DBHD is an extremely rare autosomal recessive condition with around only twenty affected individuals described worldwide2. In the UK there is a single family group with two affected individuals. Patients affected experience significant autonomic dysfunction through their inability to convert dopamine into noradrenaline and adrenaline. This presents primarily as exercise intolerance, postural hypotension and dehydration intolerance. Baroreceptor reflexes are thought to be normal. The responses to cardiovascular challenges of general anaesthesia are not known, nor the responses to direct and indirect sympathomimetics. DBHD can now be treated with the drug Droxidopa, a synthetic precursor of Noradrenaline that doesn't require Beta-Hydroxylation.

Regular medications; Aspirin 300mg OD, amlodipine 10mg od, Alfacalcidol 250ng OD, Darbepoetin 80mcg monthly, Ferrous Fumarate 210mg BD, Renacet 950mg TDS and Doxidropa 100mg OD.

Pre-op a virtual MDT took place with local anaesthetic, surgical and renal physcians, along with her team from Queen's Square Hospital, London. Surgery was timed for mid-morning, to allow oral hydration and medication administration pre-op. A large array of vasopressors and chronotropic medications were prepared in a variety of dilutions including Atropine, Glycopyrrolate, Ephedrine, Metaraminol and Labetolol.

After an arterial line was sited, intravenous induction of general anaesthesia was undertaken with 120mg of Propofol, 200mcg Fentanyl and 20mg Atracurium. The airway was secured with an endotracheal tube and positive pressure ventilation commenced. Dexamethasone 6.6mg and Ondansetron 4mg were administered as antiemetics. Surgery was uneventful and the patient was remarkably cardiovascularly stable and no vasopressors, chronotropes or antihypertensives were required at any point during the procedure.

The first stage of recovery was uneventful and she remained stable in the high dependancy unit overnight before being stepped down to a normal ward on her first day post-operatively, taking care to mobilise carefully. She was discharged after a course of haemodialysis on her second day post operatively. Her condition remains controlled and she is currently under consideration for a renal transplant.

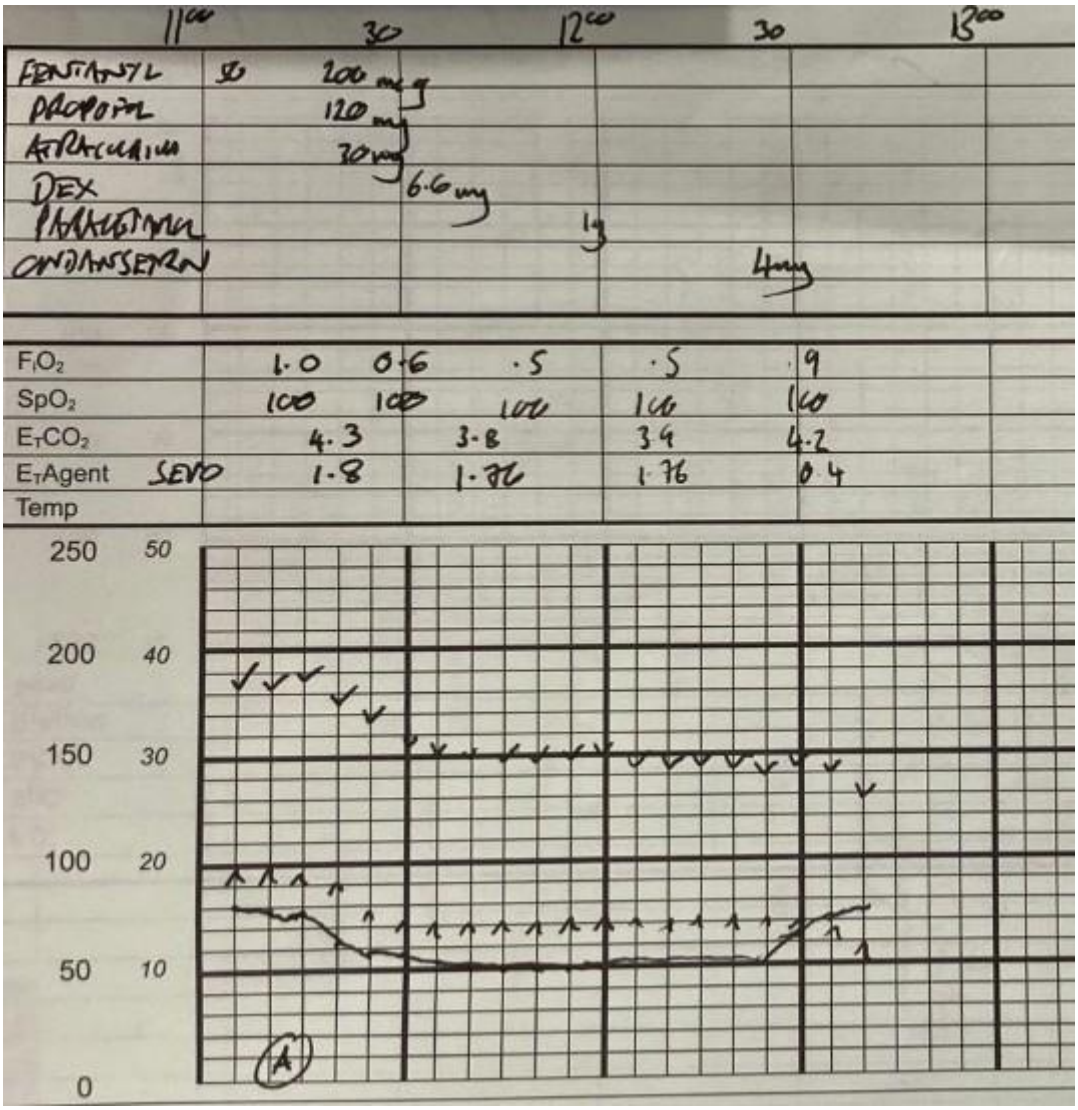
This is the first known case report of general anaesthesia in DBDH. Despite the potential for haemodynamic instability the patient was very stable under general anaesthesia and had a satisfactory post operative course with normotension throughout. The response of these patients to vasopressors and chronotropic medications remains unknown.

References

1. SCURRAH NJ, et al Anaesthesia and Intensive Care, Vol. 30, No. 4, August 2002

2. MedlinePlus. Bethesda (MD): National Library of Medicine (US); [updated 2020 Jun 24]. Noonan syndrome; [updated 2008 Sep 1; cited 2022 Jul 16];. Available from: https://medlineplus.gov/genetics/condition/dopamine-beta-hydroxylase-deficiency/#frequency.

Figure 1 - Extract from the patient's anaesthetic chart illustrating haemodynamic stability.



Major Lower Limb Amputation during the Pandemic. A re-look at Anaesthetic Technique and Outcomes in a Regional Centre

Dr Simon Smith, Royal Victoria Hospital, Dr Caroline Curry, Royal Victoria Hospital
Mr Louis Lau, Royal Victoria Hospital

Our vascular unit in Belfast studied Major Lower Limb Amputations (MLLA) over a one-year period in 2015. This planned review aimed to identify changes in patient, peri-operative and anaesthetic factors in relation to that period. Undertaking this review in March 2021 also provided the opportunity to explore the impact of the pandemic on MLLA locally.

MLLA in April to June 2021 were identified using the theatre management system. Patient notes, anaesthetic charts and operation notes were reviewed. Data was collected on a proforma. Follow up at 30 days, 90 days and 1 year was via the Northern Ireland Electronic Care Record (NIECR).

28 MLLA were identified. 86% were Male. The age range was 53-87 years. The rate of 0.31 MLLA per day studied was comparable to the rate of 0.32 in 2015. Patients admitted via ED rose from 21% in 2015 to 53%. The distribution between MLLA type remained broadly similar across both periods. The proportion of amputations that took place on vascular lists was also similar at 79% in 2021. Most Emergency List amputations were out of hours. 64% of patients were diabetic compared to 52% in 2015 but fewer were insulin dependent (IDDM), 27% compared with 59% previously. More patients were seen by specialist diabetic services in 2021 but this remained low at 27%. Those with pre-operative haemoglobin of less than 100g/dl fell from 44% to 29% and no patients had intra-op blood transfusion in 2021. Mortality was 0% at 30 days, 7.14% at 90 days and 25% at one year in 2021 compared with 9.5%, 20% and 30.5% in 2015. 75% had spinal anaesthesia compared to 32% in 2015. 87% had sciatic nerve catheters placed. 88% had lower limb blocks, up from 38% in 2015. 48% had pain team review.

The static amputation rate suggests we haven't seen the reduction in MLLA rates identified elsewhere during the pandemic.(1) The increase in admissions via ED likely represents structural change in the health service at the time e.g. reduced outpatient clinics coupled with pandemic related changes in health care seeking behaviour. It is difficult to attribute a cause to the reduction in short-term mortality in 2021. Improved pre-operative haemoglobin, reduction in intraoperative blood transfusion and a reduction in patients with IDDM could signal a lower risk patient group in 2021.(2)

The predominance of spinal anaesthesia in 2021 contrasts with the National Vascular Registry Report from the same year which showed 67% of MLLA had GA.(3) The increase in spinal anaesthesia and regional blocks was likely influenced by local tendency to regional techniques during the pandemic, a recognition that spinal anaesthesia may reduce post-operative complications in suitable vascular patients and increasing regional use in our unit led by the appointment of anaesthetists specialising in this area.(4,5) The change to a high proportion of spinal anaesthesia coupled with lower mortality in 2021 suggests further study is needed into anaesthetic technique and mortality in patients undergoing MLLA.

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Cerebrospinal Fluid Drains in Aortic Surgery: a case series and improvement programme

Dr Leonie Murphy, University Hospitals Sussex, Nilo Sadeh, Brighton & Sussex Medical School
Dr Ruth De Las Casas, Norfolk & Norwich University Hospitals,
Dr Thomas Clewley, University Hospitals Sussex, Dr Richard Stoddart, University Hospitals Sussex
Dr Abhijoy Chakladar, University Hospitals Sussex, Dr Vanessa Fludder, University Hospitals Sussex

Thoraco-abdominal aortic aneurysm repairs carry significant mortality and morbidity, with spinal cord ischaemia (SCI) being particularly devastating. Neuroprotective strategies to optimise spinal cord perfusion include the placement of lumbar cerebrospinal fluid drains (CSFD) [1]. These can be inserted prophylactically for higher-risk patients, or as a rescue technique if neurological dysfunction develops post-operatively.

We reviewed case notes for 14 patients who had CSFD inserted in our institution between 2017 and 2021. These patients all underwent elective TEVAR (Thoracic EndoVascular Aneurysm Repair) or FEVAR (fenestrated-EVAR) and included 7 prophylactic and 7 rescue drains. A retrospective quantitative and qualitative notes review was performed, in 2 cases significant data was missing. 9 patients experienced post-operative neurological dysfunction, with 8 deemed to have new SCI (remaining patient diagnosed with gluteal compartment syndrome). Symptoms of SCI in these patients included unilateral and bilateral reduction in lower limb power, altered sensation and areflexia, urinary retention and incontinence, and faecal incontinence with loss of anal tone. Time between surgery and symptom onset ranged from 1 to 48 hours, whilst time from symptom onset to drain insertion ranged from 6 to 23 hours. Reasons for delay in CSFD treatment included uncertainty regarding symptoms and diagnosis, imaging delays, lack of clear post-operative instructions and poorly documented handover. There seemed to be a lack of awareness of local guidelines and confusion about who was responsible for care.

In response to these findings, we have identified a number of systemic issues which require significant improvement and have implemented a range of interventions to improve care for this group of patients. We have re-written our local guideline to be more comprehensive and easier to read, using infographics, pictures, flowcharts and diagrams. We have designed a multidisciplinary training package to ensure that all staff are aware of the guidance and the importance of prompt escalation and management in the event of neurological deterioration. We have produced a management booklet for all patients undergoing aortic procedures with significant risk of SCI, which contains all the required assessment, handover and monitoring proformas. This enables us to ensure important information is communicated effectively and individualised targets for physiological parameters are recorded and readily accessible. We are developing a database to facilitate ongoing surveillance of CSFD usage and neurological complications of aortic surgery.

Reference

1. Etz C, Weigang Em Hartert M et al. Contemporary spinal cord protection during thoracic and thoracoabdominal aortic surgery and endovascular aortic repair: a position paper of the vascular domain of the European Association for Cardio-Thoracic Surgery. Eur J Cardiothorac Surg 2015; 47: 943-957.

Development of a Spinal Drain Protocol for Postoperative Spinal Cord Injury in Patients Undergoing Abdominal Aortic Surgery at Derriford Hospital

Dr Adam Green, Derriford Hospital, Dr Anna Fergusson, Derriford Hospital
Dr Elliot Catchpole, Derriford Hospital

We describe the introduction of a spinal drain protocol, a novelty for our institution (in a non-neurosurgical population) brought about after a case of postoperative spinal cord injury (SCI).

A 53 year old female underwent elective aortobifemoral bypass grafting. Post-operative analgesia was provided via rectus sheath catheters. The surgery was complicated by post-operative occlusion of the right common and internal iliac arteries.

During the immediate postoperative recovery period, it was noted that the patient was unable to move her legs. Formal neurological examination was performed once the patient was fully awake, showing both reduced sensation and reduced power (2/5) bilaterally. An MRI lumbar spine was performed, demonstrating abnormal high T2 signal within the conus extending up to approximately T11, with extensive fat stranding and abnormality associated with the visualised abdominal and pelvic vasculature. This was consistent with the ischaemic damage within the conus medullaris.

A likely diagnosis of SCI was made, and blood pressure (BP) augmentation with fluids and vasopressors was commenced. Spinal drain insertion was considered but not pursued due to a lack of both experience and a protocol.

Collateral arterial supply to the spinal cord is at risk in patients undergoing aortic surgery, most commonly in patients with thoracoabdominal aortic aneurysms but also in those with abdominal aortic aneurysms (AAA). Vascular compromise can lead to SCI with potentially catastrophic implications, including permanent paralysis. The mechanism is likely to be multifactorial.

The incidence of SCI is approximately 1 in 130 patients undergoing ruptured AAA repair and in 1 in 600 patients undergoing unruptured AAA repair [1].

Cerebrospinal fluid (CSF) drainage is a well described technique to protect the spinal cord, both pre-emptively and postoperatively, in response to new symptoms. Combined strategies of draining CSF, thus maintaining a low normal CSF pressure alongside augmenting the patient's BP to supra normal levels allows the spinal cord perfusion pressure to be maximised and spinal cord oedema to be reduced.

Current guidance does not support the use of pre-operative lumbar drains in AAA surgery. However, there should be a low index of suspicion for identifying a SCI in the postoperative period and consideration of lumbar drain insertion alongside BP management should be instigated.

We have developed a protocol for management of patients having elective or emergency, open or endovascular AAA surgery who develop neurological symptoms in the postoperative period. The protocol does not consider patients undergoing thoracic aortic surgery, where lumbar drains are commonly inserted preoperatively to reduce the risk of SCI.

The key subsections covered in the protocol include: making the initial diagnosis, immediate management of SCI, consideration of lumbar drain insertion, and subsequent management of a lumbar drain if inserted.

In conclusion, we have instigated a new protocol for use in the rare, but potentially catastrophic cases of postoperative SCI associated with abdominal aortic surgery. As yet, the protocol has not been required but will be evaluated and refined if and when it is utilised.

Reference:

1. Gialdini G, Parikh NS, Chatterjee A et al. Rates of Spinal Cord Infarction After Repair of Aortic Aneurysm or Dissection. Stroke. 2017 June;48:2073-2077

Development of a Guide to the Perioperative Management of Cardiac Implantable Electronic Devices (CIEDs)

Dr Michael McCann, Royal Victoria Hospital, Dr Kerry Featherstone, Royal Victoria Hospital
Dr Rebecca Noad, Royal Victoria Hospital, Mr John Dowd, Royal Victoria Hospital

In March 2022 the Association of Anaesthetists published the most recent British Heart and Rhythm Society (BHRS) guidelines with respect to the Perioperative Management of People with Cardiac Implantable Electronic Devices (CIEDs) (1). This recent publication fell in line with local departmental teaching around the management of CIEDs in the perioperative period.

The different devices were discussed including how best to manage these in daily practice. No clear local guidance was found for the management of patients with CIEDs. Guidelines from different trusts were reviewed and this provided a basis for developing this guide (attached).

An informal survey of the nine trainees present at this teaching was undertaken and there was a unanimous response that a clear and concise guide to support management of these patients would be beneficial and of use to their practice.

Input was sought from a Cardiology Consultant with a specialist interest in Cardiac Devices and the trust lead for Cardiac Physiology for multidisciplinary input into the development of the guide.

The aim was to develop a clear and concise guide which summarises the key points made in the recent BHRS guidance and act as a quick reference point in theatres for anaesthetists, surgical colleagues and nursing staff who are working regularly in theatre. A single page infographic was produced to be displayed in the anaesthetic rooms throughout the main theatre department, and ultimately to be used in all operating departments in the trust.

The completed guide is attached as a single page poster with text and associated QR code to the latest BHRS guidance.

During development of this guidance further opinion has been sought throughout the consultant and trainee body working within the main theatre block and there has been a universally positive response to the plan to develop and roll out this guidance.

Multidisciplinary input into the guide has allowed the development of an agreed management plan for the perioperative management of patients with CIEDs between the cardiology, anaesthetic and cardiac physiology teams.

Future aims include introducing this guide into our department starting in our main theatre block. It will be presented the departmental patient safety and governance meeting to introduce it to as many clinicians as possible at the stage of rollout to the department. Following introduction, an audit will be conducted in the department to ascertain satisfaction/confidence in using the guide.

References:

1. Thomas H, Plummer C, Wright I, Foley P, Turley A. Guidelines for the peri-operative management of people with cardiac implantable electronic devices. Anaesthesia 2022;77:808-817

Perioperative Management of CIEDs

Dr Kerry Featherstone; Dr Rebecca Noad; Mr John Dowds; Dr Michael McCann
June 2022

PPM ¦ ICD

Ophthalmic

If using monopolar diathermy proceed as per ***above umbilicus***

If using monopolar diathermy proceed as per above umbilicus

Above umbilicus / Below umbilicus

Pacing Dependent*	Pacing Independent
Reprogram to fixed rate if prolonged diathermy anticipated	Monitor during surgery - no reprogramming
Monitor during surgery - no reprogramming - - clinical magnet available	Monitor during surgery - no reprogramming
Consider reprogramming to fixed rate if prolonged diathermy or argon beam	Monitor during procedure - no reprogramming

Pacing Dependent*	Pacing Independent
Deactivation of ICD and fixed rate reprogramming **OR** Magnet application only if short diathermy	Deactivation of ICD **OR** Magnet application
Monitor during surgery to ensure appropriate function. No need to deactivate. Have magnet available.	
Deactivation of ICD + fixed rate reprogramming **OR** Magnet application if diathermy/argon not anticipated	Deactivation of ICD if argon beam/diathermy **OR** Magnet application

Endoscopy

***Pacemaker Dependency**

-No intrinsic rhythm greater than 40bpm OR haemodynamic instability with intrinsic rhythm
-Presents as inadequate or absent intrinsic rhythmic which is symptomatic in event of CIED failure
-The absence of any spontaneous ventricular activity (or the presence of low-rate, clinically not tolerated, spontaneous activity when the CIED is transiently programmed in VVI 30-40bpm)
-Most patients are **NOT** pacing dependent based on the above criteria
- Clinical Features suggesting pacing dependency:
  1. High percentage pacing (Greater than 40%) (See NIECR)
  2. History of complete heart block or AV nodal ablation

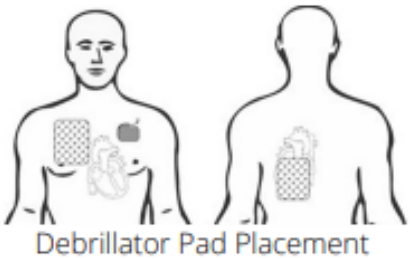
REMEMBER
All device information is available on a patient's NIECR record under the **REPORTS** section- this will provide information on:
-Type of device
- Manufacturer
- Percentage of Pacing
- Indication for insertion
- Date of last check
- Remaining battery life

Clinical Magnet Guidance

-Clinical magnets are acceptable means of PPM and ICD management in the emergency setting or where cardiac physiology support is not available
-Should be available in all off site facilities
-Available in Level 3 Th 6 CD Cupboard and RVH CCU (5D)
-Cardiac physiology 'Guide on How to Use Magnets' - available on intranet and alongside clinical magnets

For further information

BHRS 2021 Guidelines



Debrillator Pad Placement

Examples of CIED and magnet placement
(D) Sorin ICD: ring magnet placed off-centre avoiding the header on the top end
(E) Medtronic, Boston Scientific, and Biotronik ICDs: ring magnet placed directly on top
(F) St. Jude ICD: the curve of the ring/doughnut magnet on the top or bottom end

Cardiac Physiologists
In hours: RVH Ext: 51083 BCH Ext: 40403 (M - F - 08.30 - 16.30)
Out of Hours: RVH Ext: 50825 BCH Ext: 40736 (Weekends and 16.30 - 08.30)

Belfast Health and Social Care Trust
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Adapted from British Heart Rhythm Society Guidelines for the Management of Patients with Cardiac Implantable Electronic Devices (CIEDs) around the time of Surgery(Dec 2021)

The Use of Rectus Sheath Catheters in Open Aortic Vascular Surgery

Dr Katherine Saunders, Musgrove Park Hospital, Dr Isabelle Ferarrio, Musgrove Park Hospital

Rectus Sheath Catheters (RSCs) are increasingly being used for analgesia following open abdominal surgery but there is little data evaluating their effectiveness, particularly for their use in open vascular surgery. Thoracic epidural analgesia (TEA) is the current gold standard for analgesia following such operations (1). Our objective was to analyse the effectiveness of RSCs in providing analgesia for patient's undergoing open abdominal aortic vascular surgery when TEA failed or was not possible.

Retrospective data collection of patients undergoing open aortic vascular surgery between January 2020 and August 2021. Pain scores were not prospectively recorded, we allocated pain scores using a combination of clinical narrative in medical notes, and use of PRN medications as surrogate markers. Data collected also included patient demographics, length of stay and complications including hypotension, ileus, hospital acquired pneumonia (HAP) and acute kidney injury (AKI).

Data was analysed from 57 patients who underwent open aortic vascular surgery between January 2020 and August 2021. Ages ranged from 35-82 years. 18 patients used RSCs as their primary mode of analgesia (11 failed TEA, 7 TEA not inserted). Pain scores were compared to patients who used TEA as their primary mode of analgesia. Pain scores were similar between groups (TEA 76% with Mild pain vs RSC 79% with Mild pain, p= less than 0.001) (. There were a similar number of HAPs and AKIs between the groups but no incidence of hypotension in RSC group (0 vs 13). Failure rates were lower in the RSC group (7% vs 22%). Overall length of stay (LOS) was higher in the RSC group (Median 8 vs 6), however length of stay was dramatically reduced when RSCs were used as primary mode of analgesia to rescue failed TEA (9.26 vs 12.3 days).

The data show similar pain scores when RSCs are used as primary mode of analgesia compared to TEA following open aortic vascular surgery. RSCs have a lower incidence of failure and lower incidence of hypotension without an increase in other complications. We conclude RSCs provide a suitable alternative when TEA is contraindicated or fails and we have developed a protocol to include the use of RSCs in open aortic vascular surgery at our hospital. This study provides a good foundation for a future prospective study. To further investigate the effectiveness of this analgesic technique we intend to re-evaluate pain scores within our hospital following implementation of the protocol. Further to this, a formal prospective study would enable direct comparison of RSCs and TEA following open aortic vascular surgery.

References

1. NG156 NI. Abdominal aortic aneurysm: diagnosis and management.2020

VASCULAR ANAESTHESIA SOCIETY

FREE PAPERS

Autologous Cell Salvage Use During Lower Limb Amputation – An Audit of Current Practice
Dr Samuel Lillywhite, Southmead Hospital
Dr Amy Dodd, Southmead Hospital
Dr Graeme Ambler, Southmead Hospital
Dr Dragos Dragnea, Southmead Hospital
Dr Mihaela Onofrei, Southmead Hospital
Mr Owen Richards, Bristol University Medical School

Hospital Stress Factors and their Relation to Peri-operative Care for Non-elective Lower Limb Revascularisation
Dr Katharina Kohler, Cambridge University Hospital
Dr Daniel J Stubbs, Cambridge University Hospital

Emergency Management of Post-Carotid Endarterectomy Neck Haematoma: A Teaching and Simulation Training Package
Dr Ross Little, Royal Liverpool Hospital
Dr Emilia Spodniewska, Royal Liverpool Hospital
Dr Gwydion Hughes, Royal Liverpool Hospital
Dr Maria Safar, Royal Liverpool Hospital
Dr Tom Irving, Royal Liverpool Hospital

Vascular E-learning for Anaesthesia – An Interactive E-learning course Designed to Educate Anaesthetist on the Peri-operative Care of the Vascular Patient
Dr Pallab Rudra, Bedford Hospital
Dr S Samad, Bedford Hospital
Dr R Haddon, Bedford Hospital
Dr S Goon, Bedford Hospital
Dr L Grimes, Bedford Hospital
Dr C Sharpe, Bedford Hospital
Dr C Christou, Bedford Hospital
Dr R Burnstein, Bedford Hospital

Autologous Cell Salvage Use During Lower Limb Amputation - An Audit of Current Practice

Dr Samuel Lillywhite, Southmead Hospital, Dr Amy Dodd, Southmead Hospital,
Dr Graeme Ambler, Southmead Hospital, Dr Dragos Dragnea, Southmead Hospital
Dr Mihaela Onofrei, Southmead Hospital, Mr Owen Richards, Bristol University Medical School

Southmead Hospital acts as the primary vascular centre for the Bristol region and carries approximately 50-100 lower limb amputations per year. Amputations are commonly associated with highly comorbid patients (1). Previous local audit work from 2019 data identified a high requirement for allogeneic blood transfusions in these patients (33% transfused, average 3.6 units per patient). We carried out an audit of practice with regards to the use of cell salvage during these procedures and the rate of blood transfusion. We implemented a multidisciplinary education programme targeting the use of cell salvage and re-audited practice to determine any changes to the use of cell salvage with the aim of reducing allogeneic blood transfusion rates.

This project was registered and approved by the local Quality Governance Team at North Bristol Trust. Baseline data was collected retrospectively on all lower limb amputations occurring in the trust during 2020. Electronic notes were examined to collect data on; Tourniquet use, type of amputation, indication for surgery, surgeon grade and cell salvage use (not used vs collection only vs transfusion given). Transfusion records were interrogated to determine the frequency and number of blood products transfused to each patient. Data was then collected from the 3 months immediately prior to our planned intervention (Jan-March 2022). Following analysis of this data an education programme was initiated involving posters, presentations to surgical and anaesthetic teams and emails to all scrub and theatre staff. This multidisciplinary approach aimed to embed the default use of cell salvage for lower limb amputations. Practice was then re-audited over the following 3 Months (April-June 2022) to determine if cell salvage use had increased & if allogeneic transfusion rates had decreased.

During 2020, 55 lower limb amputations were performed, 2 patients had cell salvage set up in theatre (0 reinfused blood). 14 patients received a blood transfusion (25%). The average number of units transfused was 1.6. During the 3 months prior to our intervention (Jan-March 2022) 22 patients underwent lower limb amputation. 2 patients had cell salvage used during their procedure, 1 patient received cell salvage blood (434 mls). 8 patients received an allogeneic blood transfusion (36%) with an average of 1.3 units administered. After our cell salvage educational intervention (1st April to 9th June) 16 lower limb amputations took place. 11 patients had cell salvage set up during their procedure with 3 patients receiving cell salvage blood back (average transfusion 111 mls). Data is still being collected with regard to allogeneic transfusion rates in the April to June group.

This project has demonstrated that a low-cost multidisciplinary educational programme can increase the use of cell salvage during lower limb amputation surgery. The preliminary results show an increase from 9% use to 68% use following our approach (Fig 1.). The percentage of patients receiving cell salvage blood rose from 5% to 18%. With our ongoing audit work we hope to demonstrate a concurrent reduction in allogeneic blood transfusion rates in this group of comorbid patients.

Reference:
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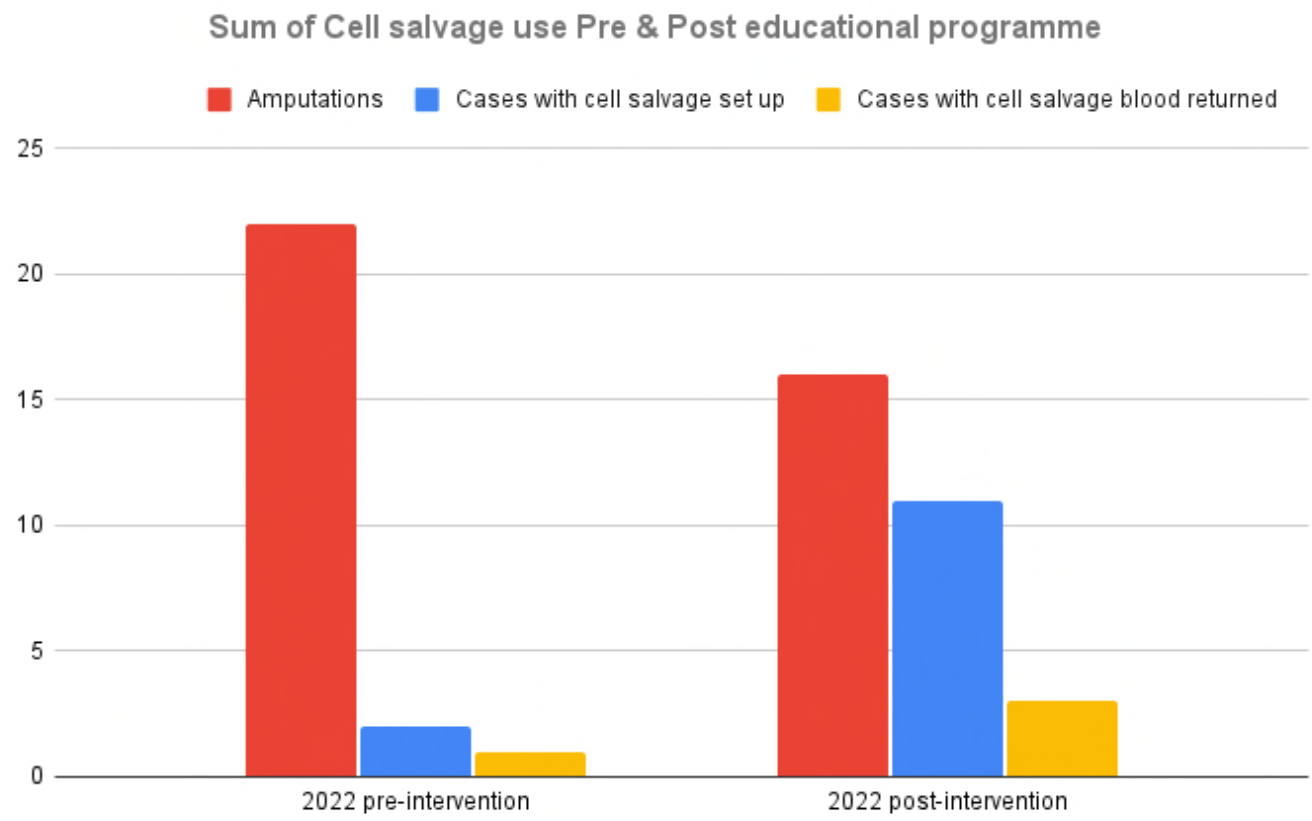
Figure 1. The number of amputations performed in the period immediately pre and post our educational intervention with rates of cell salvage use and autologous cell salvage reinfusion. An increase in cell salvage use and reinfusion is demonstrated.



Hospital Stress Factors and their Relation to Peri-operative Care for Non-elective Lower Limb Revascularisation

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Patients requiring re-vascularisation for ischaemic lower limbs present a challenge to the peri-operative service as they require urgent intervention, may have complex medical needs and present outside of elective pathways. The current capacity challenges in the NHS have resulted in a stressed peri-operative care system that faces significant challenges to provide expedient care. Hospital stress may result in worsened patient outcomes (1)

Post-operative care can be characterized by both the time to home discharge and the complications a patient encounters. The severity of encountered complications can be summarized using an electronic post-operative morbidity score (EPOMS) score (2).

The aim of this study was to investigate whether routinely collected hospital stress measures (e.g. bed state and emergency department waiting times) are related to post-operative complications and length of stay (LOS)

We used OPCS codes to identify patients who received non-elective lower limb revascularization at our tertiary centre between January 1st 2015 and August 1st 2021. We aggregated parameters such as basic demographics, length of stay, post-operative complication score and related both routinely collected and novel hospital stress parameters (including average inpatient acuity) to outcomes including average number of post-operative complications (linear regression) and length of stay (Cox model).

Our cohort contained 1072 unique patient encounters that had sufficient data completeness. Of these patients, 136 (13%) had an ICU stay, mean length of stay was 6.25 days (+/-6.2) and 29 (2.7%) patients died in hospital. 73% of patients had an ASA of 3 or higher. The median average EPOMS score was 2 (interquartile range 1- 3).

We build a linear regression based on patient factors with $R^2 = 0.006$ and a p value of 0.03. When adding daily averaged stress measures (hospital occupancy, ICU occupancy, number of theatre sessions cancelled, daily discharges, number of ED breaches and the average acuity of all inpatients represented by NEWS2 score) we improved the model performance to R^2 0.05 and p-value=0.0001. A cox-model for length of stay (censored for patients who died in hospital or were discharged back to their base hospital) demonstrated a concordance of 0.58.

Our results suggest that hospital stress factors explain approximately 5% of the observed variation in post-operative complications in patients undergoing non-elective lower limb revascularisation as well as being significantly associated with time to discharge home. Further investigation into the specific factors affecting care provisions is needed but these results warrant further investigation as to how hospital stressors can affect patient care

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Emergency Management of Post-Carotid Endarterectomy Neck Haematoma: A Teaching and Simulation Training Package

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Post-operative neck haematoma is a clinical emergency that can rapidly progress to airway obstruction and cardiorespiratory arrest if not recognised and managed in a timely manner. In response to a number of high profile cases, joint national guidelines have recently been produced by the Difficult Airway Society, the British Association of Endocrine and Thyroid Surgeons, and the British Association of Otorhinolaryngology, Head and Neck Surgery (1). Although these focus primarily on the management of neck haematoma post-thyroid surgery; the principles can be applied to other forms of neck surgery, including patients who have undergone carotid endarterectomy (1). Based on the recommendations set out in these guidelines, 'neck haematoma boxes' were introduced to our department to facilitate the rapid emergency decompression of a neck haematoma using the SCOOP (Skin exposure, Cut sutures, Open skin, Open Muscles, Pack wound) approach (1). The contents were rationalised and standardised following discussion with our surgical colleagues to include laminated guidelines, scissors/scalpel, sterile gloves, and gauze.

Alongside the introduction of the boxes, a training package was created to develop the knowledge and skills of the non-surgical members of the perioperative team, with the aim of improving their competence and confidence in the early recognition and management of post-operative neck haematoma. This consisted of a short presentation, followed by familiarisation with the new boxes, and finally the opportunity to decompress a mannikin's 'neck haematoma' in a low-fidelity simulation. In the initial pilot phase, the training package was delivered to a range of members of the multidisciplinary perioperative team (n=65); including recovery nurses, operating department practitioners (ODPs), and anaesthetists. Pre- and post- knowledge questionnaires (with a maximum score of 23) and confidence surveys (with a ranking of 1-10) were performed to gain objective and subjective feedback respectively.

The mean questionnaire score pre-training was 8.8 (SD 3.48) compared to a mean of 18.98 (SD 2.33) post-teaching (see Table 1). When comparing pre- versus post-training surveys, similar improvements were seen in candidates' confidence for the recognition (mean 5.88 vs 8.43), initial management (mean 4.52 vs 8.18), and performance of SCOOP decompression (mean 2.72 vs 7.95) of a post-operative neck haematoma. Analysis using paired t-test demonstrated statistically significant improvement in each of these score measures (p: less than 0.0001). In conclusion, as a result of the introduction of this training package, our staff have both improved knowledge and confidence in the management of this life-threatening emergency.

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Table 1: Comparison of mean scores pre- and post- training package.

	Pre-	Post-
Questionnaire (0-23)	8.8	18.98
Confidence: Recognition (0-10)	5.88	8.43
Confidence: Initial Management (0-10)	4.52	8.18
Confidence: SCOOP Decompression (0-10)	2.72	7.95

Vascular E-learning for Anaesthesia
An Interactive E-learning Course Designed to Educate Anaesthetists on the Peri-operative Care of the Vascular Patient

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Introduction - The Covid-19 pandemic has had a devastating impact worldwide with the number of lives the virus has affected. Whilst on a much smaller scale, its impact resulted in a loss of training opportunities for doctors. However, the pandemic and the requirements for social distancing has resulted in a rapid adoption and explosion of online distance learning and blended learning platforms. Within anaesthetic training in the England, we identified that whilst there was some learning content online, there was a distinct lack of an organised e-learning course to educate anaesthetist on providing peri-operative care for the vascular patient. Therefore, we sought to create a comprehensive accredited course that would enable an anaesthetist to learn the key elements of vascular anaesthesia via an interactive e-learning platform.

Method – We utilised the 5 step ADDIE model (Analyse, Design, Development, Implementation and Evaluation) as the template to guide our course design. We ensured institutional alignment by mapping the learning objective of the course to those currently set by the Royal College of Anaesthetist curriculum. Our target audience were anaesthetist preparing to sit their final fellowship examinations and trainees who were learning vascular anaesthesia as part of their training. The course was designed to rely on an adult learning theory model and we ensured that the design of the course would appeal to all learner types such as visual, auditory and kinaesthetic learners. To ensure high quality content, specialist vascular anaesthetist from the East of England deanery were recruited to write and create the content for the course. Once the content had been created by the specialist, we then refashioned the information to make it more interactive and segmented the content into smaller sections to reduce learner cognitive load. We then created the course using the Rise Articulate platform.

Outcome – Once the course was completed on the platform. The complete course was sent back to the original content creators for review. Once the initial corrections and adjustment were made, we then sent the course to a small pilot group of trainee anaesthetist for review from a learner perspective and edited the course accordingly based on initial feedback. Finally, to ensure high level accreditation and validation, the course was reviewed and edited by the Vascular Society of Great Britain and Ireland and will also be reviewed by the e-learning for healthcare team at the Royal College of Anaesthetist prior to being made available on their e-learning for healthcare platform.

Conclusion – Distant learning and blended learning is becoming ever present in education and with the increasing recognition of the importance of a stable work life balance, it is critical that doctors are able to learn and educate themselves independently at a time that suits their learning needs. We believe that we have created a highly interactive and comprehensive vascular e-learning course with high quality content that will not only engage the learner but provide them with essential knowledge that they can then apply to their daily clinical practice.