



“From the Trough”

Perioperative Interest Group Notes

Based on Cases discussed at the Weekly PIG Clinical Meeting on 19th January 2017. Publication date 25th January 2017.

Website: www.perioptalk.org

Attendance: Pragma Ajitsaria, Tracey Tay, Keith Streatfeild, Louise Hails, Michelle Castro, Ross Kerridge, Lisa Doyle, Clare Wohlfahrt, Berni Frost, Matt Spencer, David Cottee, Rebekah Potter

TOPIC 1: High Risk Whipples Surgery

76yo male with a cholangiocarcinoma deemed technically resectable by surgeon, referred for preoperative assessment. Surgery would be a ‘complex’ Whipples Procedure. Comorbidities include severe COPD and obesity (BMI 40). Very poor exercise tolerance, reflecting a very sedentary lifestyle. There was no ‘hard’ evidence of IHD, and the echocardiogram was surprisingly normal. CPET demonstrated an anaerobic threshold of 8.8mls/kg/min. It is possible that this could be improved by ‘aggressive’ exercise regime.

Implications of CPET results and comorbidities had been discussed with the patient, and he appeared likely to choose not to proceed with surgery.

Discussion:-

- All agreed this was a high risk surgical patient. Details were entered in NSQIP risk calculator at PIG meeting, showing significantly above average risk for all complications. This case is a good illustration of the value of NSQIP in discussions with surgeons about fitness for surgery.
- Potential for optimisation of comorbidities was discussed along with the value of prehabilitation. This is very dependent on the patient’s motivation and choices. In this case it appears unlikely to be successfully to change CPET result or risk profile.
- If the full Whipples procedure is unacceptable, what plans should be made regarding alternative surgical or non-surgical treatments, or palliative procedures? What is the natural course of the patient’s illness without intervention? This needs to be clarified with surgeon.
- The value of a multidisciplinary discussion with surgeons, anaesthetists +/- oncologists was noted.

Recommendation:

Follow-up discussion to be had with surgeon about treatment alternatives. This information should clarify final advice to be given to surgeon (and patient) for their next consultation.

TOPIC 2: ‘Minor’ indication for surgery in a high-risk patient

88yo female for superficial parotidectomy for slow-growing tumour. Extensive list of comorbidities including IHD with previous CABG, COPD (120 pack year smoking history), CKD (Stage 3b), T2DM. Very poor exercise tolerance and history of post-operative pneumonia (6 week admission for respiratory complications after CABG). Procedure requires a GA as per surgeon. Fitness for surgery questioned.

Discussion:-

- Natural course of the disease was again questioned. Why does this need to be done? The patient’s main (stated) concern was cosmetic. Is the tumour likely to enlarge significantly? It would seem preferable to leave it alone unless growth becomes truly problematic.
- Attempt to ascertain the main cause of the patient’s SOB (cardio vs. resp). Recent echo and angio appeared acceptable. Clarify if her respiratory status be optimised with respiratory input?

Recommendation:

- Discussion to be had with surgeon to clarify the natural course of disease (tumor growth) and outcome of no intervention. This may then need to be re-explained to the patient, if it is appropriate to not resect the tumour.
- If to proceed, seek input from a respiratory physician.

TOPIC 3:

A confusion of indications

87yo female referred for preoperative assessment for a right common iliac stent. This had previously been unsuccessful when attempted two years previously under local anaesthetic (patient unable to tolerate discomfort). The patient was not followed up by Vascular Surgeons. Has recently been assessed for a THR and re-referred for the vascular procedure (the orthopaedic surgeon wanted this done prior to the THR). Significant comorbidities including COPD and continued smoking, SOB at rest, (SaO₂ 86% on room air), aortic stenosis, IHD, chronic pain (known to HIPS).

Discussion:-

Do either of these procedures need to be done? Patient is asymptomatic with regards to her PVD. Orthopaedic Surgeons communication seems equivocal regarding if this procedure will improve anything. The daughter is concerned, and appears to not want the procedure.

Recommendations:

Patient appears to be asymptomatic of her vascular pathology and a THR is unlikely to significantly improve her quality of life. Perhaps neither procedure needs to be performed.

Patient needs geriatric assessment to clarify what interventions are worthwhile.

TOPIC 4:

Obesity and ovarian mass. Not just obesity?

52yo lady with large ovarian mass is booked for operative removal. Obese (165kg, 170cm), and unable to lie flat due to dyspnoea, and hence sleeps in a recliner.

Despite these inauspicious details, careful history and examination suggested that this may not be 'just' obesity:- She has lost 15kg in last 12 months on a 'better diet'; Obesity around her face, neck and upper chest is less than normally expected in a patient of this BMI. She has a large pannus apron that the surgeons plan to resect. She has brawny oedema and secondary cellulitis of both legs, possibly due to continuous dependency and venous obstruction. The ovarian mass is 40x40x25cms (approx 24kg). She will therefore lose more than 30kg of ovarian mass and pannus.

Discussion:-

Appropriate to proceed as is; Need to plan procedure with surgeon, aiming to remove mass early to decompress the abdomen. The effect of the mass causing aortocaval compression may be exacerbated by muscle relaxants. Plan strategies to reduce this during surgery (e.g. use of tilt as in pregnancy).



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Perioperative Interest Group Notes

Based on Cases discussed at the Weekly PIG Clinical Meeting on 2nd February 2017. Publication date 8th February 2017.

Website: www.perioptalk.org

Attendance: Gary Leung, Pragma Ajitsaria, Michael Hicks, Libby Freihaut, Ross Kerridge, Bernard Frost, Leonard Conrad

TOPIC 1: *A Cardiac Catch 22*

61 year old gentleman requiring an oesophageal dilation for a post-radiotherapy low stricture has multiple comorbidities that are suboptimally treated. Past history of ischemic heart disease with a stent in situ; pre dialysis renal failure (fistula in situ); Poorly controlled hypertension. OSA but not currently using CPAP as machine broken. Active smoker. Previous TIA. NSTEMI 8 weeks ago. BP 180/105 in hospital. Echocardiogram at that time was somewhat surprisingly reassuring. Self-discharged before planned inpatient angiogram. Coronary angiogram after discharge shows a 90% ostial LAD lesion and 90% RCA. Appears to have slipped through follow-up since the angiogram. On clopidogrel. Currently reports having daily chest pain. Is continuing to eat food with some solid material (sausages etc.) and vomits every 2 to 3 days. Significant social disadvantage and behavioural issues. May have some cognitive impairment. If he obstructs, he will not be able to absorb his oral medication (clopidogrel, antihypertensives etc) - indeed, he may not be absorbing them now. So he needs a dilatation.....

Discussion:- Despite the clear need for esophageal dilation, it is inappropriate to consider him for a procedure in his current cardiology state. Despite his apparent non-compliance, it is appropriate to continue to pursue cardiology intervention. PLAN:- Discussed at perioperative cardiology review meeting:- Senior cardiologist will contact the GP directly to ensure that he has the information from the angiogram, to enlist his assistance in getting cooperation from the patient, and to attempt to get some progress in planning cardiology intervention. This may not be successful, or total obstruction may occur acutely. Hence there needs to be a documented plan for management if he comes in an emergency with esophageal obstruction. Plan would be to proceed with close monitoring and BP control, RSI intubation, and cardiology on standby.... Documentation to be placed in the correspondence section of CAP records in case he presents through emergency department.

TOPIC 2: *Does No mean No?*

24 year old female with a congenital urological abnormality - over 70 anaesthetics in the past - has bladder stones and persistent infection as a result. Has been avoiding hospitals for about 5 years, but does understand that intervention is required. Planned for cystoscopy and laser lithotripsy. Has previously abandoned planned intervention when overcome by acute anxiety and phobias associated with having hospital procedures. Following this episode (six months previously) she was seen in the pre-op clinic to discuss the situation. An agreement was made that there would be a familiar surgeon and anaesthetist for any future procedures. She consulted with a psychiatrist and then with a psychologist to explore and develop strategies for dealing with her anxieties. These have been somewhat successful. She was then seen in pre-operative clinic again to plan management for this procedure. A plan was made for admission the night before for oral sedation, and insertion of an IV cannula. (Although there is concern about any medical procedure, there is not an excessive needle phobia.) After insertion of the IV cannula oral sedation would be given overnight if necessary, and stronger IV sedation given on the ward prior to taking the patient to theatre if necessary.

This plan was followed up until the morning of the procedure. On the morning she was anxious but co-operative on the ward, and decided to come up to the operating room accompanied by her partner, to be anaesthetised there. Shortly after arriving in the anaesthetic bay, she became severely distressed and then became irrational calling out "no" repeatedly. Even though still communicating with anaesthetist and partner it was not possible to stop her saying no.... Eventually, with the partner's encouragement and assistance (holding her), an induction dose of propofol was given despite her protestations, and the procedure took place. Shortly after waking up after the successful procedure, the patient was profusely apologetic and thankful to have had the procedure done. So....Does no mean no?

Discussion:- In retrospect there should have been a pro-active discussion as to what to do if this occurred. Ideally a documented agreement in advance that the procedure should take place even if she was overwhelmed by anxiety in this setting. Pragmatically, comparisons with other possible assault scenarios (in a non-medical situation) don't necessarily apply, although legally the distinction is not necessarily clear... The clear record of thoughtful, caring preparation, consistent personnel and involvement of a partner is also important. For future planning, the patient's situation should be documented by correspondence, and registered on Risk Database. IV sedation on the ward may be preferable but if sub-anaesthetic, may make things worse... She is going to continue working with the psychologist to continue to address her anxiety issues.

TOPIC 3: *Is there a line in the sand?*

A 16 year old female wishes to have an implanon removed as she can feel it under her skin. It has expired its medical usefulness. She has a major needle phobia as well as a poorly controlled asthma and is an active smoker. Multiple other social issues. On first presentation (without a pre-operative clinic consult) she was seeking a gas induction however it was felt that her poorly controlled asthma made this a risk. The request was refused, and the procedure was cancelled pending clinic consultation/discussion and planning. The procedure is entirely elective and could be described as cosmetic. Where to from here? When is it appropriate to say no?

Discussion:- Prior to the first presentation she had been told by non-anaesthetists that she would be given gas for cannulation. This may have been interpreted by her as fully gaseous induction. The situation needs to be discussed further and clarified in the pre-op clinic. It was felt appropriate to offer EMLA, nitrous oxide analgesia, and/or oral temazepam to enable insertion of intravenous access, but in view of her airway issues an intravenous induction was required - and that would depend on optimising her asthma management. It was felt that it was definitely inappropriate to offer a full gaseous induction without establishing intravenous access (in a patient with difficult IV access) for a procedure that is essentially cosmetic. Given the nature of the procedure, and previous compliance issues, a line in the sand must be drawn....



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Based on Cases discussed at the Weekly PIG Clinical Meeting on 9th February 2017. Publication date 2nd March 2017.

Website: www.perioptalk.org

Attendance: Candice Peters, Bernard Frost, Daniel Orr, Gavin Sullivan (additional post-meeting contributions from Pragma Ajitsaria, Andrew Powell, Caroline Phelan and Ross Kerridge)

TOPIC 1: *Trans-tibial (15cm below knee) Amputation*

- 40y/o with brittle T1DM now well-controlled on insulin pump with Charcot’s foot
- Multiple debridements & VAC dressings now for amputation electively
- Seen in Pre-op Clinic, but no pre-op anti-neuropathic agents prescribed for loading dose.
- B/g: Chronic Renal Impairment with eGFR 25

Questions:

- 1) What is the current evidence for use of gabapentinoids for acute prevention of neuropathic pain?
- 2) Is there evidence for prophylactic agents for post-amputation pain?
- 3) Considerations for choice between Pregabalin vs Gabapentin
- 4) Should dose be adjusted in renal impairment?

1) Perioperative Gabapentinoids.

Overall, there is good evidence for the use of pregabalin and gabapentin in chronic pain conditions including neuropathic pain states such as diabetic polyneuropathy, postherpetic neuralgia and central neuropathic pain as well as fibromyalgia (Wien 2013b Level I [Cochrane], 91 RCTs, n=17,995).

The following represents conclusions based on clinical experience and expert opinion: *“Based on the experience in chronic neuropathic pain states, it would seem reasonable to use alpha-2-delta ligands (gabapentin, pregabalin) in the management of acute neuropathic pain.”*

The clearest evidence for perioperative use is for opioid-sparing effect in the first 48 hours postoperatively:- The evidence for longer-term benefit from gabapentinoids in preventing neuropathic pain is equivocal.

REFS Acute Pain Management, Scientific Evidence, FPM 2015

(n.b. There have some concerns expressed regarding conflict of interest in some studies.)

2) Post-Amputation Pain

Studies in this area are remarkably small in number and size and hence it is difficult to make any definitive statements.

Peri-operative gabapentin was found to be ineffective in reducing incidence and severity of phantom limb pain (Nikolajsen 2006 Level II, n=46, JS 5).

A small observational study found that the overall incidence of long-term phantom limb pain was similar in patients given **IV ketamine** (bolus dose followed by an infusion, started prior to skin incision and continued for 72 h postoperatively) compared with no ketamine; however the **incidence of severe phantom limb pain was reduced in the ketamine group** (Dertwinkel 2002 Level III-3); both groups received regional analgesia.

Another RCT from Drs Hayes, Armstrong-Brown & Burstal (yes, our very own!) looking at the effects of IV ketamine (0.5mg/kg pre-induction IV bolus followed by a 0.15mg/kg/hr infusion for 72hours post-operatively)

reported a numerical, but not statistically significant, difference in the incidence of phantom limb pain at 6 months after amputation (47% in the ketamine group and 71% in the control group). There was no improvement in stump pain at 6 months (Hayes 2004 Level II, n=45, JS 4). Peri-operative ketamine given by the epidural route showed no preventative effect (Wilson 2008 Level II, n=53, JS 5).

Other drugs and modalities:

Amytriptiline and systemic lignocaine have been looked at (again in small RCTs, n = <50 each) with no benefit demonstrated.

Morphine: effective for short term post-operative pain

Epidurals: Perioperatively: will reduce the incidence of severe phantom limb pain. Evidence is inconclusive for prevention of all phantom limb pain.

Peripheral nerve sheath catheters: Provide post-operative analgesia but have demonstrated no benefit in preventing post-operative phantom limb pain or stump pain.

Non-pharmacological therapies – appear to be the most promising strategies for reversing the changes in cortical organisation. This includes mirror therapy, sensory discrimination training, use of prostheses and TENS.

REFS Acute Pain Management, Scientific Evidence, FPM 2015

3) Which Drug:- Pregabalin vs Gabapentin?

There is no difference in clinical effectiveness between Gabapentin and Pregabalin. Anecdotally, Pregabalin results in less side-effects as the smaller dosage per tablet allows titration to effect more gradually/accurately than with Gabapentin. Local Acute Pain Service Policy is based on cost considerations for the patient, as although both Pregabalin and Gabapentin are PBS subsidized, the indications within the PBS are more restrictive for the latter (i.e. it is not subsidized for acute or non-established neuropathic pain). In this case the patient pays full price for gabapentin. Hence the APS prescribes Pregabalin for inpatients so that the patient does not incur unnecessary costs on discharge in the event the drug needs to be continued on discharge.

4) Renal Adjustment

Pregabalin and gabapentin are renally eliminated with no hepatic metabolism. Dose reduction is therefore required in renal impairment in accordance with the patient's eGFR. Note that neither are cleared by peritoneal dialysis.

The Broader Context of these Drugs

From:- Pharmaceutical Benefits Advisory Committee Public Summary document on Pregabalin:

"The PBAC recommended the listing of pregabalin on the PBS as an Authority Required (Streamlined) benefit for the treatment of refractory neuropathic pain not controlled by other drugs on the basis of acceptable cost-effectiveness compared with placebo in patients dissatisfied with their current pain relief. The PBAC agreed with the sponsor that pregabalin was superior to placebo and non-inferior to amitriptyline/gabapentin. The PBAC acknowledged the difficulty of modelling future use and future cost-effectiveness of pregabalin. The PBAC remained concerned about the potential for use beyond the estimates presented in the submission."

Please also see our local guideline:

'Reconsidering drug therapy for neuropathic pain, CRPS and fibromyalgia' (Health Professional Resources. Hunter Integrated Pain Service March 2014) (attached).



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Based on Cases discussed at the Weekly PIG Clinical Meeting on 16th February 2017. Publication date 23rd February 2017.

Website: www.perioptalk.org

Attendance: Monica Diczbalis, Rebekah Porter, Julian Baldwin, Candice Peters, Stalini Rajan, Peter Harrigan

TOPIC 1: *68F for insertion grommets (symptomatic)*

- Morbidly obese 116 kg BMI 46
- Undiagnosed OSA: due for review Scott Twadell
- ‘Occasional’ CP
 - S/B cardio 2013
 - MIBI — mild CAD, no plasty
 - Stable symptomatology
 - Moderate diastolic dysfn on previous TTE.
 - Exc tol: ~4 METS
- Episode ‘stopped breathing’ during endoscopy. Hypoxic episode on endoscopy record (sedation by anaesthetist).
- ? Utility of repeat echo
 - To inform PA pressures & progression.
 - Would it change management? Unlikely.
- Seeing Dr Twadell before surgery.
- Consensus
 - Begrudgingly accept; no immediate optimisation possible.
 - LMA / high-flow in recovery.

Discussion:

- Managing similar cases (high risk, ↑BMI, minimal sedation, etc.) in theatre:
 - Morbidly obese patient for hysteroscopy.
 - Consider spinal, although in a ‘bowling ball’ patient this is also not straightforward.
 - THRIVE, small amount midazolam (½ mg) & ketamine (<½ mg/kg [ideal weight]). Careful ‘wording up’ of the patient as to recall and possible psychiatric effects.
 - Describe the ketamine experience in pleasant terms: ‘bright lights’ rather than ‘spiders crawling out of the ceiling’
 - No recall of procedure in this instance.
 - Technique requires careful timing with surgeon.
 - Can also consider cervical / pudendal block in this instance.

TOPIC 2: *Male patient for resection of non-secreting pituitary adenoma*

- Severe depression when seen in clinic
 - Multiple life events: family breakup, loss of house
 - Now on disability pension & living at home with parents.
 - Suicidal in the recent past (not currently).
 - No current endocrine cause for depression.
- Attempt to contact liaison psychiatry regarding recommencing desvenlafaxine.
 - Very difficult on a Friday afternoon!
- Subsequently able to contact on Monday.
 - Outpatient, therefore ‘no involvement’
 - Persuaded to take case by anaesthetist & will follow up from this point.
- Options in clinic for severely depressed patients:
 - PECC unit at CMN if at risk of harm.
 - Mental health emergency line (at least for NSW) — 1800 011 511

MH Testing / Managing Susceptible Patients

- No reliable genetic test as yet, therefore IVCT requiring invasive muscle biopsy.
- Perform initial muscle test on index case where possible & genetic testing to
- identify known mutations.
- Personal experience with MH during renal transplant (following clamp release)
 - Rapid rise in CO₂ — to 90 mmHg
 - Potassium to 9
 - Temperature 37 → 39 in 15 minutes.
 - Rapid resolution with administration of dantrolene.
- Possible to give a non-triggering anaesthetic with minimal effort.
- List planning for elective cases:
 - Place MH-susceptible patients first on list with a clean machine.
- Use of charcoal filters:
 - Shown to rapidly reduce volatile concentrations in the breathing system.
- Unknown exactly what the triggering concentrations of volatile are.
 - Modern anaesthetic machines take long time to flush.
 - Utility of using filters in the circuit to reduce agent concentrations during a crisis:
 - Secondary priority to administering dantrolene.
 - Utility during non-triggering anaesthesia for susceptible patients is controversial.
 - Activated charcoal filters in the MH box.
 - Formal project by former JHH trainee Dr P. T. Farrell.
 - Question: should we put charcoal filters in the circuit for MH-susceptible patients?
 - Need to establish minimum requirements to prepare an Aisys for MH sensitive patients
 - GE: 30 min @ 15 L/min
 - MHANZ: 90 min @ 10 L/min

Outcome:

- Involve Steve Threlfo in establishing what is required to prepare a machine in an emergency situation
 - No current 'MH machine' in JHH.
 - Note that the need to take extra precautions is reduced with increasing genetic distance from the index case.
- Find out cost of filters — may be cost-effective. (Kate Lewin)
- In the setting of an emergent case (e.g. intubated patient from ED), it is reasonable to consider administering TIVA and using Oxylog from ED until MH-ready machine available. (i.e. start flushing the OT9 / PACU machine when notified and swap machines during the case).



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Attendance: Ross Kerridge, Roland Passier, Matt Spencer

TOPIC 1: *No substitute for clinical suspicion....*

An 85 year old female was booked for a total knee replacement. She was noted to have a history of ‘seasonal asthma’ that had started about four years ago. Spirometry in the preoperative clinic suggested this was well controlled:- FEV1 1.32L(85%) FVC 1.63L(84%). The clinic doctor noted on history that the dyspnoea had an increasing exertional component. The patient was also noted to have a soft systolic ejection murmur. Echocardiogram was ordered to investigate the murmur. This showed a tight aortic stenosis with a mean aortic valve gradient of 51mmHg. The operation was postponed for cardiology evaluation:- the cardiologist has suggested the patient be considered for a TAVI rather than a TKR.....

Discussion:- A relatively recent conference presentation (recalled generally, but authors not remembered) reported a study of blind comparison of findings on echo compared to findings on auscultation. It emphasised that many “sinister” echoes are not associated with significant valve lesions, and vice versa. Neither auscultation nor echo can be interpreted alone - the overall history and physical evaluation must be considered. The case reminds us that there is no substitute for clinic suspicion and history taking.

TOPIC 2: *Surgery in poorly controlled diabetes*

A 75 year old female was booked for surgery on bunions. She is a known diabetic, and reports that she normally has good glycaemic control based on her own report. Her HbA1C was found to be 12.2%. The patient insists that she is compliant with all treatment, and takes all medications as prescribed. Discussion with her (very experienced) GP found that he suspects otherwise. She has never seen a specialist about her diabetes. There is no evidence of peripheral vascular disease or ischaemic heart disease. GFR normal. The operation could be described as low morbidity. The patient became irate when it was suggested that the operation may be postponed. The patient accepts the risks. Should she be postponed to 'force' evaluation of her diabetes??

Discussion: - It must be considered that either:- the patient’s compliance with therapy is poor (despite her report); or the prescribed therapy is not appropriate. In either situation, it is appropriate to seek specialist review. Presumably if the therapy is not appropriate, the patient will accept improved therapy:- If she chooses not to, this should be on the basis of an explicit choice, rather than in the context of denial. Even though surgery is 'low-morbidity', an infection in the feet of a poorly controlled diabetic can be catastrophic. Hence there should be some effort to improve the diabetes for this elective surgery. The patient has been waiting for three years and is understandably keen to have surgery, nevertheless she should be 'forced' to see a diabetes specialist to review therapy and identify why her HBAIC is high despite her claimed compliance.

TOPIC 3: *Unrealistic expectations & catastrophising*

A 66 year old female booked for revision left total hip, with significant pain and disability. The patient has a BMI of 42, 'severe OSA' with home oxygen, although indication for latter appears to be uncertain and unclear. She had previously tried CPAP but was not continuing to use it. The patient appears to have unrealistic expectations of benefits from surgery, but has very significant chronic pain behaviours. She catastrophizes her current situation. She is very keen to have surgery and threatened suicide if the operation was postponed. Her medical management is appropriate for her chronic physical state. Her psychological state suggests that it is unrealistic to expect that there would be any possibility of improving her by postponing the operation for weight loss or prehabilitation.

Discussion:- Liaise with surgeon to confirm that he does expect worthwhile benefit from the surgery, and as 'heads up' that she will be problematic perioperatively. Do not postpone, but in the two weeks available preoperatively, schedule urgent assessment appointments with both rehab and with pain services for planning postoperative care. Accept that surgery should go ahead, but the patient will have increased requirements immediately post operatively (HDU) and for rehabilitation after that.

TOPIC 4: *Unappreciated Risks*

A 60 year old patient was booked for total knee replacement. She has a long-term history of large vessel arteritis with multiple PE's, and previous arterial thrombosis resulting in amputation of one leg. The patient is dependent on IVIG and mycophenolate. Patient has had recurrent clots whenever the INR is <1.5, and the patient is terrified of having another clot. The patient did not seem to be adequately aware of clot risk associated with surgery. The patient was booked by the surgeon without any detailed discussion with the patient (or anyone else) of the planned management of Warfarin perioperatively, or the need for this. In the clinic, after considerable discussion, the supervising sub-specialist physician was contacted. He was unaware of planned surgery, but suggested dewarfarinisation onto heparin infusion preoperatively, for preoperative cessation and restarting 12 hours postoperatively.

Discussion:- Postpone the operation to enable a case conference involving surgeon, physician, and anaesthetics to consider risks and benefits, and develop a perioperative plan. Following that, plan a further consultation with the patient to ensure that she understands the risks of the proposed surgery.



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Attendance:

Notes from Grand Rounds Presentation 2nd March

Perioperative Medicine: - Current developments and future challenges

Overview of International Developments

There is an emerging consensus of developments internationally that support the general focus on reorganisation and changing delivery of procedural healthcare that can be broadly described as an International transformation to perioperative systems. In the UK “perioperative medicine” is a major initiative of the Royal College of Anaesthetists working with the NHS. In the US the American Society of Anaesthesiologists has launched the perioperative surgical home initiative and is “driving” the uptake of this model of care across the US. Note that this is not without its controversy, and in some centres a more collaborative model working with surgeons and other stake holders is favoured (reference to be added). In Europe the most common description of the new model of care is ERAS (Enhanced Recovery after Surgery). Despite the title, implying a focus on postoperative care, there are substantial elements of preoperative care included in the ERAS model. ERAS is also being promoted in the USA. In Australia the NSW agency for clinical innovation has recently updated the perioperative toolkit (first released in 2007) the new version includes much more comprehensive models of care to support changing perioperative systems. All of these developments reflect the emerging paradigm of perioperative care being modelled on “Industrial” approaches to health procedures.

Supporting the organisational changes around perioperative systems is a rising body of clinical science that can be described as perioperative medicine. This is an emerging focus of clinical and scientific research, recognising that the outcomes of high risk surgery are often defined most critically by management of patient’s comorbidities, rather than a uniquely related to the particular surgical procedure. Perioperative medicine has been labelled the future of anaesthesia (Reference to be added).

Emerging Evidence

The most visible aspect of the change to the perioperative systems is the ##### rise of preoperative clinics. There have been provocative editorials questioning the rational for preoperative medical evaluations (Reference to be added) there is an emerging debate questioning the cost and clinical justification for “simple” preoperative clinics that do not “add value”. Part of this debate is related to differing opinions about the rational for preoperative medical evaluation. Some centres have addressed this by taking an automated and cost reduction strategy with regard to “simple” preoperative assessment and instruction. Other centres have added value by exploring new clinical interventions that can be appropriated undertaken at the time of preoperative preparation, including medical optimisation particularly focusing on cardiovascular disease, diabetes, smoking, anemia and rehabilitation.

An important paper published in mid-2016 showed for the first time that preoperative evaluation clinic visit is associated with decrease risk of in hospital post-operative mortality. The study from New York looked at patients who came through the preoperative evaluation clinic versus those who by passed it. There was a significant reduction in in hospital mortality. The clinic was a “high value” clinic, perusing opportunities to add value to patient preparation. Although there are weaknesses in the study, the evidence was powerful enough to make this the most prominent paper in the August, 2016, edition of Anaesthesiology.

A report from Vanderbilt Hospital in Tennessee showed that introduction of the perioperative consult service (largely incorporating ERAS and other features of the perioperative system) produced significant improvements in cost and length of stay for colorectal surgical patients. This was in the setting of a hospital that was already a “high performing” surgical service when compared to other hospitals in the US.

Current Clinical Issues

The BRIDGE Trial, published in late 2015, looked at the traditional practice of preoperative bridging with LNW Herons during Warfarin cessation preoperatively. It suggests that the risk associated with short term stopping of Warfarin (and presumably other anticoagulants) prior to surgery has probably been generally over emphasised in the past. For most patients on warfarin for low and moderate risk indications, it is appropriate to nearly cease the anticoagulant without preoperative bridging.

There is widespread interest in optimising perioperative fluid and nutritional status. In particular the unnecessary culture of fasting patients preoperatively needs to be addressed. A recent innovation in Australia has been development of a high calorie drink that is cheap enough to be used routinely for patients preoperatively up until 2 hours prior to surgery. Although the evidence is available, a cultural change to make fluid and nutrition maintenance “routine” on surgical wards is the major challenge.

The rising epidemic of opioid abuse in the US and similar countries has raised questions about exposure of surgical patients to opioids unnecessarily, and particularly prescription of excessive quantities of opioids. It has been said that addiction to opioids is the greatest long term complication of anaesthesia. (Reference to be added)

For those who are frequent visitors to operating theatres, or have not been in an operating theatre for some years, a notable change in practice has been the use of local anaesthetics both for wound infiltration or for advanced blocks such as tap blocks.

Dexamethasone is becoming widely used as an anti-emetic, for which it is highly effective. There have been concerns raised about the adverse effects of dexamethasone or other glucocorticoids such as infection risk, hyperglycaemia or impaired wound healing. A recent meta-analysis has found that there does not appear to be a significant safety concerns with the doses used for antiemesis preoperatively. (Reference to be added) The PADDI Trial currently commencing in Australia and New Zealand will provide a clearer answer to this concern.

The enthusiastic uptake of preoperative (Cpap cardio pulmonary exercise testing) in the UK has led to a number of “spin off” scientific discoveries, particularly clarifying the role of exercise testing for preoperative assessment, and revealing the benefits of exercise for a wide range of health conditions. Most interestingly there is emerging evidence of improved cancer survivorship including slowed cancer growth and reduced metastasises. Exercise appears to accelerate mitochondrial recovery from the effects of chemo therapy. It also aids recovery from chemo therapy fatigue, at least partly because of effects that mitochondrial level.

The concept of “Onco Anaesthesia”

Has been put forward and remains controversial. There is biological plausibility for a number of interventions associated with anaesthesia and surgery that may increase or inhibit cancer cell growth. This includes modification of the stress response, inflammation, direct effects of volatile agent’s opioids and local anaesthetics on cancer cells, and a number of other “minor” interventions that have been postulated to offer opportunities for modification of anaesthesia to have beneficial effects on cancer survivorship. This remains controversial. An alternative model of onco anaesthesia put forward by Bernard Rydal and others focusses on optimising perioperative care so that the patient can rapidly “RIOT” (Return To Intended Oncological Therapy). He suggests that rather than focusing on the somewhat congenial benefits of direct effects of cancer cells, we should also focus on optimising the patients return to conventional oncological therapy such as radiotherapy and chemotherapy.

Risk Prediction Tools

There has been varying uptake of available risk prediction tools such as P-POSSUM Scoring to predict the postoperative mortality. This is an ongoing area of research, with conventional emphasis on developing a tool that was easy to use in a clinical setting (parsimonious) the development of the surgical risk calculator through NSQIP has heralded the arrival of “big data”. The risk calculator is based on a database of some 4 million operations in some 240 American Hospitals, is free to use on the web and generates a print out that can be used to a patient discussion. Of note is that (for Australian users) the prediction of discharge to nursing or a rehab facility may be misinterpreted as implying long term residential age care, whereas it actually implies discharge to a postoperative rehab facility. Given the size of the database, and developments that will be based on it (there is an upgrade of the surgical risk calculator that is about to be “launched”, and is difficult to see anything being available that will be an improvement on this system).



“From the Trough”

Perioperative Interest Group Notes

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Attendance: Ross Kerridge, Tracey Tay, Peter Harrigan, Kylie King, Anne Carter

TOPIC 1: Risk of spinal haematoma in an 'old' quadriplegic

A 60ish long standing quadriplegic (C4) has had many cystoscopies under spinal anaesthetic. He has a history of significant autonomic dysreflexia, with a severe episode six months previously. He is also currently on aspirin and clopidogrel for vertebral artery stenosis. His last cystoscopy was performed under general anaesthetic using an LMA, and was uncomplicated. For this procedure he has ceased aspirin and clopidogrel, but only for 4 days.

Question: Given that he is already quadriplegic, is the risk of a spinal haematoma still significant? (i.e. does it really matter if it happens anyway) Hence why not do a spinal? What is the most appropriate source of advice regarding a care of quadriplegic patients locally?

Discussion:- Even though the cord has been interrupted at C4, the lower cord is still independently functional and the bladder is thus not denervated but has “lower motor neurone” function:- This means it has a degree of (independent) neurological control, and this is better for the patient than a denervated and atonic bladder, which could be a complication if there was a spinal haematoma. Therefore there is an ongoing reason to avoid the risk of a spinal haematoma.

Resources:- There is a useful guideline from NSW Agency for Clinical Innovation on autonomic dysreflexia, (attached) and some other issues pertaining to spinal injury which can be used for advice & reference. Locally, the rehabilitation service is the best current source of advice regarding management of long term spinal injury patients. There has been a suggestion that a CNC service for these patients (similar to the Parkinson's CNC) would be appropriate, but this has not been established.

TOPIC 2: Anaphylaxis – or is it? 1

A 50ish year old patient of 150 kilograms and 150cm was anaesthetised electively for a laparoscopic gastric sleeve procedure. Prior to this anaesthetic she had recommenced smoking after many years, in order to cope with her preoperative anxiety, although advice in the anaesthetic clinic one week preoperatively, she reported she had stopped prior to surgery. There was no history of asthma, although she had been given bronchodilators one year previously when she had a lower respiratory tract infection. She had been given preoperative ranitidine. Induced with midazolam, fentanyl, propofol, rocuronium. Severe bronchospasm after induction and intubation. Surgery was abandoned.

Although there were no other signs suggestive of anaphylaxis, a series of tryptase measurements were done. Tryptases following the reaction were elevated. Follow-up skin testing for all drugs used was negative, hence not suggesting anaphylaxis. Further follow up by immunology found that her resting tryptase was similarly elevated (10 to 16) suggesting that she has a histamine release disorder. Immunologist's advice was to avoid histamine-releasing drugs. This would suggest that the muscle relaxants of choice would be cisatracurium or pancuronium. **Question:-** How should she be managed next time?

Discussion:- Suggested management must recognise that this is an elective procedure:- Her risks can be reduced by other means. There should be initial 'serious discussion' about the risks of surgery and other options:- the patient has a choice of other ways of losing weight. It must be presumed that at least part of the problem is related to a tendency to bronchospasm:- Hence strong (mandatory) advice to quit smoking well

before surgery. Inhaled steroids for one week preoperatively, and bronchodilator before induction. Prophylaxis against aspiration with ranitidine.

Immunologists suggest pre-treatment similar to that used by radiologists. Dose of prednisone 25mg on the day before and day of surgery, and antihistamine of choice (probably phenergen).

Consider adjusting intubation technique to minimise physical triggers for bronchospasm.

Note she is not anaphylactic to suxamethonium, or rocuronium. Both of these could be used if the perceived risk of possible histamine-release bronchospasm was less than the advantages of using these for intubation.

TOPIC 3: *Anaphylaxis – or is it? 2*

A 70 year old female with comorbidities (diabetes, hypertension, etc) for a total hip replacement appeared to be an otherwise routine case. She was given a spinal anaesthetic including intrathecal morphine. The case was unusually 'bloody'. Blood pressure was persistently low throughout the case, and became increasingly low despite fluid replacement (six litres of crystalloid and estimated blood loss of slightly more than one litre). 'Eventually', anaphylaxis was considered as a possible cause. Hence towards the end of the case she was intubated, a central line inserted and an adrenaline infusion started. There was a good response. Note there was no rash before adrenaline, nor after restoring blood pressure (and hence skin perfusion). A tryptase was done 90 minutes after induction and then repeated 3 times overnight. All were within normal range. There were no signs of any cardiac cause (troponin and ECG both normal) and the lactate was only slightly raised.

Question: - Does the normal tryptase eliminate anaphylaxis as a cause of the persistent unexpectedly severe hypotension? What other causes should be considered?

Discussion (Advice from immunology):- given the clinical picture, and the normal tryptase, anaphylaxis would be extremely unlikely cause and no further investigations would be appropriate in this regard. For completeness an echocardiogram should be done. The patient had been taking ACEI preoperatively, but not on the day of surgery. Nevertheless this may be the most likely explanation of this persisting hypotension with a regional anaesthetic.

A recent secondary analysis of the VISION study cohort, focussing on ACEI & ARBs and anaesthesia suggests that it is appropriate to withhold them routinely preoperatively for most patients. (See attached) Based on this, the recent update of the Canadian perioperative cardiology guidelines suggest withholding ACEI for 24 hours preoperatively. (Note the authors of these guidelines include the VISION authors)

REFERENCE

Roshanov PS et al:- Withholding *versus* Continuing Angiotensin-converting Enzyme Inhibitors or Angiotensin II Receptor Blockers before Noncardiac Surgery: An Analysis of the Vascular events In noncardiac Surgery patients cOhort evaluatioN Prospective Cohort *Anesthesiology* 2017;126:16-27



“From the Trough”

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Attendance: Sam Jacobson, Mark Davies, Kim Rackemann, Ross Kerridge, Peter Harrigan, Simon Campbell, Claire Wohlfahrt, Bernie Frost, Sabry Eissa

TOPIC 1: *Multiple Complexities...*

A 73 year old male, 120 Kilos (BMI 38) with poorly controlled BP, probable OSA, and poorly controlled diabetes had a diagnosis of possible (low grade) knee infection after a TKR 18 months ago. Planned for synovial biopsy to confirm diagnosis and microbiology. There is no effusion suitable for aspiration. Saddle pulmonary embolism in December 2016, now on Rivaroxaban but suboptimal follow-up due to patient issues. Echocardiogram in 2015 showed moderate pulmonary hypertension and dilated right ventricle. The patient reports increasing breathlessness (at least in NYHAIII) Question: - Should we go ahead, if so when. Can the patient be optimised?

Discussion: - The infection does need diagnosis as if it gets worse, the outcome will be disastrous. The pulmonary hypertension needs to be investigated and managed even though this is only a “minor procedure” as it may herald the start of a therapeutic journey including multiple operations including revision knee replacement. HENCE

(1) The echocardiogram should be repeated. Given the questions about pulmonary hypertension and sleep apnoea an urgent referral to the pulmonary hypertension clinic is the best way to deal with all these issues. If necessary they will commence CPAP as well. (2.) Check CRP: - if low this may exclude an infection and obviate the need for surgery. (3.) Given the recent pulmonary embolism bridging is definitely needed. Discuss with haematologists regarding what is the best strategy for doing this. Recurrent pulmonary emboli will be diagnosed as part of the work up by the pulmonary hypertension clinic by CTPA or scan.

TOPIC 2: *Should we proceed?...*

A 54 year old man is planned for right shoulder decompression for chronic shoulder pain and disability. He has decompensated alcoholic cirrhosis with a previous ascites but has been abstinent for 12 months and currently has only mild ascites, no encephalopathy, and no coagulopathy. (Childs B) Current smoker (100 pack/years) and refuses to stop. Most recent HbA1C 10.3% – recently reviewed by diabetes clinic and changes made to insulin regime. The patient himself is ambivalent about surgery, and reports that his shoulder is about the same as it was 5 years ago.

Discussion:- Strong feeling that we should not go ahead with surgery at this time.

TOPIC 3: *Pulmonary vs Ventilatory vs Cardiac dyspnoea*

A 55 year old female with mitral valve replacement 8 months ago has persisting dyspnoea limiting her ability to go back to work, which she wants to do. She has a raised right hemidiaphragm. Spirometry available (which is surprisingly less abnormal than expected). No other respiratory evaluation. Planned for thoracotomy, decortication and diaphragmatic plication. She has a metal mitral valve.

Discussion:- The cause of the dyspnoea is not adequately explained:- it is too simplistic to attribute it to the raised hemidiaphragm without complete respiratory evaluation. There may be a respiratory parenchymal component. Consult with respiratory physicians and obtain complete respiratory function tests including DLCO. Consider CPET testing as a way of clarifying if breathlessness is cardiac or respiratory in origin, as it seems out of proportion to the patient’s spirometry.

Metal mitral valve indicates she will need high level anticoagulation bridging. Bridging can be by heparin infusion or by twice daily clexane. The evidence is unclear and there are different opinions about appropriate management. In this case the cardiologist has already indicated he wants inpatient heparin infusion, and this is an acceptable technique.

How to Bridge? Warfarin should be stopped 4 days preoperatively and patient admitted to hospital on the afternoon after the omitted dose, with heparin started either on admission or early on the next day. If there was certainty that the patient could be admitted early on the next morning, (36 hours post warfarin) and heparin started, that would be acceptable, however pragmatically this is unlikely. Hence admission one day after ceasing warfarin is appropriate.



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Attendance: Patrick Farrell, Ross Kerridge, Mark Davies, Tracey Tay, Bernie Frost, Elyse Farrow, Libby Freihaut, Daniel Orr

New Canadian Guidelines on Perioperative Cardiac Risk Assessment

Introduction: - The Canadian Cardiovascular Society has recently released a new set of guidelines on preoperative cardiac risk assessment. They have a number of significant differences from the current European and US Guidelines on the same topic. The summary abstract is as follows: -

ABSTRACT

The Canadian Cardiovascular Society Guidelines Committee and key Canadian opinion leaders believed there was a need for up to date guidelines that used the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system of evidence assessment for patients who undergo noncardiac surgery.

Strong recommendations included:

- 1) measuring brain natriuretic peptide (BNP) or N-terminal fragment of pro BNP (NT-pro BNP) before surgery to enhance perioperative cardiac risk estimation in patients who are 65 years of age or older, are 45-64 years of age with significant cardiovascular disease, or have a Revised Cardiac Risk Index score of 1 or greater;*
- 2) against performing preoperative resting echocardiography, coronary computed tomography angiography, exercise or cardiopulmonary exercise testing, or pharmacological stress echocardiography or radionuclide imaging to enhance perioperative cardiac risk estimation;*
- 3) against the initiation or continuation of acetylsalicylic acid for the prevention of perioperative cardiac events, except in patients with a recent coronary artery stent or who will undergo carotid endarterectomy;*
- 4) against α_2 agonist or β -blocker initiation within 24 hours before surgery;*
- 5) withholding angiotensin-converting enzyme inhibitor and angiotensin II receptor blocker starting 24 hours before surgery;*
- 6) facilitating smoking cessation before surgery;*
- 7) measuring daily troponin for 48 to 72 hours after surgery in patients with an elevated NT-pro BNP/BNP measurement before surgery or if there is no NT-pro BNP/BNP measurement before surgery, in those who have a Revised Cardiac Risk Index score equal or greater than 1, age 45-64 years with significant cardiovascular disease, or age 65 years or older; and*
- 8) initiating of long-term acetylsalicylic acid and statin therapy in patients who suffer myocardial injury/infarction after surgery.*

Discussion Points: -

1. The recommendation for testing of BNP in everybody over 65, or over 45 with a single cardiac risk factor was “very interesting” but needs more consideration. Point of Care Testing for BNP is available in Australia, but the cost is significant, and is currently not reimbursable. It is not clear whether this would be feasible but needs further investigation. One concern would be that if a raised BNP was found, then having done the investigation this must then be followed up and investigated further. What is the pathway for investigation of a raised BNP?
2. Perhaps the most controversial issue in the guidelines is the recommendation to withhold aspirin (including on patients already on long term aspirin therapy) for all patients having surgery except for

carotid endarterectomy, and where there is a recent stent (BMS 6 weeks or DES 12 months). The rationale for this recommendation is because the POISE2 study showed that aspirin therapy increases the risk of bleeding, and complications (including cardiac complications) as a result of bleeding. Secondly, in the POISE2 trial, cessation or continuation of aspirin therapy appeared to have no effect on perioperative infarct rate. It was noted that this is a major change from our current practice. At the recent SPAQI Meeting (Perioperative Summit Meeting) in Florida (attended by Tracey Tay) there was considerable discussion and controversy around this point. If there is any consensus, it is that perhaps the risk of aspirin cessation preoperatively, for most patients, has been over estimated in the past. Conversely, anaesthetists seeing patients preoperatively should (perhaps) be “more relaxed” if the surgeon wishes aspirin to be ceased.

3. A noticeable ‘stylistic’ difference from the US Guidelines is that they emphasise that testing should only be undertaken *if it will change further management*. This point is not clearly emphasised in the Canadian Guidelines. Testing merely to assess risk is seen as valid in itself. But does testing really enable substantially more accurate risk estimation??
4. Decision-making for perioperative management appears to be entirely dependent on preoperative risk assessment, modified by post-operative assessment (troponin assays, ECG in PACU), and using this as an indication for shared care postoperatively, or long-term secondary cardiac risk prevention therapies. There appears to be no incorporation of intraoperative events as an indication to modify risk assessment. It was suggested that this may reflect the authorship of the guidelines by cardiologists, perhaps “at a distance” from the operating theatre.
5. The Canadian Guidelines recommend almost ubiquitous measurement of troponin postoperatively in any patient with a risk factor, or age over 65. This is based on a presumption that detection of Myocardial Injury after Non-Cardiac Surgery (MINS) is worthwhile. But how does diagnosis of MINS indicated by troponin rise in the absence of symptoms or ECG change alter patient management, and does that change patient outcomes? The VISION trial and other studies have shown that raised troponins post operatively are associated with reduced long term survival, but it is not clear that this will be altered by the diagnosis:- The therapeutic interventions indicated by diagnosis of MINS would have been indicated anyway. (i.e. The guidelines make a point of introducing secondary prevention measures (aspirin, statin and beta blockers) to patients with MINS, but presumably most of these patients would be or should be on these therapies anyway. NOTE:- The US Guidelines currently recommend against routine post-operative troponin.
6. Apart from risk discussion with the patient, more formalised risk assessment including use of BNP may provide a ‘numerical’ tool as an aid for discussion with the surgeons and others pre operatively, which may appear to have more credibility than a “simple” clinical assessment based on individual opinion/impression. It also acts as an anchor-point to “aid” for preoperative discussion. In academic discussion, it may be easy to underestimate the pragmatic value of this for discussions between surgeons, anaesthetists and physicians without an established working relationship...

So what should we do?

The following changes to current management were discussed as worthy of further consideration.

1. We need more local information:- We should have a more systematic identification of high risk group, and audit their 30-day post-surgical outcome.
2. Based on the above, consider the feasibility and utility of measuring troponins on selected patients.
3. Use of NT-BNP in preoperative assessment should be considered further. Clarify the availability of POCT (Point of Care Testing) for BNP, at least for familiarisation. Further discussions need to be had with the cardiologists on this point. We need to develop local clinical practice guidelines for BNP testing in perioperative practice, and for what to do if a raised BNP is diagnosed.
4. Be more “tolerant” of surgeons concerns about aspirin, and request to stop aspirin preoperatively.