



“From the Trough”

Perioperative Interest Group Notes

Based on Cases discussed at the Weekly PIG Clinical Meeting on 31st October 2019. Publication date DAY MONTH 2019.

Website: www.perioptalk.org

The imperfect opinions in these reports are only meant to stimulate discussion: - they should not be considered a definitive statement of appropriate standards of care.

Attendance: Paul Healey, Mark Davies, Lee-ann Kitto, Kim Rackemann, Len Conrad, Tim Webb, Maryann Cassim, Simon Ellis, Neha Gosavi, Will Ridley, Sam Jacobsen, Gary Leung, Angela Baker, Lauren Paton

TOPIC 1: Right Arthroscopic Shoulder Reconstruction with congenital heart disease

15year old male presenting for a right arthroscopic shoulder reconstruction.

Background:

1. Congenital heart disease
 - Left hypoplastic heart syndrome with fenestrated Fontan Circulation (completed 2009 age 6yo)
 - sees cardiologist regularly who reports last echo shows good RV function and patent caval connections
 - on Warfarin
 - walks up two flights of stairs without difficulty
2. Epilepsy - focal and prolonged, last seizure was 2018
3. CVA - post Norwood procedure as a baby
 - mild left sided weakness
4. ADHD/Learning Difficulties - lovely young man in clinic who was attentive and able to give much of his history
5. Obese - 100kg BMI 35
6. Allergic Rhinitis - recently saw paediatrician regarding noisy breathing
 - no snoring or apnoeas
 - given nasonex

Right Shldr - significantly reduced mobility – uncertain how it was injured. Very keen to have it fixed as they believe it will improve his job prospects

Examination:

Essential Normal

- obese young man who didn't appear breathless or have noisy breathing
- Sats 94-95%
- HSDNM
- Lung fields were clear
- no pitting oedema

Medications:

Keppra, Clobazam, Topomax, Concerta, Warfarin, Midazolam PRN

Discussions so far:

Pt & family - GA +/- nerve block, IVC, Art Line, PICU, bridging including risks of bridging warfarin

Cardiologist - happy with cardiovascular function, will need bridging recommended Clexane 1mg/kg bd

Orthopaedic Sx - arthroscopic procedure, lateral position, mostly patients receive either single shot Intrascapular or catheter, "not a very painful operation"!!

Discussion:-

- Paediatric anaesthetist necessary? – recommendation that paediatric anaesthetist would be appropriate for this list
- Single shot vs catheter block? – much debate and discussion from experienced regional anaesthetists. Those with anaesthetic experience suggested that there is much pain in first 6 hours and recommend regional technique in addition to GA! Questions raised about possible loss of diaphragm function with interscalene block and effect on venous return with Fontan circulation. General agreement to use 0.2% ropivacaine with dexamethasone IV or in block to prolong block and minimise effect on diaphragm. Mechanical ventilation post op may be a rescue technique if symptomatic from diaphragm paralysis.
- PICU bed for post operative monitoring.

TOPIC 2: ECG conundrum

69 year old male for left TKR

Background:

1. Atrial fibrillation
2. Hypertension
3. Pulmonary sarcoidosis
4. Thyroid cancer – treated
5. Vocal cord implant – discussed with ENT : pushes left vocal cord medially – should be able to pass ETT as normal

Good exercise tolerance – DASI : 6.8 METS.

No angina or syncope.

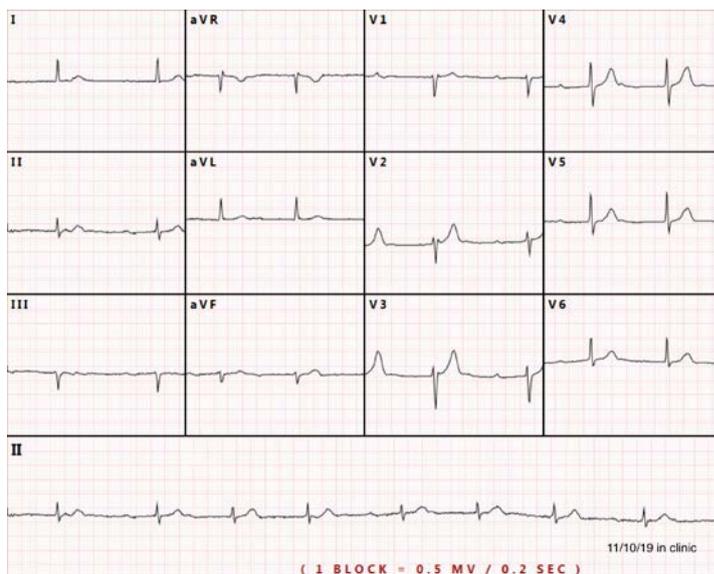
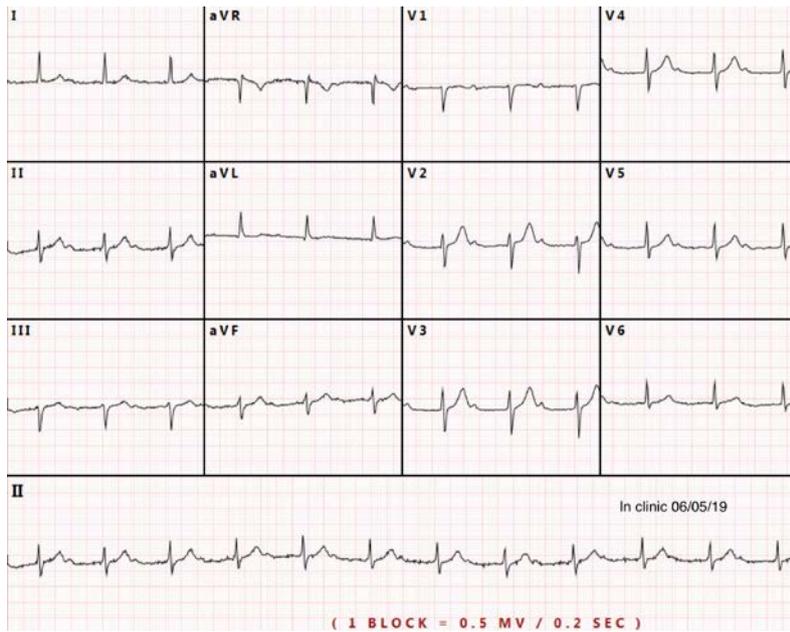
Attended clinic in May and early October 2019.

Previous surgery cancelled due to URTI, on waitlist for over a year

Medications: rivaroxaban, antihypertensives x 3

Multiple previous ECGs prior to clinic appointments with varying reports, including: 1st degree heart block, Wenckebach, complete heart block and PVCs. No formal cardiology review.

Two ECGs taken in clinic (shown below):



Reports from ECG:

6/5/19: Sinus with PR 500ms

11/10/19: High degree AV block. "He is likely to need a pacemaker (ideally prior to undergoing a TKR)"

The patient's ECG was interpreted in clinic as AF and proceeded to surgery. On the day prior to surgery a review of the notes by the registrar discovered the formal ECG report and the surgery was cancelled. The patient was referred for cardiology opinion.

Cardiology were particularly cautious given history of un-investigated arrhythmia in a patient with sarcoidosis, as CHB can be particularly refractory to medical management in these patients

Discussion:

- Considerations for pacemaker insertion in brady-arrhythmia:
 - The associating of symptoms with the bradyarrhythmia
 - The location of the conduction abnormality
 - Within the AV node vs below the AV node
 - The absence of a reversible cause
- Potential reversible causes included in table below

Table 4. Medications That Can Induce/Exacerbate Bradycardia or Conduction Disorders

Antihypertensive	Antiarrhythmic	Psychoactive	Other
<ul style="list-style-type: none"> ■ Beta adrenergic receptor blockers (including beta adrenergic blocking eye drops used for glaucoma) 	<ul style="list-style-type: none"> ■ Adenosine 	<ul style="list-style-type: none"> ■ Donepezil 	<ul style="list-style-type: none"> ■ Anesthetic drugs (propofol)
<ul style="list-style-type: none"> ■ Clonidine 	<ul style="list-style-type: none"> ■ Amiodarone 	<ul style="list-style-type: none"> ■ Lithium 	<ul style="list-style-type: none"> ■ Cannabis
<ul style="list-style-type: none"> ■ Methyldopa 	<ul style="list-style-type: none"> ■ Dronedarone 	<ul style="list-style-type: none"> ■ Opioid analgesics 	<ul style="list-style-type: none"> ■ Digoxin
<ul style="list-style-type: none"> ■ Non-dihydropyridine calcium channel blockers 	<ul style="list-style-type: none"> ■ Flecainide 	<ul style="list-style-type: none"> ■ Phenothiazine antiemetics and antipsychotics 	<ul style="list-style-type: none"> ■ Ivabradine
<ul style="list-style-type: none"> ■ Reserpine 	<ul style="list-style-type: none"> ■ Procainamide 	<ul style="list-style-type: none"> ■ Phenytoin 	<ul style="list-style-type: none"> ■ Muscle relaxants (e.g., succinylcholine)
	<ul style="list-style-type: none"> ■ Propafenone 	<ul style="list-style-type: none"> ■ Selective serotonin reuptake inhibitors 	
	<ul style="list-style-type: none"> ■ Quinidine 	<ul style="list-style-type: none"> ■ Tricyclic antidepressants 	
	<ul style="list-style-type: none"> ■ Sotalol 		

- Indication for pacemaker (see algorithm below from AHA guidelines). Note lower threshold for pacemaker insertion in neuromuscular diseases, in absence of symptoms.

Ref: http://www.onlinejacc.org/content/74/7/e51?_ga=2.94912220.1332810360.1572954158-1421452148.1572954158

TOPIC 3: “Just a quick TOE in CCU”

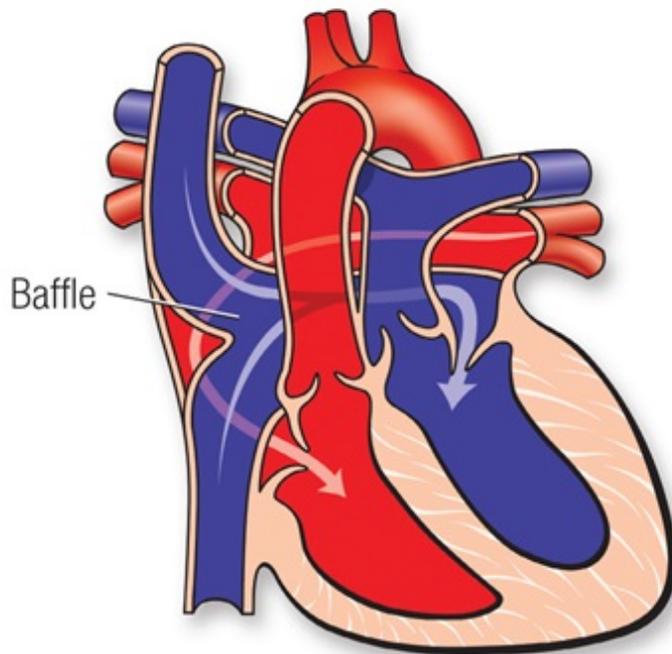
50 year old Male presented to Maitland Hospital – increasing breathlessness. TTE at Maitland reported pulmonary systolic pressures of 110mmHg consistent with severe pulmonary hypertension.

Background:

- Transposition of great arteries – treatment with Mustard procedure (see picture below)
- Atrial flutter
- Had been lost to follow-up by cardiologists and ceased all his cardiac failure medications.

Patient had attempted TOE by cardiologist in CCU with 10mg of midazolam and 200mcg of fentanyl, but failed due to strong gag reflex!

Intra-Atrial Baffle (Mustard or Senning Procedure)



Discussion

- Mustard or Senning procedure is palliative procedure – long term complications include AF, atrial flutter and SVT. There is long term risk of heart failure as the anatomical RV is not designed to manage systemic vascular pressures. The TTE in Maitland was measuring the systemic pressures in the anatomical RV! This TOE was performed to examine if the baffles were still patent and possible baffle stenosis.
- Modern day surgical management for TGA includes atrial switch or arterial switch surgery with the ventricles matched to the appropriate pulmonary and systemic circulation.
- This procedure was managed in similar manner to other TOE procedures with slow titrated Propofol and Hi-flow nasal Oxygen.
- Patient is planned for electrophysiology studies and catheter ablation in the future.

TOPIC 4: **Solve CRT Trial**

Recent review of 2 patients in the Preoperative clinic for SOLVE-CRT trial.

This is a trial of advanced cardiac re-synchronisation therapy for patients with heart failure and ongoing symptoms despite Biventricular pacing. Anaesthesia will be provided for implantation of subcutaneous ultrasound transmitter (similar to subcutaneous defibrillator). This transmitter will emit signals to a pacemaker positioned in the apex of the left ventricle via the right atrium and a transeptal puncture.

See information below.

▶ **Wireless**

Does not require a lead to pace the heart

▶ **Endocardial**

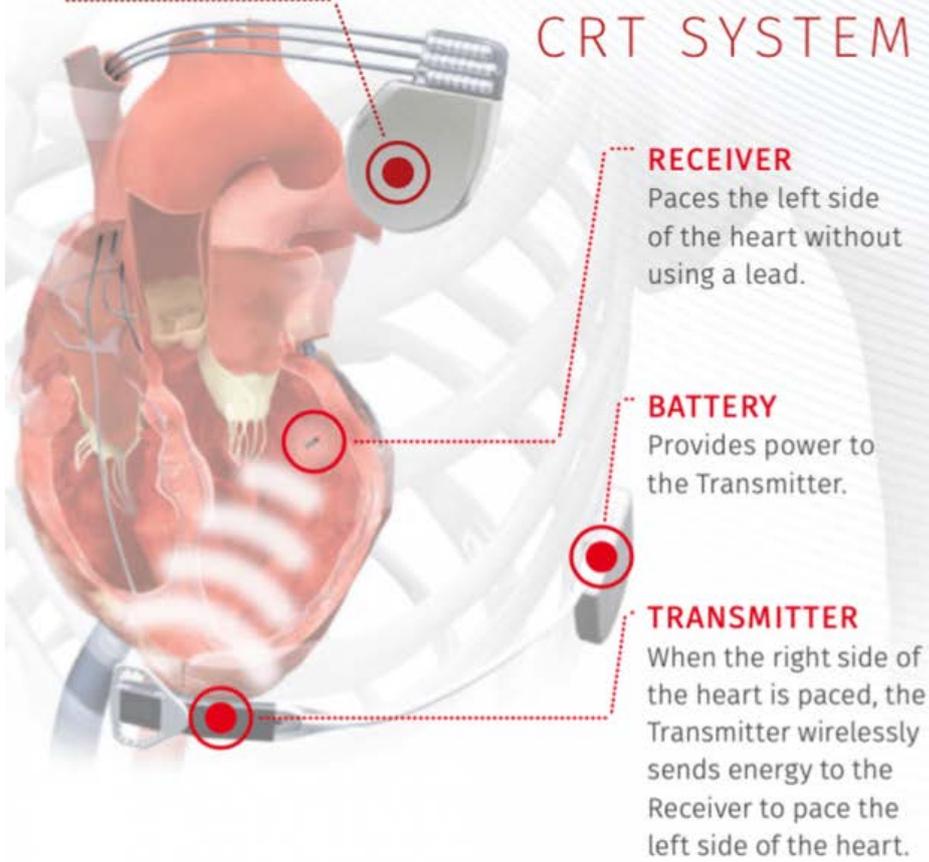
Paces from the inside of the heart which promotes a more functional heartbeat

▶ **Customized**

The Receiver is positioned in the heart where it can provide the most benefit

PREVIOUSLY IMPLANTED PACEMAKER or ICD

WiSE™ CRT SYSTEM



RECEIVER

Paces the left side of the heart without using a lead.

BATTERY

Provides power to the Transmitter.

TRANSMITTER

When the right side of the heart is paced, the Transmitter wirelessly sends energy to the Receiver to pace the left side of the heart.

The WiSE CRT System works together with a pacemaker or ICD that paces the right side of the heart. The WiSE CRT System paces the left side at the same time as the right side to improve the heart's pumping ability and help overcome the symptoms of heart failure.