Case Study

Acute Cardiac Care: Cardiogenic Shock Update

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National Heart Centre Singapore
46 year old chinese male

- Premorbidly well
- Non-smoker

**Past Medical History**

1) Ischaemic Heart Disease
   - Coronary angioplasty with DES to mid RCA (Raffles Hospital 2004)
   - Patient stopped aspirin for 5 months post-PTCA on his own accord as he was concerned about side effects

2) Dyslipidemia
Presented to NHCS on 13/12/10

1) **Acute onset of chest pain x 1 day**
   - squeezing pain over central chest, sudden onset at 10pm
   - no radiation, pain score 7-8/10
   - similar to previous angina but severity has increased this time
   - minimal improvement with GTN

   - NO SOB, diaphoresis, palpitations
   - no recent fever/URTI

2) **Vomiting**
   - 3 episodes
   - not associated with abdominal pain, diarrhoea
O/E

- Afebrile
- BP 96/68, PR 137, SpO2 100% on 3L
- Lethargic looking
- H: S1S2, irregularly irregular
- L: Clear
- A: soft, NT. BS+
- No differential BP between both upper limbs

Given IV morphine at ED -> Pain score 3-4/10
ECG on Admission
What are the differential diagnoses?

1) Acute coronary syndrome
2) Pulmonary Embolism
3) Aortic dissection
Initial Investigations

TW 14.06, Hb 14.7, Platelet 219
Na 132, K 3.8, Cr 89, HCO3 18, Ur 5.5

CXR: No pulmonary congestion. No cardiomegaly

Became hypotensive 83/64 -> started on dopamine
What would you do next?

1) CCU with IV GTN
2) IV thrombolysis
3) CVL activation
4) CT thorax
Cardiogenic shock secondary ACS

CVL activated
Progress

- IABP inserted
- Coronary angiography performed
Coronary Angiogram
What to do now?

1) Call the CTS
2) Primary PCI
3) Send to CCU
4) Call for help from more senior colleagues
Progress

- CTS was called in for consideration of emergency CABG
- While awaiting CTS, PCI was attempted
Primary Coronary Angioplasty

XB 3 6Fr Fielder wire in LAD

Kaneka Thrombuster II 6Fr
Primary Coronary Angioplasty

Post Kaneka Thrombuster II 6Fr

Asahi Fielder 0.014 Guidewire in LCX, Terumo Tazuna balloon 2.0x15 in distal LM - ostial LAD
Primary Coronary Angioplasty

Asahi Fielder Guidewire 0.014 LCx
TIMI 2 flow after balloon angioplasty
What should we do next?

1. Wait for surgeon
2. Stent the Left Main
3. ECMO
4. More ballooning
Left Main Stenting

While waiting, TIMI 1 flow to distal vessel
Left Main Stenting

Biomatrix stent 3.4 x 14mm
Left Main Stenting

Post Biosensors Biomatrix 3.5X14 (DES) stent LM
LCx

Asahi Fielder Guidewire 0.014 LCx  Boston Scientific 2.5X8 Balloon LCx
Final Results
Final Results
Primary Coronary Angioplasty

- PCI/DES (Biomatrix 3.5 x 14mm) to LM 100% lesion
- Distal LM 50% eccentric lesion left untouched.
- POBA to mid to distal LCx
- Residual disease in LCx
- Previous RCA stent patent
- Distal RCA lesion 70%
What is next?

1. Well done, send to CCU
2. Surgeon is here, send to OT urgent
3. Suboptimal result, stent the left main and LAD
Progress

- Developed APO and respiratory distress after procedure
- Airway team activated as difficult airway due to frothy oral secretions and grade 4 larynx
- Intubated in CVL with glidescope
- Stabilized on IABP and inotrope dopamine
- Systolic BP >100 mmHg

- ?? Role of prophylactic ECMO
Repeat ECG Post Procedure
Progress

• NO ECMO was placed as BP was satisfactory
• Patient transferred to CCU
• Bedside ECHO: LVEF 15 to 20%, RWMA and ?LV thrombus
• 3 hours later in CCU, patient become hypotensive not responding to maximal inotropic support
• ECMO activated and inserted by CTS
CCU Progress

- Remained on IABP, ECMO and maximum inotropic support following few days
- Weaned off inotropic support first
- Remained on IABP and ECMO (as BP tolerated)
- Repeat 2D ECHO on 14/12 confirmed presence of LV apical thrombus
Complications

1) LV apical thrombus
2) Sepsis (secondary to right middle lobe consolidation),
   -> Positive ETT cultures (Kiebsiella and Pseudomonas),
   -> ID consult
   -> Commenced on IV Tazocin / Vancomycin / Caspofungin
3) Spontaneous left thigh haematoma
4) Regular blood products transfusion (secondary to consumptive thrombocytopenia and mechanical haemolysis)
2D Echocardiogram
2D Echocardiogram

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107 BPM
What is next?

1. Explant ECMO and hope for the best
2. LVAD
3. Heart transplant
Role of LVAD

- Referred to HFS and CTS -> for consideration of LVAD as bridge to heart transplant
- Repeat 2D ECHO 7 days post AMI showed improvement of LVEF to 30-35%.
- Multi-disciplinary team approach
- ECMO successfully explanted on the 22/12/2010
- Intensive rehabilitation
- Discharged on 04/01/2011
Repeat 2D Echocardiogram
What to do with the lesion RCA?

1. PCI to RCA
2. CABG
3. Repeat cath in 3 months and if presence of LM restenosis, for CABG
4. Medical therapy
Progress

- Extensive discussion with family and combined departmental cardiac conference regarding long term plans
- Recommend CABG at later date
- Was reviewed in outpatient Jan 2011 and doing well
- Due for CABG soon
Thank You