State of the Art Surgical Management of Cardiovascular Diseases

Dr Pau Kiew Kong
Consultant Cardiothoracic Surgeon
Outline of lecture

1. Introduction
   - Cardiac surgery census of IJN
   - Cardiac surgery outcome
2. Intra cardiac mass
3. Heart too weak for heart surgery?
4. Chest pain require emergency cardiac surgery
5. Thoracic tumour
6. Bloodless cardiac surgery in small baby
7. Cardiac surgery in elderly
Cardiac OT set up
Census of Cardiothoracic surgery in IJN

Cardiovascular Updates for Doctors & Allied Healthcare Professionals Symposium
### CARDIOTHORACIC SURGERY DONE IN IJN

<table>
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<th>Year</th>
<th>Thoracic</th>
<th>Closed Heart</th>
<th>Open Heart</th>
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<td>2013</td>
<td>116</td>
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## OPEN HEART SURGERY DONE IN IJN

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Cardiac surgery outcome
## CABG outcome – Risk scoring

### All CABG Operation in IJN
Jan-Dec 2013 (Total patients=1965 patients)

<table>
<thead>
<tr>
<th>Euroscore Risk Group</th>
<th>Total Patient</th>
<th>Total Alive</th>
<th>Actual Survival Rate (%)</th>
<th>Predicted Survival Rate (%)</th>
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<tbody>
<tr>
<td>Low Risk</td>
<td>765 (38.8%)</td>
<td>752</td>
<td>98.6</td>
<td>99.0 (98.3-99.7)</td>
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<tr>
<td>Medium Risk</td>
<td>830 (42.2%)</td>
<td>809</td>
<td>97.5</td>
<td>96.2 (94.9-97.5)</td>
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<tr>
<td>High Risk</td>
<td>372 (18.9%)</td>
<td>358</td>
<td>96.2</td>
<td>92.6 (89.9-95.3)</td>
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<tr>
<td>Total Number Of Patients</td>
<td>1965(100%)</td>
<td>1919</td>
<td>97.7</td>
<td>96.6 (95.8-97.4)</td>
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</table>

<table>
<thead>
<tr>
<th>Parsonnet Risk Group</th>
<th>Total Patient</th>
<th>Total Alive</th>
<th>Actual Survival Rate (%)</th>
<th>Predicted Survival Rate (%)</th>
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<tr>
<td>Low Risk</td>
<td>1576 (80.2%)</td>
<td>1544</td>
<td>98.0</td>
<td>94.6(93.5-95.7)</td>
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<tr>
<td>Medium Risk</td>
<td>343 (17.5%)</td>
<td>333</td>
<td>97.1</td>
<td>85.9(82.2-89.6)</td>
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<tr>
<td>High Risk</td>
<td>46 (2.3%)</td>
<td>42</td>
<td>91.3</td>
<td>75.3(62.8-87.8)</td>
</tr>
<tr>
<td>Total Number Of Patients</td>
<td>1965(100%)</td>
<td>1919</td>
<td>97.7</td>
<td>92.7 (91.5-93.8)</td>
</tr>
</tbody>
</table>
Mortality of CABG increase with age

United States National Cardiovascular Network collects information.
October 1993 and December 1999 there were complete data on just over 51,000 CABG patients; 30% were women.
Intra cardiac mass
Introduction

• M/34 years, previously well and active.
• Admitted to private hospital, echo done
  – Large pericardial effusion
  – Mass in RA, suspected extensive thrombosis of RA/RV/IVC
• Treated with s.c. Clexane and methyprednisolone
• Discharged well 9 days later - with weaning oral Prednisolone
Introduction

- Readmitted 5 days later with worsening symptoms
- Rpt echo – right atrial mass increased in size obstructing tricuspid valve
- Very symptomatic, saturation <80% despite high flow mask
- Referred to IJN for urgent management
- Admitted to ICU for monitoring
Condition in IJN (A & E)

- Blood pressure stable
- Tachynoic, RR=20/min
- Poor saturation, 78% on HFM15L/m
- Urgent Echo
  - poor window
  - Large mass in RA seen to obstructing TV
- Condition explained to patient and family, agreed for urgent surgery
- Admitted to ICU for monitoring
Transthoracic Echo
(portable)
Intraop TEE
External appearance of right atrial tumour
Incising right atrial tumour
Removing RA tumour
RA tumour removed
**Histopathology (1)**

**H & E stain:**

- Tumour show proliferation of vascular channels with formation of new lumina and in dispersed between are spindle shapes cells which are plump with eosinophilic cytoplasm, plump, oval to round nuclei with coarse chromatin and prominent nucleoli.

- Mitotic activity is abundant about 12/10 HPF. Lot of these new vascular channels contain red blood cells within them. There is no evidence of myxomatous differentiation. This vascular channels formation is seen throughout and also extends up to the surface of resection.
Histopathology (2)

**H & E stain (cont’d)**

- Large foci of necrosis and haemorrhage are noted within the tumour.
- One fragment shows myocardium which is also infiltrated by the tumour.
- Diagnosis: Angiosarcoma, right atrium mass

*Immunohistopathology Report:*

Tumour cells are strongly and diffusely positive for vascular markers CD31, CD34 and Factor VIII, confirming the presence of angiosarcoma.
Previously, most of the diagnoses were made either at autopsy or shortly before the patients' deaths.

Recent advances of diagnostic methods have allowed antemortem diagnosis to be made and the patients to be treated with a therapeutic strategy including surgical excision of the tumor.

In this patient, the tumour extended into the right atrial free wall with bloody pericardial fluid.

With the aid of Heart lung machine, near total excision of tumor was achieved except the part of mass that infiltrate the mid RCA.
Outcome -2

- Postoperative recovery was uneventful and patient was discharged home well one week after the surgery.
- Patient had chemotherapy by oncologist in UMMC
- Last seen Aug 2013, very well clinically
  - Echo done June 2013—no residual tumour
- Dec 2013 – liver secondary with ascites
- Passed away 28 Jan 2014 (10 months) after surgery
- Family donate the body to UMMC for “silent mentor”
Take home message

- Commonest cardiac mass – Atrial myxoma
- Commonest cardiac tumour – secondary
- Primary cardiac angiosarcoma is a rare malignant cardiac tumor
- Carry a high mortality rate due to its rapid local relapse and high incidence of systemic metastasis.
F/41 with huge LA myxoma

Large LA Myxoma  Removed LA myxoma
Heart too weak for surgery?
Pt with very poor LV function

- M/40 yrs
- Shortness of breath since 2002
- Initial diagnosis
  - asymmetric cardiomyopathy
- Feb 2003
  - gross cardiac failure, EF=25%
  - Diagnosis – “burnt out cardiomyopathy”
Surgery or not?

• Admitted to IJN on 19th Aug 2013 x 2 weeks
  – Aortic stenosis with cardiomyopathy
  – EF=18%, AVA=0.7cm², AV PPG=64mmHg, MPG=42mmHg, mod AR
  – Anti failure treatment & inotrope
  – need preop angiogram

• Readmitted 10th Sept 2013
  – Angiogram normal, advised for AVR surgery
  – Estimated mortality 25%, pt undecided
Transthoracic Echo
A major decision

- Patient worsened on 25\textsuperscript{th} Sept 2013
  - Echo EF=10%,
  - Renal failure, BU=20.7, Cr=140
  - Estimated mortality 50%, pt very keen for surgery

- Surgery done 28\textsuperscript{th} Sept 2013
  - Very calcified AV with small aortic root
  - Root enlargement and AVR with tissue valve CE #23mm
  - Uneventful surgery, elective IABP post Op
  - Extubated POD2, off IABP POD3, to HDU POD4
TEE - preop and post Op

- PreOp TEE - AV
- Pre Op TEE - LV Fn

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After the surgery ...

• POD5, had VF while doing Echo – CPR done successfully
• Referred EP team -AICD implanted 9\textsuperscript{th} Sept 2013
• Kidney recovered
• Echo 3\textsuperscript{rd} Oct 2013
  • EF=20\%, AV functioning well, TAPSE=0.7
• Patient discharged home on 18\textsuperscript{th} Oct 2013
The untold story …. 

• First F/u: 27\textsuperscript{th} Nov 2013
  ➢ EF=27%, TAPSE=1.2
  ➢ Pt very well clinically

• Patient told me about what anaesthetist told him while doing pre-med that no body with his condition ever survive the cardiac surgery

• Latest F/u: 5\textsuperscript{th} May 2014
  ➢ EF=38%, TAPSE=1.6
  ➢ Still no shock from AICD
Take home message

• Poor LV function - higher risk for cardiac surgery

• Pre op assessment and patient selection
  – To differentiate between operable patient and those who are too far gone

• Uncorrected cardiac condition - cardiac function do get worse over time

• If ability to correct a mechanical lesion, the chance of recovery will be better
“Surgeon refuse to operate”
Exertional dyspnoea

- M/48 years, Indonesian man
- Exertional dyspnea since 2007
- Diagnosed to have Hypertrophic obstructive cardiomyopathy (HOCM) in Indonesia
- Advised medical treatment only - as risk of surgery said to be very high
Journey to Malaysia ...

- Came to IJN on 11\textsuperscript{th} May 2012
- Echo done
  - Systolic anterior motion (SAM)
  - IVS thickness 2.7cm
  - LVOT gradient = 50 mmHg
- Cardiac MRI done 8\textsuperscript{th} Jan 2014
  - Diagnosis HOCM confirmed
- Angiogram 7\textsuperscript{th} Feb 2014 - normal coronary
- Pt undecided on surgery
Cardiac MRI
Decision day …

• Had surgery done on 8th Feb 2013
  – Transaortic septal myomectomy done
  – Preop TEE: SAM with mod MR, LVOT grad= 55mmHg
  – Post Op TEE Preop, Trivial MR, LVOT grad =5mmHg
  – Uneventful surgery
  – Transient heart block

• ICU stay ..

• Discharged well
Photo of excised septal muscle
Intraop TEE

PreOp TEE

Post Op TEE

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Take home message

• Cardiac condition like Hypertropic Obstructive Cardiomyopathy (HOCM) can be operated successfully with good surgical outcome
Sudden chest pain that needed emergency cardiac surgery
Severe chest pain

• WKS, mrn 202419, 57 years old Gentleman
• Sudden onset severe chest pain on 8/9/2013
  • assoc with neck and jaw pain,
  • severe headache and sweating
• Admitted to SL Hospital
  • ECG x3 – Q in III and AVF
  • Trop T – ve
  • CKMD – normal
  • Bedside Echo – no RWMA
  • Diff diagnosis: 1) Intracranial bleed 2) Aortic dissection
• Referred to IJN for further management

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Investigations

- Admitted to IJN same night
- HR 68/m, SR, BP=104/57
- ECG - Normal Sinus
- Blood investigation: Within normal
- CXR - CTR 54.2%
Bedside TTE 9.9.2013

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CT scan thoracic aorta done 9.9.2013

- **Report available on 10.9.2013**
- Type A Dissection of ascending aorta extended to L2
- Small pericardial effusion
- False lumen is largely unopacified
- Max asc aorta diameter is 6cm
Bedside TTE 10.9.2013
Intraoperative TEE 10.9.2013 - preop
Surgical repair

• Urgent surgical repair 10.9.2013
• BP dropped on GA induction
• Large haemopericardium, BP improved with opening of pericardium
• Ascending aortic cannulation
  • Locate true lumen using needle with TEE
  • Confirmed correct aortic cannulation with TEE
• RA cannulation
Operative findings

• Near circumferential dissection, except lesser curve of aortic arch
• Dissection to aortic root – to below the aortic valve insertion
• Big tear in posterior ascending aorta, just above LCA origin
• Flaps of aortic tissue with prolapsed NCC and RCC, resulting in severe AR
• Coronary buttons intact.
Operative techniques

- Supracoronary repair
  - Resuspension of aortic valve leaflets
  - Sandwich of aortic wall above just above the coronary origin/aortic valve
  - Anastomosed tubular graft to this composite
  - Distal aorta trimmed and use sandwich technique to occlude the false lumen
  - Circulatory arrest time <10 min
  - Anastomosis completed with graft to distal ascending aorta.
Operative pictures
Operative pictures
Operative pictures
Operative pictures
Post Operative TEE 10.9.2013
Post Op outcome

• Extubated on POD2
• No neurological deficit
• On BIPAP x 3 days
• Post Op Echo -
• Plan for discharged home today (POD8)
Discussion - Aortic Dissection

Anatomy and Classification of Aortic Dissection

- False lumen
- True lumen
- Intimal tears

DeBakey:
- I
- II
- III

Stanford:
- A
- B
Take home message

• Acute aortic dissection can mimic acute coronary artery disease
• Wider availability of CT scan has increase earlier diagnosis
• Surgical repair can produce good surgical outcome
• Aortic valve sparing/preservation is possible in many cases with aortic root aneurysm
Large thoracic tumour
Short history

- M/21, university student from Nigeria
- Short history of progressive SOB
- Had CXR 4 months earlier in Nigeria – normal
- CT scan –
  - Heterogenous tumour left lung, 28cm
  - Bony lesion in T11, T12, L1, L2
  - Biopsy done
    - Initial HPE report - NSCC of lung
    - After IHC study - Germ cell tumour
Chemotherapy

- Started on Standard BEP regimen
- After 2 cycles chemo, rpt CT scan
  - Tumour size 22cm
  - Central necrotic lesion
  - Bony lesion same - in T11, T12, L1, L2
- After another 2 cycles, tumour size 18cm
- Thus referred for consideration of surgery excision before further 2 cycle
Chest X-ray

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CT scan thorax
Surgery

• Tumour excision done on 27\textsuperscript{th} April 2013

• Intraop findings:
  – Dense adhesions of left pleural space
  – Huge tumour 20x15x10cm
  – Lower part of tumour invade central portion (dome) of left diaphragm
Large thoracic tumour
Left diaphragm repair
Histopathology

- HPE - High grade germ cell tumour
- Extensive central necrosis
- Brisk mitotic activity seen – indicative of an aggressive tumour
Progress

- Recovery uneventful
- Prolong stay due to air leak from chest tube
- Discharged well on POD 17
- Follow up -1 mth, very well clinically
- Later, told by oncologist that pt has recurrent in right shoulder joint
Take home message

- Large thoracic tumour is a surgical challenge
- Some tumour may decrease in size after chemo or radiotherapy – thus make surgical excision possible
Bloodless cardiac surgery in small baby
Bloodless surgery in small baby

• Diagnosis – Atrial septal defect, Trisomy 21
• Jehovah witness – want surgery with no blood transfusion
• First seen at 11m baby old (7kg), baby well, thus suggest to defer surgery
Request early surgery

• Seen in clinic again at 2 years old
• Given erythropoietin earlier in private hospital in preparation for early surgery
• Had financial problem, thus refer to IJN for op
• Pt weight 9kg, family requested to do surgery
PCV during perioperative period

Wt=9Kg
Total surgery=90min
CPB=25 min
X clamp=10 min

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<th>Pre CPB</th>
<th>CPB</th>
<th>Intra CPB</th>
<th>Post CPB</th>
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<td>PCV (%)</td>
<td>44%</td>
<td>27%</td>
<td>30%</td>
<td>41%</td>
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Progress

• Uneventful recovery
• ICU stay – 2 days
• Discharge well on POD 5
• Latest f/u 23 Jan 2014
  – Baby well
  – Wt=11.4kg
Take home message

• Bloodless surgical has many potential advantages
  – Better survival
  – Lower risk of blood transfusion related complications

• It can even be done in
  – Small baby
  – Pt undergone repeated heart surgery
Cardiac surgery in elderly
How old is too old for heart surgery?

- Mdm THP, F/92
- Diagnosed as severe AS in UMMC for several years
- Keeping well and pt refused surgery
- Presented with 3 weeks of severe SOB,
- Pt felt “almost killed her, suffered enough, wanted surgery now”
- Surgical risk deem too high
- Referred to Dato Rosli for TAVI
Valve lesion is “growing”…

- Admitted in IJN on 25th May 2011
- Echo- severe AS and severe MR
  - Not suitable for TAVI
- Saw pt – pt look weak,
  - able to walk to nurse station
  - Mentally alert
  - Pt very keen for surgery
- Hesitated, as previous oldest pt was 86 old
To operate or not?

• After much hesitation, decided to take the challenge

• *Had seen a 97 years man undergone aortic valve surgery while training in USA – that pt recovered well*

• Pt was keep in hospital for optimization
  – physiotherapy and breathing exercise

• Coronary angiogram - normal
The day ....

- Surgery done on 8\textsuperscript{th} June 2011
  - Valves very diseased
  - Extra precaution in view of age and disease
  - AVR CE\#23mm, MVR CE\#29mm
  - Total surgery time 5 hours
- Pt wake up next day with no neurological deficit
- Slow recovery, home on POD 20.
POD 2

for Doctors & Allied Healthcare Professionals Symposium
Current status

• Nearly 3 years post Op now
• Had one recent admission to UMMC for general weakness
• Still able to ambulate now, she is 1 month to 95 years old
Take home message

• Elderly should not be denied of cardiac surgery
• Chronological age is more important than biological age
• Proper preop preparation improve surgical outcome
THANK YOU

IJN
1992 - 2005

Expansion
2005 onwards