Transcatheter Aortic Valve Implantation (TAVI)
QEH Registry – A Multi-disciplinary Team Approach

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Hong Kong SAR

HA Convention 2013
Introduction

- Aortic Stenosis – most common valvular heart disease in the elderly
- 4.6% in adults $\geq$ 75 years of age
- Once symptomatic, average survival 2-3 years with high risk of sudden death
- Medical treatment is not effective
- Surgical AVR is the gold standard
- TAVI emerges as a viable alternative in inoperable or high risk elderly patients (no open-heart surgery, no cardio-pulmonary bypass)
Aortic Stenosis is Life-Threatening and May Progress Rapidly

Treatment Options and Timing Matters

“Survival after onset of symptoms is 50% at two years and 20% at five years.”

“Surgical intervention [for severe AS] should be performed promptly once even ......... minor symptoms occur...
TAVI Program in QEH

- Extremely high-risk procedure
- Multi-disciplinary Heart Team formed in 2009:
  - Interventional Cardiologists
  - Echo Cardiologists
  - Cardiac Surgeons
  - Cardiac Anaesthesiologists
  - Radiologists
  - Cardiac Nurses
Queen Elizabeth Hospital Patient Flow

HA/Private Hospitals
QEH Physicians / Surgeons Overseas

Initial assessment by cardiologists + Echo

TEE
Coro angio +/- PCI
CT angio

Pre-TAVI case review

QEH TAVI Referral Centre

Heart Team final decision → workup for TAVI/SAVR

Independent assessment by cardiac surgeons

TAVI Day

QEH TAVI Conference (debriefing)
Vascular Access
31mm valve target at high implant
Stepwise deployment of 31mm CoreValve
Final position of the CoreValve
Hong Kong Experience

- Queen Elizabeth Hospital: 25 cases
- HK Adventist Hospital: 5 cases
- Prince of Wales Hospital: 15 cases
- Queen Mary Hospital: 2 cases

TOTAL: 47 cases

Medtronic CoreValve - 45

Edwards Sapien - 2
QEH Registry

1 subclavian vascular complication treated with stent graft
No iliac/femoral vascular complication
All femoral wounds closed with Prostar/Proglide x 2
One patient had PCI to LAD done before TAVI, returned for NSTEMI and with redo-PCI done, died 3 months after TAVI because of acute coronary stent thrombosis
All 25 patients have functionally normal CoreValve with trivial to mild AR, only 1 mild to mod AR

<table>
<thead>
<tr>
<th>Characteristic (N = 25)</th>
<th>Number (%) or Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs.)</td>
<td>82.1 ± 4.8 (78 – 98 years old)</td>
</tr>
<tr>
<td>Males</td>
<td>16 (64.0%)</td>
</tr>
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<td>Procedural Success</td>
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Characteristic (N = 25) | Number (%) or Mean ± SD
---|---
Age (yrs.) | 82.1 ± 4.8 (78 – 98 years old)
Males | 16 (64.0%)
Procedural Success | 100%
In-hospital Mortality | 0%
30-day Mortality | 0%
Procedure

Subclavian 4.0%

Direct Aortic 0%

Transfemoral 96.0%

<table>
<thead>
<tr>
<th>Size</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>26mm</td>
<td>56.0%</td>
</tr>
<tr>
<td>31mm</td>
<td>4.0%</td>
</tr>
<tr>
<td>29mm</td>
<td>40.0%</td>
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</table>
## Procedure & Hemodynamics

### Comparison of QEH Registry – Asia Registry – ADVANCE

<table>
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<tr>
<th>Variables</th>
<th>QEH Registry</th>
<th>Asia Registry</th>
<th>ADVANCE</th>
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<tbody>
<tr>
<td>N = 25</td>
<td></td>
<td>N = 140</td>
<td>N = 996</td>
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<tr>
<td>Procedural success</td>
<td>100%</td>
<td>98.6%</td>
<td>97.8%</td>
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<tr>
<td>Serious vascular complications</td>
<td>4%</td>
<td>3.6%</td>
<td>NR</td>
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</table>

### Hemodynamics

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<tr>
<td>≤ Mild PVL</td>
<td>96%</td>
<td>84.3%</td>
<td>87%</td>
</tr>
<tr>
<td>LVEF</td>
<td>59.8%</td>
<td>61 ± 10%</td>
<td>NR</td>
</tr>
<tr>
<td>AVA (cm²)</td>
<td>2.0</td>
<td>1.7 ± 0.7</td>
<td>1.7</td>
</tr>
<tr>
<td>MPG (mmHg)</td>
<td>9.0</td>
<td>9 ± 6</td>
<td>9.3</td>
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</tbody>
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NR = Not Reported
### 30-day Outcomes
Comparison of QEH Registry – Asia Registry – ADVANCE

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<tbody>
<tr>
<td></td>
<td>N = 25</td>
<td>N=140</td>
<td>N=996</td>
</tr>
<tr>
<td>Mortality</td>
<td>0%</td>
<td>2.1%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Stroke</td>
<td>0%</td>
<td>0.7%</td>
<td>2.9%</td>
</tr>
<tr>
<td>NYHA</td>
<td>1.4</td>
<td>1.5</td>
<td>NR</td>
</tr>
<tr>
<td>Pacemaker Implantation</td>
<td>16%</td>
<td>15.7%</td>
<td>26.3%</td>
</tr>
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</table>

NR= Not Reported
2. Meredith. VARC-adjudicated Outcomes in Inoperable and High Risk AS Patients. TCT 2010, Washington, DC.
30-Day Stroke Rate

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Mean Gradient & Valve Area

The PARTNER Trial

CoreValve ADVANCE Study
QEH | Symptom Status (NYHA Class)

NYHA Classification

Pre-TAVI  | Post-TAVI | 30-day | Post-TAVI 6-month
---|---|---|---
4%  | 4%  | 4%  | 12%
52% | 61% | 88%

Changes in NYHA Classification

- Improved 2 Classes: 5
- Improved 1 Class: 1
- Maintained: 18

* NYHA: New York Heart Association Functional Classification for Heart Failure Stages
(Class I = Best, Class IV = Worst)
6-Minute Walk Test

Paired-sample t-test: $p<0.05$

- Pre-TAVI: 220.3 meters
- Post-TAVI: 268.5 meters
Measurement for Quality of Life (SF-12)

Physical Component
Paired-sample t-test: $p<0.05$

Mental Component
Paired-sample t-test: $p<0.05$
Conclusions

• TAVI – rapid adoption worldwide as a viable treatment option for inoperable or high-risk symptomatic severe AS patients
• Improve survival with better quality of life (QoL) and functional capacity
• Multi-disciplinary Heart Team approach
• Promising short- and intermediate-term outcome results in Hong Kong
• Long-term outcomes meticulously monitored
Surgical AVR
The “Past”

TAVI
The “Future”
Thank you!
Step-wise Deployment

18Fr delivery
Repositionable prior to annular contact
Gradual release
Conformable at annulus with supra-annular function