3 years after introduction of TAVI in QEH

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Queen Elizabeth Hospital
Hong Kong
Introduction

• Aortic Stenosis – most common valvular heart disease in the elderly
• 4.6% in adults ≥75 years of age
• Once symptomatic, average survival 2-3 years with high risk of sudden death
• TAVI (Transcatheter Aortic Valve Implantation) or TAVR (Transcatheter AV Replacement) has emerged as a viable alternative in inoperable or high risk elderly patients with symptomatic AS
• 5-10% immediate complications
• 30-day mortality of 5.6% - 12.7%
• Reduces all-cause mortality by 27% at 3 years
CoreValve® Transcatheter Procedure

Balloon catheter threaded through sheath and into heart

Figure 1

CoreValve placed into position over the diseased aortic valve

Figure 2

CoreValve in place, procedure completed

Figure 3

Experimental Device in the United States and Limited by Federal Law to Investigational Use.
TAVI Program in QEH

• High-risk procedure
• Multi-disciplinary Heart Team formed in 2009:
  ➢ Interventional Cardiologists
  ➢ Echo Cardiologists
  ➢ Cardiac Surgeons
  ➢ Cardiac Anaesthesiologists
  ➢ Radiologists
  ➢ Cardiac Nurses
Since 2002, >120,000 TAVI procedures have been performed in >700 international sites

Asia:

33 TAVI centres in 11 Asian countries
# Current Status of TAVI in Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>MDT CoreValve</th>
<th>EDW Sapien</th>
<th>Venus A-Valve</th>
<th>Symetis Acurate</th>
<th>Total</th>
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<tbody>
<tr>
<td>China</td>
<td>63</td>
<td>10</td>
<td>57</td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>Taiwan</td>
<td>119</td>
<td>16</td>
<td></td>
<td></td>
<td>135</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>62</td>
<td>5</td>
<td></td>
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<td>67</td>
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<tr>
<td>Korea</td>
<td>152</td>
<td>100</td>
<td></td>
<td></td>
<td>252</td>
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<tr>
<td>Japan</td>
<td>81(^A)</td>
<td>407(^B)</td>
<td>17</td>
<td></td>
<td>505</td>
</tr>
<tr>
<td>Singapore</td>
<td>46</td>
<td>100</td>
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<td>146</td>
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<td>Philippines</td>
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<td>41</td>
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<td>Malaysia</td>
<td>32</td>
<td>10</td>
<td></td>
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<td>Thailand</td>
<td>18</td>
<td>30</td>
<td></td>
<td></td>
<td>48</td>
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<tr>
<td>Vietnam</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>India</td>
<td>24</td>
<td>0</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>642</strong></td>
<td><strong>678</strong></td>
<td><strong>58</strong></td>
<td><strong>17</strong></td>
<td><strong>1394</strong></td>
</tr>
</tbody>
</table>

\(^A\) Include CoreValve Japan Trial and Private Import Cases  
\(^B\) Include Sapien AMT Trial, Sapien XT Japan Trial and commercial launch since Oct 2013
Hong Kong Experience

Dec 2010
Queen Elizabeth Hospital

Nov 2011
Prince of Wales Hospital

June 2013
Union Hospital

2010  2011  2012  2013

May 2011
HK Adventist Hospital

Dec 2012
Queen Mary Hospital
Hong Kong Experience

Medtronic CoreValve - 61

- Queen Elizabeth Hospital: 34
- HK Adventist Hospital: 7
- Prince of Wales Hospital: 19
- Queen Mary Hospital: 5
- Union Hospital: 1

TOTAL: 66

Edwards Sapien - 5
QEH Registry

Characteristics (N = 34) | Number (%) or Mean ± SD
---|---
Age (yrs.) | 81.2 ± 5.4 (67 – 97 years old)
Males | 22 (64.7%)
Procedural Success | 97.1%
In-hospital Mortality | 2.9%
30-day Mortality | 2.9%

- 1 subclavian vascular complication treated with stent graft
- 2 femoral artery dissection with stenting done
- All femoral wounds closed with Prostar/Proglide x 2
- One patient developed coronary artery occlusion after CoreValve implantation. Urgent surgical AVR done with ECMO support. Passed away on Day 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
- One patient died of pneumonia and end-stage COPD 1 year after TAVI
- All patients have functionally normal CoreValve with trivial to mild AR except 3 with mild to mod AR
**Procedure**

- **Subclavian**
  - 2.9%

- **Direct Aortic**
  - 0%

- **Transfemoral**
  - 97.1%

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<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>26mm</th>
<th>31mm</th>
<th>29mm</th>
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<tbody>
<tr>
<td>Percentage</td>
<td>52.9%</td>
<td>5.9%</td>
<td>41.2%</td>
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</table>
## Asia CoreValve Registry Participating Centers

<table>
<thead>
<tr>
<th>Country</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>QEH</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>PWH</td>
</tr>
<tr>
<td>South Korea</td>
<td>AMC</td>
</tr>
<tr>
<td>South Korea</td>
<td>SNUH</td>
</tr>
<tr>
<td>Singapore</td>
<td>NHC</td>
</tr>
<tr>
<td>Malaysia</td>
<td>IJN</td>
</tr>
<tr>
<td>Taiwan</td>
<td>NTUH</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Cheng Hsin</td>
</tr>
<tr>
<td>Thailand</td>
<td>Chulalongkorn</td>
</tr>
<tr>
<td>Philippines</td>
<td>St Luke</td>
</tr>
<tr>
<td>China</td>
<td>Chengdu</td>
</tr>
<tr>
<td>China</td>
<td>Shanghai</td>
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</table>
# Characteristics

## Comparison of QEH Registry – Asia Registry – ADVANCE

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>QEH Registry N = 34</th>
<th>Asia Registry N = 285</th>
<th>ADVANCE N = 996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs.)</td>
<td>81.2 ± 5.4</td>
<td>79.3 ± 7.3</td>
<td>81 ± 6</td>
</tr>
<tr>
<td>Males</td>
<td>64.7%</td>
<td>54%</td>
<td>49.4%</td>
</tr>
<tr>
<td>Mean Log EuroSCORE</td>
<td>19.4 ± 12.0%</td>
<td>22 ± 19%</td>
<td>19.2 ± 12.4%</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>57.2 ± 9.4</td>
<td>59.8 ± 12.2</td>
<td>NR</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>159.3 ± 7.9</td>
<td>158 ± 9</td>
<td>NR</td>
</tr>
<tr>
<td>Mean NYHA</td>
<td>2.7 ± 0.6</td>
<td>2.6 ± 0.7</td>
<td>NR</td>
</tr>
<tr>
<td>MPG (mmHg)</td>
<td>51.6 ± 10.7</td>
<td>54 ± 20</td>
<td>45.6</td>
</tr>
<tr>
<td>AVA (cm²)</td>
<td>0.7 ± 0.2</td>
<td>0.6 ± 0.2</td>
<td>0.7</td>
</tr>
<tr>
<td>LVEF</td>
<td>55.5 ± 11.5%</td>
<td>51 ± 22%</td>
<td>NR</td>
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</tbody>
</table>

NR= Not Reported
## 30-day Outcomes
Comparison of QEH Registry – Asia Registry – ADVANCE

<table>
<thead>
<tr>
<th>Variables</th>
<th>QEH Registry N = 34</th>
<th>Asia Registry N=285</th>
<th>ADVANCE N=996</th>
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</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>2.9%</td>
<td>3.2%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Stroke</td>
<td>0%</td>
<td>1.8%</td>
<td>2.9%</td>
</tr>
<tr>
<td>NYHA</td>
<td>1.5</td>
<td>1.5</td>
<td>NR</td>
</tr>
<tr>
<td>Pacemaker Implantation</td>
<td>14.7%</td>
<td>15.4%</td>
<td>26.3%</td>
</tr>
</tbody>
</table>

NR= Not Reported
30-Day All-Cause Mortality

- Meredith. VARC-adjudicated Outcomes in Inoperable and High Risk AS Patients. TCT 2010, Washington, DC.
Primary Endpoint: 1 Year All-cause Mortality

- Surgical: 3.3% at 1 year
- Transcatheter: 4.5% at 1 year

P = 0.04 for superiority

No. at Risk:
- Surgical: 357, 341, 297, 274
- Transcatheter: 390, 377, 353, 329
30-Day Stroke Rate

2. Meredith. VARC-adjudicated Outcomes in Inoperable and High Risk AS Patients. TCT 2010, Washington, DC.
1. Meredith I.T. 12 Month Results from ANZ CoreValve TAV Study. Presented at: TCT 2011.  
QEH | Symptom Status (NYHA Class)

* 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: $p<0.05$
Measurement for Quality of Life (SF-12)

Physical Component
Paired-sample t-test: \( p < 0.05 \)

Mental Component
Paired-sample t-test: \( p < 0.05 \)
<table>
<thead>
<tr>
<th></th>
<th>Pre TAVI (n = 34)</th>
<th>1 month Post TAVI (n = 32)</th>
<th>1 year Post TAVI (n = 23)</th>
<th>2 years Post TAVI (n = 13)</th>
<th>3 years Post TAVI (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVA</td>
<td>0.71 +/- 0.17</td>
<td>1.92 +/- 0.31</td>
<td>1.97 +/- 0.34</td>
<td>1.93 +/- 0.39</td>
<td>2.18 +/- 0.27</td>
</tr>
<tr>
<td>MPG</td>
<td>51.56 +/- 10.74</td>
<td>8.62 +/- 2.61</td>
<td>8.54 +/- 2.78</td>
<td>7.86 +/- 2.34</td>
<td>5.2 +/- 2.08</td>
</tr>
<tr>
<td>Cumulative Mortality</td>
<td>--</td>
<td>2.9%</td>
<td>8.8%</td>
<td>8.8%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>
Mean Gradient & Valve Area

The PARTNER Trial

CoreValve ADVANCE Study

QEH Registry
2-Year All-cause Mortality

- Surgical
- Transcatheter
- QEH TAVI

No. at Risk

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>6</th>
<th>12</th>
<th>18</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical</td>
<td>357</td>
<td>341</td>
<td>274</td>
<td>28</td>
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</tr>
<tr>
<td>Transcatheter</td>
<td>390</td>
<td>377</td>
<td>329</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

- 25th month:
  - Surgical: 4.5%
  - Transcatheter: 14.2%
  - QEH TAVI: 19.1%

- 24th month:
  - Surgical: 8.8%
Surgical AVR
The “Past”

TAVI
The “Future”
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
• Benefits maintained at 3 years after TAVI
Thank you!