Aortic valve reconstruction using the Ozaki technique, when and in whom?

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Consultant Cardiac Surgeon
Royal Brompton Hospital London
Disclosure of Interest

Cesare Quarto

• I have the following potential conflicts of interest to report:
  – Consulting for Abbot Medical
Today’s presentation

What is the Ozaki procedure?

Which patients could benefit from the Ozaki procedure

Ozaki Surgical technique

Professor Ozaki’s results  Worldwide experience

Royal Brompton results
Osaki Procedure

Is an aortic valve reconstruction (AV neo-cuspidisation) using aortic leaflet made of autologous or heterologous pericardium and is an alternative to an aortic valve replacement (AVR)
Types of Aortic Valve Prostheses

Which patients could benefit?
There is no ideal aortic prosthetic valve for the young patient, this is when the Ozaki procedure comes into play.
Which Patients could benefit?

AV neo-cuspidization (Ozaki’s Procedure) is a alternative technique to AVR especially in:

• younger patients who oppose anticoagulation and the valve can not be repaired
• Patients who have a small aortic annulus
• Patients with Aortic Endocarditis with preserved annulus
Preparation

Osaki surgical technique
Suturing

Ozaki surgical technique

All bites are at even intervals

Pledged
5mm x 10mm

Wings

Coaptation Zone

3:1

1:1

Annulus

Annulus

Cusp

Cusp

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Completion

- Before closing aorta, adjusting the three cusps so that they become “windmill” shape.
- 3 commissures and the contact point of those commissure should be on the same plane.
Pre-op data

- April 2007-Jan-2015
- 765 pts had AV neo-cuspidization
- Mean Age- 68.4 +/- 14.2 yrs
- Male/Female-385/380
- AS-519 AR-246
- BAV-195
- Uni-21
- Quad-2
- AAE-20
- IE-22
- Annulus size 20.9 +/-3.3 mm

Post-op data

- Results
  - Aortic X-clamp time- 107.2 +/- 26.9 mins
  - CPB time- 150 +/- 29.4 mins
  - Freedom from re-operation- 98.3% (8 pts re-operated on for IE)
  - Survival at 6 yrs 85.4%
Echocardiographic Evaluation of AR after AVNeo (765)

Ozaki’s results
Peak LV-Ao pressure gradient

Ozaki’s results
Freedom from Re-operation

Ozaki’s results
Worldwide Experience
## Progress in the U.S.

**Total AVNeo >49 cases**  
*As of Aug 2016*

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>KOL</th>
<th>Cases</th>
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<tbody>
<tr>
<td>Cleveland Clinic</td>
<td>Gosta Pettersson</td>
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<tr>
<td>Columbia University</td>
<td>Yoshifumi Naka</td>
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<tr>
<td>Boston Children Hospital</td>
<td>Pedro del Nido, Christopher Baird</td>
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<td>West Virginia University (previously UMPC)</td>
<td>Vinay Badhwar</td>
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<td>Pinnacle Health Cardiac and Thoracic surgery Associates</td>
<td>Mubashir Mumtaz</td>
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<td>The Heart Hospital Baylar Plano</td>
<td>William Brinkman</td>
<td>1</td>
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<tr>
<td>VA Pittsburgh Healthcare System</td>
<td>Danny Chu</td>
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<tr>
<td>Holly Spirit</td>
<td>Serrie Lico</td>
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Baylor Houston DeBakey VA Medical center  
Cornwell  
1
## Progress in EMEA

Total AVNeo >170 cases
As of Aug, 2016

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<thead>
<tr>
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<td>Germany</td>
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<td>Markus Krane</td>
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<td>Domenico Mazzitelli</td>
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<td>Italy</td>
<td>Centro Cardiologico Monzino</td>
<td>Gianluca Polvani</td>
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<td>Federal Centre for Cardiovascular Surgery (Penza)</td>
<td>Evgenii Rosseikin</td>
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<td>Serbia</td>
<td>Mother &amp; Child Health Institute, Department of Cardiotoracic Surgery</td>
<td>Martin Kostolny</td>
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<tr>
<td>Switzerland</td>
<td>University Hospital Basel</td>
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<td>Royal Brompton Hospital</td>
<td>Oliver Ghez</td>
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<td>Cesare Quatro</td>
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<td>Total</td>
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# Progress in Asia

**Total AVNeo >27 cases**  
As of Aug, 2016

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<td>Sivakumar</td>
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<td>ALL INDIA INSTITUTE OF MEDICAL SCIENCE</td>
<td>Shiv Choudhary</td>
<td>India</td>
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<tr>
<td>Fortis Hospitals</td>
<td>Vivek Jawali</td>
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<tr>
<td>SEX</td>
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<td>VALVE MORPHOLOGY</td>
<td>PATHOLOGY</td>
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<tr>
<td>Male</td>
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<td>Severe AR</td>
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<tr>
<td>Male</td>
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<td>BAV (Endocarditis)</td>
<td>Severe AR</td>
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<tr>
<td>Male</td>
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<td>BAV (endocarditis)</td>
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<tr>
<td>Female</td>
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<tr>
<td>Male</td>
<td>14</td>
<td>TAV</td>
<td>AR</td>
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RBHT conclusion of results

• Good medium-term results
• Less calcification is expected due to better flow dynamics and reduced mechanical stress
• Excellent haemodynamic in patients with small annulus
• Low thrombogenicity therefore suitable for patients with high bleeding risks
• Low cost compared to TAVR and conventional AVR, AV-neo is most cost-effective.
• Using the sizer and the template method, provides consistency of the procedure.
European Ozaki Registry

- Only large series from a single surgeon published
- Now a number of European centres performing procedure
- Need to find away to collate data from multiple surgeons
European Ozaki Registry

• Aims: establish multi-centre short and longer term outcomes

• Compare autologous pericardium and bovine pericardium

• Promote collaboration
European Ozaki Registry

- 5 Countries: UK, Germany, Belgium, Italy, Switzerland
- 10 Centres
- 120 patients
In Summary

• We need to continue to explore the possibility of creating the perfect aortic valve procedure that would guarantee no need for anticoagulation and durability.
ADAPT (CardioCel)
(J Heart Valve Dis. 2010)

- Acellular engineered bovine pericardium
- Cross-linking is achieved with an ultra-low engineered glutaraldehyde concentration
- Undergoes anti-calcification process and a non-glutaraldehyde sterilization and storage solution with added anti-calcification properties