CT before the TAVI

George Latsios, MD, PhD, FESC, MEAPCI
consultant, interventional cardiologist, deputy-in-charge CCU
1st Univ. Dpt. Cardiology, GHA “Hippokration”, Athens
TAVI is:

- femoral access & femoral closure
- prosthesis implantation
TAVI is:

- femoral access & femoral closure
- prosthesis implantation
what do we measure?

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Ascending Aorta Diameter (mm)</td>
<td></td>
<td></td>
<td>31,7</td>
</tr>
<tr>
<td>Sinotubular Junction Diameter (mm)</td>
<td>30,6</td>
<td>31,7</td>
<td></td>
</tr>
<tr>
<td>Perimeter (mm)</td>
<td>58,5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Derived Diameter**

Area: 269,1 mm², 18,5 mm

- Sinus of Valsalva Diameter (mm)
  - LCC: 30,9
  - RCC: 28,3
  - NCC: 29,4
- Sinus of Valsalva Height (mm)
  - Left: 10,9
  - Right: 14,3
- Coronary Ostia Height (mm)
  - Left: 5,9
  - Right: 7,1
- LVOT Diameter (mm)
  - Min: 19,9
  - Max: 23,7
  - Mean: 21,8
<table>
<thead>
<tr>
<th>Valve Size Selection</th>
<th>CoreValve®</th>
<th>Evolut® R TAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>23 mm</td>
<td>26 mm</td>
</tr>
<tr>
<td>Annulus Diameter</td>
<td>17*/18 – 20 mm</td>
<td>20 – 23 mm</td>
</tr>
<tr>
<td>Annulus Perimeter (π x Diameter)</td>
<td>53.4*/ 56.5 – 62.8 mm</td>
<td>62.8 – 72.3 mm</td>
</tr>
<tr>
<td>Sinus of Valsalva Diameter (Mean)</td>
<td>≥ 25 mm</td>
<td>≥ 27 mm</td>
</tr>
<tr>
<td>Sinus of Valsalva Height (Mean)</td>
<td>≥ 15 mm</td>
<td>≥ 15 mm</td>
</tr>
</tbody>
</table>
CT measurements

A

\[ \frac{A + B}{2} = \text{Mean Diameter} \]
\[ \text{Area} \]
\[ \text{Perimeter} \]

B

Hinge Point Plane

- Sinus Width
- Diameter of the Sinutubular Junction
- AsAo Width in 4 cm Distance from Annulus
- Sinus Height
- Distance to Coronaries
MSCT & 3D Reconstruction

Coronal Oblique Plane

Sagittal Oblique Plane

Valve Plane

Transverse Plane
mistakes in echo vs CT measurements
aortic annulus measurements

perimeter: linear distance of tracing around the aortic annulus

area: area contained within tracing around the aortic annulus

major & orthogonal minor diameters: linear distances through the center of the aortic annulus

mean diameter: Calculated mean of major and minor diameters
aortic annulus measurements
the minimum Sinus of Valsalva Diameter is equal to the constrained portion (waist) of the valve plus 5 mm.
LCA & RCA height measurements
Aortic Root Angulation
Implanter’s view

<table>
<thead>
<tr>
<th>Acceptable Aortic Root Angle*</th>
<th>Direct Aortic</th>
<th>Left Subclavian / Axillary</th>
<th>Right Subclavian / Axillary</th>
<th>Iliofemoral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Any angle</td>
<td>&lt;70°</td>
<td>&lt;30°</td>
<td>&lt;70°</td>
</tr>
</tbody>
</table>
LVOT & AoV Ca^{++} predicts PPM & PVL

TAVI is:

- femoral access & femoral closure
- prosthesis implantation
Vascular Complications after TAVI Impact Mortality

N=403

HR (CI 95%) = 1.90 (0.9-3.9); p=0.08.
what do we measure?

**RIGHT**
- CIA Min Diameter (mm): 9.3 x 9.7
- EIA Min Diameter (mm): 7.0 x 7.2
- Femoral Min Diameter (mm): 5.1 x 6.1

**LEFT**
- CIA Min Diameter (mm): 8.7 x 9.5
- EIA Min Diameter (mm): 5.2 x 5.7
- Femoral Min Diameter (mm): 5.6 x 6.4

**Calcium:**  
- Mild ✓  
- Moderate □  
- Severe □
peripheral arteries
peripheral arteries
Trans-Subclavian TAVI
Trans-Aortic TAVI

Transaortic Transcatheter Aortic Valve Implantation: A Novel Approach for the Truly “No-Access Option” Patients

George Latsios, MD, Ulrich Gerckens, MD, and Eberhard Grube, MD
TAVI and standard 2\textsuperscript{nd} approach
TAVI and 2nd approach trans-radial

Transcatheter Aortic Valve Implantation

Tips and Tricks to Avoid Failure
ΚΕΦΑΛΑΙΟ 25
ΔΙΑΔΕΡΜΙΚΗ ΕΜΦΥΤΕΥΣΗ ΑΟΡΤΙΚΗΣ ΒΑΛΒΙΔΑΣ (TRANS-CATHETER AORTIC VALVE IMPLANTATION - TAVI)

Γ. Λάτσιος¹, Κ. Τούτουζας², Χ. Στεφανάδης³
¹Επιμελητής, ²Επίκουρος Καθηγητής, ³Καθηγητής Καρδιολογίας
Α’ Πανεπιστημιακή Καρδιολογική Κλινική, ΓΝΑ «Ιπποκράτειο»
Multi-slice CT (MSCT) imaging in pretrans-catheter aortic valve implantation (TAVI) screening. How to perform and how to interpret

George Latsios a, b, c, Themistoklis N. Spyridopoulos b, c, Konstantinos Toutouzas a, Andreas Synetos a, George Trantalis a, Konstantinos Stathogiannis a, Vassiliki Penesopoulou a, George Oikonomou a, Elias Brountzos b, Dimitrios Tousoulis a

a 1st Department of Cardiology, National and Kapodistrian University of Athens, Medical School, Hipposkration Hospital, Athens, Greece
b 2nd Unit of Diagnostic and Interventional Radiology, National and Kapodistrian University of Athens, Medical School, Evangelion Hospital, Athens, Greece

Table 1

CT parameters - measures in pre-CTA screening.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic annulus (AA)</td>
<td>AA short and long diameters</td>
</tr>
<tr>
<td></td>
<td>AA perimeter and perimeter-based effective diameter</td>
</tr>
<tr>
<td></td>
<td>AA area and area-based effective diameter</td>
</tr>
<tr>
<td></td>
<td>Ideal fluoroscopic projection angle</td>
</tr>
<tr>
<td>Aortic valve</td>
<td>Pattern and extent of calcifications</td>
</tr>
<tr>
<td></td>
<td>Presence of calcified cusps</td>
</tr>
<tr>
<td></td>
<td>Curvilinearity of the aorta</td>
</tr>
<tr>
<td>Aortic root</td>
<td>Height and width of sinus of Valsalva</td>
</tr>
<tr>
<td></td>
<td>Distance from the AA plane to the coronary artery ostia</td>
</tr>
<tr>
<td></td>
<td>Sinusoid abnormalities</td>
</tr>
<tr>
<td>Aorta</td>
<td>Anatomy</td>
</tr>
<tr>
<td></td>
<td>Tortuosity and elongation</td>
</tr>
<tr>
<td></td>
<td>Intimal calcification, thrombi, and dissections</td>
</tr>
<tr>
<td></td>
<td>Ascending aorta, aortic arch, and descending aorta diameters</td>
</tr>
<tr>
<td>Biomedical arteries</td>
<td>Minimal luminal diameters bilaterally</td>
</tr>
<tr>
<td></td>
<td>Tortuosity and angulation</td>
</tr>
<tr>
<td></td>
<td>Calcifications</td>
</tr>
</tbody>
</table>

Fig. 1. Double-oblique axial CT image in the short axis of the native aortic valve apparatus.
Ευχαριστώ!