CT before the TAVI

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TAVI is:

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

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

[A] Annulus Diameter
[B] Sinus of Valsalva Width
[C] Ascending Aorta Diameter
[D] Sinus of Valsalva Height
[E] Frame Height (≈ 5 cm)
## Sizing Chart Re: Annulus

<table>
<thead>
<tr>
<th>Valve Size Selection</th>
<th>CoreVale® Evolut® R TAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>23 mm</td>
</tr>
<tr>
<td>Annulus Diameter</td>
<td>17*/18 – 20 mm</td>
</tr>
<tr>
<td>Annulus Perimeter (π x Diameter)</td>
<td>53.4*/56.5 – 62.8 mm</td>
</tr>
<tr>
<td>Sinus of Valsalva Diameter (Mean)</td>
<td>≥ 25 mm</td>
</tr>
<tr>
<td>Sinus of Valsalva Height (Mean)</td>
<td>≥ 15 mm</td>
</tr>
</tbody>
</table>
CT measurements

![Image showing CT measurements](image)

**Hinge Point Plane**

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

- **A** = Area
- **B** = Perimeter

- 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

Valve Plane

Sagittal Oblique Plane

Transverse Plane
mistakes in echo vs CT measurements

AA = Ascending Aorta
AV = Aortic Valve
OT = Outflow Tract
  ● = Annulus
  ● = Hinge Points
  ○ = Virtual Ring

→ = True measurement at the level of the virtual ring.
→ = Measurement at the level of the upper outflow tract shows a good correlation with the hinge point plane.
→ = Off-center measurement between two hinge points underestimates the annulus size.
→ = Measurement upward in the aortic sinus overestimates the annulus size.
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>Any angle</td>
<td>&lt;70°</td>
<td>&lt;30°</td>
<td>&lt;70°</td>
<td></td>
</tr>
</tbody>
</table>
LVOT & AoV Ca^{++} predicts PPM & PVL

TAVI is:

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- prosthesis implantation
Vascular Complications after TAVI Impact Mortality

N=403

Steinvil et al. Am J Cardiol, 115; 1, 2015, 100 - 106
what do we measure?

<table>
<thead>
<tr>
<th>Table</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIA Min Diameter (mm)</td>
<td>9.3 x 9.7</td>
<td>8.7 x 9.5</td>
</tr>
<tr>
<td>EIA Min Diameter (mm)</td>
<td>7.0 x 7.2</td>
<td>5.2 x 5.7</td>
</tr>
<tr>
<td>Femoral Min Diameter (mm)</td>
<td>5.1 x 6.1</td>
<td>5.6 x 6.4</td>
</tr>
</tbody>
</table>

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 2\textsuperscript{nd} 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, Themistoklis N. Spyridopoulos, Konstantinos Toutouzas, Andreas Synetos, George Trantalis, Konstantinos Stathogiannis, Vassiliki Penesopoulou, George Oikonomou, Elias Brountzos, Dimitrios Tousoulis

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2nd Unit of Diagnostic and Interventional Radiology, National and Kapodistrian University of Athens, Medical School, Evgenidion Hospital, Athens, Greece

In a dual-source CT scanner, a prospectively ECG-triggered CTA, with a high pitch of 3.4 (shorter acquisition scan time) and a low tube voltage at the level of 100 kV (lower radiation), may

Table 1

CT parameters - measurements in pre-TAVI screening.

Aortic annulus (AA)
- AA short and long diameters
- AA perimeter and perimeter-based effective diameter
- AA area and area-based effective diameter
- Ideal fluoroscopic projection angle

Aortic valve
- Patterns and extent of calcifications
- Presence of calcified cusps
- Coaptation

Aortic root
- Height and width of sinus of Valsalva
- Distance from the A4 plane to the coronary artery ostia
- Sinotubular junction diameter

Aorta
- Anatomy
- Turbulence and elongation
- Intraluminal calcification, thrombus, and dissections
- Ascending aorta, aortic arch, and descending aorta diameters
- Branch vessels
- Minimal luminal diameter: bivalvular
- Turbulence and stenosis
- Calcifications

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