CT screening measurements quick reference

CT imaging and analysis for transcatheter heart valve sizing

Overview

After locating the annular plane, measurements of the annulus and related structures are obtained. These measurements can be grouped into those that are dependent on the annular plane and those that are not.

Measurements dependent on the annular plane

- Annular dimensions
- Distance to the coronary ostia (Left and right coronary artery height)
- Sinus height (sinotubular junction heights)
- Ascending aorta length
- Left ventricular outflow tract diameter
- Prediction of fluoroscopic angle

Measurements independent of annular plane

- Sinus of valsalva width
- Sinotubular junction (STJ) diameter
- Ascending aorta diameter

Note: Although several automated tools are commercially available to expedite the measurement work flow, it is important to understand the approach for each measurement in order to be capable of performing the assessment manually, and to recognize errors which may occur in an automated analysis.

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CT report quick reference

Reporting

The analysis report should contain the following data:

Acquisition
- Data acquisition mode
- Timing of images in the cardiac cycle (systolic vs diastolic)
- Contrast volume
- Image quality

Aorta
- Presence of kinking
- Presence of intraluminal obstruction
- Presence of intraluminal thrombus

Ascending aorta
- Width at 40 mm from annulus
- Position relative to sternum

Aortic arch
- Width
- Branch anatomy (for embolic protection device purposes and/or alternative access)

Descending aorta
- Width

Iliofemoral arteries
- Minimum width on both sides
- Tortuosity
- Calcification

Aortic root
- Sinotubular junction diameter
- Sinus of valsalva width
- Sinus of valsalva height
- Distance of coronary ostia from aortic annular plane

Aortic valve
- Cuspidity
- Qualitative extent of aortic valve calcification, separately for commissures and annulus
- Presence of a severly calcified cusp which may obstruct a coronary ostium

Aortic annulus
- Long and short diameters
- Area and area-derived diameter
- Perimeter and perimeter-derived diameter

Fluoroscopic coplaner angle
- C-arm angulation with right coronary cusp in the middle

Left ventricle
- Prescence of thrombus
- Septal hypertrophy

Timing of images
It is important to report the phase in which the measurements were obtained due to the dynamism of the aortic annulus.

Image quality
It is important to report if there were acquisition and/or reconstruction artifacts in the dataset that could affect the accuracy of the provided measurements.

Aorta
If there is a significant amount of aortic disease, an alternative access route may be considered.

Iliofemoral arteries
If there is a significant amount of iliofemoral disease an aletrnative access route may be considered. Additional focus should be placed on the access site for the presence of calcification.

Aortic root, aortic valve and aortic annulus
All of the items listed in these categories are critical in the determination of the approriate prosthesis size and optimal positioning of the prosthesis in the native anatomy, as well as the suitability of the patient for transcatheter aortic valve placement.

Fluoroscopic coplaner angle
The reporting of the predicted fluoroscopic coplaner angle can significantly decrease the amount of contrast required during the procedure to identify the deployment angle.

Left Ventricle
The prescence of significant septal hypertrophy may alter the desired landing zone for the prosthesis.

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