Understanding the tricuspid valve for transcatheter valve repair: comparative anatomy of different imaging modalities

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Multimodality imaging represents an essential tool in transcatheter tricuspid valve (TV) therapies. A combination of Computed tomography (CT)-Scan, echocardiography and fluoroscopy, is used for planning and intra-procedural guidance. The understanding of anatomy through the different imaging modalities is challenging and not standardized yet. However, their interpretation is fundamental to navigate in the right atrium towards the desired therapeutic target.

We here show an example of comparative anatomy of the TV with different imaging modalities in a patient who underwent direct tricuspid annuloplasty with the CardioBand (ValtechCardio, OrYehuda, Israel) device.

Panel A resumes anatomical findings in short axis transgastric view using 2D transesophageal echocardiography. The identification of aortic valve is the first step to understand the leaflet orientation: opposite to the aortic valve (AV) (that in this case is easily identified by a previous surgically implanted bioprosthesis), there is the posterior tricuspid leaflet (P). Going counterclockwise, respectively septal (S) and anterior (A) can be identified.

Three-dimensional transesophageal echocardiographic surgical view is reported in Panel B (the stars are located in correspondence of the commissures). Both Panels A and B images are from the atrial side.

Conversely, fluoroscopy and CT look at the tricuspid valve from ventricular side. In Panel C, pre-procedural CT shows the so-called ‘en-face’ view of the TV: the orange line represents the TV annulus and leaflets orientation is summarized.

At fluoroscopy, the correspondent ‘en face’ view of the TV is showed in LAO projection (Panel D). The close relationship between the tricuspid annulus and the right coronary artery is also appreciated.

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