

Case study using 4D ICE NUVISION Ultrasound Catheter



Courtesy of Dr. Nadira Hamid MD, Minneapolis Heart Institute, Abbott Northwestern Hospital, U.S.A.

Patient History/ Pathology

This is a very pleasant 78 year old lady presented to clinic with increasing shortness of breath and right-sided heart failure symptoms. She has the following comorbidities: Previous Mitral valve repair with an annuloplasty ring, Non-ischemic dilated cardiomyopathy (now LVEF improved to 50%), previous transient ischemic attack (TIA), obstructive sleep apnea and persistent atrial fibrillation (on oral anticoagulation). Echocardiography (both TTE and TEE) demonstrated torrential atrial functional tricuspid regurgitation. She was discussed at our multi-disciplinary valve meeting and was deemed high surgical risk. Hence, she was considered for transcatheter tricuspid intervention i.e tricuspid edge to edge repair (TEER).

Challenges

Challenges include imaging difficulty in visualization of the tricuspid leaflets adequately for tricuspid valve intervention. This is due anatomical factors including shadowing of the

previous surgical mitral valve repair and orientation of her heart (horizontal).

System, probe & device used

System used is the VIVID E95 by GE Healthcare. The Probe used is the NUVISION 4D ICE Ultrasound Catheter.

Step-by-step procedure

The procedural steps include advancing the delivery system, orientation of the implant and confirming the trajectory of the delivery catheter. The NUVISION 4D ICE Ultrasound Catheter is used to better visualize the tricuspid leaflets and the grasp. After identifying the arms or the clip above the tricuspid valve (TV) and confirmation of the implant orientation (central antero-septal), the clip is advanced below the TV leaflets. Grasping of the leaflets is performed and this is confirmed by imaging with the 4D ICE NUVISION Ultrasound Catheter. Pre-release assessment was performed and once confirmed adequate leaflet grasp with appropriate reduction in TR, the clip was released. Decision was made to place

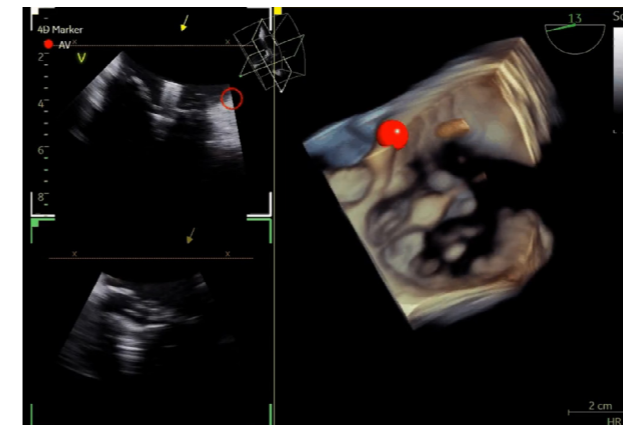
another clip in the central postero-septal region. The above steps were repeated and the second clip was placed successfully. There was residual mild tricuspid regurgitation at the end of the procedure with improved hemodynamic benefit (no reversal seen in the hepatic veins).

Conclusion

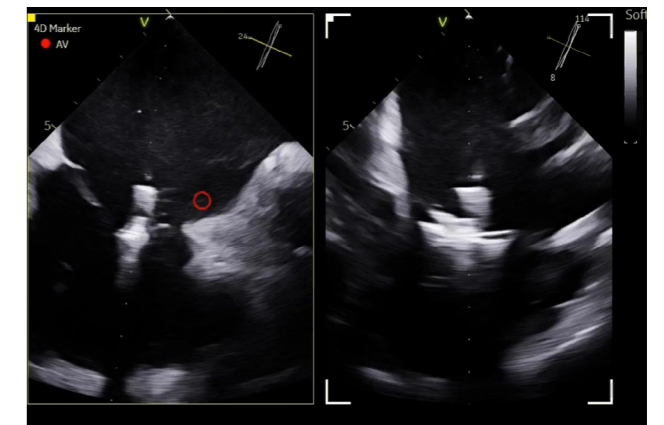
Overall, the 4D ICE NUVISION Ultrasound Catheter is a great adjunct and complement for transcatheter tricuspid valve intervention imaging. It helps improve the workflow for efficiency of the procedure and enhances the procedure with great certainty and precision.

Echo lab follow-up

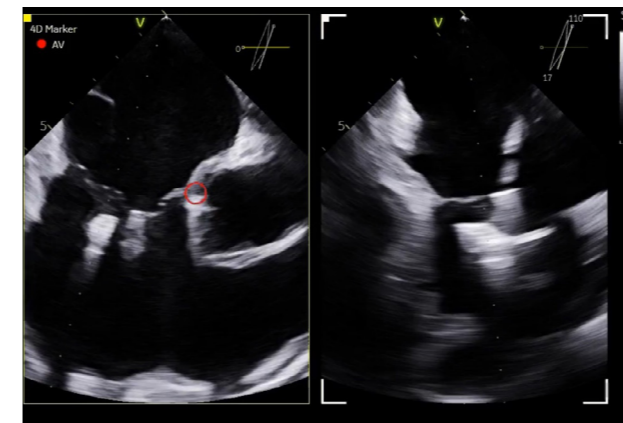
Follow up transthoracic echocardiogram (TTE) prior to discharge and one month after device implantation showed 2 well-seated tricuspid clip, which are stable and Color Doppler confirmed residual trace tricuspid regurgitation. There was also absence of flow reversal in the hepatic veins.



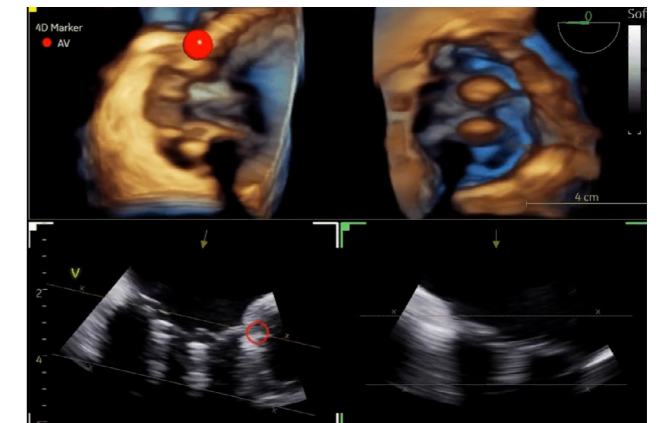
Live 4D image of Tricuspid Valve using the NUVISION 4D ICE Ultrasound Catheter aligning EER clip to the regurgitant orifice of the TV. 4D Marker is in area the AV to help identify and maintain orientation of the Tricuspid Valve leaflets.



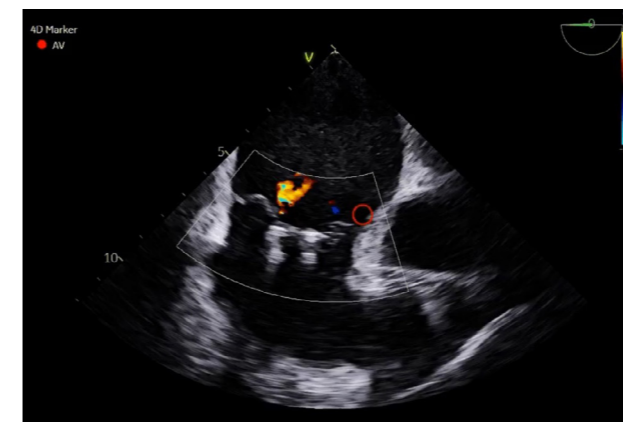
Biplane image showing 2 simultaneous images of the advancement of the open clip and grasping arms to get proper positioning and to ensure enough leaflet can be grasped by clip arms.



Biplane image of 2nd clip being deployed and positioned properly to help reduce Tricuspid Regurgitation further.



Live 4D image using Dual crop to visualize the 2 clips from both the right atrium and right ventricle simultaneously, while seeing the 2D reference planes.



Post assessment color flow showing reduction of Tricuspid Regurgitation to mild

¹ 4D ICE NUVISION catheter is only available in the U.S.A. The combination of Vivid E95 with 4D ICE NUVISION is not CE-marked. 4D ICE NUVISION is distributed by Biosense Webster. Doctors are paid consultants for GEHC and were compensated for participation in this article. The statements described here are based on their own opinions and on results that were achieved in their unique setting. Since there is no "typical" hospital and many variables exist, i.e. hospital size, case mix, etc., there can be no guarantee that other customers will achieve the same results. JB24984XX