Three-dimensional mapping and Cryo Ablation of Atrioventricular Nodal Reentrant Tachycardia in a Patient with Dextrocardia and Situs Inversus.

Masato Fukunaga
Kenichi Hiroshima
Kenji Ando

Introduction: Dextrocardia with situs inverses is a rare condition, the anatomical approach for slow pathway ablation in this setting is challenging with conventional method. Cryomapping mode suggests actual slow pathway safely. Combined use of three-dimensional mapping makes the procedure even safer. We present a case of atrioventricular nodal reentrant tachycardia in a patient with dextrocardia treated with three-dimensional mapping and cryoablation.

Methods: A 84-year-old female was referred for our center to treat a narrow QRS tachycardia. She had no particular medical history but a chest X-ray showed dextrocardia with situs inverses. We planned to use a cryoablation catheter (Freezor Max, Medtronic Inc., Minneapolis, MN, USA) and three-dimensional (3D) mapping system (Ensite Precision, St. Jude Medical, Inc., St. Paul, MN, USA) for better understanding and safe procedure.

Result: Catheters were placed in the morphologic right atrium, right ventricle, the coronary sinus, and the His position, where the catheter positions were typical but mirror image (Figure1A). With a multi electrode catheter located in coronary sinus (Snake, Japan Life line,), anatomical map was created. On electrophysiology study, the mechanism of the tachycardia was determined as slow/fast atrioventricular nodal reentrant tachycardia (AVNRT). A cryoablation catheter with 4mm tip was employed for slow pathway ablation, which was possible to be displayed on the created 3D map. Cryomapping was applied from the inferior aspect of Koch's triangle region, where jump phenomenon was disappeared with -30℃ and cryoablation with -70℃ for 4 min was applied. After several application of temporary success, we gradually moved the catheter up along the tricuspid annulus. Finally, complete success was achieved at the mid septal area (Figure 1B, red tag). Additional application as Freeze saw freeze was done. The tachycardia became non-inducible even under isoproterenol infusion. The total procedural time was 105 min and the fluoroscopic time 10 min. There was no complication and the patient has had no recurrence of palpitation for 6 months.

Conclusion: To the best of our knowledge, this is the first report to employ cryomapping to AVNRT in a patient with dextrocardia. This way of procedure is reliable especially for such a rare condition of anatomy because the disappearance of jump phenomenon indicate the tip of the catheter is located on the anterograde slow pathway. This direct evidence gives an operator more confidence in a case of unusual anatomy.