Permanent Pacemaker Implantation in Patient with Sick Sinus Syndrome and Dextrocardia: a Unique Technical Challenges

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Introduction: Dextrocardia is a rare congenital heart disease in which the heart is located on the right part of the chest, with its apex pointed on the right side. The incidence of dextrocardia is 0.8 per 10,000 live births. The complex anatomy and different fluoroscopic orientation may pose challenges for transvenous Permanent Pacemaker Implantation (PPI). Here we present a case of Dextrocardia who underwent PPI due to Sick Sinus Syndrome (SSS).

Methods: Reporting 35 yo male with chief complaint of syncope since 3 months before admission. Patient doesn’t have any history of cardiac disease before. Echocardiography showed dextrocardia with normal ventricular function. Holter report showed Sinus tachycardia, sinus bradycardia with 7 seconds of pause and frequent runs of Atrial Tachycardia (AT) and paroxysmal Atrial Fibrillation (AF). Based on the report, we conclude that patient had SSS. The patient underwent dual chamber PPI with DDDR mode. The bipolar lead was placed in Right Atrium (RA) and apex of Right ventricle (RV). During procedure, we experienced difficulties when placing the atrial lead in Right Atrial Appendage (RAA). We decided to place the lead on septal wall of RA. No Phrenic Nerve Stimulation (PNS) were observed. One week after procedure, the patient felt upper abdominal discomfort, and we observed PNS on the patient. We decided to turn off the atrial lead in order to stop PNS. Post PPI Cardiac Ct Scan showed dextrocardia with atrial lead at posteroinferior wall of RA.

Result: In dextrocardia with normal situs, both atria along with the appendages and connecting great veins retain their normal relationship, while ventricles are rotated to the right. Dextrocardia patients without intracardiac major anomalies can survive into adulthood and may presence with degenerative conduction diseases. Dextrocardia may pose major challenge, particularly how to guide the bipolar lead into RA and RV. Venous angiography via the second access may reveal important anatomical information regarding orientation of the septum, venous chambers morphology, and act as a roadmap to facilitates lead implantation. Since Dextrocardia with is a mirror image of normal heart, the use of flipped image and opposite angulated view (RAO instead of LAO and vice versa), have been suggested to facilitate implantation.

Conclusion: PPI in dextrocardia needs certain technique for successful implantation. Venous angiography from second access and view-modified fluoroscopy is helpful in determining the route of endocardial catheter.