TIP THROMBOSIS DURING MICRA IMPLANTATION AS THE CAUSE OF HIGH IMPEDANCE AND THRESHOLD

Introduction: Leadless pacemaker is the latest pacemaker technology that has several advantages compared to conventional transvenous pacemaker in prevention of lead and device’s pocket complications. We report a case of thrombosis at the tip of MicraTM (Medtronic Inc) causing unnecessary device repositioning due to unacceptable pacing threshold and impedance during implantation. As this technology continues to mature, complications and device-related problems need further investigations.

Methods: A 65 years old female patient has a history of Long standing Persistent Atrial Fibrillation with frequent episodes of slow ventricle response. Echocardiography examination revealed no structural heart disease nor regional wall abnormality. Coronary CT angiography revealed non-significant stenosis. Patient was scheduled for MicraTM pacemaker implantation.

Result: The procedure was performed by femoral venous access. Leadless pacemaker delivered to right ventricle and deployed to apical septal region and got electrically tested, high level of impedance and threshold were revealed; electrical impedance level was more than 800 Ω and measured threshold was never below 2 mV. The leadless pacemaker then retracted and repositioned to mid septal region, another electrical testing revealed another high impedance and threshold. The device was then repositioned one more time to more inferior part of apical region, similar results of electrical testing was gained. Operators then removed the device and catheter delivery system just to find thrombus covered entire tip portion of the device. The thrombus then was removed using syringe needle (figure 1) and flushed with heparinized normal saline. The device was again inserted after bolus of 5000 IU of heparin and deployed to septal portion of apex region (previous site). Measurement showed impedance of 450 Ohm and threshold of 0.4 mV. “Pull and hold” test confirmed the fixation, the tether then removed and followed by the introducer.

Conclusion: The presented case showed possible complication of latest pacemaker technology. Thrombus formation at the tip of the leadless pacemaker can lead to high impedance and threshold level than expected. Appropriate dose of heparin should always be given just after femoral vein puncture to prevent thrombus event.