Unusual Electrogram Pacemaker lead Tracing of Atrial Paced Event Followed by Dual Ventricular Sensed Event due to Late Atrial Pacemaker Lead Displacement

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Introduction: Lead displacement is an uncommon complication of cardiovascular implantable electronic device. The incidence of early displacements of atrial leads have been reported to be 3.8% in DDD pacemakers. Late displacements which occur after the first six weeks of implantation is a rare complication. Only significant displacements (macro-dislodgement) that causes malfunction will produce clinically relevant symptoms. This case describes a patient with a past history of dual chamber pacemaker implantation in 2012 who developed pacemaker syndrome only recently due to late atrial lead displacement of DDD pacemaker which was detected initially by an unusual electrogram (EGM) tracing of atrial paced event followed by a dual ventricular sensed event.

Methods: N/A.

Result: A 73 year old woman came to our clinic with symptoms of fatigue and mild shortness of breath on exertion for the last 3 months. She was previously active and had a history of dual-chamber pacemaker implanted in 2012 due to complete heart block and regularly attended the scheduled 6-12 monthly follow up which from previous reports showed no abnormal findings. Current EGM tracing revealed an unusual annotation of atrial paced event (AP) followed by a closely spaced dual ventricular sensed event (VS S) persistently occurring in DDD pacing mode (fig. 1). Simultaneous (during DDD) Electrocardiogram (ECG) was done and clearly showed atrioventricular (AV) dissociation in what appears to be “VVI” pacing mode. (fig. 2). After comparing the current ECG with the previous ECG in September 2018 it was suggested that the atrial pacemaker lead was dislodged into the right ventricular (RV) apex. In the September 2018 ECG an atrial sensed event followed by ventricular paced event was evident indicating AV synchrony. The QRS complex had a rS pattern in lead II, III and aVF and qR pattern in lead I and aVL which suggest RV lead was implanted in RVOT mid-septum compared to current ECG which suggest RV lead implanted in RV apex due to QS complex in lead II, III and aVF and monophasic R wave morphology in I and aVL (fig. 2 and 3). Changing the pacing mode to VVI showed the QRS complex morphology to be the same as the QRS complex of the ECG in September 2018 (figure 4). Probable explanation of the dual ventricular sensed event is pacing stimulus artifact from the atrial lead followed by the actual ventricular capture sensed by the ventricular lead. Chest radiograph confirmed our findings (figure 5). Patient underwent atrial lead extraction and dual chamber pacemaker whole system replacement.

Conclusion: Pacemaker lead tracing combine with 12 lead ECG recordings can be helpful in determining the cause of pacemaker malfunction. Atrial lead displacement (macro-dislodgement) with pacemaker malfunction albeit uncommon can still occur years after the initial device implantation.