Changing QRS duration and morphology with a A-paced rhythm and A-sense rhythm in post Cardiac Resynchronization Therapy (CRT) patients.

Ameya Udyavar
Saurabh Deshpande

Introduction: Meticulous interpretation of the post-procedure ECGs of patients with cardiac resynchronization-defibrillator therapy (CRT-D) device is paramount during follow up to ensure optimal synchronization of both the chambers. We present the ECGs of a patient who was implanted with a CRT-D device and was noted to have different morphologies of the biventricular paced QRS depending on where it was an atrial-sense (A-sense) or atrial-paced (A-paced) rhythm. This interpretation is of importance to ensure A-sense rhythm and optimal atrioventricular (AV) delay for maximum benefit of CRT therapy.

Methods: A 61-year-old male, diabetic and hypertensive, presented with heart failure. He had a past history of myocardial infarction with LVEF of 30%. He had LBBB at baseline and was implanted with a CRT-D device. During follow-up after 6 months, his QRS morphology and duration was noted to change depending on whether it was A-sense or A-paced rhythm. The first ECG shows an A-paced rhythm with QRS duration (QRSD) of 200ms, R wave in V1, deep S wave in V5, V6 and RS pattern in lead II. While during A sense rhythm the QRSD reduced to 140ms, RS pattern in V1 and QS (W) pattern in lead II. This narrowing of the QRS and a better BiV paced morphology during A-sensed rhythm will ensure better clinical outcome. There may be multiple reasons for narrowing of the QRS and change in morphology. 1. The A-paced rhythm will cause a delayed left atrial contraction causing decrease LV filling. 2. The morphology of the QRS suggests that A-sense causes a better fusion of the QRS. This fusion might be due to an earlier intrinsic right bundle activation along with the LV paced activation. It is important to note the percentage of A-paced beats so that beta-blockers may need to be adjusted accordingly to ensure A-sense beats.

Result: N/A

Conclusion: In a case of CRT, correct interpretation of the ECG is of paramount importance to ensure A-sense rhythm with a better fused QRS. So, it is prudent to allow the intrinsic atrial beats for the beneficial effects of CRT.