

Electro-mechanical assessment of left ventricle rotation in heart failure patients with left bundle branch block using the NOGA system.

**Objectives:** This study sought to evaluate left ventricle (LV) rotation in heart failure (HF) patients with left bundle branch block (LBBB) by using the 3D NOGA XP electro-mechanical mapping system. **Methods:** 30 patients with HF and LBBB (QRS duration above 150ms) underwent LV electro-mechanical mapping using NOGA XP system. 3D trajectories of catheter movements were recorded and converted to rotational displacement data. Global and segmental rotational electro-mechanical (EM) characteristics were quantified. Based on apex-basal rotation pattern, patients were qualitatively classified into 2 main categories: normal rotation (Group A) and rigid body-type (Group B). Group B was further divided into predominantly clockwise and predominantly counterclockwise rotation subtype. Additionally, selected ventricular EM parameters were measured. **Results:** In patients with HF and co-existing LBBB abnormal rigid-body type rotation was present in 80% of the study population (24 patients). Predominantly clockwise rotation pattern was found in 73% and predominantly counterclockwise rotation pattern in 7% of study participants. NOGA XP system was able to qualitatively characterize ventricular rotational parameters. LV peak torsion was statistically significantly higher in Group A ( $6.19 \pm 3.04$ ) compared to Group B ( $3.7 \pm 1.81$ ),  $p=0.01$ . No differences were observed in global conduction velocity or electro-mechanical delays between the groups. **Conclusion:** Analysis of NOGA XP data allows the evaluation of myocardial EM rotational parameters. This new technique might be applied for further characterization of HF patients based on simultaneous assessment of electrical and mechanical ventricular activation.