

Validated ECG Marker of Sudden Death Risk in Patients With Heart Disease

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Technology description

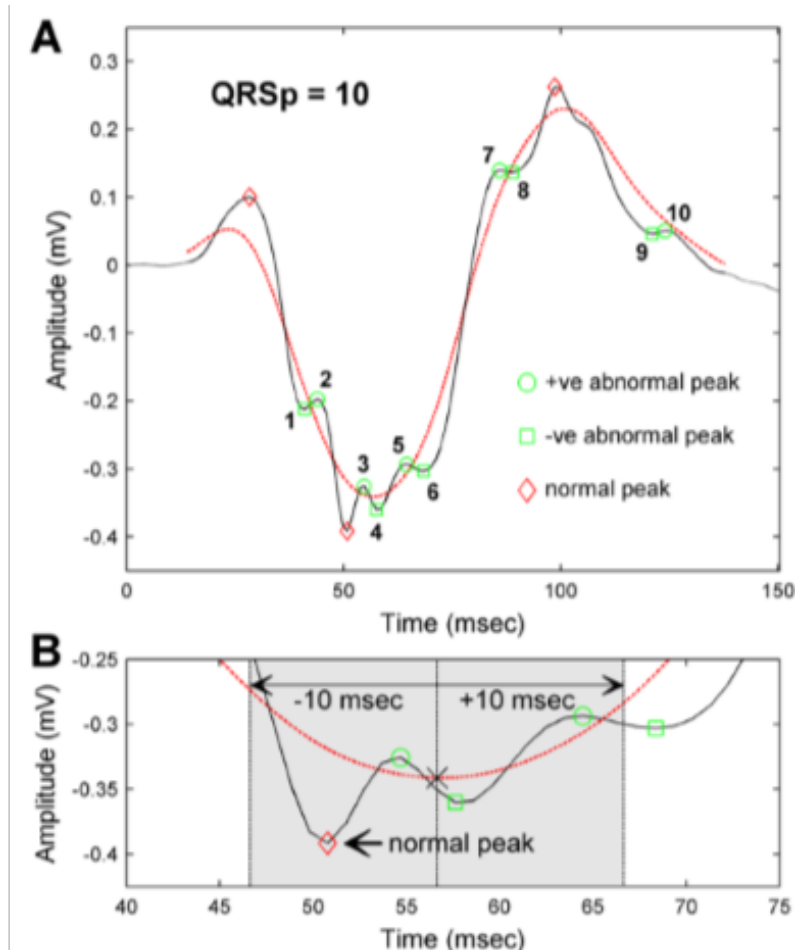
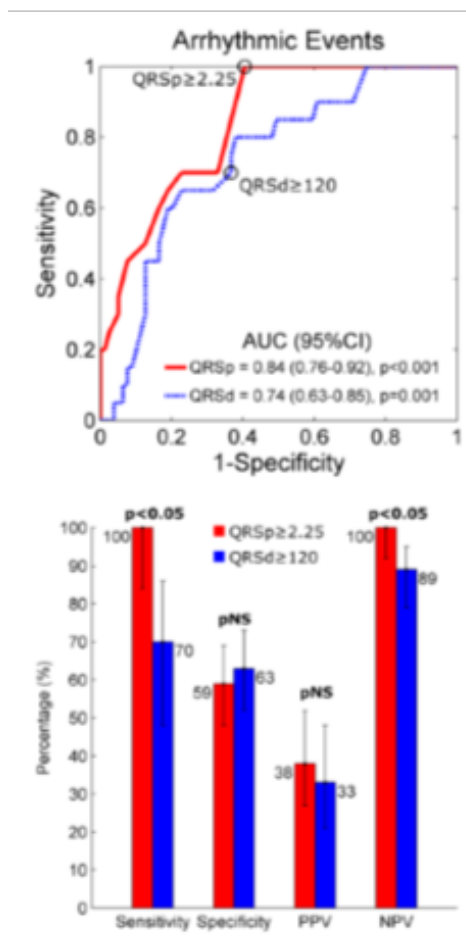
Low amplitude QRS peaks predict ventricular tachyarrhythmias in patients with cardiomyopathy:

Refining risk stratification using quantitative QRS morphology analysis

Cardiomyopathy patients are at risk of sudden death, typically from heterogeneous myocardial scarring that alters normal electrical activation patterns and promotes lethal reentrant ventricular arrhythmias. Identifying high risk patients who will derive survival benefit from defibrillator therapy remains challenging, and traditional QRS metrics have not been reliable. Quantification of low amplitude QRS peaks (QRS_p) on the electrocardiogram (ECG) can provide an index of abnormal conduction, thereby defining arrhythmogenic myocardial substrate.

QRS_p is measured from high resolution digital 12-lead-ECGs recordings. Using our proprietary algorithm, QRS_p is quantified for each ECG lead based on the total number of low amplitude deflections that deviated from the respective naive QRS template. In a large prospective clinical validation study, QRS_p independently predicted ventricular arrhythmic events in patients with cardiomyopathy, such that the risk increased 2-fold for each QRS_p detected. The sensitivity and negative predictive value of QRS_p ≥ 2.25 in detecting arrhythmic events was 100% and 100%, respectively.

When compared to traditional QRS metrics, such as QRS duration, QRS_p had significantly greater sensitivity and negative predictive value. Thus, QRS_p has the potential to improve sudden death risk stratification and patient selection for prophylactic defibrillator therapy.



Publications

Suszko A, Dalvi, R, Das M, **Chauhan VS** . Quantifying abnormal QRS peaks using a novel time-domain peak detection algorithm. Application in patients w. cardiomyopathy at risk of sudden death. IEEE International Conf Electro/Information Technology May 2015;20-24

Application area

Risk stratification of patients with heart disease
Guide prophylactic defibrillator therapy in cardiac patient

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