Title: New diagnostic criteria for accurately localizing the focus of ventricular extrasystoles of outflow tract from surface electrocardiogram analysis

Category: Arrhythmias and Clinical EP

Abstract

Background: The ventricular outflow tract is considered the commonest site of Idiopathic ventricular tachycardia (VT) and premature ventricular contractions (PVCs) in the absence of clinically apparent structural heart disease.

Aim: To assess the diagnostic accuracy of precordial QRS complex voltage in surface ECG for localizing the origin of outflow tract premature ventricular contraction (PVC) and ventricular tachycardia (VT) in patients without structural heart disease.

Patients and Methods: Among 81 consecutive (20 left-sided origin foci) patients, who underwent acutely successful outflow tract ablation, surface ECG was analysed and voltage of QRS and R wave of precordial leads of the PVCs or VT measured.

Results: Of the different various criteria for determining a left from right-sided origin focus, The ratio of Σ (R-voltage) /Σ (QRS-voltage) of all precordial leads was the best discriminator cut-off values of 0.7 with area under the curve (AUC) values based on receiver operator characteristics (ROCs) of 0.892, P<0.001, sensitivity= 0.80(CI:0.743– 1.0) and specificity= 0.966 (CI:0.82- 0.99).

Conclusion: surface ECG analysis allows accurate and reproducible determination left from right-sided ventricular outflow tract foci facilitating mapping and ablation.

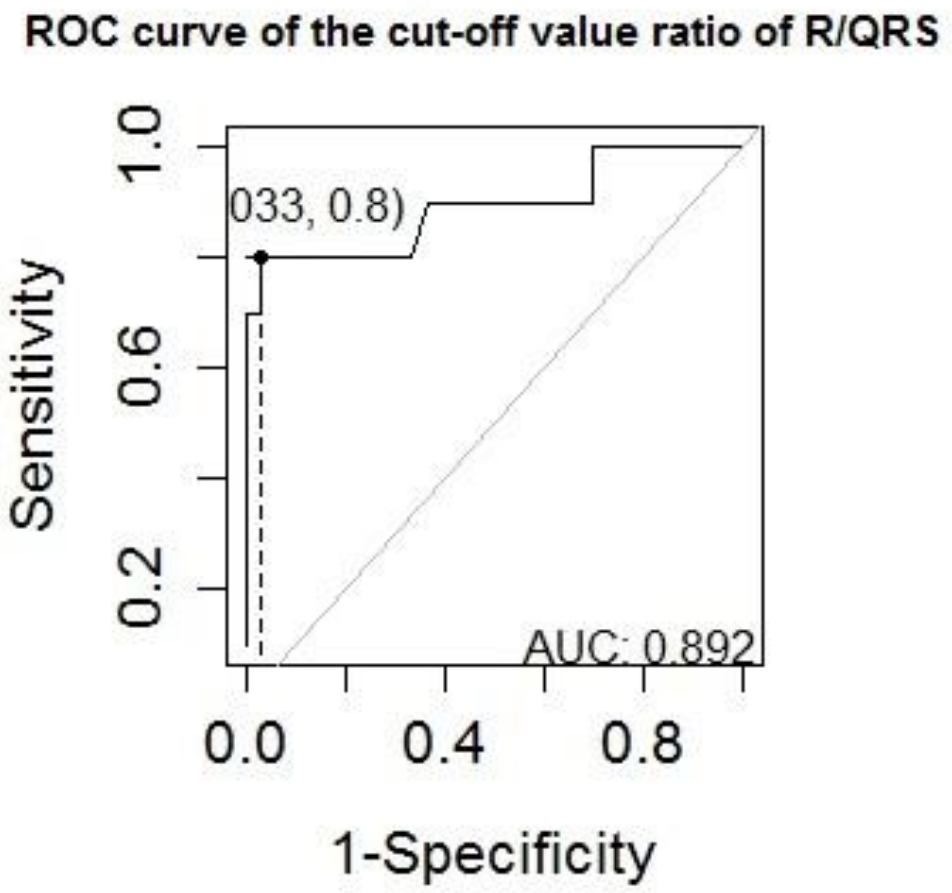
Demographic data:

Variables

Total patients	80
Age	50.41± 15.2
Gender (female)	49 (61.%25)
Hypertension	32 (40%)
Diabetes mellitus	6 (7.5%)
CAD	6 (7.5%)
Congestive heart failure	
• **(TMC)**	4 (5%)
Echo parameter	
• **LVEF (%)**	58.7% (±8%)
• **LVEDd (mm)**	52.08 (±4.9)
• **LVESd (mm)**	35.08 (±5.4)
• **TAPSE (Cm)**	25.38 (±2.7)
• **RVd (mm)**	24.5 (±9.3)
CT	6 (7.5%)
MRI	14 (17.5%)
Myocardial biopsy	1 (1.25%)
(AAD)	
• **Flecanide**	24 (30%)
• **Amiodarone**	5 (6.25%)
• **Sotalol**	2 (2.5%)
• **βB**	52 (65%)
• **CCB**	4 (5%)

Ablation Naive	66 (82.5%)

CAD: coronary artery disease; TMC: tachycardia mediated cardiomyopathy; LVEF: left ventricular ejection fraction; LVEDd: left ventricular end diastolic dimension; LVESd: left ventricular end systolic dimension; TAPSE: Tricuspid annular plane systolic excursion; RVd : right ventricular dimension; CT: computed tomography; MRI: magnetic resonance image; AAD: antiarrhythmic drugs; βB: beta blockers; CCB: calcium channel blockers.



ROC curve: **receiver operating characteristic** of the cut-off value of the ratio of Σ (R-voltage) /Σ (QRS-voltage**) identifying its performance according to sensitivity, specificity and area under the curve.**