Abstract: **P501**

**Electrophysiological characterization of a chronic infarction model with high ventricular tachycardia inducibility rate**

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**Topic(s):**
Ischemia, Infarction, Cardioprotection

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**Introduction**
The risk of sudden cardiac death is higher within the few months after acute myocardial infarction. Identification of proarrhythmic substrate characteristics is necessary in order to stratify the risk of suffering a sudden cardiac death of chronic infarct patients. Therefore, it becomes important to understand the process of electrophysiological remodeling during chronic infarction and its role in the initiation of tachyarrhythmias.

**Purpose**
The purpose of this study is to evaluate the effect of the electrophysiological properties of a chronic infarction swine model with high ventricular tachycardia inducibility rate.

**Methods**
In 25 swine, myocardial infarction was induced by the left anterior descending coronary artery occlusion transiently by a balloon catheter placed just distal to the first diagonal branch for 150 minutes followed by reperfusion. Animals were sacrificed 16 weeks after myocardial infarction and hearts were explanted to be perfused in a Langendorff system where optical mapping of the electrical activity was performed (Fig. 1A). Action potential duration (APD) and conduction velocity (CV) were measured during epicardial right ventricle pacing and during ventricular tachycardias (Fig. 1B). Measures were grouped by zones to distinguish between the normal zone, the heterogeneous tissue present at the scar border zone and the conduction channels.

**Results**
During pacing, APD presented values of $194 \pm 48$ ms in the the normal zone, $222 \pm 52$ ms in the heterogeneous tissue present at the scar border zone, $281 \pm 61$ ms in the conduction channels, differences were identified between the regions under study (p<0.05). CV was $75.6 \pm 12.2$ cm/s, $52.5 \pm 7.2$ cm/s, $33.7 \pm 7.9$ cm/s (p<0.05) for the same areas listed before. Finally, during ventricular tachycardia CV in the border area of infarction presented values of $17.3 \pm 9.2$ cm/s whereas APD was $213 \pm 12$ ms, the area farthest from the infarct presented values of $52.4 \pm 12.3$ cm/s and $181 \pm 9$ ms (p<0.05) (Fig. 1C).

**Conclusions**
Initiation and maintenance of ventricular tachycardia is associated with heterogeneity on APD duration and CVs. This chronic infarction swine model is a consistent ventricular tachycardia model, which simulates realistic tachyarrhythmias. High-resolution optical mapping in this model is useful to study the mechanism of ventricular tachycardia and evaluate the effects of different therapies.
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