COMPARISON OF MONOPHASIC ACTION POTENTIALS RECORDED SIMULTANEOUSLY IN THE RIGHT AND LEFT ATRIUM IN RE-ANIMATED PORCINE HEARTS

Poster Contributions
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Background: Monophasic Action Potentials (MAPs) are electrical signals that represent the focal depolarizations and repolarizations of cardiac myocytes. The detection of MAPs via applied catheters may aid in determining both characteristic waveforms as well as the electrical activity of the underlying cardiac tissue. Recording MAPs in the right and left atria simultaneously can lead to a better understand the depolarization and repolarization times. In addition, we can use this methodology to deduce these values change during arrhythmias. The purpose of the present study was to collect and compare MAPs recorded from the left and right atria in isolated swine hearts.

Methods: Hearts from swine were re-animated using previously described Visible Heart® methodologies: each heart was functioning in a normal sinus rhythm. Modified 7 Fr mapping catheters, with 4 ball electrodes and 2 ring electrodes each, were placed upon the endocardial surface of the right and left atria. The locations of the catheters were verified through internal imaging with endoscopes and fluoroscopy. Right and left atrial MAPs, along with the ECG, were recorded using a multichannel recorder.

Results: Preliminary results show the activation times (AT) for the right atrium were around 70msec shorter than those of the left atrium (n = 10). When looking at the time taken to repolarize by 90% (APD90) the Right Atrium depolarized slightly slower, taking about 9 msec longer on average. These two results combined lead to the right atrium having shorter repolarization time than the left atrium by about 52 msec (AT + APD90). Arrhythmias were induced in both the right and left atria and the relative activation/repolarizations were recorded.

Conclusion: The assessment of Monophasic Action Potentials simultaneously recorded from the myocardium in both the right and left atria, can lead to a better understanding of the conduction pathways and the origin of arrhythmias. Using this approach, we can begin to better understand the specifics behind the changes in right and left atrial contractions, and how they are altered during arrhythmias.