

1-2020

Evaluation of Ventricular Repolarization in Patients Undergoing Cardiac Resynchronization Therapy (CRT) Using Two Modalities: Conventional Biventricular Pacing vs. His-Bundle Pacing

Anshul Gupta

Behzad B. Pavri, MD, FHRS

Follow this and additional works at: https://jdc.jefferson.edu/si_dh_2022_phase1

 Part of the [Cardiology Commons](#)

[Let us know how access to this document benefits you](#)

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Phase 1 by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.

SKMC Class of 2022: SI/DH Abstract

Word Count: 269

Evaluation of Ventricular Repolarization in Patients Undergoing Cardiac Resynchronization Therapy (CRT) Using Two Modalities: Conventional Biventricular Pacing vs. His-Bundle Pacing

Anshul Gupta, Behzad B. Pavri, MD, FHRS*

** indicates primary project advisor*

Introduction:

Permanent His-bundle pacing (HBP) is being used as an alternative to biventricular pacing (BiVP) for CRT. HBP preserves the physiologic pattern of ventricular activation and markedly reduces ventricular dyssynchrony. While ventricular depolarization with HBP vs. BiVP has been studied, the effects of the 2 modalities on repolarization have not been compared. The purpose of this study was to compare ventricular repolarization in patients with HBP and BiVP. We hypothesize that HBP provides more physiologic repolarization as compared to BiVP.

Methods:

ECG repolarization parameters were analyzed in patients who underwent HBP and BiVP using the first available ECG post implant. Parameters included:

- 1) T Peak – T End (Tp-Te_{Apical}): Tp-Te in lead V5, and if not measurable, then in V4/V6
- 2) Tp-Te_{Total}: Earliest T peak to the latest T end across all precordial leads
- 3) T Peak Dispersion: Absolute difference between the earliest and latest T peaks across all precordial leads

Data was compared using a two-tailed unequal variance Student's t-test.

Results:

Data from 23 HBP patients and 23 BiVP patients was analyzed. The average HBP Tp-Te_{Apical} of 74 ± 7 ms was less than the BiVP Tp-Te_{Apical} of 112 ± 15 ms ($p < 0.01$). Similarly, average HBP Tp-Te_{Total} of 106 ± 11 ms was smaller than the BiVP Tp-Te_{Total} of 145 ± 17 ms ($p < 0.01$). The difference between Tpeak dispersion between the two groups was not significant.

Conclusion:

Tp-Te interval, a known measure of dispersion of repolarization and marker of arrhythmic risk, is more physiologic (lower) with HBP as compared to BiVP. These data suggest that in addition to physiologic depolarization, HBP also provides physiologic repolarization and potentially lower arrhythmic risk compared to BiVP.