

Impact of His bundle pacing versus right ventricle pacing on right ventricular performance in patients undergoing permanent pacemaker implantation

Domenico Grieco¹, Edoardo Bressi², Karol Curila³, Santosh Padala⁴, Kamil Sedlacek⁵, Jordana Kron⁶, Elisa Fedele², Ermenegildo de Ruvo⁷, Kenneth Ellenbogen⁸, Leonardo Calò², Oana Ionita³, Sara Giannuzzi², Alessandro Fagagnini², Jessica Formichetti², Luca Sangiovanni², Monia Minati⁹, and Germana Panattoni²

¹Policlinico Casilino of Rome

²Policlinico Casilino

³, Charles University and University Hospital Kralovske Vinohrady

⁴Virginia Commonwealth University, Medical College of Virginia hospitals

⁵University Hospital Hradec Kralove

⁶Virginia commonwealth University

⁷Policlinico Casilino, ASL RM/B

⁸Virginia Commonwealth University

⁹Policlinico Casilino, ASL Roma B

September 8, 2020

Abstract

Introduction. His Bundle pacing (HBP) is an emerging pacing technique that reproduces a more physiological ventricular synchronization than right ventricle pacing (RVP). However, its effects on the right ventricle (RV) performance are still unknown. **Methods.** In this observational study, we enrolled 84 patients (mean age 75.1 ± 7.9 years, 64% male) with indication for pacemaker implantation to compare the effects of HBP versus RVP on RV performance. 42 patients (50%) underwent successful HBP and 42 patients (50%) apical RVP. Patients were evaluated both at baseline and after six months by transthoracic echocardiogram. **Results.** At six months follow up, we found a significant improvement in RV-GLS (baseline: HBP -17.2 ± 4.7 vs. RVP -16.1 ± 3.7 to 6-months: HBP -19.5 ± 4.2 vs. RVP -13.6 ± 2.9 , $p < 0.0001$) and RV-FAC (baseline: HBP $33.8 \pm 3.9\%$ vs. RVP $33.3 \pm 5.3\%$ to 6-months: HBP $36.2 \pm 3.7\%$ vs. RVP $30.9 \pm 5.1\%$, $p < 0.0001$) with HBP whereas RVP was associated with a significant decline in both parameters. Moreover, RVP was associated with a significant worsening of TAPSE (baseline: HBP 20.2 ± 4.1 mm vs. RVP 21.2 ± 4.3 mm to 6-months: HBP 20.3 ± 3.8 mm vs. RVP 18.5 ± 3.5 mm, $p = 0.014$) and tricuspid S wave velocity (baseline: HBP 11.2 ± 2.9 cm/sec vs. RVP 11.8 ± 2.3 cm/sec to 6-months: HBP 11.3 ± 2.2 cm/sec vs. RVP 10.3 ± 1.9 mm, $p < 0.0001$) compared to HBP. Conversely from RVP, HBP significantly improved PASP (baseline: HBP 36.7 ± 7.3 mmHg vs. RVP 34.6 ± 6.1 mmHg to 6-months: HBP 32.4 ± 5.9 mmHg vs. RVP 38.7 ± 5.6 mmHg, $p < 0.0001$) and tricuspid regurgitation ($p = 0.005$) at six-months. **Conclusions.** HBP ensues a beneficial and protective impact on RV performance compared with RVP.

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