

Does Changing the Pace Anode Affect Phrenic Nerve Stimulation Thresholds?

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Introduction:

One approach to mitigating phrenic nerve stimulation (PS) is to change the programmed pace vector. While it is common to change the cathode (-), the clinician may prefer to change the anode (+) instead, for hemodynamic reasons. Research was conducted to characterize the impact of changing either the cathode or the anode in order to avoid PS. Data were collected from pts who exhibit PS during LV pacing in the Detection of Phrenic Nerve Stimulation using Accelerometer and Electrogram Signals (DETECT PS) Study.

Methods:

CRT-D pts with bipolar LV leads were enrolled if PS was present in at least one pacing configuration. Step-up voltage tests were conducted in 2 bipolar, 2 extended bipolar, and 2 unipolar pacing vectors at a pulse width of 0.4ms, and pt-reported PS thresholds were recorded for each test. The cathodes tested were LV Tip and LV Ring, while the anodes were LV Ring/Tip (bipolar), RV(extended bipolar), or Can (unipolar).

Results:

PS threshold data were obtained from 53 patients. Of the 33 patients with PS present in both cathodes, switching from one cathode to another (with any anode combination) resulted in an average change of $2.1 \pm 1.4V$ between the PS threshold and the LV capture threshold (PS-LV margin). With a constant cathode, the average maximum change in PS-LV margin observed when switching between the three anodes is $1.4 \pm 1.1V$. With an LV Tip and an LV Ring cathode, 18 and 14 patients benefitted from a change in anodes (PS threshold $> 7.5V$), respectively.

Conclusion:

Although changing the pace vector cathode has a larger impact on the PS-LV margin, switching the anode can have a considerable effect on the PS-LV margin and may be an option for avoiding PS.

