Indian Pacing and Electrophysiology Journal 19 (2019) 39

Contents lists available at ScienceDirect

Indian Pacing and Electrophysiology Journal

journal homepage: www.elsevier.com/locate/IPEJ

Paced QRS morphology and outcomes

The paper by van Zyl et al. from the Mayo Clinic [1] is of great interest as it demonstrates that valuable prognostic information can be gleaned from the morphology of the Paced QRS. The authors bring to their study a very substantial number of patients with long and detailed follow-up. The great beauty of the study is its simplicity, offering something that is easily assimilated and used in practice for all clinicians involved with permanent cardiac pacing. Their data has all been drawn from two leads (I & aVL) of the standard 12-lead ECG. Twelve lead ECGs are a routine part of patient management after pacemaker implantation but not necessarily part of routine out-patient follow-up. A necessity for this is implied in order to capture the available information on patient progress. However, 12-lead ECGs, at least in standard form, are not now part of remote monitoring of cardiac implantable electronic devices (CIEDs). A surrogate for this, indeed lead I only, may be adequate and feasible, tested for reliability would seem to offer increased value as remote monitoring is generally accepted to be an extremely helpful and predictive tool in long-term CIED management [2].

The authors examined total paced QRS complex duration and intrinsicoid deflection (R-wave peak time) but the two parameters seemed to give very similar prognostic information. The more surprising finding, even perhaps counter-intuitive, was that when the measured parameters were longer carrying a worse prognosis for left ventricular function there was less atrial fibrillation. The authors explain this by citing their own data from within this study and that of another report from their group [3]. Pacing at non-right ventricular apical sites appears to increase incidence of atrial fibrillation but decrease the deterioration of ventricular function over time. In this study the vast majority of patients was paced from the right ventricular apex. The authors state that 'septal pacing may substantially improve LV activation time which, in turn, could abbreviate atrial emptying before valve closure. This could lead to higher left atrial pressures, atrial stretch, and – ultimately – atrial fibrillation'. This is an interesting hypothesis which requires further exploration. A simple 12-lead ECG will be the main methodology for this. Analysis of paced QRS in His bundle pacing may further illuminate the relation of intrinsicoid deflection to incidence of atrial fibrillation [4].

In acting as reviewer for this paper for publication, I recalled that in the very first issue of the European Journal of Cardiac Pacing and Electrophysiology, in 1991 [5,6], was a similar but simpler article with many fewer patients. The Mayo authors did not know of this work, unsurprisingly, because that journal is now defunct and is not in Index Medicus. However, they were gracious enough to reference it as it showed that the concept was not new but they have been able to take it much further in the two major ways covered above. Their literature search revealed nothing on the subject of prediction of left ventricular dysfunction from the paced QRS until the years 2005–2016 (their references 14–19).

The Mayo authors are encouraged to continue their excellent work on the paced QRS.

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Available online 8 March 2019

Peer review under responsibility of Indian Heart Rhythm Society.

https://doi.org/10.1016/j.ipej.2019.03.002