QRS narrowing and prediction of response to cardiac resynchronization therapy

To the Editor,

Şipal et al. (1) have reported that surface electrocardiogram (ECG) can be used to guide left ventricular (LV) lead placement in patients with multiple target veins. In this prospective study, they demonstrated that LV lead placement guided by ECG improves response to cardiac resynchronization therapy (CRT).

In this well-presented article by Şipal and colleagues, they randomized 80 patients into two groups at a 1:1 ratio. In group 1, they placed the LV lead at the site with the narrowest BiV-paced QRS, as intraprocedurally measured using surface ECG. In group 2 (control), the patients un¬derwent standard CRT implantation without ECG guidance, preferentially in a lateral, posterior, or posterolateral vein. In group 1, they observed that ECG duration 6 months postoperatively was shorter than that at the baseline. In group 2, they observed that ECG duration 6 months postoperatively was similar to that at the baseline. Nonetheless, functional class improved in both the groups.

Korantzopoulos et al. (2) have demonstrated that QRS narrowing was a positive predictor of response to CRT. Lecoq et al. (3) have shown that the extent of QRS shortening (DeltaQRS) associated with biventricular stimulation was the only independent predictor of response to CRT. In the light of this knowledge, it might be beneficial to describe why patients in study group 2 showed a better functional status despite no change in the ECG duration.

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References

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Author`s Reply

To the Editor,

We would like to thank the authors for their valuable comments on our recently published study titled "Surface electrogram-guided left ventricular lead placement improves response to cardiac resynchronization therapy" (1). Compared with group 2 (conventional LV lead placement group), group 1 (ECG-guided LV lead placement group) had a greater proportion of clinical responders; however, no significant differences were found (85% vs. 70%, p=0.181). In contrast, group 1 had a significantly higher rate (85% vs. 50%, p=0.02) of echocardiographic response to cardiac resynchronization therapy (CRT).

CRT is an established therapy for heart failure patients with reduced LV ejection fraction and prolonged QRS duration, leading to important improvements in LV function and prognosis. However, up to 30% of patients do not respond to CRT. In group 1, both clinical and echocardiographic responses were found to be 85%. Therefore, the newly applied method can be considered useful for patients with multiple target veins.

CRT helps to restore dyssynchrony, improves LV function, reduces functional mitral regurgitation, and induces LV reverse remodeling (2, 3). Since the mechanism of benefit is rather heterogeneous, a clear deŞnition of response to CRT remains to be established, and both echocardiographic and clinical end-points can be used. As such, "identifying optimal predictors" used to define a favorable response remains a challenge. Furthermore, whether patients with clinical response also improve in echocardiographic end-points remains unknown (4). Bleeker et al. (5) have evaluated the correlation between clinical and echocardiographic improvement and have found discordance between the clinical response and >15% LVESV reduction as well as discordance in the clinical response and >5% absolute LVEF improvement. Despite such a discordance, it should be noted that the echocardiographic response rate was significantly low (50%) in group 2.

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