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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 definition 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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