

Abstract:

More than 20 % of patients (pts) with congestive heart failure (ischemic or non ischemic)do exhibit one form or another of mechanical dyssynchrony, intraventricular conduction impairment, or bundle branch block.

In 1992 Hochletiner introduced the concept of dual chamber pacing in refractory heart failure to be followed later by the introduction of the technique of biventricular pacing to restore cardiac synchrony in the failing heart. Technical and economic limitations currently restrict the use of biventricular pacing to only pts with LBBB or conduction impairment or those in whom tissue Doppler imaging (TDI) shows a wide septal-posterior wall asynchrony.

The present study is addressing the issue of applying the technique of left ventricular (LV) pacing to that substrate of heart failure pts with normal rather than wide QRS complex, and with LV rather than biventricular pacing in order to permit the use of an ordinary dual chamber pacemaker rather than the expensive multisite pacemaker generator.

Patients & Methods: To achieve our purpose, we conducted an acute study on 12 pts (10 M, 2 F mean age 45 yrs) all had CHF (7 ischemic, 3 rheumatic and 2 idiopathic) with normal QRS duration on ECG.

All pts were under conventional anti failure treatment. Following clinical evaluation, all pts were subjected to M-mode & 2D echocardiography with the following parameters measured: left ventricular end diastolic dimension (LVEDD), left ventricular end systolic dimension (LVESD), fractional shortening (FS), ejection fraction (%EF) and cardiac output (CO) before and after intervention. All pts were under conventional antifailure treatment (4 pts needed vasoactive drugs at one time or another). Following stabilization, all pts were subjected to temporary dual chamber RA, LV pacing, the LV lead was passed retrogradely via transaortic route. Hemodynamicis were measured using trilumen, balloon-tipped thermodilution Swan Ganz catheter for monitoring of hemodynamic variables. Hemodynamic measurements involving RAP, PCWP & CO were taken at the basal level without pacing and following 30 min of pacing in VDD-LV fashion. Patients were divided into those with PCWP > 15mmHg (7 pts) & those with PCWP < 15mmHg (5 pts).

Results: Compared to pre pacing phase, hemodynamics after pacing in group I (pts with PCWP > 15 mmHg) exhibited significantly lower RAP (from 23.2 to 18.2 mmHg, P <0.03), lower PCWP (form 28.43+3.6 to 21.14+1.68 mmHg, P < 0.004) and higher CO (from 3.44±0.53 to 4.03±0.44 L/min, P < 0.043) where as echo measurements showed significantly lower LVEDD (6.53 vs 5.12 cm, P <0.004), lower LVESD (4.65 vs 4.01 cm, P <0.034), higher FS% (16.71 vs 18.42%, P <0.04) and higher EF% (32.71 vs 39.42%, P < 0.0336).

On the other hand, following pacing in group II, (pts with PCWP < 15 mmHg), hemodynamics were not significantly different from pre pacing values.

In Conclusion: Single LV -rather than biventricular -pacing, could achieve remarkable hemodynamic beneficial effects in pts with CHF even with normal QRS, but only in that substrate of pts with a high PCWP.

Although this is an acute study, yet our findings open the scope for wide spread application of the concept of multisite pacing for those pts without the classic echo criteria of dyssynchrony using simple DDD with LV pacing.

Key words: Echocardiographic, left ventricular pacing, heart failure, narrow QRS