

# Over-time mitral regurgitation changes following cardiac resynchronization therapy

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## ABSTRACT

**Purpose:** Mitral regurgitation (MR) is a leading cause of mortality in patients with heart failure (HF). Cardiac resynchronization therapy (CRT) has been shown to improve MR in these patients, but maintenance of MR improvement after CRT implantation has not yet been evaluated. We aimed to evaluate the post-CRT improvement pattern of MR in a 6-month follow-up period.

**Materials and Methods:** 65 consecutive patients scheduled for CRT implantation with inclusion criteria of moderate to severe heart failure, left ventricular ejection fraction (LVEF)  $\leq 35\%$ , and QRS duration  $>120$  ms with left bundle branch block configuration were invited to participate. 60 patients with MR were registered. Clinical, electrocardiographic and echocardiographic evaluations were recorded before CRT implantation and 3 and 6 months after.

**Results:** We found significant improvement in MR score, NYHA class, QRS duration, LVEF and left ventricular end diastolic diameter (LVEDD) at the 3-month follow-up ( $p < 0.001$ ). These parameters also improved significantly ( $p < 0.0001$ ) between the 3 and 6-month follow-ups except for the MR score, which did not show any significant improvement.

**Conclusion:** MR improvement was sustained after CRT implantation between the 3 and 6-month follow-ups.

**Key words:** cardiac resynchronization therapy, congestive heart failure, mitral regurgitation.

## INTRODUCTION

Cardiac resynchronization therapy (CRT) has been shown to improve hemodynamic parameters, exercise capacity, symptoms and quality of life, and also to reduce hospitalization among patients with heart failure (HF) who have prolongation of the QRS duration [1,2].

Functional mitral regurgitation (MR) is common in patients with chronic HF and represents a significant complication of end-stage cardiomyopathy. Correction of MR is a major issue in the management of patients with HF and has important prognostic implications, since the presence of moderate to severe mitral regurgitation is associated with a higher mortality rate among both the middle-aged and the elderly suffering from HF [3-9]. Ventricular asynchrony has been shown to be a factor influencing the severity of MR in patients with HF [10], and several studies have shown that CRT improves functional

MR both acutely and in trials lasting up to 6 months [1,11-14], but a review of the literature indicates that little is known about the improvement pattern of MR by post-CRT duration. This motivated us to design a longitudinal study to assess MR changes over a period of 6 months in patients with moderate to severe HF.

## MATERIALS AND METHODS

### Study population and data collection:

We studied 65 consecutive patients with moderate to severe heart failure (New York Heart Association [NYHA] class III or IV), LV ejection fraction (LVEF)  $\leq 35\%$ , and QRS duration  $>120$  ms with left bundle branch block configuration scheduled for the implantation of CRT devices in Jamaran Heart Hospital from 2004 to 2007. 60 patients who had MR