

## Percutaneous Mitral Valve Repair and CRT: What are we Forgetting?

Andrea Matteucci MD

Department of Experimental Medicine, University of Rome "Tor Vergata", Rome, Italy.

### Article Info

Received: June 25, 2021

Accepted: June 29, 2021

Published: July 02, 2021

**\*Corresponding author:** Andrea Matteucci, Department of Experimental Medicine, Policlinico Tor Vergata, University of Rome, Viale Oxford 81, 00133 Rome, Italy.

**Citation:** Matteucci A. (2021) "Percutaneous mitral valve repair and CRT: what are we forgetting?" *J Clinical Cardiology Interventions*, 2(4); DOI: <http://doi.org/04.2021/1.1020>.

**Copyright:** © 2021 Andrea Matteucci. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Abstract

Left ventricular dysfunction in patients with dilated cardiomyopathy frequently induces secondary mitral regurgitation (MR), which correlates with a poor long-term prognosis. SMR also occurs in about one third of patients undergoing cardiac resynchronisation therapy (CRT) [1,2]. The simultaneous presence of HF with severe SMR not improving after CRT results in an even higher risk of mortality and morbidity [3]. Transcatheter mitral valve repair (TMVr) of severe SMR is now widely used and ensures improvement in functional class. Several studies have already shown that major adverse cardiovascular events (MACE) reduced after TMVr [3].

**Keywords:** cardiac resynchronisation therapy; mitral valve repair; premature ventricular complexes

### Introduction

Left ventricular dysfunction in patients with dilated cardiomyopathy frequently induces secondary mitral regurgitation (MR), which correlates with a poor long-term prognosis. SMR also occurs in about one third of patients undergoing cardiac resynchronisation therapy (CRT) [1,2]. The simultaneous presence of HF with severe SMR not improving after CRT results in an even higher risk of mortality and morbidity [3]. Transcatheter mitral valve repair (TMVr) of severe SMR is now widely used and ensures improvement in functional class. Several studies have already shown that major adverse cardiovascular events (MACE) reduced after TMVr [3].

It has also been demonstrated that in the presence of not excessively dilated ventricles it can reduce left ventricular volumes leading to reverse remodelling in patients who are not responding to CRT3. Additionally, chronic mitral regurgitation is a potential trigger for complex ventricular arrhythmias [4]. In recognition of this, it could be interesting to determine whether left ventricular remodelling after MR reduction is also associated with an improvement in non-life-threatening arrhythmias. Specifically, a very frequent condition is the association of premature ventricular complexes (PVCs) with MR and ischaemic heart disease [5].

PVCs lead to dyssynchronous ventricular contraction, decrease cardiac output, and worsen the quality of life of the heart failure (HF) patient. The significance of these effects is even greater in patients with CRT, where the presence of PVCs is responsible for the reduced effectiveness of resynchronisation therapy. TMVr is often used as MR therapy in patients with HF and CRT. After TMVr, left ventricular changes allow a partial return to pre-MR conditions over time. The indirect effect of mitral repair is to modify the substrate from which PVCs originate, leading to a reduction in the burden of PVCs. In other words, TMVr may improve the efficacy of CRT by decreasing PVCs, which commonly represent the first cause of dyssynchrony. Resynchronisation devices are equipped with remote monitoring systems that can provide the clinician with information on the status of the device [6].

The burden of PVCs is indeed an unrewarding finding from monitoring. It is therefore possible to discriminate between PVCs associated with triggered activity or reversible disturbances of myocardial working tissue, which are likely to disappear with remodelling, and PVCs associated with re-entry phenomena whose substrate is different and which require other treatments to eradicate them. This is why large, randomised trials cannot neglect this aspect, and should also focus on the analysis of the PVCs burden post TMVr.



This simple parameter can provide a lot of information and can easily be used to further improve and optimise the CRT patient experience. The aim is to analyse and better understand, through remote monitoring of CRT patients, the underlying pathophysiological mechanisms of PVCs in order to guide the patient in the choice of the best treatment and improve quality of life.

**Funding Source:** None

**Conflict of Interest:** The Author report no relationships that could be construed as a conflict of interest

**Final Approval of Manuscript:** All Authors

## References

1. Koelling TM, Aaronson KD, Cody RJ, Bach DS, Armstrong WF. (2002). Prognostic significance of mitral regurgitation and tricuspid regurgitation in patients with left ventricular systolic dysfunction. *Am Heart J.* 144:524–529.
2. Sannino A, Smith RL 2nd, Schiattarella GG, Trimarco B, Esposito G, Grayburn PA. (2017). Survival and cardiovascular outcomes of patients with secondary mitral regurgitation: a systematic review and meta-analysis. *JAMA Cardiol.* 2:1130–1139.
3. Auricchio A, Schillinger W, Meyer S, Maisano F, Hoffmann R, Ussia GP, Pedrazzini GB, van der Heyden J, Fratini S, Klersy C, et al; (2011). PERMIT-CARE Investigators. Correction of mitral regurgitation in nonresponders to cardiac resynchronization therapy by mitraclip improves symptoms and promotes reverse remodeling. *J Am Coll Cardiol.* 58:2183–2189.
4. Graf G, Pascale P, Monney P. (2021). Prolapsus mitral: une étiologie méconnue d'arythmie ventriculaire et de mort subite [Mitral valve prolapse beyond mitral regurgitation, the arrhythmic risk]. *Rev Med Suisse.* 17(740):1029-1033
5. Marcus GM. (2020). Evaluation and Management of Premature Ventricular Complexes. *Circulation.* 141(17):1404-1418.
6. Boriani G, Da Costa A, Quesada A, Ricci RP, Favale S, Boscolo G, Clementy N, Amori V, Mangoni di S Stefano L, Burri H; (2017). MORE-CARE Study Investigators. Effects of remote monitoring on clinical outcomes and use of healthcare resources in heart failure patients with biventricular defibrillators: results of the MORE-CARE multicentre randomized controlled trial. *Eur J Heart Fail.* 19(3):416-425.. Epub 2016 Aug 28. PMID: 27568392