JACC
Cardiovascular Imaging
A Journal of the American College of Cardiology

OCTOBER 2017
VOLUME 10
NUMBER 10
PART A

ORIGINAL RESEARCH

1091 Long-Term Outcome After CRT in the Presence of Mechanical Dyssynchrony Seen With Chronic RV Pacing or Intrinsic LBBB
I. Stankovic, J.-U. Voigt, et al.
■ EDITORIAL Rocking and Flashing With RV Pacing: Implications for Resynchronization Therapy
J. Gorcsan III, J. Lumens

1103 Coronary Artery PET/MR Imaging: Feasibility, Limitations, and Solutions
P.M. Robson, Z.A. Fayad, et al.
■ EDITORIAL Can PET/MR Imaging Assess Coronary Artery Plaque Biology?
D. Li, D.S. Berman

1116 Accuracy of Noncontrast Quiescent-Interval Single-Shot Lower Extremity MR Angiography Versus CT Angiography for Diagnosis of Peripheral Artery Disease: Comparison With Digital Subtraction Angiography
A. Varga-Szemes, T.M. Todoran, et al.
■ EDITORIAL QISS MR Angiography: An Alternative to CT Angiography for Peripheral Vascular Evaluation
J.C. Carr

1128 Coronary Plaque Burden and Adverse Plaque Characteristics Are Increased in Healthy Relatives of Patients With Early Onset Coronary Artery Disease
M.K. Christiansen, H.K. Jensen, et al.
■ EDITORIAL What's a Malignant Family History? You'll Know It When You See It
A. Khera, P. Joshi

1139 A Highly Predictive Risk Model for Pacemaker Implantation After TAVR
Y. Maeno, H. Jilaihawi, et al.
■ EDITORIAL Pacemaker Implantation After TAVR
S.R. Kapadia, A. Krishnaswamy, et al.

1151 Serial Assessment of Tissue Precursors and Progression of Coronary Calcification Analyzed by Fusion of IVUS and OCT: 5-Year Follow-Up of Scaffolded and Nonscaffolded Arteries
Y. Zeng, P.W. Serruys, et al.
■ EDITORIAL Consequences of Vascular Calcification: Implications for Bioresorbable Vascular Scaffolds
M. Joner, E. Xhepa

STATE-OF-THE-ART PAPERS

1165 MR/PET Imaging of the Cardiovascular System
P.M. Robson, M.R. Dweck, et al.

1180 Role of Cardiac Magnetic Resonance in the Diagnosis and Prognosis of Nonischemic Cardiomyopathy
A.R. Patel, C.M. Kramer

IMAGING VIGNETTE

1194 Use of Echocardiography for Guiding Percutaneous Tricuspid Valve Procedures
E. Agricola, A. Latib, et al.

1199 LETTERS TO THE EDITOR

■ www.jacc-imaging.org

ELSEVIER
ISSN 1936-878X

4. Morino Y, Abe M, Morimoto T, et al. Predicting successful guidewire crossing through chronic total occlusion of native coronary lesions within 30 minutes. J Am Coll Cardiol Intv 2011;4:213–21.

THE AUTHORS REPLY:

We thank Dr. Opolski and colleagues for their interest in our study (1). Compared with the study by Dr. Opolski and associates (2), our study (1) had a lower 30-min wire crossing rate (29% vs. 55%), but a much higher procedural success rate (83% vs. 62%) when treating chronic total occlusions (CTOs) with percutaneous coronary intervention (PCI). A possible reason for the lower prevalence of 30-min wire crossing in our study was that we began each procedure with a soft to intermediate guidewire and were not quick to switch to a stiffer wire, and we often used a parallel wire technique to optimize the frequency of intraplaque versus subintimal tracking.

The main reason for this approach was to reduce short-term complications. Moreover, we were concerned that stent implantation into a subintimal space could have a negative impact on long-term patency of the treated vessel. In addition, true lumen re-entry devices were not available in our institution. Thus our goal was not to cross a CTO as soon as possible, but to be methodical and minimize vessel trauma. This methodical approach, along with the possibility of a population of patients with simpler CTOs, may explain the much higher success rate because the lesions in our study (1) did have a lower J-CTO (Multicenter CTO Registry Japan) score than in the study by Dr. Opolski and colleagues (2). Furthermore, the prevalence of the retrograde approach in our study was 3 times higher than in the study by Dr. Opolski and colleagues (2) (33% vs. 11%, respectively); consequently, we had more fluoroscopy time (74 min vs. 30 min, respectively) and more contrast volume (327 ml vs. 213 ml, respectively). Finally, physicians are less interested in predicting 30-min wire crossing times than previously, whereas predicting the final procedural success rate has become a more important endpoint for operators. Predicting procedural success may be more challenging than predicting 30-min wire crossing because procedural success can be influenced by many factors other than lesion morphology; it indeed depends on the indication for PCI for of CTO, the procedure strategy, and allocation of resources, especially in difficult CTO lesions. Nevertheless, we agree with Dr. Opolski and colleagues (2) that as an adjunctive strategy for comparing PCI for CTOs including morphological features and success rates, computed tomography angiography should be used more universally.

Akiko Fujino, MD*
Satoru Otsuji, MD
Katsuyuki Hasegawa, MD
Yorihiko Higashino, MD

*Department of Cardiology
Higashi Takarazuka Satoh Hospital
2-1 Nagaocho, Takarazuka
Hyogo 665-0873, Japan
E-mail: kakibouzu@gmail.com

http://dx.doi.org/10.1016/j.jcmg.2017.08.002

Please note: The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

REFERENCES

1. Fujino A, Otsuji S, Hasegawa K, et al. Accuracy of J-CTO Score derived from computed tomography versus angiography to predict successful percutaneous coronary intervention. J Am Coll Cardiol Img 2017 June 14 [E-pub ahead of print].

2. Opolski MP, Achenbach S, Schuhbäck A, et al. Coronary computed tomographic prediction rule for time-efficient guidewire crossing through chronic total occlusion: insights from the CT-RECTOR multicenter registry (Computed Tomography Registry of Chronic Total Occlusion Revascularization). J Am Coll Cardiol Intv 2015;8:257–67.

Exercise Echocardiography in Aortic Stenosis

A Happy End?

We read with interest the paper from Messika-Zeitoun et al. (1), which showed that neither the increase in mean pressure gradient (MPG) nor the systolic pulmonary hypertension at exercise were predictive of aortic stenosis (AS)-related events in patients with asymptomatic AS and a normal exercise test. A small proportion of the patients (24%) examined had an abnormal exercise test. Thirty-four percent of those with a normal test had a MPG increase >20 mm Hg and/or systolic pulmonary artery pressure at peak exercise >60 mm Hg, which occurred at a lower rate than in previous studies (2). Intriguingly, only 2 patients had both criteria at exercise. The inclusion of patients with moderate AS might have contributed to this observation. Noteworthy would be to know the impact of each parameter taken separately on the outcome of patients with severe AS. Interestingly, MPG changes during exercise were higher in patients with an abnormal exercise test, indicating a more advanced disease stage. However, the rate of changes in MPG was particularly high, with values reaching a delta of more than 120 mm Hg. To avoid any

confusion, it would be of paramount to get the delta for the peak pressure gradient. A very high gradient at exercise, although it may characterize very severe AS with limited valve compliance, could result from mistaking the aortic flow with mitral regurgitation or in the case of dynamic outflow tract obstruction. Adequate image recording during exercise is mandatory to ascertain the strength of exercise echocardiography. The technology and training requirements needed for the use of exercise echocardiography in AS impose additional skills as compared with those applied to coronary artery disease (3). In the present study, the authors included 148 patients over a 10-year period, meaning 1.4 patients per month on average for the imaging operators.

Patrizio Lancellotti, MD, PhD*
Tadafumi Sugimoto, MD
Raluca Dulgheru, MD

*Domaine Universitaire du Sart Tilman
Batiment B35
Department of Cardiology, University Hospital
Université de Liège, CHU du Sart Tilman
4000 Liège, Belgium
E-mail: plancellotti@chu.ulg.ac.be

http://dx.doi.org/10.1016/j.jcmg.2017.08.011

Please note: The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

REFERENCES

1. Goublaire C, Melissopoulou M, Lobo D, et al. Prognostic value of exercise-stress echocardiography in asymptomatic patients with aortic valve stenosis. J Am Coll Cardiol Img 2017 Jul 13 [E-pub ahead of print].

2. Maréchaux S, Hachicha Z, Bellouin A, et al. Usefulness of exercise-stress echocardiography for risk stratification of true asymptomatic patients with aortic valve stenosis. Eur Heart J 2010;31:1390–7.

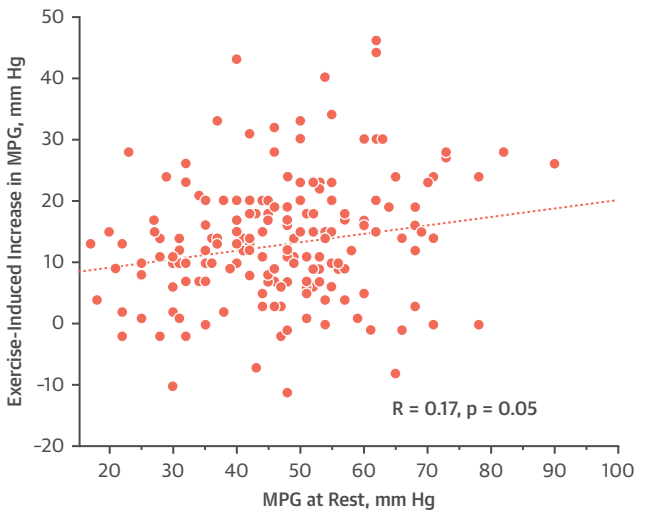
3. Lancellotti P, Pellikka PA, Budts W, et al. The clinical use of stress echocardiography in non-ischaemic heart disease: recommendations from the European Association of Cardiovascular Imaging and the American Society of Echocardiography. Eur Heart J Cardiovasc Imaging 2016;17:1191–229.

THE AUTHOR REPLIES:

We thank Prof. Lancellotti and colleagues for their interest in our work (1) and for their comments, although questioning our ability to perform proper exercise echocardiography. Several of their comments, however, are no longer valid as, unfortunately, we made an error in the y-axis of Figure 2B during the art production, which we have now corrected (**Figure 1**). Nevertheless, we would like to take the opportunity in this letter to emphasize several points:

- First, Prof. Lancellotti and colleagues seemed to somewhat minimize the finding that 24% of patients considered as asymptomatic had a positive exercise test. A positive exercise test is a symptom's equivalent and a Level I recommendation for intervention. The exact percentage may vary according to the populations selected to undergo an exercise test, but our results strongly reinforce the importance of further use of exercise testing in asymptomatic patients with aortic stenosis (AS). Fifteen years ago, the Euro Heart Survey (2) had shown that exercise testing was underused. Future prospective registries and surveys will address whether or not we have made any improvement.
- Second, we indeed enrolled 148 patients during a 10-year period, but 91 were enrolled during the last 5 years. These 148 patients were selected among 1,152 patients (approximately 90% for the evaluation of valvular heart diseases) who underwent exercise echocardiography during the same period, which underlines our expertise in this field and the careful selection of patients. Furthermore, our sample size compared well to the published reports, in particular the 2 papers of the group from Liege (n = 66 and n = 105, respectively) (3,4). Finally, patients with moderate AS only represented a minority of our population, and 80% presented with severe AS.
- Third, as mentioned by Prof. Lancellotti and colleagues, patients with a positive (abnormal) exercise test presented with greater baseline AS severity and more severe mean pressure gradient increase

FIGURE 1 Correlations Between Rest and Exercise-Stress Echocardiographic Parameters



Correlation between mean pressure gradient (MPG) at rest and changes in mean pressure during exercise.