

Image in cardiology

Pre- and post-TAVI myocardial work in the critically-ill patient

Trabajo miocárdico antes y después del TAVI en paciente crítico



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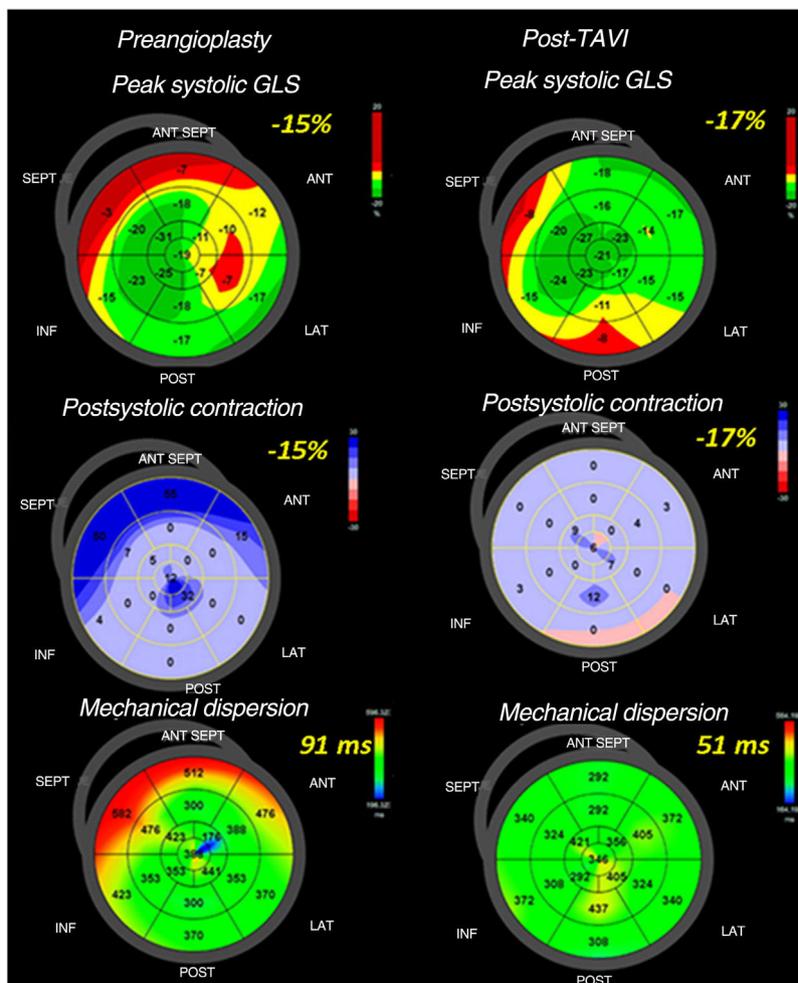


Figure 1.

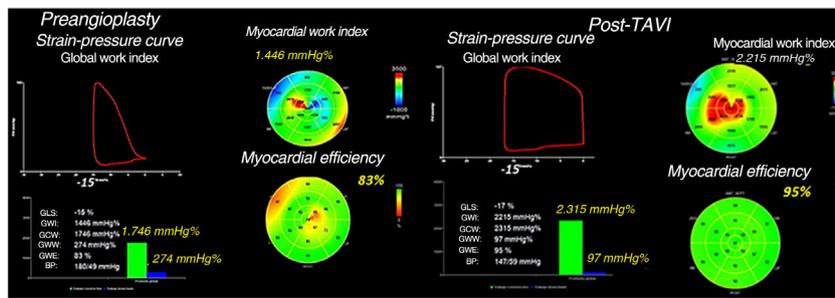
Myocardial work has emerged as a promising tool for studying left ventricular systolic function, as it takes into account afterload as well as myocardial deformation.

The images correspond to a critically ill octogenarian with severe aortic stenosis who was admitted for septic shock and angina. The patient underwent stent implantation to treat a moderate lesion in the anterior descending artery and a severe lesion in the circumflex artery. He experienced no further episodes of angina, but developed acute pulmonary edema associated with hypertension and therefore underwent transcatheter aortic valve implantation (TAVI).

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**Figure 2.**

The echocardiogram performed before the coronary angioplasty (figure 1, figure 2, and video 1 of the supplementary data) showed normal left ventricle dimensions, moderate septal hypertrophy with an absence of segmental wall motion abnormalities, a left ventricular ejection fraction (LVEF) of 49%, high-gradient severe aortic stenosis, normal flow (97/51 mmHg; area, 0.6 cm<sup>2</sup>), diastolic dysfunction (pseudonormal pattern, L wave, E/e' 14), global longitudinal strain (GLS), decreased global work index (GWI, strain-pressure curve), decreased global constructive work (GCW, green bar), extensive postsystolic contraction (PSC), and increased global wasted work (GWW, blue bar) with a resulting decrease in myocardial work efficiency (GWE).

The echocardiogram performed 48 hours after the TAVI (figure 1 and figure 2, video 2 of the supplementary data) showed an LVEF of 57%, an E:A ratio < 1, and a transvalvular gradient of 28/14 mmHg without signs of failure. It also revealed an increase in LGS, GWI, and GCW (green bar) and a decrease in GWW (blue bar), without PSC. GWE and synchrony returned to normal.

Comparison of the bull's eye plots, curves, and bar graphs quickly showed the favorable progression experienced by the patient after resolution of the myocardial ischemia and the post-TAVI decrease in afterload (figure 1 and figure 2).

We expect that further studies will examine the usefulness of myocardial work parameters in the evaluation of critically ill patients.

This study was conducted in accordance with international clinical research recommendations (2013 World Medical Association Declaration of Helsinki). As it was not a research study, ethics approval was not required. Telephone consent was obtained from the patient.

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## AUTHORS' CONTRIBUTIONS

All authors were involved in the collection of data, critical review of intellectual content, and approval of the final version for publication. The authors accept responsibility as defined by the International Committee of Medical Journal Editors.

## CONFLICTS OF INTEREST

None.

## APPENDIX. SUPPLEMENTARY DATA

Supplementary data associated with this article can be found in the online version, at <https://doi.org/10.1016/j.rec.2022.05.026>