



Multimodality Imaging

BEYOND LONGITUDINAL STRAIN: THE PROGNOSTIC SIGNIFICANCE OF BIVENTRICULAR CIRCUMFERENTIAL MECHANICS

Moderated Poster Contributions

Multimodality Imaging Moderated Poster Theater 12_Hall F

Sunday, March 5, 2023, 2:45 p.m.-2:55 p.m.

Session Title: A Look Ahead: Multimodality Imaging for Prognosis

Abstract Category: 27. Multimodality Imaging: Echo

Presentation Number: 1067-05

Authors: Alexandra Fabian, Máté Tolvaj, Bálint Károly Lakatos, Alexandra Assabiny, Ujvári Adrienn, Andrea Ferencz, Kai Shiida, Walter Richard Schwertner, Boglárka Veres, Annamaria Kosztin, Levente Staub, Balázs Sax, Bela Merkely, Attila Kovács, Semmelweis University, Heart and Vascular Center, Budapest, Hungary, Argus Cognitive, Lebanon, NH, USA

Background: Global longitudinal strain (GLS) is an established predictive parameter of adverse outcomes in several cardiac diseases. Despite the significant contribution of circumferential shortening to the global ventricular function, data are scarce concerning its prognostic value on long-term mortality. We aimed to assess both left (LV) and right ventricular (RV) GLS and circumferential strain (GCS) using three-dimensional echocardiography (3DE) to determine the prognostic importance of the deterioration of biventricular mechanics.

Methods: Patients with various established left-sided cardiac diseases (n=357) were retrospectively identified with a median follow-up of 41 months. All patients underwent clinically indicated 3DE and LV and RV GLS, and GCS were quantified. To determine the prognostic power of the different patterns of biventricular mechanics, patients were divided into 4 groups using the median values of LV GLS and RV GCS. Group 1 had patients with both LV GLS and RV GCS above median values; Group 2 had patients with LV GLS below, while RV GCS above the median; Group 3 had patients with LV GLS values above, while RV GCS below the median. Group 4 had patients with both LV GLS and RV GCS below the median. The primary endpoint was all-cause mortality.

Results: Fifty-five patients (15%) met the primary endpoint. Among 3DE-derived functional parameters, LV GLS and RV GCS were the best predictors using hierarchical multiple regression, but only RV GCS was an independent predictor using multivariable Cox regression (HR, 1.09 [95% CI, 1.03-1.15], $p < 0.05$). Patients in Group 4 were associated with a more than 5-fold increased risk of death compared with those in Group 1 (HR, 5.09 [95% CI, 2.39-10.79], $p < 0.05$) and more than 3.5-fold compared with those in Group 2 (HR, 3.57 [95% CI, 1.26-10.12], $p < 0.05$).

Conclusion: Decreased LV and RV GCS were associated with adverse outcomes, emphasizing the importance of assessing biventricular circumferential mechanics. Risk stratification based on our 4 groups showed that reduced RV GCS was associated with a significantly increased risk of long-term all-cause mortality even if LV GLS is maintained.