Constrictive Pericarditis in the Modern Cardiology Era: Time-Volume Curve Assessment by 4D MRI

Hamdan, Ashraf[1]; Abu Baker, Fady[2]; Di Segni, Elio[1]; Goitein, Orly[3]; Eldar, Michael[1]; Konen, Eli[3]

[1]Sheba Medical Center, Heart Center, Tel Hashomer, Israel; [2]Sheba Medical Center, Internal Medicine C Department, Tel Hashomer, Israel; [3]Sheba Medical Center, Radiology Department, Tel Hashomer, Israel

Table 1: Diastolic parameters in normal subjects and constrictive pericarditis

Background: Accurate diagnosis of constrictive pericarditis (CP) is a well-recognized clinical challenge. Since magnetic resonance imaging (MRI) provides high resolution assessment of ventricular volumes, we sought to investigate left and right ventricular time-volume curve using four-dimensional MRI (4DMRI).

Methods: Fourteen patients with pathologically proven CP and 20 normal subjects were included. Three dimensional MRI covering the whole myocardium in the short axis projection was performed using 1.5-Tesla scanner. Left and right ventricular volumes were evaluated over the whole cardiac cycle to generate a 4DMRI dataset for time-volume curve assessment. Diastolic function was assessed via: E/A ratio, time to peak filling rate (TPFR), filling time (FT), calculated as the relative time interval required for recovery of 90% of stroke volume, and diastolic volume recovery (DVR), calculated as proportion of diastole required for recovery of a 90% of stroke volume.

Results: In patients with CP, E/A ratio of both ventricles was significantly higher and the TPFR was significantly lower compared with normal subjects. In addition, FT and DVR were significantly lower for both ventricles in patients with CP compared with healthy subjects.

Conclusion: Non-invasive time-volume curve assessment by 4DMRI may provide detailed diastolic filling profile in patients with CP.