

Echocardiographic Characteristics in Tetralogy of Fallot with Arrhythmia: Assessments Using 2D Speckle Tracking

Naoko ICHIKAWA*, Yumi SHIINA**, Yasufumi KIJIMA**,
Terunobu FUKUDA** and Koichiro NIWA**

Abstract

Purpose: Arrhythmia is one of the long-term complications in adults with Tetralogy of Fallot (TOF). Arrhythmia is triggered by right-sided volume- and pressure-overload and surgical scars. Limited studies have investigated arrhythmia and atrial function in this population. Hence, the present study aimed to investigate the correlation between arrhythmias and atrial as well as ventricular function assessed by using 2D speckle tracking in adults with TOF.

Subjects and Methods: We retrospectively enrolled 77 patients who were divided into three groups— (A) patients with atrial arrhythmias, (B) patients with ventricular arrhythmia, and (C) patient without any arrhythmia. We evaluated the atrial and ventricular function using 2D speckle tracking.

Results and Discussions: In the supraventricular arrhythmic group, lower RV GLS ($p < 0.01$) and more patients with severe TR were identified compared with healthy controls. Moreover, higher atrial and lower atrial SR were observed, and arrhythmia from the RA was suggested. Furthermore, impaired LA could be a trigger of arrhythmia as well. The univariate logistic analysis suggested a correlation of dilated atria, lower LA booster strain, lower LA conduit strain, and lower LA reservoir SR with supraventricular arrhythmia. In the ventricular arrhythmic group, we observed lower LV GLS ($p = 0.03$), enhanced RVEDA ($p = 0.01$), lower RV GLS ($p = 0.01$), enlarged atria ($p = 0.02$), lower LA conduit SR ($p = 0.04$), and lower RA booster SR ($p = 0.02$) compared with healthy controls. The univariate logistic analysis suggested a correlation of enlarged LV, dilated atria, and lower LA booster strain with ventricular arrhythmia.

Conclusions: The deteriorated atrial and biventricular function could correlate with arrhythmia in adults with TOF; hence, assessments using atrial and ventricular strain are highly informative in this population.

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Clinical Laboratory, St. Luke's International Hospital**, Cardiovascular Center, St. Luke's International Hospital**

St. Luke's International Hospital, 9-1 Akashi, Chuo-ku, Tokyo, 104-8560 Japan

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