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ASSESSMENT OF RIGHT VENTRICULAR REGIONAL AND GLOBAL FUNCTION IN PATIENTS WITHOUT SYMPTOMS WITH REPAIRED TETRALOGY OF FALLOT BY ULTRASOUND SPECKLE TRACKING IMAGING

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Purpose Early detection of right ventricular dysfunction is essential in the assessment of patients with repaired tetralogy of Fallot. Because right ventricular dysfunction in many postoperative tetralogy of Fallot patients is correlated with arrhythmias and sudden cardiac death. The aim of our study was to assess latent right ventricular dysfunction in patients without symptoms with repaired tetralogy of Fallot by ultrasound speckle tracking imaging.

Methods 36 patients without symptoms with repaired tetralogy of Fallot and 35 healthy controls were studied. Right ventricular longitudinal peak systolic strain (ϵ), strain rate (SRs) were measured in right ventricular free wall and interventricular septum for basal, mid and apical segment by speckle tracking imaging from the apical four-chamber view. Right ventricular global longitudinal peak systolic strain

(GLS), strain rate (GLSRs), early diastolic strain rate (GLSRe) and late diastolic strain rate (GLSRa) were measured from the above views. The correlations between right ventricular systolic functional parameters and postoperative period, degree of pulmonary regurgitation and QRS duration were explored.

Results (1) Compared with control group, ϵ and SRs of right ventricular free wall and interventricular septum for all segments, GLS, GLSRs, GLSRe and GLSRa were significantly impaired in patients with repaired tetralogy of Fallot ($p < 0.05$ for all). Both GLS and GLSRs were lower in postoperative patients with transannular patch than in those with infundibular patch. (2) In comparison with controls, GLS, GLSRs, GLSRe and GLSRa were decreased in postoperative patients with mild, mid and severe pulmonary regurgitation. Whereas, there was no difference in right ventricular global function among the patients with varying degree of pulmonary regurgitation. (3) GLSRs of right ventricle was correlated inversely with postoperative period and QRS duration ($r_1 = -0.431$, $p = 0.009$; $r_2 = -0.469$, $p = 0.004$), right ventricular GLS and GLSRs had no correlation with pulmonary regurgitation.

Conclusions Right ventricular regional and global function in patients with repaired tetralogy of Fallot are decreased. Speckle tracking imaging can early detect right ventricular dysfunction in patients without symptoms with repaired tetralogy of Fallot. The type of operation impacts on prognosis. Right ventricular dysfunction is associated with electrical depolarisation abnormalities.