Isolated parachute tricuspid valve in an asymptomatic adult patient detected by three-dimensional echocardiography

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A 21-year-old man applied to our outpatient clinic with palpitation. The 12-lead electrocardiogram showed a sinus rhythm. Physical examination was in normal limits. Two-dimensional transthoracic echocardiography (2D TTE) revealed an echogenicity on the septum at the right ventricle (Figure 1A). The max/mean pressure gradient across the tricuspid valve was 7/3 mmHg and there was trivial tricuspid regurgitation. To clarify this pathology, we performed 3D TTE and transoesophageal echocardiography (3D TEE).

Three-dimensional TTE after cropping revealed a single papillary muscle attached to the interventricular septum (Figure 1B, arrow; see Supplementary data online, Movie S1B). Two-dimensional TEE upper transoesophageal short-axis view and transgastric view confirmed features of the parachute deformity such as a solitary papillary muscle, pear-like right atrium, and chordal redundancy (Figure 1C and D; see Supplementary data online, Movie S1C and D). Moreover, 3D full-volume TEE showed a funnel-shaped tricuspid valve and a single papillary muscle (Figure 1E, asterisk, arrow; see Supplementary data online, Movie S1E). A minimum-intensity-projection axial oblique computed tomographic angiography image also revealed features of a parachute tricuspid valve (PTV; Figure 1F, arrow).

Atrioventricular valve parachute deformity was generally seen in the mitral position. Parachute deformity is also seen in the tricuspid position but this has rarely been reported as a sporadic case. All of these cases were associated with other congenital defects such as double outlet right ventricle, left-to-right shunt. We herein demonstrated 2D and 3D echocardiographic features of isolated PTV, which is the first case in the literature as we know. RA, right atrium; RV, right ventricle; LV, left ventricle; arrow, a single papillary muscle; asterisk, a funnel-shaped tricuspid valve.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.