Assessment of tricuspid regurgitation mechanism by three-dimensional echocardiography in an adult patient with congenitally corrected transposition of the great arteries

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A man with congenitally corrected transposition with an intact ventricular septum was first symptomatic with cardiac heart failure at 54 years of age. Cardiac auscultation revealed an intense systolic murmur. An electrocardiogram showed sinus rhythm. Two-dimensional (2D) and three-dimensional (3D) echocardiographies were performed (i.e., 33, matrix probe 2–3 MHz, Philips, Andover, MA, USA). The apical 4-chamber plane depicted an atrioventricular discordance with severe tricuspid regurgitation (Fig. 1). The 3D right ventricular view of the tricuspid valve showed a non-dysplastic or Ebstein-like tricuspid leaflet in diastole and an absence of central coaptation in systole (Fig. 2). The systemic right ventricular ejection fraction was estimated at 50% using Simpson’s rule. The patient received medical therapy and is planned for surgical tricuspid annuloplasty.

The management of tricuspid regurgitation in corrected transposition of the great arteries (also called double discordance) is a difficult challenge depending on the patient’s age, the anatomy of the tricuspid valve and systemic right ventricular function. The anatomy of the tricuspid valve is most often abnormal in double discordance: dysplastic leaflets or apical displacement of the septal leaflet (called Ebstein-like). Precise description of the tricuspid anatomy could be difficult from only the 2D planes. The surface of the tricuspid leaflets as well as the commissures could be displayed by 3D echocardiography. In our patient, the 3D view from the right ventricle showed the regurgitant
orifice of the systemic tricuspid valve. Our observation is unique in its description of the functional mechanism of the tricuspid regurgitation. 3D echocardiography allows the cardiologist and the surgeon to evaluate the ability and efficiency of surgical valve repair, which remains a challenge in congenitally corrected transposition.

Appendix A. Supplementary data