Live three-dimensional transthoracic echocardiography in the assessment of the papillary muscle abnormality with mitral regurgitation

An isolated papillary muscle abnormality is a relatively rare anomaly. In the adult patient it could be missed even by two dimensional (2D) echocardiography and the finding might be detected for the first time during surgery for severe mitral regurgitation. Live three-dimensional transthoracic echocardiography (3DTTE) has become a new promising method in the evaluation of the valves and subvalvular apparatus in detail (1-4). We hereby reporting a case, whose three papillary muscles with severe insufficiency in the coaptation of the mitral valve leaflets were assessed with the use of the live three-dimensional transthoracic echocardiography.

The patient was a 17 years old girl presented with dyspnea on exertion of 3 months duration. There was no previous history suggestive of rheumatic fever or infective endocarditis. Physical examination was significant for a loud first heart sound, a grade III pansystolic murmur at the apex. An electrocardiogram showed a regular sinus rhythm. A chest roentgenogram showed normal cardiothoracic index. A 2D transthoracic echocardiography showed a normal ranged left ventricular dimension. Left atrial dimension was 43 mm in parasternal long-axis view and mitral valve was mildly thickened with prolapse of both leaflets and severe mitral regurgitation (Fig. 1). Three papillary muscles (anterolateral, middle and posteromedial) were demonstrated at the level of papillary muscles (Fig. 2). To evaluate the subvalvular apparatus in detail, transesophageal 2D echocardiography was performed. Interestingly, the third (middle) papillary muscle was attached to the bases of the anterior mitral valve directly (Fig. 3, 4. Video 1. See corresponding video/movie images at www.anakarder.com). The anterolateral and posteromedial papillary muscles with the normal tensor apparatus were demonstrated. The patient underwent live 3DTTE using Vivid 7 Dimension ultrasound system (GE, Vingmed, Horton, Norway). A prominent coaptation problem in the mitral valve leaflet was clearly visualized by 3DTTE (Video 2, 3 See corresponding video/movie images at www.anakarder.com). The patient underwent mitral valve leaflet replacement.

References

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