

3D echocardiographic evaluation of mitral valve annulus in patients with mitral annular disjunction

G.M. Viani, MD; L.A. Leo, MD; V. Paocchi, MD; S. Schlossbauer, MD; F. Faletra, MD; T. Moccetti, Prof

CARDIOCENTROTICINO Fondazione Cardiocentro Ticino, Servizio di imaging cardiovascolare, Lugano

Introduction

Mitral annular disjunction (MAD, fig. 1) is the anomalous insertion of posterior mitral leaflet in the left atrium wall instead of the basal portion of left ventricle free wall. MAD is typically found in degenerative mitral valve disease (DMD). The aim of our study is to evaluate if MAD presence predicts more severe anatomical abnormalities of mitral annulus in DMD, according to current scientific literature.

Methods

49 consecutive patients with severe mitral regurgitation due to DMD underwent pre-operative transoesophageal echocardiography (TEE) in our hospital from January 2015 to June 2018. 3D-TEE was performed with a commercially available ultrasound system (EPIQ7C or Philips iE33; Philips Medical System) equipped with X7-2t or X8-2t probe. 3D dataset was acquired in 3D zoom single-beat or multi-beat (4-8beats) mode. 3D mitral valve images were analysed with dedicated off-line software (Mitral Valve Navigator, MVN, Q-lab 10; Philips Medical System). Mitral valve annulus was evaluated in proto- and telesystole. Statistical analysis was performed with Stata 15.1 (StataCorp, College Station, TX, USA). A 2-sided p-value <0.05 was considered statistically significant.

Results

MAD+ patients compared to MAD- patients had significantly bigger annulus diameters, circumference and area ($p<0.05$). Annular height to commissural width ratio (AHCWR), which represents non planarity of mitral annulus, showed a trend to smaller values in MAD+ patients, although not statistically significant ($p=0.5$). This possibly indicates a more accentuated flattening of the saddle shape of mitral valve in MAD+ patients. MAD thus worsens anatomical abnormalities of mitral valve saddle shape, leading to mitral annulus dilation (fig. 2 and 3).

Conclusions

MAD presence predicts more severe changes of mitral valve anatomy and can be considered a marker of severity of anatomical alterations in DMD.

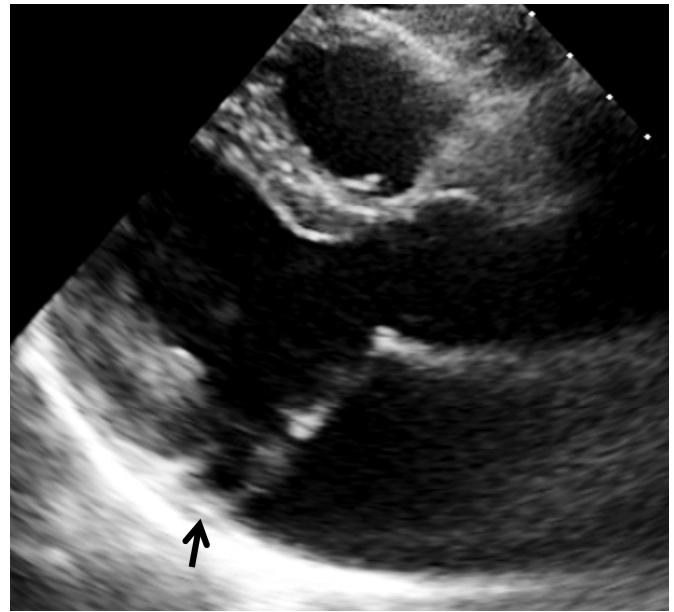


Fig.1 Mitral annular disjunction (arrow)

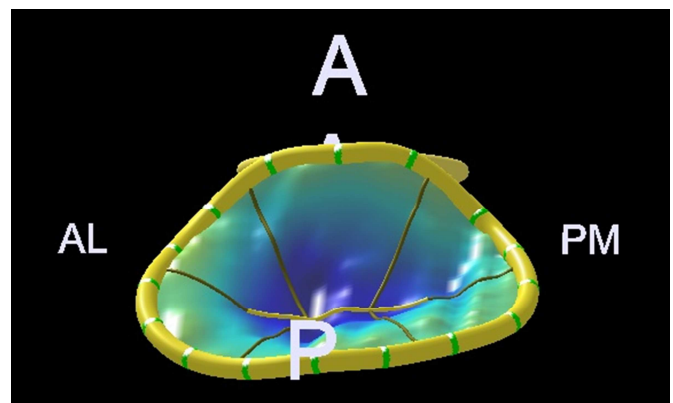


Fig.2 3D model of normal annulus geometry

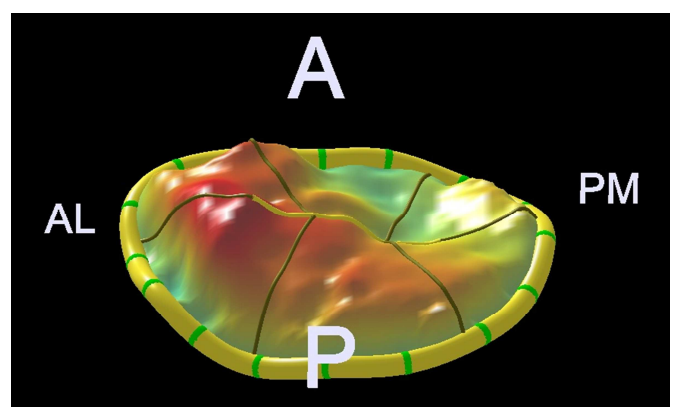


Fig.2 3D model of bileaflet prolapse in MAD+ patient