Reviewer’s report

Title: Cardiovascular Magnetic Resonance in the Evaluation of Heart Valve Disease

Version: 0 Date: 10 Mar 2017

Reviewer: Tomasz Baron

Reviewer’s report:

The authors discuss a role of CMR in evaluation of the most common valvular heart diseases.

The article is well written and can be understood even by non-experienced CMR readers. It contains 6 figures providing reference values of different measures as well as 16 pictures well illustrating the content of the article.

Some points should be considered:

When aortic regurgitation is discussed (page 10) the authors mention about the role of positioning of the imaging plane for correct estimation of stroke volume giving an example in figure 9. In my opinion the authors should even discuss potential factors leading to the underestimation of AR reg fraction/volume, as upward diastolic movement of the aortic root (more common in younger patients with higher elasticity of the tissues, higher AV-plane movement, better LV-function), localizing of the measurement plane to far from the valve, for high Venc etc.). Probably the level of STJ should be clearly recommended.

This issue is very important since quantification (especially differentiation between moderate and severe AR) of AR is very difficult by echocardiography and CMR is clinically used for improved quantification.

It should also be stated that measured values obtained by CMR and echocardiography are not interchangeable and when following up the results obtained by the same method should be compared.

On figure 12 the identification of MV scallops is not correct.

This is true that a 3ch-view (lower right) shows A2P2 scallops, but the 2ch-view shows A1A2A3-P3 looking from the LAA side (not only A3P3) and 4ch-view P1P2-A2A3 (not only A1P1) that nicely is illustrated by the cut-lines on lower left part of the picture. In order to visualize corresponding anterior-posterior scallops t ex A1-P1 or A2-P2 it is recommended to do a stack of SSFP cine acquisitions beginning from 3ch view as illustrated t ex by Gerber and Kilner in CMR Update 2012 p.128.

On page 10 when tissue characterization is discussed in aspect of aortic stenosis, one sentence about deformation by tissue/feature tracking as a new method being able to identify subclinical
systolic LV dysfunction even in cases when due to small hypertrophic LVs their systolic function is normal based on the unrealistically high EF. Even table 1 could be completed with tissue/feature tracking as one of the strengths of cMR)

Page 16 line 16 - a verb ´is´ is missing

Table 3. ´aortic stenosis´ not ´valve´ severity; I would even recommend to use the ESC 2012 guidelines instead of the American ones from 2006. In Europe a cut of for AS is 2.0m/ (not 2.5m/s). The same about table 6 regarding a mitral regurgitation. Add reference to table 5.

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