Reviewer's report

Title: Severity of Aortic Regurgitation Assessed by Area of Vena Contracta: a Clinical Two-Dimensional and Three-Dimensional Color Doppler Imaging Study

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Reviewer: Stefano Nistri

Reviewer's report:

The authors aimed at assessing the feasibility of assessing VCA by 2DE in 61 patients with AR, and compared the results of this method with 3DE; severity of AR was assessed as ERO. Significant correlations existed between 2DVCA and EROA (r = 0.89; p < 0.001). The cut-off 2DVCA for grading severe AR was 35 mm² (area under curve: 0.96; sensitivity: 86%; specificity: 98%). Significant correlations existed between 3DVCA and EROA (r = 0.89; p < 0.001). The cut-off 3DVCA for grading severe AR was 35 mm² (area under curve: 0.96; sensitivity: 86%; specificity: 98%).

The topic is interesting and aims sound from a clinical point of view. Despite the small series the results are interesting. Methods are appropriate. Major issues are:

- General characteristics of patients should be better described (e.g.: LV volumes and diameters. EF, severity of AR, etc etc)
- The threshold of velocity range (65 cm/s). is it consistent with guidelines? Why has it been chosen? Please clarify
- Please add in methods methodology for obtaining ERO
- The issue of eccentricity has been considered in discussion: I’d suggest to separate with different symbols these patients in graphs and better describe the way to manage this common problem. Moreover, the problems related to the difficulty to obtain a perpendicular image of the aortic valve (particularly in the elderly) should be more extensively debated
- Comparison with precedent studies on the same topic could be interesting
- What about the potential role (if any) of the semiquantitative methods to solve the problems related to technical issues?

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests