In this work the authors evaluated and compared deformation parameters obtained with 2D speckle tracking imaging and 3D STI in normal subjects, in athletes and in athletes with bicuspid aortic valve. The authors found significant differences on the secondary strain between athletes with and without bicuspid aortic valve and normal healthy subjects. Secondary strain obtained with 3D STI software was significantly higher in athletes than in control subjects. These observations are of potential interest. There are, however, several issues that need clarification/improvement:

1. When we look at the table 1, we can see that the athletes appear to have the same heart rate as the control group, the same LVEDd and wall thickness. How come?

2. Table 3. Circumferential strain usually is highest at the apex and lowest at the base in normal subjects. In this work it appears to be highest in mid-ventricular segments in control subjects and in athletes? Please check your calculations.

3. Interrelationships between principal and secondary strain are based on the interaction between torsion/ twist angle and amplitude of the strain. Rotation, torsion, twist angle can be measured with 2D strain and possible can find differences between athletes and control subjects. The 3D strain that the authors use appear to have very low frame rate - 20 frames per second and low resolution. Please comment.

4. Why not to try to understand the nature of the differences in the secondary strain? Which measurements performed with speckle tracking can affect secondary strain? For instance, measures of basal/apical rotation and torsion for better investigation of secondary strain – why are they lower in control subjects? Does rotation and torsion affect secondary strain?

5. Why did you choose to include the subgroup of athletes with bicuspid aortic valve? The main problem in these individuals is the aortic root diameter/significance of the valvular lesion. This group appears not appropriate for the study purpose.