Intra-operative Vector Flow Imaging Using Ultrasound of the Ascending Aorta among 40 Patients with Normal, Stenotic and Replaced Aortic Valves

Stenosis of the aortic valve gives rise to more complex blood flows with increased velocities. The angle-independent vector flow ultrasound technique transverse oscillation was employed intra-operatively on the ascending aorta of (I) 20 patients with a healthy aortic valve and 20 patients with aortic stenosis before (IIa) and after (IIb) valve replacement. The results indicate that aortic stenosis increased flow complexity (p < 0.0001), induced systolic backflow (p < 0.003) and reduced systolic jet width (p < 0.0001). After valve replacement, the systolic backflow and jet width were normalized (p > 0.52 and p > 0.22), but flow complexity was not (p < 0.0001). Flow complexity (p < 0.0001), systolic jet width (p < 0.0001) and systolic backflow (p < 0.001) were associated with peak systolic velocity. The study found that aortic stenosis changes blood flow in the ascending aorta and valve replacement corrects some of these changes. Transverse oscillation may be useful for assessment of aortic stenosis and optimization of valve surgery. (E-mail: lindskov@gmail.com) 2016 World Federation for Ultrasound in Medicine & Biology

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