Quantitative Assessment of Severity of Ventricular Septal Defect Use of the Noninvasive New Method: An Interclassical Distance Flow Convergence Region Study

Masahiro Ishii, Yoko Sugahara, Toyoiro Matsushita, Kureme University, Kureme, Japan

A new approach using the interclassical distance of the flow convergence region (FCR) from 2 dimensional (2D) color Doppler has offered the opportunity of evaluating the FCR without directory identifying the defect center. We evaluated VSD shunt flow quantification using the distance between adjacent aliasing boundaries (interclassical distance = IAD) of the FCR in 14 patients with biventricular VSD (age 6 to 36 months). With Doppler data were obtained with 7.5 MHz or 12 MHz probe (Philips Inc.) placed on the chest and syst- tem Nyquist limits (V) set at 22 to 66 cm/sec. VSD shunt flow (Q) was calculated by deriv- ing the area of the two FCR hemispheres (IAD) and multiplying this by the velocity difference (V) according to the simplified equation: Q = 72.5 V²/2. There was an excellent correlation and agreement between the VSD shunt flow volumes calculated from IAD and reference results by cardiac catheterization (r = 0.98, p < 0.05, mean difference = 0.19 ± 0.56 mm³). There was a good correlation between shunt flow rates calculated using the conventional 20:1 axis measurement of the FCR isovelocity surface area with the hemispheric assumption and reference results by cardiac catheterization (r = 0.94, p < 0.05, mean difference = 0.41 ± 0.69 mm³). However, the conventional 2:1 method substantially underestimated the actual shunt flow rate. Conclusion Our new method is fast, and accurate; it is easy to use, and it should facilitate use of flow field assessment method in the clinical setting.

Flow