severe mitral annular calcification, atrial fibrillation, cardiac pacemaker, or other heart diseases such as dilated cardiomyopathy and rheumatic heart disease. We scanned the patients prior to and three months after renal transplantation. We used an ultrasonic diagnostic apparatus (FFS*, Hitachi-Aloka Company, Tokyo, Japan) with a UST-2105 cardiac probe (Hitachi-Aloka). After 10 minutes' rest, the patients lay in the left lateral decubitus position. ECG recording was performed throughout the study, which was done under quiet breathing. After a conventional echocardiography examination, an apical four-chamber view was selected, displaying the mitral valve. Color Doppler sampling volumes included the entire left ventricle, the mitral valve, and part of the left atrium. Dynamic images were acquired over three stable consecutive heartbeat cycles and stored for analysis off-line with commercial imaging software (DAS-RS1 version 3.0*, Hitachi-Aloka). Maximum vortex area and maximum vortex intensity were measured during the left ventricular filling phase (including rapid filling phase and slow filling phase), the atrial systolic phase, and the left ventricular systolic phase. Data were processed using commercial software (SPSS 19.0*, IBM, Armonk NY, USA). Numerical data are presented as mean ± SD. Differences between preoperative and postoperative scans were compared using paired t-tests, with P < 0.05 being considered statistically significant.

RESULTS During all the phases, maximum vortex area in the preoperative scans compared with that in the postoperative scans were not significantly different (P > 0.05). During the left ventricular filling phase, the maximum vortex intensity in the preoperative scans compared with that in the postoperative scans was significantly different (6.22 ± 2.41 m²/s vs 9.44 ± 3.24 m²/s, P < 0.05). During the atrial systolic phase, the preoperative maximum vortex intensity was significantly higher than the postoperative value (37.12 ± 10.44 m²/s vs 24.33 ± 5.90 m²/s, P < 0.05). The left ventricular systolic phase maximum vortex intensity was significantly lower preoperatively than postoperatively (15.68 ± 4.66 m²/s vs 24.49 ± 7.51 m²/s, P < 0.05).

CONCLUSIONS Changes in left ventricular blood flow field parameters in patients before and 3 months after renal transplantation suggest partial recovery of left ventricular function after surgery.