Doppler derived dP/dt Predicts Postoperative Left Ventricular Systolic Function in Patients with Chronic Aortic Regurgitation

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1. Background

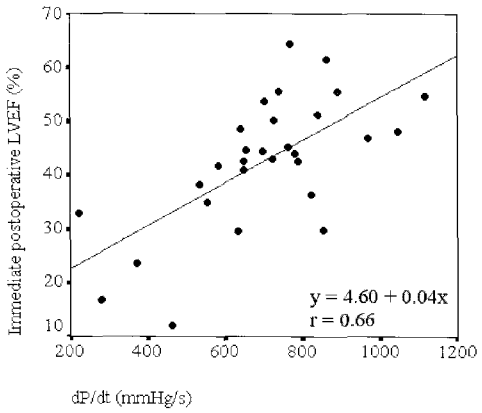
To determine the timing of surgery, predicting postoperative (postop.) left ventricular(LV) systolic function is critical in patients with chronic aortic regurgitation(AR). Clinical usefulness of the Doppler derived dP/dt has not been evaluated in patients with chronic AR. We evaluated the value of Doppler derived dP/dt as a predictor of postop. LV systolic function.

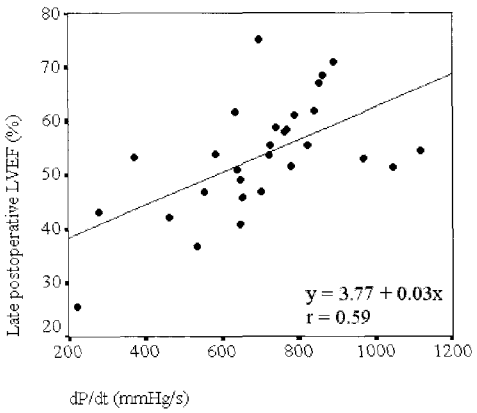
2. Methods and Results

We evaluated 29 patients (22men: 41 ± 14 years old) with chronic AR who underwent aortic valve replacement(n=23) or repair (n=6) surgery. Doppler derived dP/dt was determined from the continuous wave Doppler spectrum of the AR jet before surgery. Preoperative LV end-diastolic and end-systolic dimensions were 70±11mm and 50±11mm, respectively. LV ejection fraction (LVEF) was 48±10% and Doppler derived dP/dt was 701±204mmHg/sec. LVEF decreased to 43±12% immediately after surgery and improved to 54±11% at late follow-up. Multivariate analysis showed that only preoperative dP/dt was an independent predictor of postop. LVEF (R=0.59, p=0.008 at late follow-up). A preoperative dP/dt < 700mmHg/sec was the best predictor of postop. LV systolic dysfunction (LVEF<50%) with a sensitivity of 94% and a specificity of 62% at immediate after surgery, and 94% and 75% at 1-year follow-up.

3. Conclusion

Doppler derived dP/dt may be useful to predict postop. LV systolic function and, therefore, to determine the timing of surgery and postop outcome in patients with chronic AR.


Immediate postoperative LVEF (%)
70
60
50
40
30
20
10
200
400
600
800
1000
1200
y = 4.60 + 0.04x
r = 0.66
dP/dt (mmHg/s)


Late postoperative LVEF (%)
80
70
60
50
40
30
20
200
400
600
800
1000
1200
y = 3.77 + 0.03x
r = 0.59
dP/dt (mmHg/s)