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From a cohort of patients referred for elective transluminal coronary angioplasty, a subset of patients was evaluated to determine whether revascularization using coronary angioplasty could salvage chronically ischemic myocardium. Reversible chronic ischemic left ventricular dysfunction was identified by a severe wall motion abnormality at rest and at least one of the following: 1) persistent angina pectoris; 2) postextrasystolic ventricular contraction potentiation of motion in the asynergic zone on baseline ventriculogram; and 3) thallium-201 uptake in the asynergic zone. Twelve patients were identified as having reversible chronic ischemia and underwent coronary angioplasty. Their mean age was 63 +/- 11 years and duration of symptoms 8.3 +/- 9.7 weeks. Immediate pre- and postangioplasty left ventriculograms were obtained. Regional wall motion was analyzed using a radial axis model, and global ejection fraction was calculated. After angioplasty, tension development (heart rate-systolic pressure product) increased in the absence of an increase in left ventricular end-diastolic pressure. Global ejection fraction increased from 46 +/- 20 to 62 +/- 19% (p less than 0.005). The percent of left ventricular diastolic perimeter showing asynergy decreased from 29 +/- 11 to 10 +/- 13% (p less than 0.005). During follow-up ranging from 6 to 51 months, sudden death occurred in one patient who had had no improvement in wall motion after angioplasty, repeat angioplasty was performed in three patients and eight patients remained asymptomatic. Application of easily obtainable clinical data identifies a subset of patients with chronically ischemic myocardium. Coronary angioplasty in such patients is useful in salvaging hibernating myocardium.