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Editorial Comment

Because We Can, Should We?*

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The present study. The search for new indications for coronary angioplasty continues as does the search for improved methods of treating acute myocardial infarction. In the current issue of the Journal, Stone et al. (1) report their experience with immediate coronary angioplasty in patients with single vessel coronary artery disease and acute myocardial infarction. They conclude that angioplasty provides "improved symptomatic status" and "extended long-term survival" for such patients. However, because their study lacks comparative information about the conservative medical treatment of acute myocardial infarction in patients with single vessel coronary disease, one may question the validity of their conclusions.

First, to advocate a new therapy requires convincing evidence that it is a better form of treatment than the one currently in use, particularly if the new therapy is more invasive and potentially more costly. Stone et al. (1) report important indexes of the results of treating acute myocardial infarction with coronary angioplasty: in-hospital mortality rate, 3 year survival rate and late events (recurrence of angina or myocardial infarction and the need for revascularization by angioplasty or coronary bypass surgery). They report an in-hospital mortality rate of 1.4%, a 3 year survival rate of 90% (92% if only cardiac deaths are included), a recurrence rate for myocardial infarction of 4% and a need for coronary bypass surgery in 5%. Repeat angioplasty was performed during the initial hospitalization in 6% and at a later date in another 24% because of symptoms of restenosis. Because the authors' study (1) was retrospective and uncontrolled, only "historical control subjects" from other published reports can serve for comparative purposes. Often in the past the use of historical controls in such clinical trials has made the new form of therapy appear more successful than it is subsequently shown to be in a prospective controlled study. Presumably, this occurs in part because the traditional therapy has improved with time, a fact not accounted for by the use of historical controls.

Conservative treatment versus angioplasty for acute infarction. The in-hospital mortality rate for acute myocardial infarction with single vessel disease treated conservatively without thrombolysis is low. Three year mortality from all causes is approximately 95% (2,3). In a recent report (4), there were no deaths in a mean follow-up period of 39 months. In another study (5), the 5 year survival rate was significantly in excess of 90%. The recurrence rate of myocardial infarction in the most recent study (4) was 6%, and angina recurred in 56% of patients, although only 26% needed a significant change in management; revascularization was performed in 10%. Therefore, there are no substantial differences between the results of conservative management of acute myocardial infarction in patients with single vessel disease and the results of immediate coronary angioplasty.

Unfortunately, Stone et al. (1) did not perform a controlled, prospective study, randomizing patients to conservative conventional treatment and coronary angioplasty. Furthermore, their definition of consecutive presumably does not include every patient with single vessel disease who had an acute myocardial infarction. The inclusion criterion for their study of 1 mm ST segment elevation in two contiguous electrocardiographic (ECG) leads excludes patients with subendocardial infarction who presented with ST segment depression or T wave inversion, or both, as the ECG manifestation of their myocardial necrosis. The clinical course of this latter patient group may be substantially different from that of patients with Q wave infarction (6).

Is there greater improvement in left ventricular function after angioplasty? Stone et al. (1) also conclude that "50% of patients" showed a "dramatic improvement in left ventricular function." This conclusion is also unwarranted because only 59% of their patients had left ventricular function assessed after angioplasty and, as the authors recognize, a selection bias may have been involved in the patients studied. The lack of controls also makes it impossible to know how much improvement in ventricular function would have resulted from recovery of stunned myocardium if patients had been treated conservatively. It is well known that some patients show spontaneous improvement in ventricular function after acute myocardial infarction. Therefore, only 50% of the patients studied, or 30% of the total group, had documented improvement in left ventricular function. It is unknown whether the improvement in left ventricular function after myocardial infarction in patients with single vessel disease treated with coronary angioplasty is better than that in similar patients treated with conservative methods.

Effects on hospital costs. Finally, advocacy of coronary angioplasty for this patient group cannot be endorsed without consideration of the costs. In my institution the cost of a

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single vessel angioplasty is $5,150. In the report of Stone et al. (1), 6% of patients had repeat angioplasty for reocclusion while still in the hospital, and another 24% returned for repeat angioplasty for delayed restenosis. Therefore, the average patient cost for angioplasty, excluding additional hospitalization costs, would be $6,695. Furthermore, in-hospital reocclusion was silent in 64% of patients. Does this mean that every patient needs a predischarge coronary arteriogram? If so, patient costs would be even greater.

Conclusions. Caution must be used in recommending immediate coronary angioplasty for acute myocardial infarction in patients with single vessel disease when it is unclear whether the outcome will be better than that with conservative management and when the cost may be substantially greater. Furthermore, as Stone et al. (1) point out, angioplasty treatment of acute myocardial infarction is available in only 12% of United States medical centers. At this juncture it is even difficult to recommend a randomized controlled study of the two forms of therapy. Certainly our ability to perform immediate coronary angioplasty with reasonable safety in patients with acute myocardial infarction and single vessel disease is not sufficient justification to perform it. Currently, conservative medical management of single vessel disease is recommended. If the patient later develops disabling angina, there is ample time to perform angioplasty or coronary bypass surgery with safety (4).

References

1. Stone GW, Rutherford BD, McConahay DR, et al. Direct coronary angioplasty in acute myocardial infarction: outcome in patients with single vessel disease. J Am Coll Cardiol 1990;15:534–43.
2. Taylor GJ, Humphries JO, Mellits ED, et al. Predictors of clinical course, coronary anatomy and left ventricular function after recovery from acute myocardial infarction. Circulation 1980;62:960–70.
3. Roubin GS, Harris PJ, Bernstein L, Kelly DT. Coronary anatomy and prognosis after myocardial infarction in patients 60 years of age and younger. Circulation 1983;73:743–9.
4. Wilson WW, Gibson RS, Nygaard TW, et al. Acute myocardial infarction associated with single vessel coronary artery disease: an analysis of clinical outcome and prognostic importance of vessel patency and residual ischemic myocardium. J Am Coll Cardiol 1988;11:223–34.
5. Sanz G, Castaner A, Betriu, et al. Determinates of prognosis in survivors of myocardial infarction: a prospective clinical angiographic study. N Engl J Med 1982;306:1065–70.
6. Gibson RS, Beller GA, Gheorghiade M, et al. The prevalence and clinical significance of residual myocardial ischemia two weeks after uncomplicated non-Q wave infarction: a prospective natural history study. Circulation 1986;73:1186–98.