

# Coronary arteriography in unstable angina pectoris

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The National Unstable Angina Pectoris Study randomized 288 patients with unstable angina pectoris into one group receiving urgent surgery and another receiving intensive medical therapy. All patients had transient ST- or T-wave changes on the electrocardiogram during pain, and all had greater than 70% fixed luminal narrowing of at least one coronary artery at arteriography. Patients with 50% or greater luminal narrowing of the left main coronary artery were advised to have surgery. Patients with normal or insignificantly diseased coronary arteries, those with inoperable coronary artery disease, and those with left ventricular ejection fractions less than 30% were advised to have medical therapy.

This study demonstrated similar in-hospital and late myocardial infarction rates and similar in-hospital and late mortalities during an average 30-month follow-up. However, medical patients had a significantly higher incidence of severe (Class III or IV) angina during the follow-up period, and 36% of medical patients received elective surgery later for relief of incapacitating angina. No clinical or electrocardiographic phenomenon could identify those medical patients whose angina would eventually be inadequately controlled with an intensive medical program. The only significant correlate

was the extent of coronary artery disease. Of the medical patients, 49% with three-vessel disease, 32% with two-vessel disease and 20% with one-vessel disease eventually turned to surgery for relief of unacceptable angina.

In the arteriographic evaluation of more than 500 patients who met the clinical and electrocardiographic criteria during the initial part of the National Study, 10% had left main coronary disease, 15% had normal or insignificant coronary artery disease, and 7% had inoperable disease. At the Massachusetts General Hospital, 166 patients had coronary angiography during the 4 years of the National Study. Of these, 4% of the patients were not eligible for randomization because of left main coronary artery disease, 7% because of inoperable disease, and 13% because of minimal disease.

These results indicate that the yield of the coronary arteriogram is high in patients with unstable angina both in terms of the acute decision-making process and in the threshold for recommending surgery in a patient who later is inadequately controlled with intensive medical therapy. In 20% to 30% of the patients, a long-term decision for medical or surgical therapy can be made immediately. Those with left main coronary artery disease should have surgery based on the VA Study, those with inoperable disease will not be future candidates for surgery even if they have severe angina, and those with minimal disease are not candidates for surgery

and can be strongly reassured that their prognosis is good.

Among the 70% of patients who have one-, two- or three-vessel disease, which makes them equally suitable for medical or surgical therapy in the acute management of unstable angina pectoris, there is obviously a broad spectrum. The more a patient's anatomical disease approaches the equivalent of a left main coronary artery, i.e., a great deal of muscle (perhaps 40% or more) at ischemic risk from one occlusive event, the lower the physician's threshold would be to recommend surgery. Data from the European Cooperative Study, which indicate that surgery improves survival in patients with three-vessel disease, would also favor a decision for surgery in such patients. On the other hand, the less ideal the distal vessels are for surgery or the less muscle put at ischemic risk from any one occlusive event, the higher the physician's threshold would be for recommending surgery and, therefore, the more angina one would accept on a medical program.

In summary, the definition by coronary arteriography of the location and extent of obstructive coronary lesions yields a high return in the decision-making process for the acute and long-term management of patients with unstable angina pectoris. We therefore recommend coronary angiography for patients with unstable angina pectoris who are otherwise suitable candidates for possible surgical intervention.