

## Do routine clinic visits prevent de-stabilization in patients awaiting coronary revascularization?

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*Keywords:* clinics; coronary revascularization; adverse events

### Summary

We examined retrospectively the usefulness of routine clinic visits in preventing adverse cardiac events in 115 patients awaiting coronary surgery or angioplasty. Mean waiting time from angiography to revascularization was 126 days. A total of 126 visits were made by 80 patients. No deaths occurred, but one patient, despite three visits, suffered myocardial infarction at 316 days post-angiography. Eight patients required admission for unstable angina, five having been on the waiting list for less than 5 weeks. The mean number of clinic visits, number of diseased vessels and proportion on triple anti-ischaemic therapy were similar in the patients suffering such events and those remaining stable. In conclusion, the inherent unpredictability of coronary disease greatly limits the role of interim clinic visits in the prevention of adverse cardiac events in patients awaiting revascularization.

### Introduction

Following angiographic documentation of significant coronary artery disease, some patients are recommended surgery or angioplasty. The majority are discharged from hospital, following angiography, to await re-admission for the revascularization procedure. Such patients may wait several months and may be prone to adverse cardiac events. Clinic visits during this interim period are often arranged routinely and may be useful for further explanation about the advisability of revascularization, reinforcing instructions about lifestyle modification, and for continuing to optimize medical treatment. However, it is not known whether such visits make any major contribution to maintaining stability of coronary disease in these patients. We therefore conducted an audit investigating this issue.

### Patients and methods

The cardiac catheter register from March to December 1988 was examined to identify all patients who underwent coronary angiography specifically for known or suspected ischaemic heart disease. Significant coronary disease was defined as  $\geq 50\%$  luminal stenosis of at least one major epicardial artery on visual inspection of the arteriograms. Left ventricular function was estimated visually from the ventriculogram. Patients who underwent angiography during investigation for ventricular arrhythmias or valvular disease, those proceeding directly to angioplasty and those previously revascularized were excluded from analysis.

Patients with left main stem disease demonstrated on angiography during admission with acute myocardial ischaemia were retained for surgery. Those with

stable symptoms undergoing angiography during routine admission were similarly retained unless they could not be accommodated within a reasonable time span by the surgical or intensive care unit.

Re-admission for unstable angina, myocardial infarction, and death constituted adverse cardiac events. Unstable angina was defined as that which had become crescendo in pattern, or as ischaemic rest pain without infarction.

Patient characteristics, medications, clinic attendance, waiting time from angiography to revascularization and adverse events were determined by analysis of hospital records. Data were analysed using Student's *t*-test, chi-square test and Spearman rank correlation as appropriate.  $P < 0.05$  was regarded as significant.

### Results

During the 10-month period from March to December 1988, 115 patients (mean age 58 years; range 31-75; 101 males) were placed on the waiting lists for elective coronary surgery ( $n=85$ ) or percutaneous angioplasty ( $n=30$ ) following consultant review of coronary angiograms performed for the primary indication of ischaemic heart disease. At discharge following angiography, 53 patients (46%) were on triple anti-ischaemic therapy.

#### *Angiographic findings*

Disease in the left main stem was seen in 15 patients (13%) and in the proximal left anterior descending artery in 88 (77%). Eighty patients (70%) had 3-vessel disease. Forty patients (35%) had left ventricular dysfunction.

#### *Waiting time to revascularization*

The median waiting time from angiography to revascularization was 93 days (mean 126; range 8-502). Only one patient, temporarily lost in the system despite two clinic visits, waited more than one year before revascularization.

#### *Clinic attendance*

In total, 126 clinic visits were made by 80 of 115 (70%) outpatients whilst awaiting revascularization. Fifty-one patients made one visit, 15 made two visits, 11 made three visits, and three patients made four visits each. The mean number of clinic visits correlated with waiting time to revascularization ( $r_s=0.71$ ,  $P < 0.001$ ).

#### *Adverse cardiac events*

Overall, only 9 of 115 patients (8%) had adverse cardiac events whilst awaiting revascularization. None had left main stem disease. No deaths occurred.

One patient suffered anterior myocardial infarction at 316 days following angiography. Re-investigation showed an occluded left anterior descending artery, anteroapical akinesis and significant impairment of ejection fraction. Furthermore he no longer had angina and was therefore taken off the surgical waiting list. There were no other cases needing repeat angiography.

Eight patients required admission for unstable angina; five did so within 5 weeks of angiography. Six of the eight subsequently underwent revascularization during this re-admission.

There was no significant difference between the patients with adverse events and those remaining stable in the mean number of clinic visits (1 vs 1), number of diseased vessels (2.7 vs 2.7), waiting time to revascularization (89 vs 129 days) or proportion on triple therapy (6/9 vs 47/106).

### Discussion

This audit was undertaken to examine the potential role of routine clinic attendance in preventing adverse cardiac events in patients awaiting revascularization. A significant proportion of patients undergoing coronary angiography at our regional centre are recommended either bypass surgery or percutaneous angioplasty, and this is also true in other units due to coronary disease commonly being advanced by the time angiography is performed<sup>1</sup>. Furthermore, the practice of arranging routine clinic visits is widespread, but to our knowledge, there is no published evidence that they help to prevent adverse events in outpatients awaiting coronary revascularization.

As expected, the longer the waiting time to revascularization, the greater the number of clinic visits. The only case of myocardial infarction occurred unexpectedly in a patient who had had three clinic visits whilst awaiting surgery. Five of the eight patients requiring emergency admission for unstable angina in fact did so within 5 weeks of angiography, ie before their first routine clinic appointment at 6 weeks. It is not known if first visits timed for earlier than the usual 6 weeks post-discharge from angiography might have affected the outcome. However, we found no overwhelming evidence to suggest that routine clinic attendance can have any major impact on the incidence of adverse events.

Ideally, patients need to be brought back to clinic only to discuss the appropriateness of revascularization or to allow a further trial of maximum medical

therapy. However, once a recommendation of surgery or angioplasty has been accepted by the patient who is duly placed on the waiting list, there is no compelling reason why he or she should be subjected to further routine clinic attendance. Nevertheless, patients' psychological well-being may be compromised whilst awaiting revascularization<sup>2</sup>, and we acknowledge that some may find such visits reassuring. However, if waiting lists were not so long, there might be no perceived need, either on the part of the doctor, the patient or the relatives, for interim visits.

The current reality is that routine appointments are often given and they add to the considerable workload of active cardiac units with no proven benefit in return. Many patients find follow-up visits to busy crowded clinics stressful and of questionable value<sup>3</sup>, and may be content simply to have been instructed to notify their general practitioner or even the hospital directly of any deterioration whilst awaiting revascularization.

Good communication should also be maintained between the cardiac unit and general practitioner so that the latter is aware of the patient's anatomical disease, anti-ischæmic medications and recommended revascularization method, and the former is immediately informed if the patient's symptomatic state becomes of concern.

In conclusion, it must be remembered that following angiography, patients are discharged in a stable state even if they had originally presented as emergencies, and the vast majority remain stable. When coronary disease becomes unstable, it often does so unpredictably, and no practicable amount of clinic supervision can guarantee against this occurring. However, the economics of lengthy waiting lists for coronary surgery or angioplasty must take account of such interim clinic visits, but this study suggests that their role in preventing de-stabilization of coronary disease is very limited.

### References

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(Accepted 25 March 1991)