Indications for investigation and angioplasty in unstable angina

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The treatment strategy adopted for any condition is dependent on knowing the untreated natural history and the way it is modified by the various forms of treatment available. Unstable angina was the subject of intensive study in the 1970s and reports of a number of these studies concerning a total of 1,909 patients have been reviewed to provide information on the expected outcome [1-13].

The incidence of myocardial infarction occurring within one month of hospital admission in medically treated patients ranged from 5 to 18 per cent for series reporting the results of both medical and surgical therapy and from 6.4 to 11 per cent for the series employing only medical therapy. The comparative figures for death were 0 to 5.3 per cent and 1.6 to 3.8 per cent respectively. The relatively large differences between these figures are at least in part explained by the difficulty in precisely defining this group of patients. Rest pain, which is currently considered an important diagnostic criterion, was for instance present in 26 to 100 per cent of patients in the reviewed series. In an attempt to overcome this difficulty, the London Chest Hospital series was confined to patients with recurrent attacks of rest pain. Ninety per cent was the highest figure in the remaining reports. The incidence of recent onset angina varied between 19 and 51 per cent. Despite these difficulties, it is clear that there is a definite risk of major complications occurring early after admission with unstable angina, justifying an aggressive approach to its management.

The subsequent survival of medically treated patients is better than for those with severe exertional angina and similar to those with milder angina. Figure 1 shows 10-year survival curves for 5,473 patients. The survival of the 765 patients with grade 4 angina (recurrent rest pain) was significantly better ($p < 0.01$) than for the 961 patients with grade 3 angina (pain on mild exertion). The group without angina (grade 0) includes a number of patients with severe left ventricular damage, which explains their relatively high mortality. Since all of these patients were ‘selected’ for medical treatment the differences are likely to be reliable.

There is now good evidence from pathological studies [14] and angioscopy [15] that the cause of unstable angina is plaque rupture, usually with thrombus formation. The thrombus may come and go spontaneously, probably accounting for the fluctuating symptoms. It has not been demonstrated whether or not these lesions heal, although it is likely that they do since the symptoms settle in the majority of patients, and patients with stable angina do not have such lesions although a number of them have previously been unstable. This is one factor which may be responsible for the relatively good long-term prognosis.

Another may be the fact that the coronary disease which is an important determinant of prognosis is similar in these patients to the whole spectrum of stable angina including those with mild symptoms and a good prognosis (Fig. 1). A comparison of the coronary arteriographic findings in these two groups shows that the range of disease is similar (Table 1). The distribution of disease in the reviewed reports that contained angiographic data was also similar.

Unstable angina is the commonest reason for urgent cardiac catheterisation in most laboratories dealing with adult patients. At the London Chest Hospital, it has accounted for 18.9 per cent of all procedures since 1970. Many of the patients are transferred from District General Hospitals, where they have already received full medical therapy, including intravenous nitrates, and continue to have attacks of cardiac pain at rest. These patients are investigated urgently. They were previously all then treated surgically provided there was at least one suitable coronary lesion. Forty-one per cent of the 1,333 patients with recurrent rest pain listed in the London Chest Hospital database had aorto-coronary bypass. The operative risk was higher, at approximately 5 per cent, in these patients than in the isolated elective procedures where it was less than 2 per cent between 1971 and 1982. Other centres have also reported an increased surgical risk [2,4,12,16]. There was no difference in long-term

| Table 1. Coronary arteriographic findings in patients with stable and unstable angina. |
|---------------------------------|-------|-------|
|                               | Effort angina (1617 patients) | Rest angina (100 patients) |
| Normal                         | 19    | 10    |
| Left main stenosis             | 6     | 6     |
| Single vessel disease          | 16    | 13    |
| Double vessel disease          | 23    | 23    |
| Triple vessel disease          | 36    | 36    |
| Anterior descending disease    | 70    | 64    |

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survival between the medically and surgically treated patients in the London Chest series (Fig. 2) which was retrospective, nor in the major randomised study in the USA [12]. The patients treated medically did have a higher incidence of angina during follow-up.

Angioplasty offers an alternative to surgery, especially where prognosis is unlikely to be affected. It is being used more frequently to treat patients with both stable and unstable angina. Of the first 407 patients undergoing the procedure at the London Chest Hospital, 108 were having recurrent cardiac pain at rest. Their age and sex distributions were similar to the patients with exertional angina.

The angiographic criteria for case selection were simi-
Fig. 3. Comparison of the vessels' angioplasty was used for inpatients with stable and unstable angina. AP Gr1–3 (shaded area) – varying degrees of exertional angina; AP Gr4 (unshaded area) – angina at rest; LAD – left anterior descending coronary artery; RCA – right coronary artery; LCX – circumflex coronary artery. p = NS.

Fig. 4. Comparison of the number of angioplasties per patient in stable and unstable angina. AP Gr1–3 (shaded area) – varying degrees of exertional angina; AP Gr 4 (unshaded area) – angina at rest.

Fig. 5. Comparison of the number of patients who suffered a major complication or proceeded to surgery after angioplasty either for stable or unstable angina. AP Gr1–3 (shaded area) – varying degrees of exertional angina; AP Gr4 (unshaded area) – angina at rest; EMBG – emergency bypass surgery; ELBG – elective bypass surgery; MI – myocardial infarction; Dth – death.

lar to those for stable angina. More than 60 per cent of the patients had single vessel disease and less than 10 per cent triple vessel disease.

The most frequently treated coronary artery was the anterior descending, followed by the right and then the circumflex. Figure 3 shows a comparison of the vessels treated with the stable group. Although the proportion of anterior descending arteries attempted was smaller in the latter patients, the difference was not significant. Eighty-seven per cent of the procedures were single angioplasties which is significantly greater than in the stable group (Fig. 4), reflecting the desire to deal expeditiously with the symptoms in these acutely ill patients.

Figure 5 shows the number of patients who proceeded to surgery or suffered a major complication. The 6.4 per cent incidence of myocardial infarction was significantly higher than the 2 per cent incidence in the stable group, although there were no deaths compared with four in the stable group.

The overall success rate was approximately 70 per cent for both groups. These figures include the period of learning the technique and also the results of attempts on totally occluded vessels which have a lower success rate.

Recurrence of stenosis is similar to that after angioplasty for stable angina.

These data allow the development of a policy for the management of patients with unstable angina. Figure 6 is a flow-chart to demonstrate the suggested strategy. The numbers of patients are based on the reviewed data. Medical management has improved, specifically with the routine use of both calcium antagonists and intravenous nitrates, so that more patients can be expected to have symptomatic relief than in the previous reports. The 30 patients with uncontrolled pain proceed to angiography. The remaining 70 are mobilised and some will develop symptoms and be investigated. The remainder undergo exercise testing. The 20 who complete a normal test can be followed on medical therapy. Fifty more patients therefore proceed to angiography. The likely angiographic findings are as follows: fifteen patients will have minor disease and can be treated medically; thirty-five will have left main stem stenosis or triple vessel involvement and will be treated surgically for both symptomatic
and prognostic reasons; the remaining 30 patients with single and double vessel disease would be candidates for angioplasty.

In summary, approximately 80 per cent of patients who present with unstable angina are likely to be investigated with coronary angiography for either continuing pain or an abnormal exercise test, and approximately 30 per cent of these will undergo angioplasty.

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The secret writer

Names get linked with things, like Grace Darling and lifeboats. So it is Bright for kidneys and Pitman for shorthand. Just to confuse the issue, English shorthand was actually invented by Dr Timothy Bright in 1588. That year he published his book, Characterie. An Arte of Short Swift and Secret Writing. Wisely, he dedicated his work to the Queen who rewarded him with a fifteen-year monopoly for his invention.

Bright knew the Elizabethan score. He was an impoverished student at Trinity College, Cambridge, but managed through his tutor to be known to Lord Burghley. Bright’s positive attitude to the values of patronage was well expressed by a friend who wrote of him that he ‘desired to be insinuated to the acquaintance of Mr Robert Cecil’. Who better than Lord Burghley’s son to guide your career. After Cambridge, Bright went to Europe to study medicine and was in Paris during the St Bartholomew’s day massacre. He escaped injury by staying in the English Embassy with Sir Francis Walsingham and the young Philip Sidney. On his return to England he took his medical degree at Cambridge and settled in that town to practise as a physician. There, in 1580, he started his literary career with The Sufficiency of English Medicines which extolled the remedies available in England, without recourse to any foreign medicament. This work was dedicated to Lord Zouch who had been at Trinity College with him and who had a physic garden in Hackney. After writing on hygiene and sanitation, Bright thought of London, aiming to be elected to St Bartholomew’s Hospital.

Barts, refounded by King Henry VIII, had appointed Dr Lopez as its first physician. He retired in 1581 to become the Queen’s physician. He gained the melancholy fame of being the only FRCP to be executed for high treason. A Dr Turner replaced Lopez but he developed political ambitions and left Barts in 1584 to become MP for Bridport. Bright saw his chance when Turner was preparing to go. Armed with a letter from Walsingham, he persuaded the Governors of Barts that he should gradually take over from Turner. At this point the College of Physicians announced its interest and put forward Dr Wotton FRCP. The Governors were convinced by the College’s argument that the hospital needed a distinguished physician as ‘that place hath oftentimes great and strange accidents and divers cases of importance not elsewhere usual.’ Refusing to accept that merit deserved to triumph over political clout, Bright came back with a letter signed by most of the Queen’s Privy Council. This was enough for the Governors to go back on their word, reject Wotton and appoint Bright as physician to Barts. The College licked its wounds and later summoned Bright to attend, presumably to explain why he was practising in London without a license. When Bright failed to attend, the College issued an order to commit him to the Fleet prison. This was legally correct but no friend of the Privy Council would obey. Bright continued on his way at Barts without further interference but to the discomfort of the hospital.

Living in a ‘grace and favour’ house belonging to the hospital, Bright set out on his literary career without more than scant attendance on his patients. Apart from his work on shorthand he wrote a treatise on melancholy in 1586. This was to be eclipsed by Burton’s later and more famous book Anatomy of Melancholy (1621). However, Professor Dover Wilson put forward a convincing argument that Shakespeare had read Bright’s work and made much use of it in Hamlet. It is also true that the first use of the word ‘characterie’ was by Bright in the title of his book on shorthand and it was then used by Shakespeare in two of his plays.

Barts grew more and more disillusioned with the literary physician, and Bright was finally sacked in 1591, the record showing that ‘Dr Bright hath bine often warned for neglectinge his dewty about the poore of this house.’ It seems much in character that Bright met his setback by neatly sidestepping into the established church and immediately reappearing as the vicar of a Yorkshire parish. There, he still treated patients and also indulged in a rather unsavoury dispute on tythes. So Bright faded from history. Certainly he was an enemy of the College of Physicians, and we shall never know if he was actually a friend of Shakespeare.